REPUBLIC OF THE GAMBIA

The Gambia Water And Sanitation Project (P513113)

Environmental and Social Impact Assessment (ESIA)

Fecal and Sludge Treatment Plant in Kotu

DRAFT

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List of Acronyms

AFD	Agence Française de Développement (French Development Agency)
DHS	Department of Health and Safety
DoF	Department of Forestry
DPPH	Department of Physical Planning and Housing
DWR	Department of Water Resources
EIB	European Investment Bank
ESHS	Environmental, Social Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FS	Feasibility Study
GBA	Greater Banjul Area
GBoS	Gambian Bureau of Statistics
GBV	Gender-Based Violence
GERMP	Gambia Electricity Restoration and Modernization Project (World-Bank)
GRM	Grievance Resolution Mechanism
KII	Key Informant Interviews
LAA	Local Assessment Area
LGA	Local Government Area
MOH	Ministry of Health
MoLRG	Ministry of Lands and Regional Government
MoYS	Ministry of Youth and Sport
MoYS	Ministry of Youth and Sports
NAWEC	National Water and Electricity Company
NDMA	National Disaster Management Agency
NEA	National Environment Agency
NRA	National Roads Authority
OHS	Occupational Health and Safety
PAD	Project Appraisal Document
PAD	Project Development Area
PIU	Project Implementation Unit
PURA	Public Utility Regulation Authority
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
ToR	Terms of Reference
VAC	Violence Against Children
VEC	Valued Environmental Components
GWASAP	Water Supply Project in the Greater Banjul Area
WB	World Bank
WTP	Water Treatment Plant

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Executive Summary

Introduction and Purpose of the ESIA

This Executive Summary presents the main findings of the Environmental and Social Impact Assessment (ESIA) prepared for the Wastewater Treatment Plant of the Gambia Water and Sanitation Project, implemented by the National Water and Electricity Company (NAWEC) and financed by the World Bank Group.

The ESIA identifies, assesses and manages the environmental and social risks and impacts associated with the implementation of a wastewater treatment plant in Kotu and defines the mitigation measures, monitoring plan and institutional framework required through an Environmental and Social Management Plan (ESMP).

Project Background and Rationale

Water and sanitation services in the Greater Banjul Area (GBA) are affected by chronic constraints, including intermittent service, frequent outages and failures, insufficient storage capacity, and water quality challenges. Rapid urbanisation and population growth have further increased pressure on existing sanitation infrastructure.

The GWSP Project aims to address these challenges by reinforcing sanitation treatment and storage systems and by strengthening NAWEC's operational capacity and monitoring systems.

Description of the Project

Component 1: Water Resources Monitoring and Conservation

Sub-Component 1.1: Enhancing transboundary cooperation on the Senegal-Mauritanian Aquifer Basin (US$0.5M). This sub-component aims to strengthen The Gambia's leadership in regional water governance by activating the National Permanent Water Committee under OMVG. This committee will coordinate stakeholder contributions to the upcoming Senegal-Mauritanian Aquifer Basin (SMAB) cooperation agreement. This sub-component will facilitate national multi-stakeholder consultations and encourage The Gambia's active involvement in SMAB cooperation processes, ensuring sustainable mobilization of this water source for drinking water supply. **Water Storage**.

Component 2: Improving Access to Sanitation Services

This Component aims to improve the sanitation infrastructure of the Greater Banjul Area, contributing to improved living conditions, including better air and water quality, increased flood resilience as well as increased public hygiene. Additionally, it seeks to tackle sanitation and hygiene challenges in vulnerable regions identified in the National Sanitation and Hygiene Policy (NSHP), which advocates for universal access to safely managed sanitation by 2030. The ESIA will be particularly focused on the component 2 investments.

Component 3: Improving Access to Urban Drinking Water Services

The objective of this subcomponent is to enhance access to drought resilient, improved water sources in GBA and surrounding towns. Funded initiatives will involve constructing boreholes in both deep and shallow sand aquifers, establishing a water treatment plant, and installing transmission lines and storage tanks. Additionally, the projects will include expanding the distribution network, creating more water connections, and improving management of non-revenue water.

Component 4: Support to Sector Reform, Water Utility Capacity Building and Project Management

This component will support the ongoing strategic policy and institutional reforms associated with the unbundling of NAWEC and the creation of a new National Water Company. It includes four

performance-based conditions (PBCs) with an estimated value of USD 2 million, which is 6.6 percent of the total IDA financing. These PBCs designed to ensure the effective implementation of the separation roadmap and establish a foundation for the financial sustainability of the new water company are as follows:

- **PBC 1:** Implementation of NAWEC's unbundling roadmap, adoption of the new Water Company's contract program with the government, and development of a WSS sector roadmap that includes a coherent program for Sustainable Development Goal 6 (SDG 6).
- **PBC 2:** Conducting a tariff study for the urban water sector, which should include affordability and efficiency analysis, and the adoption and implementation of a new water tariffs grill that will enable cost recovery for the water utility operations**.**
- **PBC 3:** Development of a financial model for the new water utility **(NAWEC)**; and
- **PBC 4:** Signing a performance-based contract with a private sector operator to assist in managing non-revenue water (NRW), aimed at improving NAWAC's performance.

Component 5. Contingent Emergency Response Component (CERC)

This zero-funded component will allow the Government to quickly mobilize funds in an emergency requiring immediate recovery and reconstruction response. In the event of a crisis or disaster caused by a natural hazard, including climate-related emergencies such as severe drought and flood, this component enables the Government to reallocate IDA project funds to disaster response and recovery purposes under streamlined procedures. It will therefore support The Gambia's emergency preparedness and response capacity, including financing of critical emergency goods or emergency recovery and associated services, as well as the targeted provision of post-disaster support to affected households and individuals. Following an adverse natural event, the Government's declaration of disaster in accordance with national law, and adherence to the Bank's activation policy, the contingency component would be triggered.

ESIA Methodology and Stakeholder Engagement

The ESIA was prepared through a combination of:

- Review of applicable legislation, standards and project documentation;
- Field surveys, site visits and baseline data collection (including water and soil sampling);
- Definition of spatial boundaries for environmental and social assessment;
- Stakeholder engagement and consultations with relevant public institutions and sector authorities.

Consultations were undertaken with national and local institutions (including NEA, NAWEC, DLS, PURA, DWR, Women's Bureau, Department of Social Welfare and Department of Labor). Feedback received informed route selection, design refinement and mitigation measures.

Applicable Environmental and Social Standards

The ESIA has been prepared in accordance with:

National environmental assessment requirements of The Gambia, under the authority of the National Environment Agency (NEA); and

International financier requirements, including alignment with the World Bank Environmental and Social Standards (ESS), as required.

Relevant standards addressed include those related to environmental and social risk management, labor and working conditions, resource efficiency and pollution prevention, community health and safety, biodiversity conservation, cultural heritage and stakeholder engagement.

Baseline Environmental and Social Conditions

Physical Environment

The project area lies within a Sudano-Sahelian climatic zone, characterized by a marked rainy season and a long dry season. Seasonal rainfall patterns have implications for construction scheduling, erosion control and stormwater management.

The Greater Banjul Area is generally flat and low-lying, with localized erosion and flooding risks during heavy rains. Water resources rely primarily on groundwater systems (Shallow Sand Aquifer and Deep Sandstone Aquifer), with surface water bodies and wetlands present in the wider area.

Socio-Economic Context

The Greater Banjul Area is densely populated and economically active, with livelihoods including petty trade, roadside businesses, agriculture and livestock in peri-urban zones. Sanitation mostly depends on soakaway Intermittent water supply places a disproportionate burden on households, particularly women and vulnerable groups.

Key Environmental and Social Impacts and Risks

Construction Phase

The most significant adverse impacts are expected during construction and are generally temporary and localized.

Environmental risks include:

- Dust emissions and localized air quality impacts;
- Noise and vibration from construction equipment;
- Soil disturbance, erosion and sediment mobilization;
- Construction and demolition waste generation;
- Localized vegetation clearance.

Social risks include:

- Occupational health and safety risks for workers;
- Community health and safety risks due to open trenches and machinery;
- Risks related to labor influx and worker behavior, including GBV/SEA/SH and VAC risks;
- Potential chance finds of cultural heritage during excavation.

Operation Phase

Operation is expected to generate significant positive impacts, including improved service continuity, public health benefits and socioeconomic gains. Residual risks relate mainly to chemical handling, maintenance activities and system failure events (e.g. pipe bursts), which are manageable through standard operational controls.

Mitigation Measures and ESMP

An Environmental and Social Management Plan (ESMP) has been prepared to address identified risks. Contractors will be required to develop and implement Contractor-specific ESMPs (C-ESMPs) and method statements.

Key mitigation measures include:

- Dust suppression and noise management;
- Waste segregation and disposal at authorized facilities;

- Spill prevention and hazardous materials management;
- Occupational and community health and safety measures;
- Minimization and restoration of vegetation disturbance;
- Strengthened water quality monitoring and treatment control;
- Labor management procedures and codes of conduct addressing GBV/SEA/SH and VAC risks.

Institutional Arrangements, Monitoring and Reporting

NAWEC is responsible for overall ESMP implementation, supported by contractors and supervised by the Consultant. Regulatory oversight will be provided by NEA and other relevant authorities. Monitoring, reporting and corrective actions are defined within the ESMP, including compliance monitoring and periodic reporting.

Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) will be implemented to allow communities and workers to raise concerns or complaints. The GRM includes clear procedures for intake, assessment, resolution and feedback.

Complaints related to SEA/SH and VAC will be handled through confidential, survivor-centered procedures, with trained focal points and appropriate referral pathways.

Conclusion

The ESIA concludes that the Wastewater Treatment Plant of the GWSP Project are environmentally and socially acceptable, provided that the ESMP and associated contractor measures are fully implemented. Construction-related impacts are temporary and manageable, while long-term benefits in terms of water supply reliability, public health and service delivery are substantial and aligned with national and financier objectives.

1 Introduction and background

1.1 Proposed project overview and rationale

The World Bank will fund "**Gambia Water and Sanitation Project**" (GWSP) that has been initiated by the Government of The Gambia and NAWEC to address the critical challenges facing the urban water and sanitation supply and management sector: ageing water sanitation facilities, high levels of pollution and none treated wastewater, degradation of groundwater resources (in quality and quantity), and recreational water bodies.

The deteriorating of sewage infrastructure and inadequate sanitation are creating a significant health and environmental problem in The Gambia. Currently, only 28% of the population has access to safely managed sanitation facilities, while some individuals, particularly in rural areas, still practice open defecation. The country is facing challenges with wastewater treatment, as 80% of wastewater is improperly treated, leading to groundwater contamination and associated health risks. In Greater Banjul Area, there is only one wastewater treatment plant located in Kotu, which primarily serves the hotels installed between Bakau and Fajara areas. Although stabilization ponds are in place, they are overloaded, resulting in the regular release of inadequately treated sewage into natural water bodies. Additionally, the management of fecal sludge is poor. Many residents, in Greater Banjul Area, who are not connected to the sewer system depend on poorly constructed septic tanks or soak aways, which are often built in areas with high water tables. The collection and disposal of fecal sludge in these areas is infrequent and inadequate, leading to dumping in open spaces or into waterways adjacent to agricultural zones. This mismanagement is already compromising water quality and availability, particularly due to nitrate contamination. Furthermore, flooding events are expected to exacerbate the situation by increasing the volume of untreated sewage and fecal sludge that leaches out into groundwater.

Sanitation and Hygiene: The Gambia has made progress in sanitation and hygiene, with access to basic sanitation increasing from 40% in 2000 to 60% in 2022, and basic hygiene services rising from 20% to 31% in the same period. However, challenges persist, such as the need for increased investment to achieve universal access by 2030. Currently, only 28% of the population has safely managed sanitation, 40% use unimproved sanitation facilities and less than 1% practice open defecation, particularly in rural areas. The country faces inadequate wastewater treatment, with 80% of wastewater improperly treated, leading to groundwater contamination and health risks made worse by increased frequency of climate change exacerbated flooding[1].

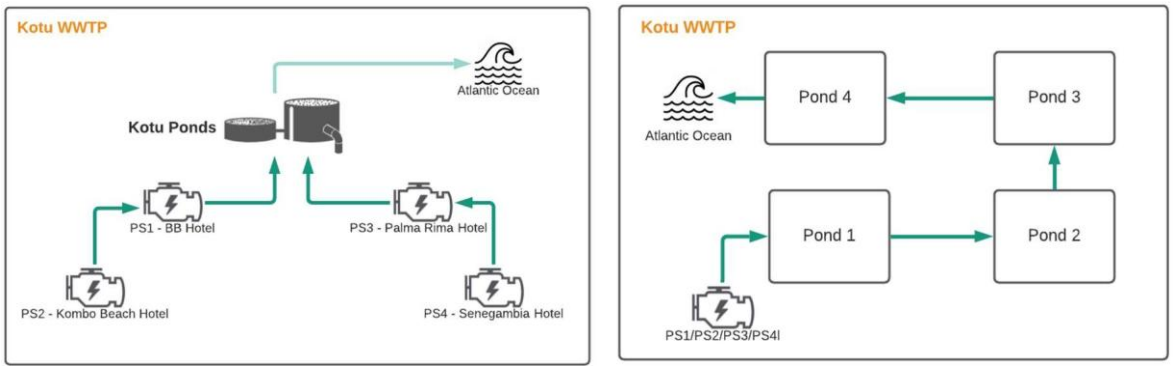
WASH Service Quality: The Institutional framework ensuring water quality standards are followed is robust but hampered by challenges such as inadequate enforcement mechanisms, limited funding and a lack of coordination among agencies. The Gambia Public Utilities Regulatory Authority (PURA) has established guidelines for minimum quality standards in water and sanitation services, which include requirements for potable water production, distribution, and sewage management. Key mandates include maintaining a water pressure of 1.5 bars, limiting service interruptions to 12 hours monthly, and ensuring sewage discharge meets specific quality standards (BOD[2] of 30 mg/L and TSS[3] of 50 mg/L). However, challenges persist, such as limited monitoring capacity and the impact of extreme weather events such as floods and droughts and changing precipitation patterns that worsen water scarcity and contamination, posing additional challenges for WASH services.

Kotu drainage system was constructed in 1988 to treat wastewater generated from tourist development areas in the Kotu area. Kotu WWTP is the only existing facility for wastewater treatment

[1] UN Water: SDG 6 snapshot in Gambia.
[2] Biochemical Oxygen Demand
[3] Total Suspended Solids

(pond system) and the influent is pumped through 4 pumping stations (PS1 to PS4) coming from the hotels installed between Bakau and Fajara areas. The wastewater treatment plant also receives fecal sludge from dumping trucks which empty their trucks directly into pond n°1. The wastewater is equipped with inlet works, coarse screening and grit removal upstream the pond system. After passing the pond system, wastewater is discharged first into a stream next to the WWTP which then discharges into the ocean.

Figure 1-1: Synoptic of Kotu WW network and treatment plant



NAWEC has been responsible for the operation of Kotu WWTP since 2020, The pond N°1 was dredged in 2022 as per the operation team information at site. This plant was originally constructed to treat only wastewater coming from the network, but today the plant is overloaded as it receives fecal sludge discharged into one of the ponds in addition to wastewater flow from the drainage system.

Today the fecal sludge volumes represent more than two thirds of the total inlet flow, and the pond system is overloaded. Considering an average of the volume entering the plant in dry and wet season, the flow is estimated respectively at 700 m3/day and 1800 m3/day. Seasonality has an impact on the wastewater collection from both sources' trucks and wastewater networks.

This project aligns with the approach of integrating interventions designed to positively impact water resource management and enhance access to water and sanitation services in selected urban and rural areas by improving wastewater and sludge management. The project design will be informed by existing feasibility studies, analytical work and insights gained from the ongoing NAWEC projects.

1.2 ESIA scope

The present ESIA is therefore additional to the Drilling Works ESIA and has been prepared to cover the remaining activities included under the Medium-Term Works package. It builds on the earlier project phases and expands the assessment to a broader range of infrastructure and service improvement activities.

Activities required as part of the Medium-Term Works to address all components of the water supply system have been identified in a revised and expanded scope and include:

- Water Production:
  - Protection of well fields;
  - Increased production capacity.
- Water Treatment:
  - New water treatment plant and improvement of existing treatment facilities.
- Water Transmission:
  - Increased capacity for the transmission of potable water, while maintaining the appropriate level of services across the system.

- Water Storage:
  - Increase capacity of existing reservoirs to mitigate peak demand requirement and maintain acceptable minimum pressure for all beneficiaries;
  - Provision of new reservoirs for the new service areas.
- Water Distribution:
  - Inclusion of service connection for vulnerable households and the provision of community water collection points;
  - Remediation of existing distribution networks layout allowing for increased service provision for beneficiaries;
  - Provision of service to new populated areas currently without.

1.3 Purpose and objectives of ESIA study

Results from the feasibility studies show that most of fecal contamination in Kotu stream, comes from wastewater discharge since upstream sample does not exceed quality limits. Fecal contamination is mostly present between the WWTP discharge and the beach.

Total nitrogen concentration values in wastewater (>300 mg/l) obtained during the sampling campaign seem extremely high when compared to typical municipal wastewater values (usually < 100 mg/l).

This ESIA concerns the construction and rehabilitation at the Wastewater Treatment Plant in Kotu GWASA Project. It assesses the potential ecological, biophysical, social and community-related impacts associated with the implementation of the revised and expanded Wastewater Treatment Plant scope of works, and defines the mitigation, management and monitoring measures required for their implementation.

The present ESIA focuses specifically on the rehabilitation and improvement of the Kotu Wastewater Treatment Plant and consolidates the environmental and social assessment framework for this portion of the Gambia Water and Sanitation Project (GWASAP).

The objectives of this ESIA report are to:

- Apply Gambia's regulatory obligations to obtain the environmental compliance certificate issued by the National Environment Agency (NEA);
- Meet international standards for the implementation of the project, especially the World Bank Environmental and Social Standards;
- Assess the risks and potential impacts resulting from the implementation of the project;
- Identify practical measures to avoid, reduce or compensate for significant negative impacts, as well as enhance positive impacts;
- Define requirements for management and monitoring;
- To consult the affected and interested parties by the project to collect their views, concerns and suggestions in order to take them into account in the avoidance, reduction, compensation and improvement measures.

1.4 Methodological approach for the ESIA

The ESIA methodology included a review of all the feasibility studies of the water and sanitation projects of NAWEC, relevant national policy frameworks and legislation; World Bank Environmental and Social Standards; the Project Concept Note (PCN) and the Project Appraisal Document (PAD); and applicable international conventions and treaties ratified by The Gambia, together with other relevant project and reference documents.

This review served to establish the description of the project activities and different components, the legal, regulatory, and institutional framework applicable to the assessment and to ensure that all relevant environmental and social issues were appropriately considered. Where legal policy instruments identified protected or sensitive receptors, such as historical sites, forests, and other areas of environmental or cultural significance, these were given special attention during the study to identify their presence within the project area and assess any associated risks or potential impacts.

The review further highlighted key issues to be taken into account during the assessment and in subsequent stages of project implementation, including the requirement for stakeholder consultation for inclusive implementation and sustainable management of the GWASAP.

The identified WB Environmental and Social Standards that have been triggered by this project also informed the assessment by identifying specific environmental and social matters requiring detailed consideration. Together with the Terms of Reference (ToR), these project documents provided the basis for the identification and evaluation of potential impacts, including:

- Physical scope of the Project in The Gambia;
- Project components, materials and activities that are likely to result in environmental and social change; and
- Institutional arrangements for the project implementation.

In addition to the above, an extensive review of a broad range of data from multiples sources was undertaken, including a selection of features derived from appropriate secondary spatial datasets collected by different national sectoral institutions. The full list of relevant documents reviewed is provided in the Bibliography.

The following sections describe the approach, methods, and tools used to address the main elements of the assessment process. As the impact assessment is site-specific, individual activities at different locations were assessed separately, and corresponding management plans were developed. Overall, the following approach was adopted:

1.4.1 Desktop research

The ESIA team conducted a comprehensive search and review of available literature relating to the project area, comparable projects, and requirements of national regulators and international development partners, particularly the WB ESS. The material reviewed included reports of similar studies, the previous feasibility studies done in 2023-2024, academic research, technical/government publications, and meteorological data relevant to the project area. Establishing a comprehensive understanding of the environmental and social information already available was essential for the ESIA process.

1.4.2 Defining the spatial boundaries for assessment

The impact assessment required the definition of the Project Development Area (PDA) as spatial boundaries for assessing potential impacts on the social and biophysical environment.

These assessment boundaries provide the basis for identifying and evaluating the significance of project-related risks and impacts on affected ecosystems and socioeconomic parameters.

The Wastewater treatment plant work of the GWASAP will be specifically implemented in Kotu where an existing WWTP is functioning.

Most of the activities with potential environmental and social impacts involve construction renovation work, equipment renovation and upgrade. Therefore, the main parameters associated with the project include soil, groundwater, ambient environment, biodiversity, socioeconomic aspects, Occupational Health and Safety. These environmental components served as the basis for defining risks and impacts.

Local Assessment Area (LAA) refers to the maximum area within which project-related impacts on the biophysical and socioeconomic environment can be predicted or measured with a reasonable degree of accuracy and confidence (

).

The LAA was defined primarily based on potential noise impacts from the use of heavy equipment, which is common across all project activities.

Figure 1-2: Map of Project spatial boundaries for assessment

1.4.3 Defining the temporal boundaries

The temporal boundaries of the ESIA have been defined to capture the potential environmental and social impacts associated with all relevant phases of the Wastewater Treatment Plant lifecycle, namely: the construction phase, the operational and maintenance phase, and the eventual decommissioning phase.

The construction/renovation phase is expected to generate the majority of the potentially adverse environmental and social impacts. These may include disturbances related to site preparation, trenching, installation of pipelines, dredging of ponds, and associated infrastructure, noise, dust emissions, occupational health and safety risks, and temporary impacts on nearby communities and economic activities.

The operational phase is anticipated to result predominantly in positive impacts, given the critical importance of reliable and safe wastewater treatment plant for public health, livelihood, and ecosystem protection and ecosystem services within the Greater Banjul Area. However, certain residual risks may arise during routine operation and maintenance activities, such as risks associated

with equipment failure, accidental contamination, improper waste management (e.g., used materials), or occupational health and safety concerns.

Although decommissioning is not foreseen within the immediate timeframe of the Project, the ESIA also considers the long-term perspective. The infrastructure installed under the GWASAP wastewater treatment plant work will eventually reach the end of its technical lifespan and may require replacement, upgrading, or removal after several decades of operation. Future decommissioning activities could generate impacts related to the dismantling, storage, recycling, or disposal of obsolete equipment and materials. These aspects are therefore acknowledged to ensure that the GWASAP is aligned with a lifecycle approach to environmental and social management.

1.4.4 Baseline data collection

1.4.4.1 Biophysical environment

A detailed understanding of the existing environmental and social conditions is needed to appropriately, and adequately, predict how these conditions might change as a result of the project.

Primary baseline data for the biophysical environment were obtained between the 03 August and 07 August 2026 through field investigations undertaken by a multidisciplinary team of specialists.

These were supported by land use and land cover mapping to characterize vegetation types, habitat conditions, and biodiversity features. Particular attention was given to species of conservation concern, including those listed under the IUCN Red List, to determine their potential exposure to project-related impacts.

1.4.5 Approach used for the stakeholder consultations

The stakeholders include national institutions such as the NEA, the NRA, DWR, and NAWEC, NSPA etc., which, by virtue of their respective institutional mandates, have interest in the project.

The ultimate objective is to adequately elaborate on the impacts of the project activities and discuss the roles, legal requirements and capacity of these institutions with respect to the Project. Therefore, the engagements had two main objectives:

- To provide stakeholders with relevant information about the project; and
- To gain their views, concerns, and aspirations about the project, including their participation.

The methods and tools used in the stakeholder consultation are described in Chapter 5, *Consultations and Public Participation*. Meetings held with organizations, institutions, and communities are listed in **Annex 2**.

1.4.6 Site visits

Reconnaissance site visits were made 03 August and 07 August 2026 to familiarize the Consultant with the intervention site to acquaint the team with the nature of the environmental and social concerns of the area.

Table 1-1: Sites visited

Date	Sites visited
03/08/26	Existing project site boundary
06/08/26	Kotu stream
07/08/26	Proposed area for expansion

1.5 ESIA report structure

The report is structured as follows:

- Executive summary
- Chapter 1: Introduction and background
- Chapter 2: Institutional and legal framework
- Chapter 3: Project Description
- Chapter 4: Alternatives analysis
- Chapter 5: Environmental and social baseline situation
- Chapter 6: Consultations and Public Participation
- Chapter 7: Assessment of potential impacts and mitigation
- Chapter 8: Environmental and social management plan
- Chapter 9: Implementation Arrangements
- Chapter 10: Monitoring and Reporting of ESMP implementation
- Chapter 11: Grievance redress mechanism
- Chapter 12: Conclusion

2 Institutional and legal framework

This Chapter describes the various national and international policies, legal and institutional frameworks, as well as the World Bank Environmental and Social Framework that will guide the development and implementation of this ESIA and its ESMP. The relationships and relevance of these instruments regarding the Gambia Water and Sanitation Project are indicated in the table below.

2.1 National policies and legal framework

Table 2-1 indicates the relevant national and international policies and legal framework that will guide the development and implementation of the wastewater treatment plant of the Gambia Water and Sanitation Project.

Table 2-1 : Relevant National and International Policies and Legal Framework

NATIONAL POLICIES			
Policy	**Description**	**Relevance To Medium-Term Works**	**Focal Institution**
Gambia Environment Action Plan, GEAP (2009-2018)	Integrated environment and natural resources management	Provides guidance in general environmental planning and natural resources management	NEA
Forestry Policy (2010-19)	Promotes state and community forests	The forested area of the Kotu site near the Kotu stream and the beach is within the Project study area.	Department of Forestry (DoF)
The National Health Policy (2012-2020)	Promotes and protects the health of the population and workers	Addresses health risks and exposures associated with negative environmental consequences of the Project at all stages	Department of Health Services (DHS)
National Climate Change Policy (2016 – 2025)	Policy provides the framework for managing climate risks, building institutions, capacities, & opportunities for climate-resilient development	Promotes sustainable wastewater management and protection of the Environment for The Gambia people	DWR
Gambia National Gender & Women Empowerment Policy (2010 – 2020)	To mainstream gender in national and sectoral planning and programming to ensure equity and equality	Women are encouraged to be well informed and take part in decision making at all levels of the Project development and implementation	Office of the Vice President & Ministry for Women Affairs
National Youth Policy (2009 – 2018)	Policy aims to mainstream youth issues into the advancement of all sectors	To be inclusive, the Project shall encourage youth participation in decision making and employment	Ministry of Youth and Sports (MoYS)
National Strategic Environmental Assessment Policy (2017- 2021)	Aims to ensure environmental sustainability	Applies when developing policies, plans or programs in all sectors, including water	NEA
RELEVANT NATIONAL LEGISLATION			
Legislation	**Interpretation of Legislation**	**Relevance to Medium-Term Works**	**Enforcing Institution**

National Environment Management Act, NEMA, 1994	Principal legislation for environmental management; Part V of provides for projects listed under Schedule A to be considered for ESMP	This Project falls under Schedule A requiring an ESIA	NEA
Environmental Impact Assessment Regulations, 2014	Prescribes the need for ESMP, its processes and procedures including ESMP development and implementation	Elaborates on the requirements for environmental and social safeguards of this Project	NEA
The Forest Act, 1998	Provides framework for the reservation and management of forests. 81(1) of the Forest Act highlights the need for EIA of Projects within forest areas	The forested area of the Kotu site near the Kotu stream and the beach is within the Project study area.	DoF
Biodiversity and Wildlife Act, 2003	Provides for the establishment of protected areas for protection of in-situ and ex-situ biodiversity.	The biodiversity near the Kotu stream and around the beach rich in biodiversity should be protected during project implementation	Department of Parks & Wildlife Management (DPWM)
Hazardous Chemicals and Pesticides Control and Management Act, 1994	Controls the movement, handling, storage and use of chemicals listed in its schedule under the various classes of hazardous materials	Handling and use of hazardous materials during construction and operation (i.e. fuels, lubricants, oils, solvents, paints)	NEA
Hazardous Chemicals Regulations, 1999	More prescribed requirements for the registration and handling of hazardous chemicals, including packaging, labelling and transportation, and for authorization for their use.	Handling and use of hazardous materials related to the project, particularly the wastewater treatment plant (i.e. treatment chemicals, fuels, lubricants, laboratory substances)	NEA
National Disaster Management Act, 2008	Outlines the institutional framework and arrangements for contingency planning and emergency response during disasters	Support of the National Disaster Management Agency (NDMA) will be required in case of major project related incidents such as flooding (i.e. natural or resulting from water transmission and distribution systems; disease outbreaks from contaminated water)	National Disaster Management Agency (NDMA)
The Anti-littering Regulations, 2007	Addresses waste management and pollution issues in relation to environmental health and hygiene	The Project must abide by ensuring that all waste produced during all phases is well managed	NEA

Waste Management Bill (1997)	Addresses waste management and pollution issues	Waste management and pollution issues should be addressed by this piece of legislation	NEA/MOH
RELEVANT NATIONAL LEGISLATION			
Legislation	**Interpretation of Legislation**	**Relevance to Medium-Term Works**	**Enforcing Institution**
Physical Planning and Development Control Act, 1991	Ensure developments in The Gambia are in line with land use planning and construction standards	The Project construction activities shall be in line with national land use and planning rules	Department of Physical Planning and Housing (DPPH)
Development Control Regulations, 1995	These Regulations further prescribe the requirements for development control	All planning and construction phases of the Project should give consideration to these Regulations	DPPH
Public Health Act, 1990	Protects public and environmental health including abatement of nuisances and any condition that may be injurious to health	Noise and other risks associated with the Project must be prevented or reduced	Department of Health
The Gambia Roads and Technical Services Authority Act, 2003	Provides for the administration, control, and maintenance of all roads in The Gambia	Relevant to the Project as the road reserve is usually disturbed in installing water infrastructure	NRA
The Gambia Public Utilities Regulatory Authority Act, 2001	Act regulates the activities of providers of certain public utilities in the various economic sectors, including water, electricity, petroleum, and gas	NAWEC, the proponent of this Project will be regulated by this Act	Public Utilities Regulatory Authority (PURA)
Environmental Discharge (Permitting) Regulations 2001	Regulations require that a permit be obtained for most discharges of potentially polluting liquids in to or onto the ground (i.e. to groundwater) or into surface waters (such as rivers or streams)	Applicable to the Project as it requires permitting and control of potentially polluting liquid discharges to land, groundwater and surface waters.	NEA
The Children's Act 2005	Act sets out the rights and responsibilities of children and provides for their care, protection, and maintenance	Rights of children impacted by the project need to be protected	Social Welfare

Labor Act (2007)	Provides the legal framework for administration of labor, recruitment and hiring of labor, and protection of wages	The project hiring and management of its labor force should adhere to this framework	Ministry of Works
State Lands Act, 1990	Regulates land tenure and property rights as well as general land administration in state land areas	All lands in the Kombo North, Kombo South, and Kombo Central are administered under this Act, including the project sites	Department of Lands and Surveys
RELEVANT NATIONAL LEGISLATION			
Legislation	**Interpretation of Legislation**	**Relevance to Medium-Term Works**	**Enforcing Institution**
Land Acquisition & Compensation Act, 1990	Provides consultation and resettlement.	Potentially applicable to the Project if any component of the project requires permanent land acquisition, restriction of land use, or compensation for affected assets or rights	Department of Lands and Surveys
Environmental Quality Standards Regulations 1999	Regulations declare standards set out in Schedule 1 in respect of ambient air, saline waters, surface fresh waters and groundwater	Applicable to the Project as it sets environmental quality standards relevant to air emissions, surface water, groundwater and water quality protection.	NEA
Water Act, 1979	Regulate the water sector for the production of water in quantity and quality for the benefit of human being	NAWEC is providing water and sanitation in the cities and is bound by this regulation	DWR
Sexual Offences Act, 2013	Updates the law and procedures regarding the trial of rape, sexual offences, and related matters	This Act is relevant to the Project due to the need for protection of vulnerable persons within the Project sites against sexual offences, which is defined in the Act	Women's Bureau
The Women's Act 2010	Aims to advance women's rights to land and natural resources to promote their economic and social empowerment	Relevant to this project in view of potential impact on agricultural land farmed by women; need for adherence to OP 4.12; avoid gender-based violence (GVB) and sexual exploitation and abuse (SEA)	Women's Bureau

As indicated in the legal and regulatory framework presented above, the wastewater treatment plant Gambia Water and Sanitation Project is subject to the national environmental assessment requirements set out under the National Environment Management Act, 1994 and the EIA Regulations. In this context, the present ESIA has been prepared to assess the potential environmental and social risks and impacts associated with the Project, and to define the mitigation, management and monitoring measures required for its implementation.

Following completion, the ESIA report will be submitted to the NEA for review and approval, in accordance with the applicable national procedures.

In line with national requirements and international good practice, the final ESIA will also be disclosed publicly, and once environmental approval is granted, NAWEC, through the Project Implementation Unit, will be responsible for ensuring implementation of the applicable ESMP requirements, with support from contractors and other relevant stakeholders.

2.2 Institutional framework

The core institutions with various implementation and regulatory responsibilities that are relevant to the project ESIA and ESMP is outlined in Table 2-2.

Table 2-2: Institutional arrangement for Medium-Term Works implementation and monitoring

Institution	Responsibilities
Ministry of Environment, Climate Change and Natural Resources (MECCNAR)	Oversees the NEA and implementation of environmental laws and policies of The Gambia
National Environment Agency (NEA)	NEA is the technical arm for environmental management in The Gambia and enforces the NEMA, 1994; ESMP Regulations 2014 and similar legislation
Ministry of Petroleum Energy and Mines (MOPEM)	The MoPEM is the overseeing institution of NAWEC, and all energy and water related projects
National Water and Electricity Company (NAWEC)	As the implementing arm of the MoPEM, NAWEC is the main operator and manager of water production in The Gambia. NAWEC is also responsible for the provision of water supply and sanitation services for the urban centers with more than 10,000 inhabitants; it is the executer of this GWASA Project which intervention area will be in the Greater Banjul Area.
Public Utilities Regulatory Authority (PURA)	PURA is a multi-sector regulator of utilities in The Gambia mandated to regulate water tariffs and sector amongst others.
Ministry of Lands and Regional Government (MoLRG)	Oversees all the local government authorities including Regional Technical Advisory Committees, enforcement of legal regulations on land use and administration. Oversees the Department of Lands and Surveys, and the Department of Physical Planning and Housing.
Department of Forestry (DoF)	Responsible for the maintenance and development of forest resources in The Gambia. It recommends sites for forest reserves and parks, community forests and private forests, and monitors their management for sustainability.
Department of Parks and Wildlife Management (DPWM)	Responsible for the maintenance and development of national parks and reserves. It advises on the control and management of wildlife, including birds, that are habitat within the project area.
National Roads Authority	Responsible for the maintenance, construction, and safety of the national road network. Relevant to the project due to the need to advise on current and planned road projects, and management of existing roads and road reserves where the water pipes shall pass.

Institution	Responsibilities
Department of Water Resources	Responsible for the management, development, conservation and protection of the country's water resources in order to ensure a safe and sustainable exploitation of these resources for domestic, trade, agriculture and other uses which are responsive to current and future quality of life and economic development needs of present and future generations of citizens of The Gambia and to provide timely and accurate weather and climate data and information to safeguard population and promote food security.
Women's Bureau	Promotes gender equity and women's empowerment. Ensures the rights of women that may be affected by the project are protected; it also participates in sensitization on gender issues
Department of Labor	Enforces employment laws and combats child labor. It responses to complaints and reports such as accidents, abuse and discrimination at work
Ministry of Health and Social Welfare (MoH&SW)	Responsible for overall formulation and direction of the national health agenda, planning and health infrastructural development. Oversees the potential beneficiary health facilities of this Project.
National Social Protection Agency	Include their roles and responsibilities

2.3 International conventions, treaties and agreements

The Gambia is party to several international conventions and agreements relevant to the environmental and social assessment of the wastewater treatment plant. These instruments provide an overarching framework for the protection of biodiversity, human rights, labor rights, gender equality and vulnerable groups, and are therefore relevant to the planning and implementation of the project.

The most relevant international conventions and agreements to which The Gambia is a party are listed in Table below.

Table 2-3 : International conventions and agreements relevant to the project

Agreement / Convention	Date of ratification	Objectives	Relevance to the project
United Nations Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) and the Optional Protocol to the Convention on the Elimination of All Forms of Discrimination against Women (OP-CEDAW)	Ratified in 1993	To eliminate discrimination against women and promote equality between women and men in political, economic, social and cultural life	Relevant to ensure that project planning, stakeholder engagement, employment practices, access to project benefits, and grievance mechanisms are implemented in a gender-inclusive and non-discriminatory manner
UN convention on the rights of the child (CRC)	Ratified in 1990	To protect the civil, political, economic, social and cultural rights of children, including their rights to health,	Relevant to ensure that project activities do not expose children to health, safety or social risks, and that contractors comply with

Agreement / Convention	Date of ratification	Objectives	Relevance to the project
		education, protection and development	applicable requirements relating to child labor, community health and safety, and protection of vulnerable groups
ILO Forced Labor Convention, 1930 (No. 29)	Ratified by The Gambia	To suppress the use of forced or compulsory labor in all its forms.	Relevant to contractor and subcontractor labor management and to ensuring that no forced labor is used in Project activities or supply chains.
ILO Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87)	Ratified by The Gambia	To protect workers' rights to establish and join organizations of their own choosing.	Relevant to labor and working conditions applicable to contractors and Project workers.
ILO Right to Organize and Collective Bargaining Convention, 1949 (No. 98)	Ratified by The Gambia	To protect workers against anti-union discrimination and promote collective bargaining.	Relevant to labor relations and fair working conditions during Project implementation.
ILO Equal Remuneration Convention, 1951 (No. 100)	Ratified by The Gambia	To ensure equal remuneration for men and women workers for work of equal value.	Relevant to non-discrimination and fair employment practices under the Project.
ILO Abolition of Forced Labor Convention, 1957 (No. 105)	Ratified by The Gambia	To prohibit and abolish any form of forced or compulsory labor.	Relevant to labor management and contractor compliance.
ILO Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	Ratified by The Gambia	To eliminate discrimination in employment and occupation.	Relevant to recruitment, employment conditions, and equal opportunity principles for Project workers.
ILO Minimum Age Convention, 1973 (No. 138)	Ratified by The Gambia	To abolish child labor and establish a minimum age for employment.	Relevant to contractor management and prevention of child labor in Project activities.
ILO Worst Forms of Child Labor Convention, 1999 (No. 182)	Ratified by The Gambia	To prohibit and eliminate the worst forms of child labor.	Relevant to labor management, supply chain monitoring and protection of children.
ILO Labor Inspection Convention, 1947 (No. 81)	Ratified by The Gambia	To maintain a system of labor inspection in workplaces.	Relevant to compliance monitoring of labor, occupational health and safety, and working conditions during construction and operation.
United Nations Convention on Biological Diversity (CBD)	Ratified in 1994	To conserve biological diversity, promote the sustainable use of its components, and ensure	Relevant in relation to the protection of natural habitats, flora, fauna and ecosystem services that may

Agreement / Convention	Date of ratification	Objectives	Relevance to the project
		fair and equitable sharing of benefits arising from genetic resources	be affected by construction activities, vegetation clearance, waste generation, pollution, or abstraction-related impacts
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	The Gambia is a Party	To control the transboundary movement of hazardous wastes and ensure their environmentally sound management.	Relevant to the management, storage, transport and disposal of hazardous wastes that may be generated by construction works, laboratories, chemicals handling and maintenance activities.
Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa	Ratified in 2000	To prohibit the import of hazardous waste into Africa and regulate its transboundary movement and management within Africa.	Relevant to the management of hazardous waste and hazardous materials associated with construction, activities, fuels, oils and water treatment chemicals.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Acceded in 1977	To ensure that international trade in specimens of wild animals and plants does not threaten their survival.	Relevant where Project activities may affect habitats of protected species or where biodiversity-sensitive areas occur within the area of influence.
Convention on Migratory Species (CMS / Bonn Convention)	The Gambia is associated with CMS-related conservation frameworks and migratory species protection initiatives	To conserve migratory species throughout their range.	Relevant where Project activities may affect habitats, ecological corridors or species of conservation importance, including avifauna and other migratory fauna.
Stockholm Convention on Persistent Organic Pollutants (POPs)	Ratified in 2003	To protect human health and the environment from persistent organic pollutants.	Relevant to the management of hazardous chemicals, contaminated materials, obsolete equipment and wastes that may contain POPs or similar harmful substances.
Revised African Convention on the Conservation of Nature and Natural Resources	Ratified in 2018 (deposited 2019)	To improve environmental protection, conservation and sustainable use of natural resources in Africa, integrating these into development planning.	Relevant to biodiversity conservation, sustainable land and water resource management, and the integration of environmental considerations into Project planning and implementation.

Agreement / Convention	Date of ratification	Objectives	Relevance to the project
United Nations Framework Convention on Climate Change (UNFCCC)	Ratified in 1994	To stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.	Relevant in relation to climate resilience, adaptation considerations, and the management of climate-related risks that may affect Project infrastructure, water resources, and long-term service sustainability.
Kyoto Protocol to the UNFCCC	Ratified in 2001	To commit Parties to the reduction of greenhouse gas emissions and to support global action on climate change mitigation.	Relevant in relation to the Project's contribution to climate-resilient and low-carbon infrastructure planning, including energy use, pumping efficiency and broader climate-related considerations.
Paris Agreement	Ratified in 2016	To strengthen the global response to climate change by holding the increase in global average temperature well below 2°C and pursuing efforts to limit it to 1.5°C, while enhancing adaptation and resilience.	Relevant in relation to climate resilience, sustainable water service delivery, adaptation to climate-related risks, and the long-term sustainability of water infrastructure and groundwater resources.
Vienna Convention for the Protection of the Ozone Layer	Acceded in 1990	To protect human health and the environment against adverse effects resulting from modifications of the ozone layer.	Relevant to the management of refrigerants, chemicals and equipment that may contain ozone-depleting substances during construction and operation.
Montreal Protocol on Substances that Deplete the Ozone Layer	Acceded in 1990	To phase out the production and consumption of ozone-depleting substances.	Relevant where the Project involves equipment, materials or facilities using refrigerants or other controlled substances, and for ensuring proper handling and disposal of such materials.
United Nations Convention to Combat Desertification (UNCCD)	The Gambia is a Party	To combat desertification and mitigate the effects of drought through effective action at all levels.	Relevant in relation to land disturbance, erosion control, protection of soils, and sustainable management of land and water resources in the Project area.
Ramsar Convention			

2.4 Environmental and social safeguard of the World Bank (WB)

In addition to complying with the applicable environmental and social laws and regulations of The Gambia, the Project has been assessed with reference to the applicable World Bank Group Environmental, Health and Safety (EHS) Guidelines. These guidelines are technical reference documents containing general and industry-specific examples of Good International Industry Practice (GIIP) and provide performance levels and measures that are generally considered achievable for new facilities using existing technologies at reasonable cost. They are used to inform the identification of mitigation measures, design considerations, construction management practices, occupational health and safety provisions, pollution prevention measures, and operational controls relevant to the Project.

For the Medium-Term Works, the principal applicable EHS Guidelines are as follows:

- General Environmental, Health and Safety Guidelines;
- Environmental, Health and Safety Guidelines for Water and Sanitation;
- Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution, insofar as the Project includes medium-voltage lines and associated electrical infrastructure for boreholes, pumping systems and water supply facilities.

Given the substantial convergence between the AFD/World Bank and EIB frameworks, the Project documentation is structured to provide a single, integrated environmental and social assessment process.

The table below summarizes the applicability of the World Bank ESSs.

Table 2-4 : World Bank E&S standards & EIB Standards

ESS n°	WB Standard	Content	Application to the project
N°1	Assessment and management of environmental and social risks and impacts	ESG No. 1, Assessment and Management of Environmental and Social Risks and Impacts, sets out the Borrower's responsibilities to assess, manage and monitor the environmental and social risks and impacts associated with each stage of a project financed by the Bank through the Investment Project Finance (IPF), in order to achieve environmental and social outcomes consistent with the Environmental and Social Standards (ESG). Because of the risks and impacts on biodiversity and the socio-economic environment during project preparation and during work implementation of the sanitation infrastructure, this standard is applicable.	Yes
N°2	Labor and working conditions	NES No. 2, Employment and Working Conditions, recognizes the importance of job creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote constructive relationships between project workers and the coordination/manager and enhance the benefits of project development by treating workers fairly and ensuring safe and healthy working conditions. Workers' working conditions and rights may be impacted during the civil work if proper mitigation measures are not implemented. That is why this Standard is applicable.	Yes
N°3	Resource efficiency and pollution prevention and management	ESN No. 3, Resource Efficiency and Pollution Prevention and Management, recognizes that economic activity and urbanization often generate increased levels of air, water and land pollution, and consume scarce resources in ways that can threaten people, ecosystem services and the environment at local, regional and global levels. The NES describes the requirements necessary to address the rational use of resources and the prevention and management of pollution throughout the life cycle of a project. The wastewater treatment plant will be built with equipment and products that can generate pollution and waste that need to be prevented with mitigation measures.	Yes
N°4	Community Health and safety	NES No. 4, Population health and safety, deals with the risks and impacts on the safety, security and health of communities affected by the project, as well as the respective responsibilities of the Borrowers to reduce or mitigate these risks and impacts, paying particular attention to groups which, because of their particular	Yes

ESS n°	WB Standard	Content	Application to the project
		situation, may be vulnerable. The sanitation infrastructure to be built is near communities; they will likely be impacted during the civil work with the transport of equipment and workers. Given the risk to their health and safety, this standard is applicable and environmental and social mitigation measures should be developed and implemented.	
N°5	Land acquisition, restrictions on land use and involuntary resettlement	NES No. 5, Land Acquisition, Land Use Restrictions and Involuntary Resettlement, covers the loss of assets or access to assets resulting in the loss of a source of income or livelihood. The basic principle of the NES is that involuntary resettlement should be avoided. Where involuntary resettlement is unavoidable, it should be limited, and appropriate measures to minimize negative impacts on displaced persons (and host communities hosting displaced persons) should be carefully planned and implemented. The type of activities and the proximity of the affected communities to areas where other GWASAP work will happen will, at least temporarily, provoke loss of access, or loss of livelihoods, disruption of economic activities. This standard will be applicable, and RAP should be developed, approved and affected people compensated before work can start. But for the wastewater treatment plant, the site is inside NAWEC premises, and no third party will be affected.	Yes
N°6	Biodiversity conservation and sustainable management of living natural resources	ESS No. 6, Biodiversity conservation and sustainable management of living natural resources, recognizes that the protection and conservation of biodiversity, and the sustainable management of living natural resources, are of key importance for sustainable development. It also recognizes the importance of conserving the key ecological functions of habitats, including forests, and the biodiversity they support. ENS 6 also addresses the sustainable management of primary production and the use of natural resources and recognizes the need to consider the livelihoods of project-affected parties, including Indigenous Peoples, whose access to or use of biodiversity or living natural resources may be affected by a project. This standard is applicable because the water treatment plant will be built near the Kotu stream and in a very forested area. During the civil work, those sensitive areas and their biodiversity may be impacted. Mitigation measures have been developed.	Yes
N°7	Indigenous peoples/sub-saharan African historically underserved traditional local communities	NES n°7, Indigenous Peoples / Historically Disadvantaged Traditional Local Communities of Sub-Saharan Africa, ensures that the development process promotes full respect for the human rights, dignity, aspirations, identity, culture and natural resource-based livelihoods of Indigenous Peoples / Historically Disadvantaged Traditional Local Communities of Sub-Saharan Africa. NES n°7 also aims to avoid the negative impacts of projects on historically disadvantaged indigenous peoples / traditional local communities of sub-Saharan Africa or, if this is not possible, to reduce, mitigate and/or compensate for these impacts.	No. No indigenous peoples as defined by NES N°7 within the study area
N°8	Cultural heritage	NES no. 8, Cultural Heritage, recognizes that cultural heritage provides a continuity of tangible and intangible forms between the past, the present and the future. NES no. 8 sets out measures designed to protect cultural heritage throughout the life of a project. The civil work involved in this project needs excavation, which may affect tangible and intangible cultural heritage; that is why this standard is applicable.	Yes
N°9	Financial intermediaries	SES No. 9, Financial Intermediaries (FIs), recognizes that sound domestic financial and capital markets and access to finance are important factors for economic development, growth and poverty reduction. FIs are required to monitor and manage the environmental and social risks and impacts of their portfolios and the FI's sub-projects, and to monitor portfolio risk in relation to the nature of the funding being channeled/managed. The way in which the FI manages its portfolio may take different forms, depending on a number of considerations, including the capabilities of the FI and the nature and scope of the funding to be provided by the FI.	No. Applicable only to financial intermediaries.
N°10	Stakeholder engagement	ESS No. 10, Stakeholder Engagement and Information, recognizes the importance of open and transparent consultation between the Borrower and project	Yes

ESS n°	WB Standard	Content	Application to the project
	and information disclosure	stakeholders as an essential element of international good practice. Effective stakeholder consultation can enhance the environmental and social sustainability of projects, improve project acceptance, and contribute significantly to the successful design and implementation of projects. This sanitation project has different stakeholders, affected groups, interested groups and administrative stakeholders. All these key project stakeholders need to be consulted to take into consideration their views, opinions and suggestions during project design and implementation. That is why this standard is applicable and the consultation of all stakeholders is a key requirement.	

3 Project description

3.1 Project components

3.1.1 Kotu wastewater system diagnosis

3.1.1.1 Kotu sewage network state & capacity

The Kotu collection network is composed of an eastern branch upstream of the P1 and P2 pumping stations which is in good overall condition (clean manhole, no deposit and a good flow of effluents), and a western branch upstream of the P3 and P4 pumping stations which suffer from several problems (counter-slope, deposits, uncovered manhole...etc.).

The following figures show the condition of the collectors upstream of the P1 and P2 pumping station:

The network upstream of P1 and P2 is in good condition.

Figure 04 - pipe inspection upstream P1 - Kotu

As for the network upstream of pumping stations P3 and P4, several malfunctions were noted:

Section	Remarks	Pictures
Upstream of pumping station P3	● Manhole without covers. ● The network is always under load, according to the operator. ● Collapsed manholes.	
Upstream of pumping station P4	● Manhole without covers. ● Deposit inside the manholes. ● Waste inside the manhole. ● High level of loading.	

Restoring the Kotu network is essential to ensure that the system functions properly and to avoid any pollution of the natural environment.

3.1.2 Kotu pumping station diagnosis

The Kotu sewage system is divided into 2 parts, an eastern branch with 2 pumping stations P1 and P2, and a western branch with 2 stations P3 and P4. The 2 pumps on each branch discharge in series to the Kotu WWTP.

The diagnostic and evaluation visits to the four pumping stations revealed stations in an advanced state of degradation but still functional.

The characteristics of the 4 pumping stations are as follows:

Description	Number of pumps	Theoretical Flow (m3/h)/head(m)	*Measured Flow (m3/h)/head(m)	Power (Kw)
P1	1	170/21	65/38	15
P2	1	85/28	68/20	7.5
P3	1	85/28	75/20	15
P4	1	85/28	68/20	7.5

*Flow and HMT measured during the energy project - 2022

Pumping station assessment:

Kotu - PS1		
Civil works	Pumping station P1 conveys effluent from the eastern zone of Kotu to the Kotu WWTP. The civil works are in good condition, except for the slab above the wet well and the valve chamber. Maintenance of the pump is difficult due to the absence of a crane to extract the pump from the well.	

Electric supply	The electrical cabinet is in good condition, but the station has no generator in case of a power cut.	
Inlet / basket screen	The pumping station does not have an inlet screen, which leads to frequent pump breakdowns due to solid waste.	

Pump capacity	According to the data collected during the feasibility phase, the pump's characteristics are: 170m3/h; 21m head, whereas measurements done as part of the 2022 energy project give 65m3/h; 38m head. The daily flow rate in the Kotu area is around 2000m3/d ~ 65m3/h (peak hour coefficient 1.6) for the eastern part. The existing pump is sufficient.	
Kotu - PS2		
Civil works	The general condition of the P2 PS is in need of serious rehabilitation. The civil works are relatively in good condition, but the concrete slabs above the tanks are heavy and broken, making maintenance operations difficult and raising the risk the development of H2s in the tank (no aeration in well + long residence time during power cuts). Maintenance of the pump is difficult due to the absence of a crane to extract the pump from the well.	

Electric supply	The electrical cabinet is in good condition, but the station has no generator in case of a power cut.	
Inlet / basket screen	The pumping station does not have an inlet screen, which leads to frequent pump breakdowns due to solid waste.	
Pump capacity	According to the data collected during the first phase, the pump's characteristics are: 85m3/h; 28m head, whereas measurements done as part of the 2022 energy project give 68m3/h; 20m head. The daily flow rate in the Kotu area is around 2000m3/d ~ 35m3/h (peak hour coefficient 1.6) for the Upstream area of the P2. The existing pump is sufficient.	

Kotu - PS3		
Civil works	The two pumping stations P4 and P3 on the western side of the Kotu stations are functional, but the concrete structures are showing signs of deterioration and disrepair. The wastewater well is at ground level and overflow during rainy events or power cuts. The manholes and valve chambers inside the pumping stations are flooded with sewage. No crane on the PS for the maintenance of the pump.	
Electric supply	The electrical cabinet is in good condition, but the station has no generator in case of a power cut.	

Inlet / basket screen	The pumping station does not have an inlet screen, which leads to frequent pump breakdowns due to solid waste	
Pump capacity	According to the data collected during the feasibility phase, the pump's characteristics are: P3: 85m3/h; 28m head, P4: 85 m3/h; 28m head whereas measurements done as part of the 2022 energy project give P3: 85m3/h; 28m head, P4: 68m3/h; 20m head. The daily flow rate in the Kotu area is around 2000m3/d ~ 65 m3/h for P3 and 35m3/h for P4 (peak hour coefficient 1.6) for the Upstream area of the P2. The existing pumps are sufficient.	

3.1.3 Kotu wastewater treatment plant diagnosis

3.1.3.1 Baseline situation

NAWEC has been responsible for the operation of Kotu WWTP since 06/2021; before that it was a private operator in charge of the plant's operation. The plant was constructed in the early 90's and ponds were dredged completely for the last time in 2016 as mentioned by the operator. In 2023, NAWEC dredged Pond N°1 and Pond N°2 was dredged in 2024.

The wastewater treatment process in place is pond treatment. Usually, this type of process includes 3 types of ponds, anaerobic, facultative and maturation ponds. The existing infrastructure presents 4 ponds "in series" where the hydraulic retention time is low due to the excessive load entering the plant. This plant was originally constructed to treat the wastewater network effluent, but, two thirds of the inlet flow come from septic tanks or pit latrines, discharged by dumping trucks, which represent a greater level of load and flow than what is acceptable in the original design.

Existing infrastructures:

1. Truck reception channel and off-site inlet pipe. These areas receive wastewater from:
    a. The network through an inlet channel directly into the pond n°1;
    b. Dumping trucks which empty fecal sludge into new reception channel - several inlet chambers discharge the effluent into a channel and then into pond n°1;
2. Pond treatment system: 4 ponds "in series", 2 anaerobic/facultative and 2 maturations as per design drawings;
3. Outlet or discharge point equipped with an open channel flow measurement (not used)

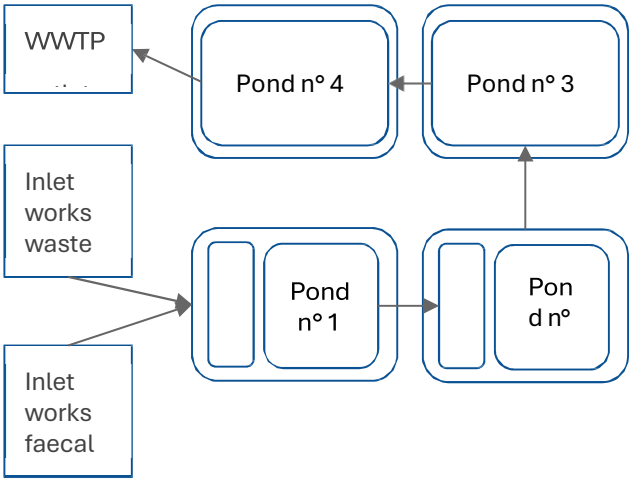


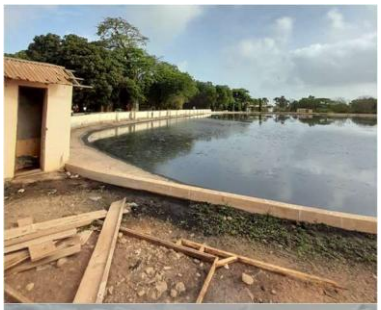
Figure 3-1: *Kotu WWTP process today (baseline).*

Infrastructure	Inlet chamber (flow coming from Kotu sewage network)	Ph 1
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	Inlet concrete structure includes 4 chambers: - 1 inlet P1 & P2 (1) - 1 inlet P3 & P4 (1)	
	- 1 WWTP feed chamber (1) - 1 WWTP by-pass chamber (1) 3 concrete chambers including: - chamber pond n°1 (not used, the flow continues to the new channel) (2) - chamber upstream inlet channel (3) - by-pass chamber, diverts flow into pond n°2, 3 or 4 (4)	 3 2 4
Electromechanical equipment & instrumentation	None	
State of civil works	Most of the civil works are in good condition, some penstocks are missing and should be replaced. Inlet chambers should be covered with a grating floor and equipped with an access ladder.	

Infrastructure	Inlet channel (wastewater + fecal sludge)	Photos:
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	Concrete structures, 2 channels, equipped with manual coarse screens & manual penstocks	
Electromechanical equipment & instrumentation	None	

State of civil works	Civil works are in good condition. The condition of some penstocks and manual screens need to be changed.	

Infrastructure	Inlet works for fecal sludge	Photos:
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	Concrete structure, 8 fecal sludge inlet chambers, flow transfer by overflow Equipped with manual coarse screen (horizontal structure)	
Electromechanical equipment & instrumentation	None	
State of civil works	New structures, commissioned in January 2023. Improvements on the screenings extraction and security are needed. Solid pavement for dumping trucks is required, pavement is damaged and when it rains it is difficult to maneuver trucks with this type of pavement.	

Infrastructure	Pond n°1	Photos: 
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	Pond is constructed with bentonite clay at the bottom and banks are on concrete lining. Anaerobic zone equivalent to 1/3 of the total area and facultative zone equivalent to 2/3 of the total area. Anaerobic area = 7 200 m2 Facultative area = 14 688 m2	
Electromechanical equipment & instrumentation	None	
State of civil works	This pond was de-sludged in 2022 and the banks were improved with a concrete berm. This pond is receiving all the flow entering the wastewater treatment plant including fecal sludge. Today, the pond system works in series, flow enters pond n°1 and goes to pond n°2.	
	It needs to be dredged and redo the bottom to perform well.	

Infrastructure	Pond n°2	Photos:
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	Pond is constructed with bentonite clay at the bottom and banks are on concrete lining. Anaerobic zone equivalent to 1/3 of the total area and facultative zone equivalent to 2/3 of the total area. Anaerobic area = 7 200 m2 Facultative area = 14 688 m2	

Electromechanical equipment & instrumentation	None	
State of civil works	This pond is being de-sludged at the moment and this operation will last some months. This pond, in normal conditions, is receiving all the flow coming from pond n°1. Today, the pond system works in series, flow enters pond n°1 and goes to pond n°2. Pond n°2 needs to be rehabilitated and banks improved.	

Infrastructure	Pond n°3 & 4	Photos:
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	Pond n°3 is a maturation pond, it receives flow from pond °2 in normal conditions. Area 3 = 5824 m2 Area 4 = 5460 m2	
Electromechanical equipment & instrumentation	None	
State of civil works	Civil works need to be renovated since the pond is submerged with sludge and plants which were never extracted from the pond. Desludging is required in order to assess the conditions of the civil works of this pond. The location of the inlet and outlet points in pond n°3 and 4 favorizes hydraulic shortcuts. It is recommended that the inlet point is placed on a slanting position as per the outlet point.	

Infrastructure	Pond by-pass network	Photos: 1 2 3
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	By-pass network for pond 1 & 2 is of PVC DN 400 and DN 225 1 - by-pass chamber from inlet works 2 - by-pass intermediary chamber 3 - by-pass chamber for pond n°1 & 2 No by-pass network for pond n°3 & 4	
Electromechanical equipment & instrumentation	None	
State of civil works	By-pass network seems to be in good condition and is being used. There is no possibility to by-pass pond n°3 & 4 for gravitary flow. By-pass network should be extended to pond n°3 and 4.	

Infrastructure	Outlet chamber	Photos:
GPS coordinates	Lat: 13.457750 Long: -16.704685	
Technical characteristics	Concrete chamber divided into 2 compartments by a metallic weir.	
Electromechanical equipment & instrumentation	None	
State of civil works	Civil works are a little old but functional. Weir is corroded and damaged. This chamber should be replaced during emergency works if the outlet of pond n°4 suffers some changings.	

Infrastructure	Outlet main discharge pipe	Photos:
GPS coordinates	Lat: Long:	
Technical characteristics		
Electromechanical equipment & instrumentation	None	
State of civil works		

The feasibility study has concluded that:

- Kotu wastewater pond system is overloaded (flow and load) mainly due to the fecal sludge flow emptied daily into the pond system;
- Kotu wastewater pond system was designed to treat only off-site sanitation effluents (network coming from the hotels);

- Fecal sludge flow is 4 times greater than the wastewater coming from Kotu network during dry season and more than half of the total flow entering the plant during wet season;
- Truck traffic in Kotu area represents many constraints for the touristic development and it has also impacted the surrounding population, in terms of odors;
- The two anaerobic and maturation ponds have been dredged for the last time in 2016 and 2023 and from site visits conclusions they will need to be dredged again;
- Currently, pond n°1 & 2 work in series which means all the inlet pollution goes into the first pond before continuing to the other ponds. Pond n°1 & 2 have anaerobic zones in the beginning (around 1 m deeper than the facultative basin), which should be used as the first step in order to favor the settling of suspended solids;
- Improvement of the structural integrity of the ponds is required, especially pond n°3 and 4;
- Sludge drying beds for sludge dewatering and dried sludge storage don't exist.

The main conclusions of the infrastructural and process assessment are that the pond system is extremely overloaded and structures need rehabilitation. Fecal sludge flow shall be diverted to dedicated treatment facilities. Besides being overloaded, Kotu WWTP will continue to receive fecal sludge in the short term, at least until these new facilities are constructed. Treating fecal sludge from dumping trucks in Kotu WWTP is not a lasting solution but at least pollution is "contained".

4 Alternatives analysis

4.1 Introduction

This section presents the main alternatives and options considered for achieving the objectives of the management of wastewater in the Greater Banjul Area. In line with ESIA good practice, the analysis considers the **"No Project" alternative** together with relevant **technical options** referred to in the project documentation. The purpose is to demonstrate, to the extent possible, that the current project design reflects consideration of practicable alternatives in light of technical, operational, environmental and social factors.

4.2 No Project Alternative

The "No Project" alternative assumes that the current situation would continue without implementation of the Wastewater Treatment Plant. Under this scenario, the envisaged environmental, socioeconomic and health benefits associated with improved water and sanitation would not be realized. The project documentation notes that, with projected population growth in the Greater Banjul Area up to 2050, the absence of additional wastewater treatment infrastructure could affect sensitive environment like the Kotu stream and the beach side of Kotu area, and beyond, constrain socioeconomic development and sustainable tourism in The Greater Banjul Area. It also notes that residents could continue to experience water-borne disease risks associated with contaminated not well treated wastewater.

Apart the very few farmers using part of the potential site for agriculture, it is hard to see advantage of the "No Project" because without the improvement of the treatment of the wastewater, sensitive biodiversity of the Kotu stream is at risk. The tourism industry needs this infrastructure to stop the pollution, fishermen, birdwatching and farmers need this area to be protected in order to continue their activities.

Nonetheless, the planned work would involve impacts like temporary construction-related disturbances such as access restrictions, dust, noise, traffic disruption and other environmental and social impacts associated with works.

The project feasibility documentation did not recommend the "No Project Development Scenario" given the urgency and importance to already improve the current situation of wastewater treatment in Kotu and also definitively address the issue of wastewater treatment in the Greater Banjul to avoid further pollution.

4.3 Technical Alternatives

4.3.1 Option 1 proposed by the feasibility studies

The long-term scenario considers that Kotu WWTP will be rehabilitated in the short term with the emergency works proposed by the Consultant. Scenario 1 considers a wastewater flow of 14 000 m3/day. In order to treat this flow, giving priority to natural processes and few electromechanical equipment, the Consultant studied the following options:

- Scenario 1 - treating 14 000 m3/day (peak flow: 933 m3/h) with the same infrastructures after rehabilitation of Kotu WWTP;
- Scenario 1 bis - treating 14 000 m3/day with the extension of the existing ponds:

- Anaerobic / facultative ponds extension: 20 m x 152 m x 2 ponds (6080 m^2) ;

Maturation ponds : 35 m x 105 m x 2 ponds (7350 m2).

Process calculation results show that:

- Scenario 1 - existing pond area is not enough to treat all the flow, BOD loadings and minimum hydraulic retention time are not respected;
- Scenario 1 bis - small improvements in the treatment performance but the extension of the existing ponds is still not enough to treat all the flow considered for this scenario.

Fecal coliforms and helminth eggs values used for the calculation consist of typical design values for network wastewater quality - calculated effluent concentrations consist of an estimate but exceed discharge limits.

HRT in the facultative and maturation ponds don't respect minimum values for the pollution typical reduction efficiencies.

Conclusions:

To treat 14 000 m3/day, the consultant proposes to treat 6 000 m3/day of wastewater in the existing ponds in Kotu and construct a new WWTP to treat 8 000 m3/day elsewhere. In order to treat 6 000 m3/day in Kotu WWTP, the Consultant proposes to install floating treatment systems in the facultative ponds. This treatment process is described in detail in scenario 2. For the new WWTP (8 000 m3/day) the Consultant considered the same treatment process - Waste Stabilization Ponds.

4.3.2 Option 2 proposed by the feasibility studies

Scenario 2 considers a wastewater treatment flow of 6 000 m3/day (peak flow 400 m3/h). For this scenario, the Consultant proposes to maintain the existing facilities in Kotu WWTP based on the following assumptions:

- Give priority to natural processes and few electromechanical equipment;
- Small area available for extension;
- Retrofit of the WSP system is enough to treat wastewater flow coming from the network.

Proposed works:

- Nature based solutions to guarantee discharge limits => Floating treatment Systems installed in the facultative ponds - with this system the existing ponds could treat the 6000 m3/day;
- Maturation ponds (if algae problems) => ultrasound is a very effective technology to eliminate the vast majority of microalgae, very easy to install, operate and with insignificant electrical consumption.

Floating treatment systems:

- Floating Treatment Systems (FTSs) are efficient systems in pollutant removal, with emerging plants growing on the surface of water instead of being rooted in the sediment;
- FTSs are a hybrid technology between the lagoons and constructed wetlands, they behave hydraulically in a similar way to a lake, while providing treatment processes similar to constructed wetland;
- The plants fluctuate over the effluent, so a high area of root contact with the water is achieved, flow speed is reduced which increases the treatment performance;

- The contact of the plant roots with the effluent leads to the development of biofilm containing communities of microorganisms responsible for various very important treatment processes;
- The plants to be used are of the species Typha Domingensis => an example of a local species.

Advantages of using Typha Domingensis:

- Adapted to be in the water (emerging macrophyte);
- Their tubular or "channel" structures allow for rapid air transfer from the surface to the roots;
- The presence of oxygen in the roots will allow biofilm growth;
- The nutrients (P and N) resulting from biofilm treatment will be used by the plant.

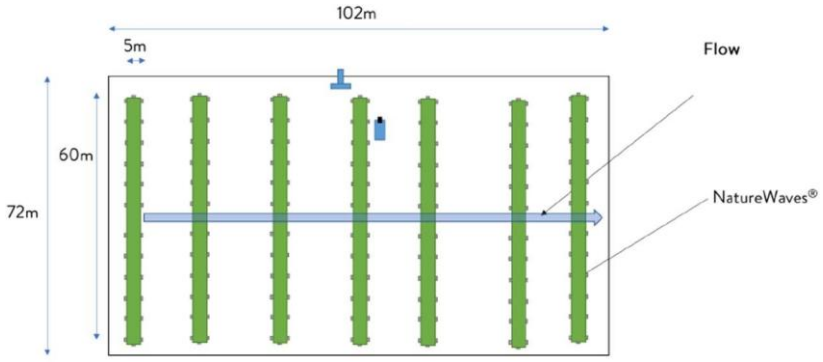


Figure 4-1: Example of the floating treatment systems (Jetfloat system) installed on a pond.

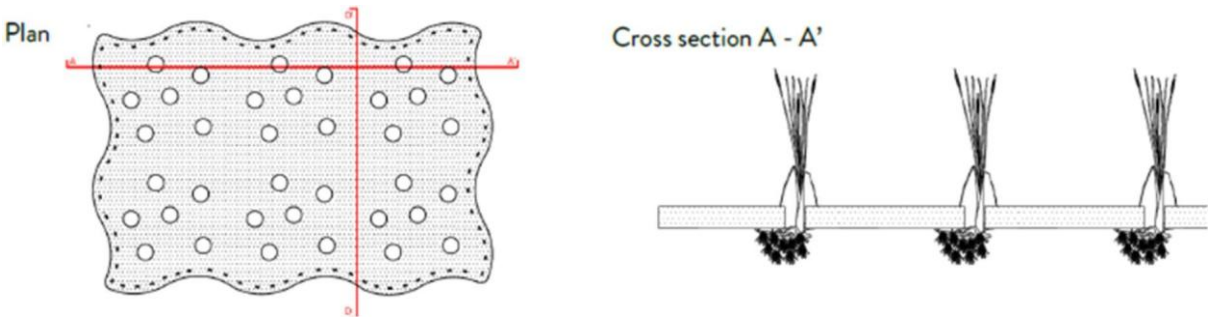


Figure 4-2: Plan and cross section for the floating treatment systems with the installed plants.

Fecal coliforms and helminth eggs values are typical design values for network wastewater quality - calculated effluent concentrations consist of an estimate.

HRT in the ponds will increase with the presence of the Floating Treatment Systems.

Conclusions:

In order to treat 6 000 m3/day, the Consultant proposes to install floating treatment systems in the facultative ponds and ultrasound system in maturation ponds in order to avoid algae development.

This solution allows to increase the treatment capacity in the existing ponds but also to increase the hydraulic retention time which improves the treatment efficiency.

4.3.3 Conclusion

The analysis of alternatives for the water sanitation project of GWASAP indicates that two scenarios were considered during project preparation. The “No Project” alternative was not retained because it would not deliver the expected improvements in wastewater management, public health and socioeconomic conditions.

Among the implementation options analyzed by the feasibility study, the second option is the one suggested by the Consultant. Residual impacts associated with the selected options are assessed in the present ESIA and are to be managed through the proposed mitigation and management measures.

5 Environmental and social baseline conditions

5.1 General Baseline Conditions

This Chapter presents the environmental and social baseline conditions within the areas relevant to the Kotu wastewater Treatment Plant Gambia Water and Sanitation Project.

The Gambia Water and Sanitation Project comprises multiple interventions distributed across several communities within the Greater Banjul Area and the provinces. But for the purpose of this ESIA, intervention will focus on the Kotu Wastewater Treatment plant in the neighborhood of Kotu and the touristic area. These works include the construction and rehabilitation of infrastructure such as treatment, storage, pumping, as well as electric equipment.

The Project area includes few farmers, a birdwatching spot, illegal occupants, the sensitive area of Kotu stream and its important biodiversity for both tourism and local communities' fishermen and farmers. The Project is situated within the Kanifing Municipal Council, which is form the GBA.

5.1.1 Climatic conditions

The country has a Sudano-Sahelian climate with two distinct seasons: a hot rainy season from June to October, and a dry season from November to May with rare occurrence of rainfall. Rainfalls are typically heavy in the GBA; July, August and September are the highest rainfall months usually accompanied by strong winds, heavy downpours and severe lightning flashes; October is the hottest month.

During the months of December to April, the Harmattan (North-easterly winds blowing from the Sahara towards the western coast of Africa) result in the presence of dust particles in the air, and general cloudless skies and dry air.

5.1.1.1 Rainfall over the project area

The ten-year average of monthly rainfall is indicated in Figure 5-1. below. As shown, rainfall over the project area, as with the rest of the country, is highest in the months of July to September. This is particularly important for project works that involve excavation for ponds and trenches that will be difficult to accomplish during heavy rains, usually accompanied by extensive pluvial flooding.

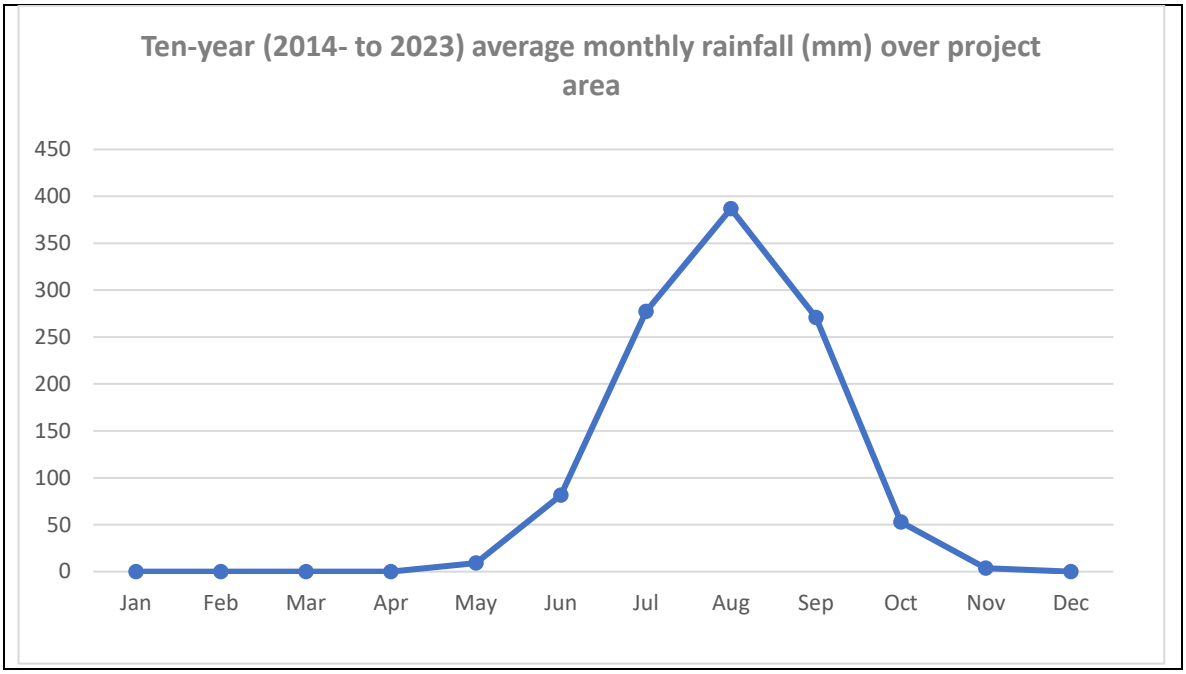


Figure 5-1 : Rainfall over the WCR (Source: DWR, 2025)

5.1.1.2 Temperature

The ten-year average monthly temperatures over the project area are displayed in Figure 5-2 below. The lowest temperatures coincide with the highest rainfall period, which should also be avoided for the implementation of certain components of the Works as described. Apparently, the best time for project works, in terms of these climatic variables, is October to February.

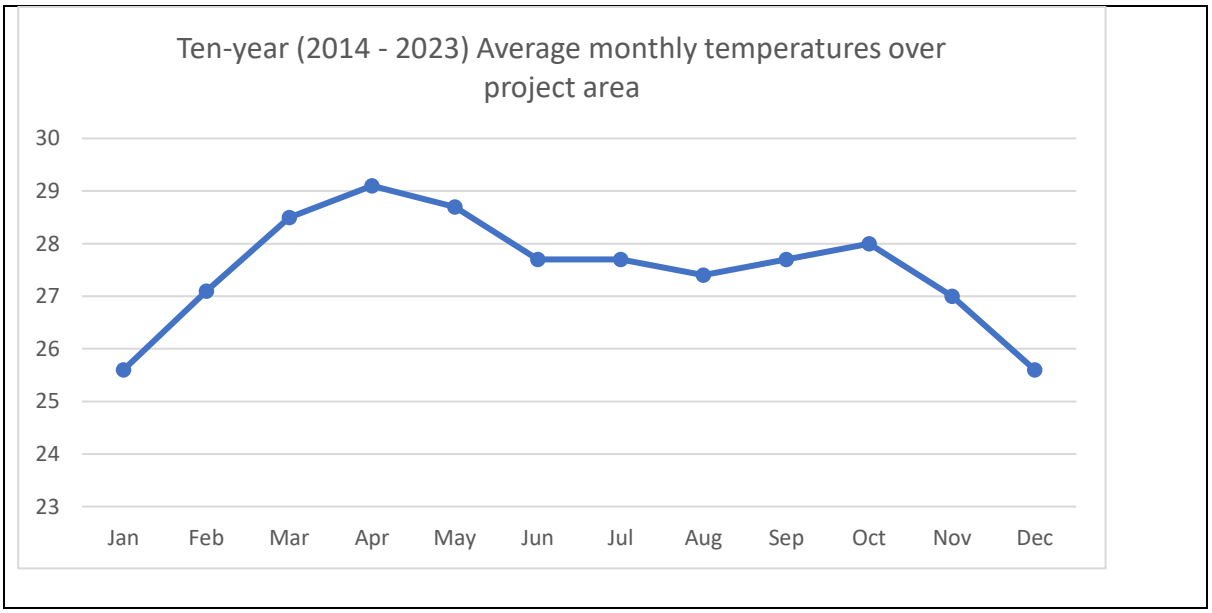


Figure 5-2 : Temperatures in the WCR (Source: DPWM, 2025)

5.1.2 Hydrology

5.1.2.1 Surface water

The surface hydrology within the project's area of influence includes Kotu stream with its important biodiversity.

5.1.2.1.1 Kotu Stream

The Kotu Stream is a defining hydrological and ecological feature of the Greater Banjul Area (GBA) in The Gambia. Spanning a catchment area of 1,881 hectares, the stream stretches approximately 11.2 kilometers from its origins near the settlement of Nema Kunku in the West Coast Region to its estuary at Kotu, where it discharges into the Atlantic Ocean between the Sunset and Palm Beach Hotels. The proposed Fecal Sludge Treatment Plant (FSTP) and the rehabilitation of the existing wastewater stabilization ponds are situated directly within the Kotu Stream catchment, making the stream a primary environmental receptor for the project.

The stream corridor traverses 11 densely populated urban and peri-urban settlements, including Nema Kunku, Latrikunda Sabiji, Bundung, Sukuta, Serrekunda, Bakoteh, Dippa Kunda, Manjai, Latrikunda Yiringanya, and Latrikunda Erinjang. As of 2020, an estimated 201,044 people resided along the stream. The corridor represents a complex interface of urban infrastructure, low-income residential areas, critical ecological habitats, and high-value tourism assets.

The hydrology of the Kotu Stream is characterized by a transition from a freshwater pluvial system upstream to a tidal, brackish estuary downstream. The stream is hydrologically disconnected from the main Gambia River system, rendering World Bank Operational Policy 7.50 (Projects on International Waterways) inapplicable to interventions within this catchment.

The Kotu Stream is officially designated as one of the five major flood hotspots in the Greater Banjul Area. The upstream sections are highly prone to pluvial (surface water) flooding due to rapid urbanization, impermeable surfaces, and inadequate drainage infrastructure, which regularly inundates schools, markets, and residential areas. The downstream estuary is susceptible to fluvial flooding and coastal erosion, threatening tourism facilities. Hydrological flow has been further compromised by human interventions; consultations with the Department of Water Resources (DWR) confirmed that a recently constructed bridge near the BB Hotel has severely restricted the natural flow of the stream, while sand deposition at the mouth occasionally blocks tidal flushing for weeks at a time.

The underlying hydrogeology consists of a shallow sand aquifer (4 to 30 meters depth) and a deep sand aquifer (40 to 120 meters depth). The Kotu area serves as a critical groundwater recharge zone but is highly susceptible to contamination due to the sandy, permeable soils and shallow water table.

Baseline water quality in the Kotu Stream and its underlying shallow aquifer is severely degraded. The stream currently functions as a de facto open sewer in several urbanized sections. The primary sources of pollution include the overloaded Kotu wastewater stabilization ponds (which discharge partially untreated effluent into the stream), leachate from the Bakoteh dumpsite, indiscriminate illegal solid waste dumping, livestock defecation, and widespread reliance on poorly constructed septic tanks.

Groundwater data indicates significant nitrate contamination in the shallow aquifer across the Kanifing and Kotu areas, driven by the high density of unlined pit latrines and septic tanks. Deeper

aquifer zones exhibit localized chloride contamination, indicative of saltwater intrusion. Recent 2023 data from the Bakoteh dumpsite also reveals severe groundwater pollution from metallic elements leaching toward the stream corridor. Furthermore, studies have detected various micropollutants, including pesticides, pharmaceuticals, and per- and polyfluoroalkyl substances (PFAS), confined primarily to the highly urbanized areas near the stream mouth.

5.1.2.1.2 Run-offs or storm water

Another surface water source is the run-off and storm water during the rainy season which runs into tributaries and adjacent fields. Water pipe construction in waterlogged/swampy areas, or along pathways of storm water could potentially impact domestic water supply in the area.

5.1.2.2 Groundwater resources and characteristics

Nationally, there are two main groundwater sources in The Gambia, namely, the Shallow Sand Aquifer (SSA) and the Deep Sandstone Aquifer (DSA) described briefly below.

5.1.2.3 Wastewater effluent quality standards

The Gambia National strategy for urban sanitation report states that sanitation infrastructures in the urban area have deteriorated mostly because of the lack of maintenance and neglect. The results are that barely 1% of the population has access to sewerage (except for the city of Banjul) and while most of the households have a toilet, in most cases the wastewater is untreated and discharged into the environment.

One of the principles and objectives of this strategy is the development and monitoring of clear national standards and guidelines. The Gambia Public Utilities Regulatory Authority (PURA) has developed a Gambian Standard which specifies the limit values for the effluent quality discharged into the environment which is presented below.

Reference	PURA	European Directive	OMS
TSS	100,0	35 150**	NSV*
PT	10,0	2 (10 000 - 100 000 PE) 1 (> 100 000 PE)	NSV*
COD	400,0	125,0	NSV*
BOD5	200,0	25,0	NSV*
pH	5.5 - 8.5	/	NSV*
T°C	30	30	NSV*

NT	NSV*	15 (10 000 - 100 000 PE) 10 (> 100 000 PE)	NSV*

Reference	PURA	European Directive	OMS
NTK	50	NSV*	NSV*
e-coli	NSV*	depending on the reuse	10^3 - 10^5
Helminth eggs	< 1	depending on the reuse	< 1

*No Set Value

**WSP system

Discharge limits imposed by PURA are not very strict and will probably evolve during the next few years. The Consultant will consider in its detailed design, EU discharge limits in order to comply with future requirements.

5.1.2.4 Comments on the results of the quality campaign

Results from sampling and quality analysis campaign confirm some of the important aspects for the rehabilitation of these infrastructures:

- Health and safety related to fecal contamination around Kotu WWTP shows that there is the need of monitoring Kotu Stream quality and the recreational waters in the beach line at the outlet of Kotu stream into the ocean. This problem should be solved by the rehabilitation of Kotu WWTP which shall guarantee the discharge limits imposed by The Gambia and European standards;
- Health and safety related to fecal contamination around the sea outfall of Banjul doesn't seem to be an issue, nevertheless, longer monitoring campaigns should take place in order to be sure. The rehabilitation of the broken sea outfall and the discharge of the wastewater offshore should reduce (even eliminate) the risk of fecal contamination in the beachline;
- Fecal sludge is around 10 times more concentrated (COD) than wastewater coming from the network. The number of solids and nitrogen into the sludge makes it difficult to treat using the same processes used to treat wastewater. The existing pond system is overloaded;
- Wastewater quality coming from each sewage network system is in accordance with urban typical wastewater parameters, apart from Total Nitrogen;
- Total nitrogen concentration values in wastewater (>300 mg/l) obtained during the sampling campaign seem extremely high when compared to typical municipal wastewater values (usually < 100 mg/l). Seureca considered NTK values, which are more consistent with wastewater quality in wastewater collection networks.

5.1.2.5 Project Area Data from the feasibility study

Discharge limits considered for the wastewater treatment process are the European directive discharge limits. Nevertheless, it is important to refer here that the Waste Stabilization Pond system in place in Kotu is a natural wastewater treatment process. Climatic conditions such as temperature, sunlight, UV exposure, wind speed have a great impact on the treatment performance of this type of process. The simplicity and easiness of operation make this process a very interesting solution in the local context but on the other hand waste stabilization ponds can't treat nitrogen or phosphorus (treatment efficiency is estimated between 40 and 70% depending on the proportion of soluble nitrogen and phosphorus). Since the Waste Stabilization Pond system is already installed in Kotu,

Seureca considers that this system can be rehabilitated and used to achieve carbon treatment discharge limits.

Reference	Discharge Limits (EU)
TSS	35 / 150**
PT	2 (10 000 - 100 000 PE) / 1 (> 100 000 PE)
COD	125,0
BOD5	25,0
pH	/
T°C	30
NT	15 (10 000 - 100 000 PE) / 10 (> 100 000 PE)
NTK	NSV*

Reference	Discharge Limits (EU)
e-coli	depending on the reuse
Helminth eggs	depending on the reuse

*No Set Value

**WSP system

The design flows considered for the project is the current wastewater network flow going into the Waste Stabilization Pond system (network only). Loads and flows considered at the inlet of the WSP are presented on the table below:

Flow & loads		Season	Flow	Units
Kotu wastewater network	Flow	Dry	422	m3/day
	Daily BOD5 loading		85	BOD5 kg/day
	Flow	Wet	1700	m3/day
	Daily BOD5 loading		343	BOD5 kg/day

Figure 5-3: - Aerial view from the existing WSP system in Kotu area

5.1.2.6 Wastewater treatment process

The existing Waste Stabilization Pond system is a natural process, which does not need almost any electromechanical equipment. Waste Stabilization Pond process consists of the following treatment stages:

1. Pre-treatment - screenings & grit removal
2. Anaerobic Pond(s) - deeper pond which favorizes sedimentation, good performance in TSS and BOD reduction
3. Facultative Pond(s) - intermediate pond with good performance on BOD5 reduction
4. Maturation Pond(s) - last pond with good performance in fecal coliforms and helminth eggs reduction

5.1.2.7 Pretreatment

The Consultant proposes new inlet works which will be equipped with:

- Flow measurement channel
- Screening
- Grit removal equipped with grit extraction pit
- Flow repartition chamber (into pond n°1 & 2)
- Small incinerator for solid waste burning
- Wetland for treated effluent before discharge into Kotu stream

5.1.2.8 Anaerobic / Facultative Ponds

Kotu WSP system is currently working with Pond n°1 and 2 in series. Pond n°1 and 2 consist of an anaerobic/facultative pond which has a deeper zone, or anaerobic zone, in the first third of the pond (around 3 m depth) and a facultative zone which corresponds to around 2/3 of the total area (around 2 depth). By working in series with these 2 ponds, hydraulic retention time is reduced and the load goes entirely to the first pond which overloads the pond.

In order to reduce overloading and increase hydraulic retention time in the anaerobic/facultative ponds, Seureca proposes to feed pond n°1 and 2 in parallel. In order to do this, two new feeding lines have to be installed but also a new outlet line from pond n°1 to maturation pond (pond n°3).

The consultant believes that the existing surface of the ponds is enough to treat wastewater flow and load coming only from the network. Nevertheless, it is proposed to construct a wetland area at the outlet of the maturation ponds that will polish the effluent before the discharge into Kotu stream. We believe this polishing step can increase the quality of the effluent, especially the suspended solids and the resulting effluent will have less impact on the natural environment downstream.

The next table presents the calculation for the WSP system process which was established using Professors Mara design method for WSP (School of Civil Engineering - University Of Leeds, Natural Wastewater Treatment and Reuse design).

Parameters	Units	Wet season Network only	Dry season Network only	Design Criteria
Flow	m3/d	1700	422	
BOD conc.	mg/l	202	202	
BOD load	kg/d	343.4	85.2	
Average T°C coolest month wet season	°C	27.3	27.3	
Average T°C coldest month	°C	22.0	22.0	
Anaerobic ponds				
Volumetric load	gDBO5.m-3.d-1	15.9	3.9	100 to 300
Recommended maximum	gDBO5.m-3.d-1	177.2	177.2	100 to 300

Parameters	Units	Wet season Network only	Dry season Network only	Design Criteria
Minimum volume	m3	1937.7	481.0	
Current volume	m3	21600	21600	
Depth	m	3.0	3.0	3 - 4
Area	ha	0.7	0.7	
HRT current volume	d	12.7	51.2	2 to 3 (>1)
BOD reduction	%	64.0	64.0	
BOD (Le) at the outlet	mg/l	72.7	72.7	
Facultative ponds				
Surface BOD loading max	kgDBO5/ha.d	291.4	291.4	80 - 400
Current surface BOD loading	kgDBO5/ha.d	84.2	20.9	80 - 400
Minimum area	ha	0.4	0.1	
Current area	ha	1.5	1.5	
Depth	m	2.0	2.0	1.5 to 2
Volume	m3	29376	29376	
HRT	d	17.3	69.6	7 to 15 (>4)
Cumulative BOD reduction	%	90.0	90.0	
Unfiltered effluent BOD (Le)	mg/l	25.0	8.4	
Filtered effluent BOD	mg/l	7.5	2.5	
Maturation ponds				
Number of ponds on series	-	2.0	2.0	2.0
Min HRT	d	3.0	3.0	3 - 5
Total recommended HRT	d	6.0	6.0	
Recommended volume	m3	10200	2532	

Parameters	Units	Wet season Network only	Dry season Network only	Design Criteria
Current volume	m3	14105	14105	
Depth	m	1.3	1.3	< 1.5
Area	ha	1.1	1.1	
Current HRT	d	8.3	33.4	
Total				
Volume	m3	65081	65081	
Area	ha	3.3	3.3	
HRT	d	38.3	154.2	
Outlet BOD conc.	mg/l	20.2	20.2	
Faecal coliforms reduction				
Concentration influent	MPN/100 ml	100000*	100000*	
Kb	-	9.3	9.3	
Concentration effluent	MPN/100 ml	0.0009	0.0000	
Removal of helminth eggs				
Influent concentration	ova/l	300*	300*	
R	%	99.92	99.99	
Effluent concentration	ova/l	0.2	0.03	< 1

*No real values are available for these parameters at the inlet of Kotu WWTP, typical values for wastewater were used to estimate the effluent concentrations. s in many parts of the country, the topography in the Project area is generally flat and low-lying with an approximate altitude range of between a minimum of 10m - 14m, to a maximum of 24m - 26m.

The elevation, and derived slope, maps of the project area are given in Figure 20 below. The maximum elevation of 47m is indicative of a generally very low elevation. The slope is also, overall flat with project sites largely located in these flat areas. In essence, the topography of the project can be largely described as regular in view of the slope.

5.1.3 Topography and land use

As in many parts of the country, the topography in the Project area is generally flat and low-lying with an approximate altitude range of between a minimum of 10m - 14m, to a maximum of 24m - 26m.

The elevation, and derived slope, maps of the project area are given in Figure 20 below. The maximum elevation of 47m is indicative of a generally very low elevation. The slope is also, overall flat with project sites largely located in these flat areas. In essence, the topography of the project can be largely described as regular in view of the slope.

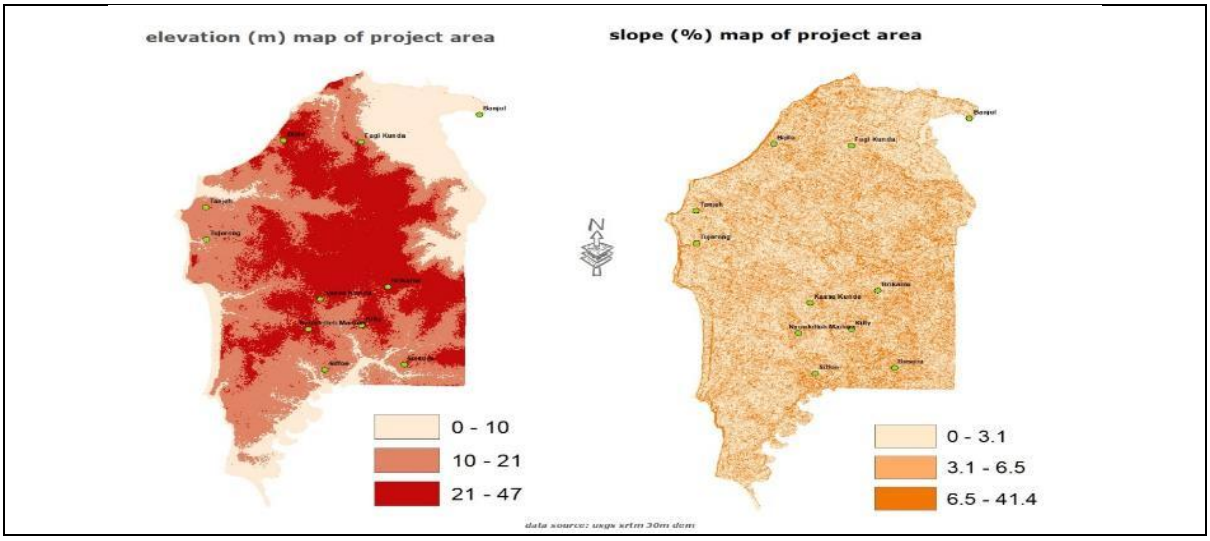


Figure 5-4 : Topography of project area; Source: USGS (SRTM DEM)

All project activities will be implemented within areas located on land allocated to NAWEC by the Gambia Tourism Board in Kotu.

In both urban and peri-urban zones, land is classified as customary land under the State Lands Act, held as Deemed Leases. Consequently, land use in these areas is predominantly residential and commercial, with additional public and social infrastructure such as schools, health centers, and community facilities.

Outside residential neighbourhoods, land use is primarily agricultural, including crop cultivation and, in some areas, cattle rearing and grazing. Generally, the proposed pipeline network will traverse narrow neighbourhood streets where physical structures—such as compound fences and parts of dwelling houses—are located in close proximity to the transmission corridors, particularly within densely built-up settlements.

The proposed area for the expansion of the Fecal Sludge Treatment Plant is situated adjacent to the existing Kotu wastewater stabilization ponds, within land historically designated for sanitation infrastructure by the Gambia Tourism Board (GTB). The site occupies a transitional zone between the urbanized Kotu-Senegambia tourism corridor to the north and the Kotu Stream estuary and its associated mangrove fringes to the south. Current land use within and immediately surrounding the proposed expansion footprint is characterized by a mixture of informal agricultural activities, scattered residential occupation, and degraded open space that has evolved organically in the absence of formal development control.

The most significant human settlement within the proposed expansion area is the compound of a Casamance refugee who has resided on the site for over twenty years. His occupation includes a permanent residential structure and cultivated agricultural plots, representing a long-established livelihood that predates any formal planning for the FSTP. During stakeholder consultations, the resident

confirmed his dependence on the land for both shelter and food production, and he requested a minimum of two to three years' advance notice before any relocation, along with fair compensation and replacement land of equivalent productive value. His case constitutes the most clearly documented physical and economic displacement that the project will trigger, requiring a full Resettlement Action Plan (RAP) compliant with World Bank Environmental and Social Standard 5 (ESS5).

Among the Project-Affected Persons (PAPs) identified during the ESIA field consultations, the case of an elderly woman residing within the proposed FSTP expansion area presents one of the most acute vulnerability profiles encountered by the survey team. The woman, who lives alone with her daughter, informed the consultants that she has occupied her current residence for more than seven years, having migrated from Banjul where she experienced extreme destitution, including a period of homelessness during which she slept on the streets. Unable to secure affordable accommodation in the capital and lacking family support networks, she made the decision to settle on the unoccupied land adjacent to the Kotu ponds, where she constructed a modest dwelling and established a small farm that now constitutes her sole means of subsistence.

In addition to this permanent resident, the expansion area supports a number of temporary market gardeners, predominantly women, who cultivate vegetables on plots allocated informally through community arrangements. These gardeners rely on the shallow water table and proximity to the stream for irrigation during the dry season. Their activities, while not formalized through legal tenure instruments, represent a critical source of household food security and supplementary income for some of the most economically vulnerable members of the surrounding community. The National Social Protection Secretariat identified these women gardeners as being at particular risk of livelihood disruption from the project, given their limited alternative income sources and the absence of formal documentation that would automatically qualify them for compensation under conventional land acquisition frameworks.

The broader land use context includes the existing Kotu wastewater ponds (operational since the 1980s, originally constructed for the hotel industry), the Bakoteh dumpsite located approximately one kilometer to the northeast, and scattered informal commercial activities along the access roads. The area also features mature trees, including cashew plantations and isolated baobab specimens, some of which may serve as cultural markers of historical settlements dating back several centuries. A mosque constructed by the long-term resident Mr. Lamine Sidibeh, which formerly served as a minor tourist attraction, is located in the vicinity, though its current status and proximity to the direct footprint require confirmation through the detailed RAP census.

The presence of these human settlements and livelihood activities within the proposed expansion area has significant implications for the ESIA. The project must demonstrate that all feasible alternatives to displacement have been exhausted, that affected persons — including those without formal legal title — are identified through a comprehensive census and asset inventory, and that culturally appropriate compensation and livelihood restoration measures are designed in close consultation with the affected households. The Department of Social Protection has recommended that affected persons be cross-referenced with the National Social Registry to ensure that the most vulnerable among them are linked to existing social safety net programs during the transition period.

5.1.4 Air quality

The project activities with potential to cause impacts have one thing in common that is the use of heavy vehicles and equipment. The excavation of ponds and trenches will potentially impact air quality. The

installation of the Wastewater Treatment Pant in Kotu, though localized, is also expected to impact air quality due to the expected extended construction period; in both cases, air quality is expected to be affected more by dust, than anything else.

5.1.5 Noise levels

As with air quality, the project's impact on ambient noise is expected from its range of heavy vehicles and machinery. Again, it is more of an expected issue with the excavation of trenches and ponds that are located within Kotu where work is expected to involve heavy machinery, also has potential for disturbing noise levels for people. Notwithstanding the importance of this potential impact, baseline noise levels could not be measured.

5.1.6 Soil chemistry baseline (distilled-water extract)

The project area is dominated by rock formations from the *Tertiary* era that are mainly sedimentary rocks. The *Holocene* rock formations that are also, largely, sedimentary are formed very much later than the formations from the *Tertiary* period.

5.2 The biotic environment

This section presents the baseline conditions of the biotic environment in and around the Kotu Wastewater Treatment Plant site, where the proposed Fecal Sludge Treatment Plant (FSTP) will be constructed. The biotic environment encompasses all living organisms and ecological communities — terrestrial and aquatic flora, avifauna, mammals, reptiles, amphibians, fish, invertebrates, and the ecological processes that sustain them. Understanding the baseline biotic conditions is essential for predicting the nature and magnitude of potential project impacts and for designing appropriate avoidance, mitigation, and enhancement measures.

The study area is situated within the Greater Banjul Area (GBA) of The Gambia, at the interface between the urbanized Kotu-Senegambia tourism corridor and the Kotu Stream estuary. This transitional position gives the site exceptional ecological significance: it lies within the functional buffer zone of the Tanbi Wetland Complex, a 6,000-hectare Ramsar site designated in 2007 and recognized as a BirdLife International Important Bird Area (IBA). The Kotu Creek system, which receives discharge from the existing wastewater stabilization ponds, supports one of the most accessible and species-rich birdwatching sites in West Africa, with over 350 bird species recorded. The ecological connectivity between the FSTP site, the Kotu Creek mangroves, and the broader Tanbi Wetland Complex means that project activities have the potential to affect biodiversity receptors of national and international conservation importance.

5.2.1 Ecoregional Context and Habitat Types

The Gambia is situated within the Guinean Forest-Savanna Mosaic ecoregion, characterized by a transition between the humid Guinea savanna to the south and the drier Sudanian woodland to the north. The country's biodiversity is shaped by the Gambia River system, which creates a longitudinal gradient from marine-estuarine conditions at the coast to freshwater habitats upstream. The western portion of the country, where the project site is located, falls within the Guinea savanna vegetation zone — described as guinea woodland savanna — with natural vegetation dominated by woodland savanna on freely drained soils and wetland communities (mangroves, grassland, and swamp forest) in low-lying areas.

The immediate project area encompasses four distinct habitat types, each supporting characteristic biological communities:

Table 5-1

Habitat Type	Location Relative to FSTP	Key Characteristics
Modified Guinea Savanna / Urban Fringe	Within and immediately surrounding the FSTP footprint	Degraded woodland with scattered mature trees (baobab, cashew, mango); subsistence agriculture; informal settlements
Mangrove-Estuarine System	South and southwest of the site, along Kotu Creek	Tidal mangrove forest (Rhizophora/Avicennia); mudflats; tidal creeks (bolongs); connected to Tanbi Wetland Complex
Wastewater Stabilization Ponds	Within the existing Kotu WWTP	Artificial wetland habitat; open water with emergent vegetation; attracts waterbirds and wading species
Coastal/Beach Zone	West of the site (approx. 1.5 km)	Sandy beach; salt-tolerant vegetation; sea-grass meadows offshore; marine fauna

The ecological value of the project area derives primarily from the mangrove-estuarine system and its connectivity to the Tanbi Wetland Complex. However, even the modified habitats within the FSTP footprint support biodiversity of local significance, including mature trees that serve as nesting and roosting sites, and agricultural land that provides foraging habitat for granivorous and insectivorous bird species.

5.2.2 Terrestrial Flora

5.2.2.1 Vegetation Communities

The terrestrial vegetation within and surrounding the proposed FSTP expansion area reflects the heavily modified character of the peri-urban landscape in the Greater Banjul Area. The original Guinea savanna woodland has been substantially altered by decades of urbanization, agriculture, and infrastructure development. Nevertheless, remnant vegetation elements of ecological and cultural significance persist within the study area.

The dominant vegetation formation on the freely drained sandy soils surrounding the Kotu ponds is a degraded woodland-savanna mosaic, characterized by scattered mature trees interspersed with shrubland, grassland, and cultivated plots. The tree canopy is discontinuous, with individual specimens or small clusters rather than closed-canopy woodland. Ground cover consists primarily of annual grasses and herbaceous species during the wet season (June-October), transitioning to bare or sparsely vegetated sandy soil during the dry season (November-May).

Key Tree Species

Field observations and stakeholder consultations have identified the following tree species of significance within the study area:

Species	Common Name	Significance	Conservation Note
Adansonia digitata	Baobab	Cultural heritage marker; settlement indicator (80-500 years); nesting site for raptors	Protected under Forestry Act; NCAC cultural significance
Anacardium occidentale	Cashew	Economic livelihood (nut harvesting); shade; scattered plantations within expansion area	Common; no formal protection

Mangifera indica	Mango	Fruit production; shade; urban forestry; roosting site for fruit bats and starlings	Widely planted; no formal protection
Borassus aethiopum	Ron/Palmyra Palm	Traditional construction material; wine tapping; prominent landscape feature	Declining nationally; protected in some areas
Khaya senegalensis	African Mahogany	High-value timber; traditional medicine; shade tree	IUCN Vulnerable; protected under Forestry Act
Parkia biglobosa	African Locust Bean	Food (fermented seeds — "netetu"); traditional medicine; nitrogen fixation	Important agroforestry species
Ficus spp.	Fig trees	Keystone species for frugivores; year-round fruit production; cultural significance	Multiple species; some sacred
Azadirachta indica	Neem	Introduced; shade; traditional medicine; insect repellent	Naturalized; widespread in urban areas

Of particular note are the baobab trees (Adansonia digitata), which the National Centre for Arts and Culture (NCAC) has identified as potential cultural heritage markers of historical settlements dating back several centuries. Individual specimens within or adjacent to the project footprint may be between 80 and 500 years old and are protected under both the Forestry Act and cultural heritage legislation. Their removal would require authorization from both the Department of Forestry and NCAC and would constitute an irreversible loss of cultural and ecological heritage.

5.2.2.2 Agricultural Vegetation

The expansion area supports subsistence agricultural activities, primarily market gardening by women during the dry season. Crops cultivated include leafy vegetables (sorrel, bitter tomato, okra), onions, and peppers, irrigated from shallow hand-dug wells exploiting the high water table. Rice cultivation occurs in the seasonally flooded margins closer to the Kotu Stream. These agricultural plots, while not constituting natural vegetation, provide foraging habitat for granivorous birds (doves, weavers, firefinches) and attract insectivorous species that feed on crop-associated invertebrates.

5.2.3 Mangrove Ecosystem

5.2.3.1 Distribution and Extent

The mangrove ecosystem associated with the Kotu Stream represents the most ecologically significant habitat within the project's area of influence. Mangrove forests in The Gambia cover approximately 31,000 hectares nationally, constituting 6.4 percent of the country's forested land. However, more than half of the original mangrove area has been lost, with the older "high mangrove" formations being particularly affected. The Kotu Creek mangroves form part of the broader Tanbi Wetland Complex (6,000 hectares, of which 4,800 hectares are mangrove), designated as a Ramsar Wetland of International Importance in February 2007 (Site No. 1657) and recognized as a BirdLife International Important Bird Area.

The Kotu Creek mangrove system extends along the tidal reaches of the stream from approximately the Kotu Bridge area downstream to the Atlantic coast. The mangroves are directly connected to the Tanbi Wetland Complex through a network of tidal creeks (bolongs) and shared hydrological processes. This connectivity means that any changes to water quality or flow regime at the FSTP discharge point have the potential to propagate through the mangrove system into the broader Ramsar site.

5.2.3.2 Species Composition and Zonation

The Gambia supports six true mangrove species, distributed according to tidal inundation frequency, salinity tolerance, and substrate characteristics. The Kotu Creek mangroves exhibit the following zonation pattern, typical of West African estuarine mangrove systems:

Species	Common Name	Zone	Ecological Role
Rhizophora mangle / R. racemosa	Red Mangrove	Seaward fringe; regularly inundated	Dominant species; prop roots provide oyster attachment substrate and fish nursery habitat
Avicennia africana	White/Black Mangrove	Mid-zone; periodically inundated	Pneumatophores stabilize sediment; salt-excreting leaves; important for crabs
Laguncularia racemosa	White Mangrove	Landward transition zone	Pioneer species in disturbed areas; less salt-tolerant
Conocarpus erectus	Buttonwood	Highest elevation; rarely inundated	Transition to terrestrial vegetation; fuelwood source
Annona glabra	Pond Apple	Freshwater-influenced margins	Fruit-bearing; supports frugivorous birds and bats
Nypa fruticans	Nipa Palm	Brackish water margins (limited)	Introduced; limited distribution in western Gambia

Rhizophora species are the dominant mangrove at Kotu Creek, as they are throughout The Gambia's estuarine systems. Their complex prop root architecture provides critical substrate for the attachment of mangrove oysters (Crassostrea gasar and C. tulipa), which are harvested by women from the Jola and other communities as a significant livelihood activity. The root systems also create sheltered nursery habitat for juvenile fish, shrimp, and crabs, supporting approximately 90 percent of The Gambia's fishery resources.

5.2.3.3 Condition and Threats

The Kotu Creek mangroves have experienced significant degradation over recent decades, culminating in a severe dieback event that destroyed substantial areas of mature mangrove forest. The causes of this dieback are attributed to multiple interacting stressors: the discharge of raw and partially treated sewage from the overloaded Kotu wastewater stabilization ponds; the dumping of solid waste and pollution from the adjacent tourism industry; changes in salinity patterns linked to reduced freshwater inflow; and the progressive deposition of sand at the creek mouth, which periodically blocks tidal flushing for weeks at a time. Climate change has exacerbated these pressures through altered rainfall patterns and increased soil salinity.

In response to this degradation, the Gambia Bird Watchers' Association (GBWA) initiated a community-led mangrove restoration program at Kotu Creek. The first planting phase in 2018 covered 2 hectares, achieving a 60 percent propagule survival rate. A second phase in 2020 extended the restoration to an additional 3 hectares. Propagules are harvested from local mangrove populations to maintain genetic diversity, and planting is timed to coincide with the wet season. The GBWA continues to map, replant, and manage mangrove areas around Kotu Creek, with the long-term vision of developing the area as a gateway to showcase The Gambia's biodiversity for sustainable ecotourism.

The current condition of the Kotu Creek mangroves can be characterized as partially degraded but actively recovering, with the trajectory of recovery dependent on the reduction of pollution loading from the wastewater ponds — a condition that the proposed FSTP is designed to achieve. This creates a direct

positive linkage between the project's primary objective (proper fecal sludge treatment) and the recovery of the most ecologically significant habitat in the area of influence.

5.2.4 Aquatic Fauna

5.2.4.1 Fish and Shellfish

The mangrove-estuarine system of Kotu Creek supports a diverse assemblage of fish and shellfish species, with approximately 33 species of fish and shellfish documented in Gambian mangrove systems. The mangrove root systems serve as critical spawning and nursery habitat: fish species spawn within the sheltered mangrove creeks before juveniles migrate offshore into the open sea. This ecological function underpins approximately 90 percent of The Gambia's fishery resources, making the health of the Kotu Creek mangroves a matter of national food security and economic significance.

The commercially and ecologically important shrimp species Farfantepenaeus notialis uses the Tanbi Wetland Complex — including the Kotu Creek system — as a critical breeding area. Shrimp fishing is one of the principal human activities within the wetland complex, supporting livelihoods for communities along the creek. The health of shrimp populations is directly linked to water quality and the integrity of mangrove habitat, both of which are currently compromised by untreated wastewater discharge from the Kotu ponds.

5.2.4.2 Mangrove Oysters

Mangrove oysters (Crassostrea gasar and Crassostrea tulipa) are among the most economically important invertebrates in the Kotu Creek system. These bivalves attach to the prop roots of Rhizophora mangroves, which provide the preferred substrate due to their complex aerial root architecture. Oyster harvesting is a traditional livelihood activity conducted predominantly by women from the Jola community, who collect, roast, and sell the oysters using firewood gathered from the mangroves. During the dry season, small groups of women wade into the mangroves at low tide to harvest oysters, which are then processed and sold at local markets.

The productivity of oyster beds is directly dependent on water quality: elevated levels of fecal contamination, heavy metals, and organic pollution can reduce oyster survival, impair reproduction, and render harvested oysters unsafe for human consumption. The current discharge of partially treated effluent from the overloaded Kotu ponds represents a significant threat to both oyster productivity and food safety. The proposed FSTP, by improving effluent quality, has the potential to enhance oyster bed recovery and restore the safety of this traditional food source.

5.2.4.3 Crustaceans and Other Invertebrates

The intertidal mudflats and mangrove margins of Kotu Creek support abundant populations of West African Fiddler Crabs (Uca spp.), which are conspicuous inhabitants of the exposed mud at low tide and an important food source for wading birds. Atlantic Mudskippers (Periophthalmus spp.) — amphibious fish adapted to intertidal life — are commonly observed on the mudflats and mangrove roots, using their modified pectoral fins for locomotion on land. The broader invertebrate community includes annelid worms, gastropod molluscs, mud crabs, and clams, which collectively form the detritus-based food web that sustains the creek's vertebrate fauna. These invertebrate communities are sensitive indicators of sediment quality and organic pollution loading.

5.2.5 Mammals

The Gambia supports over 100 mammal species nationally, though the heavily urbanized character of the Greater Banjul Area limits the diversity present in the immediate project vicinity. Nevertheless, several mammal species of conservation significance are associated with the Kotu Creek and Tanbi Wetland Complex:

Species	Common Name	IUCN Status	Presence at Kotu Creek
Trichechus senegalensis	West African Manatee	Vulnerable	Confirmed in Tanbi Wetland Complex; occasional in Kotu Creek tidal reaches
Aonyx capensis	African Clawless Otter	Near Threatened	Recorded in Tanbi Wetland; uses mangrove creeks for foraging
Piliocolobus badius temminckii	Western Red Colobus	Endangered	Troops recorded in Tanbi mangroves; sensitive to habitat fragmentation
Cercopithecus sabaeus	Green Vervet Monkey	Least Concern	Common in woodland and garden areas adjacent to the site
Herpestes paludinosus	Marsh Mongoose	Least Concern	Associated with wetland margins and mangrove edges
Mungos gambianus	Gambian Mongoose	Least Concern	Recorded in scrubland and woodland areas
Epomophorus gambianus	Gambian Epauletted Fruit Bat	Least Concern	Roosts in large trees (mango, baobab); important pollinator and seed disperser

The West African Manatee (Trichechus senegalensis) is the most significant mammal species in the area of influence. Classified as Vulnerable by the IUCN and listed on CITES Appendix I, the manatee uses the tidal creeks and mangrove channels of the Tanbi Wetland Complex for foraging on aquatic vegetation. While manatee presence in the immediate Kotu Creek area is occasional rather than permanent, the hydrological connectivity between the creek and the broader wetland complex means that water quality changes at the FSTP discharge point could affect manatee habitat downstream. The species is protected under The Gambia's Biodiversity and Wildlife Act and the Banjul Declaration of 1977.

5.2.6 Reptiles and Amphibians

The herpetofauna of the Kotu Creek area includes several species associated with the mangrove-estuarine and savanna habitats. The West African Crocodile (Crocodylus suchus), formerly classified within the Nile Crocodile complex, inhabits the tidal creeks and mangrove channels of the Tanbi Wetland Complex and has been observed in the Kotu Creek system. The Nile Monitor (Varanus niloticus) and Bosc's Monitor (Varanus exanthematicus) are common predators in the wetland margins, feeding on crabs, fish, and bird eggs. Various snake species, including the African Rock Python (Python sebae) and Puff Adder (Bitis arietans), are present in the surrounding woodland and scrub.

Amphibian diversity in the area is associated primarily with the seasonal wetlands, rice paddies, and freshwater-influenced margins of the creek system. While no formal amphibian surveys have been conducted specifically for the FSTP site, the shallow water table and seasonal flooding create suitable breeding habitat for multiple frog species. Amphibians are particularly sensitive bioindicators of water quality and chemical contamination, making them relevant receptors for monitoring the ecological effects of FSTP effluent discharge.

The coastal waters adjacent to the Kotu area support Green Sea Turtles (Chelonia mydas), classified as Endangered by the IUCN, which feed on sea-grass meadows offshore. While turtles do not enter the creek system, the quality of coastal water receiving creek discharge could indirectly affect sea-grass habitat and turtle foraging areas.

5.2.7 Ecological Connectivity and Protected Area Linkages

The ecological significance of the FSTP site cannot be understood in isolation from its connectivity to the broader landscape. The Kotu Creek system functions as an ecological corridor linking the terrestrial habitats of the Greater Banjul Area to the marine environment of the Atlantic coast, with the Tanbi Wetland Complex serving as the central node in this connectivity network. The following protected areas and sites of conservation importance are hydrologically or ecologically connected to the project area:

Protected Area	Designation	Distance/Connection	Relevance to FSTP
Tanbi Wetland Complex	Ramsar Site (No. 1657); BirdLife IBA	Directly connected via Kotu Creek tidal system	Effluent quality directly affects Ramsar site water quality and ecology
Abuko Nature Reserve	National Nature Reserve	Approx. 5 km inland; no direct hydrological connection	Shared avifauna; guides operate at both sites; no direct impact pathway
Bijilo Forest Park	National Park	Approx. 3 km west (coastal); no direct connection	Shared tourism market; no direct ecological impact pathway
Kotu Creek (unprotected)	Community-managed conservation area (GBWA)	Immediately adjacent to FSTP site	Primary ecological receptor; mangrove restoration area; birdwatching hub

The direct hydrological connectivity between the FSTP discharge point and the Tanbi Wetland Complex (Ramsar site) is the most critical ecological linkage for the ESIA. Under the Ramsar Convention, The Gambia is obligated to maintain the ecological character of designated wetlands. Any deterioration in water quality reaching the Tanbi system as a result of FSTP operations would constitute a potential violation of this obligation. Conversely, the improvement in effluent quality achieved by replacing the current overloaded ponds with a properly designed treatment facility represents a significant opportunity to enhance the ecological character of the Ramsar site — a positive impact of major significance.

5.2.8 Avifauna

5.2.8.1 Species Richness and Significance

The Gambia supports 560 bird species across its diverse habitats, making it one of the most species-rich countries per unit area in Africa and a globally significant birdwatching destination. The Kotu Creek area is the premier accessible birding site in the country, with over 350 species recorded within the immediate vicinity of the Kotu Bridge — a remarkable concentration of avian diversity within a few hundred meters of the proposed FSTP. The eBird database records 329 species for the Kotu Creek hotspot alone, while the broader Tanbi Wetland Complex supports over 360 species and qualifies as an Important Bird Area under BirdLife International criteria.

The exceptional avifaunal diversity at Kotu Creek results from the convergence of multiple habitat types — mangrove, mudflat, open water, savanna woodland, and agricultural land — within a compact area,

combined with the site's position on the East Atlantic Flyway, which brings substantial numbers of Palearctic migrant species during the northern winter (October to March). The existing wastewater ponds, despite their degraded condition, paradoxically contribute to bird diversity by providing open water habitat that attracts wading birds, herons, and kingfishers.

5.2.8.2 Key Species Groups

Group	Representative Species	Habitat Association	Conservation/Economic Significance
Kingfishers (9 species)	Pied Kingfisher, Blue-breasted Kingfisher, African Pygmy Kingfisher, Malachite Kingfisher	Creek margins, mangrove edges, pond banks	Flagship species for birdwatching tourism; indicator of fish availability
Herons and Egrets	Goliath Heron, Western Reef Egret, Black-crowned Night Heron, White-backed Night Heron	Mudflats, mangrove creeks, pond edges	Indicator of wetland health; tourism attraction
Raptors	African Fish Eagle, Osprey (Palearctic migrant), Hooded Vulture, Yellow-billed Kite	Canopy trees, open sky, water bodies	Top predators; ecosystem health indicators
Palearctic Migrants	Osprey, Black-tailed Godwit, Whimbrel, Avocet, Common Sandpiper	Mudflats, open water, creek margins	International conservation significance; East Atlantic Flyway; seasonal (Oct-Mar)
Mangrove Specialists	African Finfoot, Blue Paradise Flycatcher, Pel's Fishing Owl, Greater Painted-snipe	Dense mangrove, quiet creeks	High conservation value; sensitive to disturbance; rare/difficult to observe
Bush-shrikes and Forest Birds	Yellow-crowned Gonolek, Northern Puffback, Common Wattle-eye	Woodland, scrub, mangrove edges	Africa-endemic families; tourism draw for specialist birders
Waterbirds and Waders	Spur-winged Lapwing, Senegal Thick-knee, Black-winged Stilt, Caspian Tern	Mudflats, pond margins, open water	BirdLife IBA trigger species; population significance
Urban/Savanna Species	Bearded Barbet, Western Grey Plantain-eater, Long-tailed Starling, Little Bee-eater	Trees, gardens, open woodland	Contribute to overall species richness; accessible for tourists

5.2.8.3 Species of Conservation Concern

Several species recorded at Kotu Creek are of elevated conservation concern. The African Finfoot (Podica senegalensis) is a secretive waterbird strongly associated with quiet mangrove creeks and overhanging vegetation; it is sensitive to disturbance and water quality degradation. Pel's Fishing Owl (Scotopelia peli), one of Africa's rarest owls, has been recorded in the mangrove areas and requires undisturbed nocturnal foraging habitat. The White-backed Night Heron (Gorsachius leuconotus) is another mangrove-dependent species of limited distribution in West Africa. The Hooded Vulture (Necrosyrtes monachus), classified as Critically Endangered on the IUCN Red List, is commonly observed soaring over the area and nesting in large trees.

The site's significance for Palearctic migrants — species that breed in Europe and winter in Africa — adds an international dimension to its conservation value. The Gambia is a signatory to the African-Eurasian Migratory Waterbird Agreement (AEWA), which obliges the protection of critical stopover and wintering sites. The Kotu Creek mudflats and ponds serve as important foraging and roosting areas for migrant waders during the October-to-March period, which coincides with the peak tourism season.

5.2.8.4 Seasonal Patterns and Sensitivity

Avifaunal activity at Kotu Creek follows distinct seasonal patterns that are critical for impact assessment and construction scheduling. The period from mid-April to mid-May represents the peak of northward migration for Palearctic species and the onset of breeding for many resident species; the Gambia Bird Watchers' Association has specifically requested that no heavy construction activities occur during this sensitive period. The wet season (June-October) sees reduced tourist birdwatching activity but increased breeding activity among resident species, particularly herons, kingfishers, and weavers. The dry season (November-April) coincides with peak Palearctic migrant presence and peak tourism demand, making it the period of highest ecological and economic sensitivity for avifauna.

The biotic environmental assessment focused on the Kotu Wastewater Treatment Plant

5.3 The socio-economic baseline

The socio-economic baseline assessment covered all project host communities. Primary data collection combined quantitative and qualitative methods, including structured household questionnaires and key informant interviews. The survey was designed with the objective of obtaining pertinent socioeconomic data on the project communities. Household surveys were administered to respondents residing in settlements located along the proposed pipeline routes. Responses were recorded electronically/on paper at the time of interview by trained enumerators.

Sampling was conducted in two stages. First, a complete list of host communities within the project area was compiled using the GBOS 2024 census. This produced a sampling frame of 21 communities (Table 19). Second, a subset of nine (9) communities was selected for the household survey using simple random sampling (lottery method): each community name was written on identical slips of paper, folded, placed in a container, mixed thoroughly, and then drawn one by one until nine communities were selected. Figure 29 presents the selected survey communities.

Qualitative data were collected through key informant interviews with purposively selected individuals (e.g., community leaders, women/ youth representatives, service providers and other knowledgeable persons) to complement and contextualize the household survey findings.

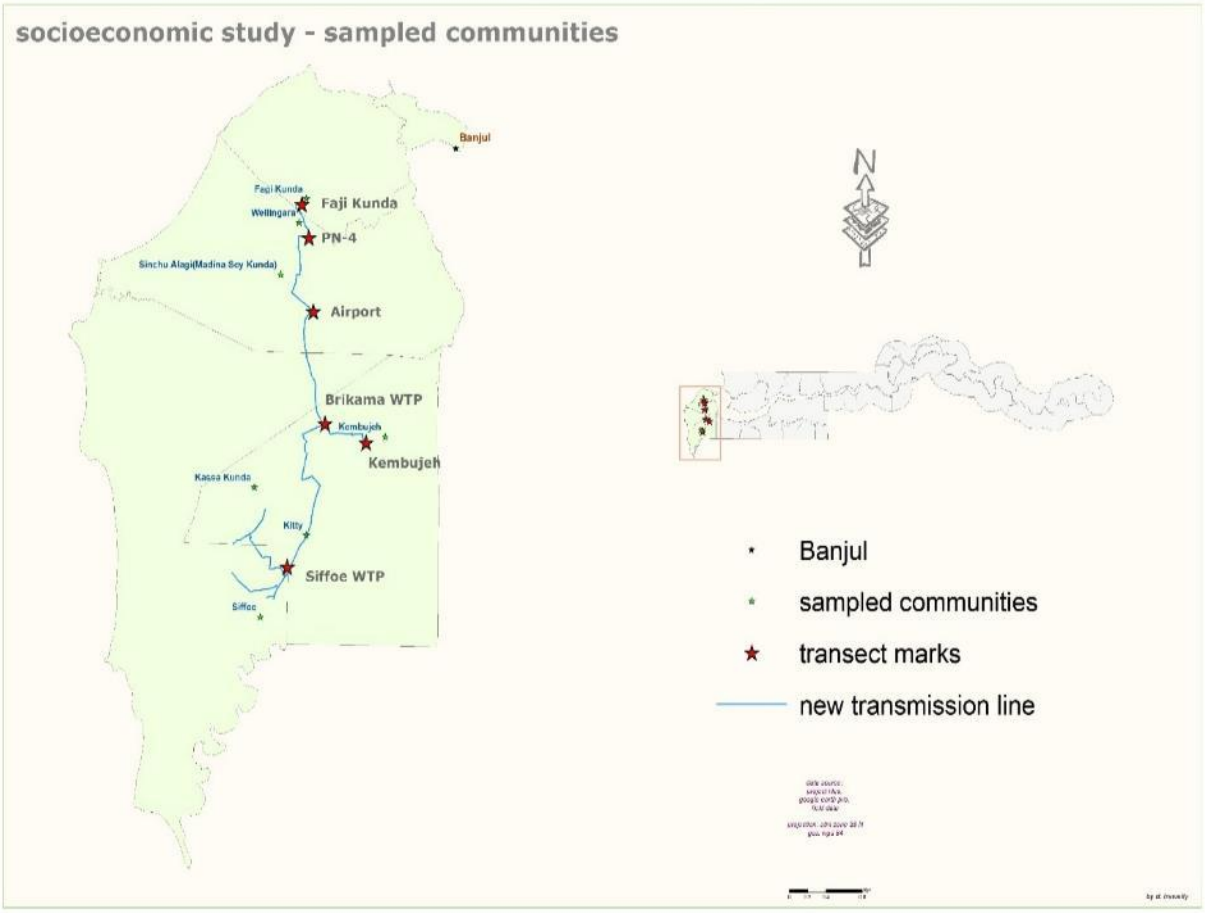


Figure 5-5 : The sample communities of the socio-economic survey

5.3.1.1 Gender

The gender distribution in the project host communities reveals a discrete pattern among the sampled populace. Females comprise 35%, and males 65%, indicating a relatively unbalanced distribution among the sampled population. This is largely associated to male dominance when it comes to discussing issues regarding either the household or compound. This is in the sense that most the women interviewed at compound/household levels, insist on putting the gender of the male household head or owner of the compound.

However, women equally participate in the discussion status of each question in the questionnaire especially when it relates to water.

5.3.2 Other aspects of the socioeconomic setting of the project area

5.3.2.1 Population of the project host communities

Table 19 shows the population of the communities within the project area. The 2024 census indicated a total population of 379,348 persons for the Kanifing LGA, and an average population density of 5,021. The total number of households is 61,586 for Kanifing LGA.

Table 5-2 : The population of project intervention communities

LGA	District	Settlement	Household	Gender		Total
				M	F	
Kanifing	Bundungka Kunda	Bundung	7868	24,324	25,666	49,990
Kanifing	Latrikunda Sabiji	Latrikunda Sabiji	2612	7,869	8,578	16,447
Kanifing	Serekunda	Serekunda	1697	4,926	4,896	9,822
Kanifing	Serekunda	Serekunda London Corner	1384	3,441	3,640	7,081
Kanifing	Tallinding Kunjang	Tallinding North	3153	10,525	10,732	21,257
Kanifing	Tallinding Kunjang	Tallinding South	2740	9,268	9,673	18,941

Source: The Gambia Population and Housing Census 2024 (GBOS August 2024)

5.3.2.2 Access to water services

GBA's water services from NAWEC are mainly derived from underground sources, production estimated around 110,000m3/day from 84 boreholes spread across the area. From its existing four water treatment plants, the treated water is transported through clean water pipes to 29 elevated water tanks located across the area.

Generally, water consumers experience disruption of water supply daily, enjoying not more than four to five hours of continuous water supply. Some parts do not have any services from NAWEC, and those people who can afford it have resorted to drilling boreholes in their properties to satisfy their water needs, often erecting overhead tanks for storage. Figure 53 shows the type of private water tanks prevalent within the area. In addition, in some areas water is provided to the communities by philanthropic organizations. Figure 54 shows a public water point provided by a private NGO in Sifoe.

Figure 5-6 : Typical private borehole water tank

Figure 5-7 : A public water point provided by NGO

Given the general shortage of water services in the area, it is common to see vendors using donkey carts to sell water in 20-L plastic containers. Figure 55 shows a loaded donkey cart with plastic containers.

Figure 5-8 : A loaded donkey cart with plastic containers filled with water

5.3.2.3 Access to education

The project area is relatively well endowed with schools; Table 20 below provides a summary of the different types of schools that are operational within the project area. The education system in the country is based on a 3-6-3-3 structure, and includes Early Childhood Development (ECD), 6 years of Lower Basic Education (grades 1-6), 3 years of Upper Basic Education (grades 7-9), and 3 years of Senior Secondary Education (grades 10-12), followed by tertiary education. It is important to note that the different types of schools include both Government and privately managed schools. A total of 445, 160 students have been enrolled in 1,361 different types of schools in the project area. These include 201,959 boys (45.36%) and 243,201 girls (54.61%).

Table 5-3 : Summary of different types of schools in the project area

Type of school	Schools/Centers	Boys enrolled	Girls enrolled	Total enrolled
ECD	737	36,733	39,531	76,264
LBE	344	103,638	119,911	223,549
UBE	138	36,602	48,328	84,930
SSE	142	24,986	35,431	60,417
Total	**1,361**	**201,959**	**243,201**	**445,160**

Source: SD Focus Ltd.

ECD: Early Childhood Development

LBE: Lower Basic Education
UBE: Upper Basic Education
SSE: Senior Secondary School

5.3.2.4 Health facilities

The GBA has a significant network of health facilities run by the government, religious organizations, Community-based organizations and private individuals. The health facilities include one Hospital, Health Centers, Medical Clinics and other private facilities.

The biggest is the Serekunda General Hospital; others include the Jammeh Foundation and Bafrow Clinic, and Major Health Centers at Serekunda, Faji Kunda and Brikama. The Health Centers are Sinchu Balia, Abuko, Banjulinding, Army Camp, New Yundum, Farato, Kassa Kunda, Sifoe and Tanji. Table 21 below shows the number and type of health facility in each town/village across the project area.

Table 5-4 : Key health facilities in Kanifing and Brikama LGAs

Town/Village	Hospital	Health Centre	Town/Village	Hospital	Health Centre
Kanifing	1	-	Army Camp	-	1
Serekunda	1	1	New Yundum	-	1
Bundung	1	-	Busumbala	-	1
Tallinding	1	-	Farato	1	1
Fajikunda	-	1	Brikama	-	1
Sinchu Balia	-	1	Nyofeleh	-	1
Abuko	-	1	Sifoe	-	1
Banjulinding	-	1	Tanji	-	1

Source: SD Focus Ltd, 2025

5.3.2.5 Agriculture and livestock production

Agriculture is among the main economic activities in the project intervention area. Agricultural activities are carried out in the periphery project intervention areas of WCR and transition areas with less densely populated areas than of Kanifing LGA, where most of the agricultural lands are now used for residential and commercial purposes. Subsistence farming forms a large part of agricultural activities in the project's intervention areas, and below are some of the different forms of agricultural practices within the project area. They include the following.

- **Cash crop production**

There are cash crops such as cashew and orchard farms (i.e., oranges, mangos, etc.) mostly located in the immediate upland fields of Sifoe, Kitty, Kassa Kunda, Busuranding, Jamisa, and Nyofeleh. Vegetable cash crops such onion, cabbage, cucumbers, pepper, tomato, etc. are largely grown by Radvile Farm in Sinchu, in the women gardens of Banjulinding, Farato Farm, Sifoe, Kitty, Kassa Kunda, Busuranding and Nyofeleh, etc. Figure 56 shows a vegetable garden along the proposed pipeline route in Nyofeleh. Excavating the trench along this road could potentially impact the garden.

Figure 5-9 : Roadside vegetable garden in Nyofeleh/women vending vegetables at Brikama market

These gardens are mostly located in shallow water-table lands and the peak of production in these gardens is during the dry season. The water requirement of these gardens is sourced from underground water, accessed through boreholes and open concrete line wells owned and managed by the producers. The producers like to own independent water sources for reliability of supply and low cost.

- **Food crops**

Food crops are subsistence, and they consist of late millet, sorghum, cassava, etc. These food crops do well in the upland areas as they are better adapted to the arid climatic conditions. Other crops grown in the backyards during the rainy season include maize, beans, cowpeas, tomatoes, spring onions, sorrel sweet potatoes, okra etc. There are potentials to transition this activity into commercial if reliable and cheap water is available to the producers.

- **Livestock production**

The low land areas with shallow water table are extensive feeding areas for livestock such as cattle, goats, and sheep especially at the peak of the dry season. Free range domestic poultry rearing is widely practiced by households in Sifoe, Kitty, Kassa Kunda, Busuranding and Nyofeleh project host communities.

Reliable and cheaper water source for drinking of livestock is among concerns raised in community meetings; the livestock current watering point is sourced from open concrete lined wells and the community/village borehole water supply system.

5.3.2.6 Fish availability

Fish selling is also among the economic activities, and fish sellers buy their stock from Gunjur or Tanji fish landing sites, in Kombo South to sell to households in the project area. Handling and processing of fish also relies on clean water. Figure 57 shows the various agricultural activities within the GBA.

5.3.2.7 Telephone communication

The project area generally has one fixed network operator (Gamtel) and four mobile phone operators: Africell, Qcell, Comium and Gamcell networks; none of the operators is currently able to offer 'the complete package', with poor network coverage, high costs across networks and while roaming. In addition, mobile internet speed is slow, contributing to many subscribers in the project area owning several mobile phones across a wide range of operators. Figure 58 shows the antenna of one of the

operators in Sifoe. There are 85.2 mobile phone subscriptions per 100 individuals [4]. This has subjected subscribers in the project area to experience mobile network coverage fluctuation.

There are Post Offices in Kanifing/KMC and Brikama/WCR, whose usage by the population is low because of the emerging and faster means of communication offered by information technology.

Figure 5-10 : Cell phone tower of one of the companies in Sifoe

5.3.2.8 Financial and commercial activities

People and businesses in Kanifing and Brikama LGA are served by numerous prominent Banks such as Standard Chartered Bank, Guarantee Trust Bank, Trust Bank, Agib Bank Gambia, etc. There are also a plethora of Forex Bureaus and prominent among them are, Yonna Forex Bureaus, APS Financial Services, Gam Direct, among others. Mobile Money Transfer Services such as Wave, AfriMoney, QMoney, Yonna Wallet etc. are accessible to many people who have no access to formal banking services.

There are a number of bottled water light industries in the project area (mostly in Kanifing LGA) such as Gam water, Aqua water, Jah water, Best water etc., and these companies either source water directly from the NAWEC main water supply grid, or from private boreholes.

5.3.2.9 Gender norms and cultural practices

While access to safe drinking water has improved in The Gambia, the social belief and practice of water collection assigned to women and girls is regarded as a source of conflict and gender-based violence. Women and children bear the responsibility of ensuring availability of water, and for which reason they spend critical hours looking for the resource.

In spite of the above however, it is expected that the project will have numerous positive impacts on women and vulnerable households in the project area. One key social aspect of the project is the possible impact on women, children and households who will benefit from the facilities i.e. helping women reduce time spent looking for water. It is for this reason that the GOTG (Government of The Gambia) is implementing the ESF Good Practice Note (GPN) “Addressing Gender-Based Violence”. The GPN is structured around three key steps that cover project preparation and implementation as follows:

1. identify and assess the risks of Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH), including social and capacity assessments. Ideally, this would be done during project preparation,

[4] https://www.giepa.gm/media/userfiles/subsite_199/files/resource-library/mobile-telecoms.pdf

with the understanding that SEA/SH risk assessment is a continuous process and should take place throughout the project life cycle as it can occur at any moment;

2. address the risks by identifying and implementing appropriate SEA/SH risk mitigation and monitoring measures;
3. respond to any reported GBV allegations, whether related to the project or not.

Adopting the above principles is critical since in big projects such as GWASAP, there are potential impacts of sexual and GBV incidents as its prevalence in the country stands at 75 % (UNFPA 2020). The GPN recognizes that projects involving civil works may increase the risk of GBV, including SEA/SH and VAC exercised in different ways by a range of perpetrators involved in the implementation of projects. The project should include effective monitoring and evaluation (M&E) mechanisms, which meet the WB's requirements on SEA/SH and VAC and allow for reporting on allegations that are project-related and for monitoring case follow-up.

5.3.2.10 Social vulnerability

Most of the population within the project area consists of women and youth, and socially vulnerable people such as people with disability, the elderly, and children. However, these categories of people remain disadvantaged and more vulnerable to poverty and other social-economic inequalities. Most youth lack adequate skills, capital, and security to access financial services.

Nonetheless, many of the youth and women in the project area are involved in small income generating activities such as farming, petty trading, car washing, brick/block making, etc. Some of these livelihood activities are taking place along the corridors and or close to the proposed alignment for the water transmission and distribution pipelines.

Some of the women are also engaged in evening time food vending along some of the proposed roads especially in the Sinchu and Wellingara settlements, and along the Brikama/Airport Junction corridor. There is a need for the project not to exacerbate such vulnerabilities.

5.3.2.11 Displacement and/or movement of communities

Taking into consideration the project intervention areas and the activities to be implemented, one can clearly say that displacement and movement of communities, families and individuals is not envisaged during the implementation.

This is premised on the fact that proposed intervention sites are existing areas, and no new land is required resulting in physical displacement of families for project activities. However, given the usually narrow roads that run through the villages, and the fact that the trenches will be excavated with heavy machinery certain private properties (such as fruit trees, fences, and other structures that protrude onto the roads may be impacted. This will result in some form of resettlement. Figure 61 shows a mango tree located near the road in Nyofeleh that may potentially be impacted.

5.3.2.12 Cultural, historical, and archaeological environment

No sensitive sites of cultural heritage within and around the project intervention areas have been so far identified; none of the project host communities and infrastructure sites are located within a 500-meter radius of cultural, historical, and archeological sites. However, there are possibilities of finding cultural heritage by chance, particularly during drilling of boreholes, digging trenches and construction of water treatment plants, etc. These may be disturbed or lost due to lack of knowledge in managing cultural heritage discovered by chance. To manage any finds, use **Annex 8**.

6 Consultations and Public Participation

This Chapter presents the outcome of the public consultations, and the approach that was taken to conduct the stakeholder consultations. It describes the process through which the stakeholders, among other things, shared local and indigenous information with the Consultant, and who, in turn listened to their views, with a view to ultimately empower them to initiate, manage and control their own self-development. In line with international best practice, the process was transparent and encouraged a high degree of stakeholder participation to minimize environmental and social risks. It will be emphasized that this process is a continuum throughout the life cycle of the project, and therefore, current consultation efforts and results are not an end but will be sustained.

6.1 Objectives of stakeholder engagement

The key objectives of the consultation process are to:

- Ensure that the communities and all stakeholders are given early and adequate information on the ESIA of the proposed project;
- Provide a framework for improving the understanding of the potential impacts of the proposed project on the ecological and social environment;
- Include stakeholders' views and concerns as part of the ESIA execution especially as it concerns the potential impacts;
- Identify alternative sites or designs, and mitigation measures, to improve environmental and social soundness;
- Clarify values and trade-offs associated with these different alternatives;
- Identify contentious issues in the proposed project execution;
- Establish transparent procedures for carrying out the proposed project;
- Provide information on the project GRM.

6.2 Stakeholder engagement strategy

The stakeholder engagement strategy employed in this study is intended to be used as a tool for defining and qualifying the relationships between the stakeholders that will be involved at the various levels of project design, and implementation, including the project personnel and management. It is needed to lay the foundations and provide the necessary guidance for stakeholder engagement during the ESIA process.

The process started with careful stakeholder mapping undertaken in consultation with the Consultant project team, and the Project Management Team at NAWEC on 3rd March 2025 during the inception stage of this exercise. **Annex 2** provides the list of the institutions consulted. Details of the meeting with the NAWEC Project Team, are also provided within the Annex. Additional consultations were held with the affected/benefitting communities during the ESIA study through KII and community meetings.

6.3 Stakeholder analysis and identification

This process focused on the identification of stakeholders, roles, and influence they wield in decision making and implementation of the ESIA. The process determines the capacities, concerns, and influence policy formulation and implementation.

For example, this ESIA acknowledges that it is possible for an agency, organization or a group to have the dominant influence over formulation of a policy but at the same time have less practical impact than a large number of groups who have no knowledge of the regulations and information about the project but nevertheless control day to day events or actions that affects the project. These will include the community members, for example, in Sifoe, Nyofeleh, etc. in whose areas the project will be implemented.

In addition, through extensive literature review, a list of stakeholders was drawn (see Table XX), and they were contacted through visits and phone calls. Categories of stakeholders in this Project include national regulatory institutions, beneficiary communities and project affected groups with varying range of influences and interests as identified below.

Table 6-1 : Categorization and analysis of the stakeholders' influence and interest

Stakeholders	Category	Description	Influence	Interest	Plan of engagement
National Environment Agency	Authority	Enforces the NEMA (1994) and EIA Regulations (2014) Evaluates the EIA/ESMP; Grants Env. Approval for the project; Monitors implementation to ensure compliance with environmental legislation	High	High	Fully engage this group and ensure that their requirements are satisfied at all times
Ministry of Environment	Authority	Oversees the NEA and thus the implementation of the environmental laws and policies of The Gambia; provides policy guidance to the Agency	High	High	Same as above
Ministry of Petroleum, Energy and Mines (MoPEM)	Authority	Oversees NAWEC, the proponent of the GWASAP Project	High	High	Same as above
NAWEC	Authority	Proponent of the project	High	High	Same as above
Department of Forestry	Authority	Manages national forests	High	High	Same as above
Dept. of Parks and Wildlife Management	Authority	Manages National Parks	High	High	Same as above
Department of Water Resources	Authority	Manages water resources	High	High	Same as above
Ministry of Finance and Economic Affairs	Authority	Manages the national finance	High	High	Same as above
Public Utilities Regulatory Authority	Authority	Regulates NAWEC's tariffs	High	High	Same as above

Stakeholders	Category	Description	Influence	Interest	Plan of engagement
National Social Protection Agency (NSPA)	Authority	Protects the interest of the vulnerable	Low	High	Save as above
Ministry of Women, Gender and Children's Affairs	Authority	Ensures that the rights of women and children are protected within the project, and that they participate in the sensitization especially on gender issues	High	High	Same as above
CBOs/CSOs	Authority	Engages in peace-building activities and the promotion of human rights and good governance	High	High	Same as above
Social Protection Agency	Authority	Engages in promotion of human rights, good governance and social justice	High	High	Same as above
Host communities	Local populations	Project beneficiaries	High	High	Same as above
Office of the Governor/Mayor	Authority	Administrative headquarters	Low	High	Same as above
Owners of water businesses	Local populations	Beneficiaries	Low	High	Fully engage this group and ensure that their rights are protected
Vulnerable persons	Local populations	Beneficiaries	Low	High	Same as above
Kanifing Municipal Council (KMC)	Authority	Beneficiaries	High	High	Fully engage this group
Ministry of Lands / Dept. of Lands and Surveys	Authority	Manage land acquisition	High	High	Fully engage this group
Ministry of Tourism / Gambia Tourism Board (GTB)	Authority	Ensure development of tourism in the TDA	High	High	Fully engage this group
NAWEC Water and Sanitation Division	Authority	Ensure provision of sanitation services	High	High	Fully engage this group
National Centre for Arts and Culture (NCAC)	Authority	Ensure protection of cultural heritage	High	High	Fully engage this group
Formal Vacuum-Truck Operators Association	Local populations	Beneficiaries	High	High	Fully engage this group

Stakeholders	Category	Description	Influence	Interest	Plan of engagement
Bird Watchers' Association / Council of Elders	Local populations		High		Fully engage this group

6.4 The consultation process

Consultation is considered an important element of an ESIA process. This is because appropriate and adequate consultations help ensure smooth project implementation and guarantee the sustainability of the proposed project. The consultation incorporates all stakeholders that may be directly or indirectly be affected by the proposed project. It involves information dissemination and interaction with identified stakeholders. Interactions with the people and eliciting feedback has allowed the affected populations to raise issues that should be considered before, during and after the project operation. The overall result would be the optimization of the potential of the proposed project and the maximization of its benefits.

The success of the implementation of this ESIA/ESMP and by extension the overall project sustainability will depend on how these groups are engaged during project preparation and implementation. To ensure that an enabling platform for consultation is prepared, the ESIA team consulted all the identified stakeholders; that was followed up with phone calls and visits to their offices and venues of meetings.

6.4.1 Institutional consultations

Consultations with key national institutions were undertaken in the form of meetings (Key Informant Interviews) using mainly unstructured methods. The stakeholders consulted for this project included: the NAWEC/GWASAP Project Team at Fajara, NEA, DoF, DWR, NRA, Office of the Governor of West Coast Region, CEO of Brikama Area Council, etc. **Annex 2** indicates the institutions and communities consulted. Figures 62 through 65 illustrate the meetings with the national regulatory institutions.

6.4.2 Consultations with stakeholder communities

The host communities are the primary stakeholders who will be directly impacted by the proposed project. In this regard, some of the communities were consulted through community meetings, focus group discussions, and administering of semi structured questions with individuals operating small scale business along the proposed pipelines routes.

As with all others consulted, the project components and activities were discussed at the meetings, emphasizing the potential negative and positive impacts as well as proposed mitigative measures for the negative impacts. Vital information about the entire project area was elicited from community members during the meetings. Everyone present was encouraged to participate actively and given sufficient time for each participant to express his/her views on the issues. An important aspect of the project that was provided at the meetings was the Project's Grievance Resolution Mechanism (GRM), the framework that provides the communities with the possibility to address their grievances including during resettlement exercises.

6.5 Stakeholders' opinions about the project

All stakeholders consulted expressed unanimous satisfaction with the Project, particularly regarding the anticipated improvement in access to clean and safe drinking water.

6.5.1 National Environment Agency (NEA)

The NEA confirmed that the FSTP requires a full Class A Environmental Impact Statement. The Agency outlined the ESIA process: application and screening, classification, scoping visit, TOR formulation, draft report production, national validation with stakeholders, approval, and continuous monitoring. NEA emphasized that the Environmental Quality Standards Regulation (1999) specifies minimum acceptable limits for fecal matter, BOD, COD, and electrical conductivity, though the regulation is considered outdated and WHO standards are also relied upon.

Key Concerns Raised:

- The facility is severely overwhelmed, originally designed for a few hotels but now receiving waste from hundreds of thousands of homes, compromising treatment quality due to insufficient retention time.
- Greatest risk is public health due to exposure to contaminated water and prolonged odour exposure, compounded by proximity to tourist areas and residences.
- Cumulative impacts: facility closure or high discharge fees could lead to illegal dumping; increased costs may result in poorly constructed septic tanks contaminating groundwater; foul odours could cause hotel closures.
- The 1999 environmental standards regulation is not fully comprehensive for emerging issues and needs updating.

Recommendations:

- Modernize treatment methods from natural sedimentation to mechanical processes for higher-capacity treatment.
- Improve aeration and desiltation of existing ponds.
- Identify and develop alternative treatment sites to reduce pressure on Kotu.
- Address indiscriminate septic tank construction contaminating groundwater.
- Key institutions to consult: GTB, DWR, Fisheries, Physical Planning, KMC, BCC, Hotel Association, Bird Watchers, Parks and Wildlife, local communities, Ministry of Health.

6.5.2 NAWEC / Project Implementation Unit (PIU)

The PIU confirmed that the main project design has not yet started, with a procurement plan in place to recruit a consultant for the feasibility study. Eight stakeholders had been met at the time of the interview. The PIU acknowledged that no prior community consultations had been conducted for this specific project, meaning communities are currently unaware of it.

Key Concerns and Issues Raised:

- Land acquisition for the extension area is underway, involving communication with the Minister and Land Department. Farming and livelihood activities were observed in the extension area, requiring interviews with land users even without legal titles.
- Need for dedicated E&S safeguard staff, as current staff are shared across multiple projects funded by different banks.

- Coordination risk: the project involves diverse components and multiple ministries, which is a new arrangement that could lead to challenges due to differing procedures.
- Site suitability concerns: the proposed land extension is within a Tourism Development Area, and there are suggestions that relocation might be more ideal.
- PPP implementation is new to the country — a previous electricity PPP took two years for procurement and remains incomplete.
- The water department lacks prior experience with World Bank safeguard requirements.
- Persistent strong odour from Kotu ponds confirmed, detectable almost every week by passersby.

Lessons Learned from Past Projects:

- Continuous stakeholder engagement is crucial (quarterly or bi-annually), not just during initial SIA/RAP stages. Previous audits revealed communities claiming no knowledge or compensation years after initial consultations.
- E&S and safety requirements, including penalties, must be explicitly integrated into contractor billing documents and performance bonds from the outset.

6.5.3 Public Utilities Regulatory Authority (PURA)

PURA confirmed its mandate to regulate the entire sewage value chain from trucking to discharge. Comprehensive sewage regulations are under active development (draft expected around 2027), covering licensing, construction, containment, collection, transportation, treatment, tariffs, and enforcement. Currently, PURA relies on "industry standards" and conducts yearly inspections using a checklist.

Key Findings:

- PURA's assessment of sanitation at the Kotu plant is "generally poor" — citing bad odours, negative tourism impact, and poor road infrastructure.
- The location is considered "ideal" due to proximity to hotels, but significant improvements are needed in environmental management, odour suppression, and modern treatment methods.
- NAWEC took over the Kotu plant from a private entity around 2019.
- A debate emerged regarding PURA's capacity to handle environmental/health aspects of sewage regulation versus NEA's role. PURA's monitoring has historically focused on service delivery and economic aspects rather than effluent quality.
- NEA rarely collects samples; Ministry of Health sampling is primarily for disease investigation — suggesting a gap in dedicated environmental monitoring.
- PURA is working with DWR to build laboratory capacity for sludge discharge testing.

6.5.4 Department of Water Resources (DWR)

The DWR provided critical hydrogeological baseline data. The region has shallow sand aquifers (4–30 m deep) and deep sand aquifers (40–120 m). The Kotu/Kanifing area experiences significant groundwater contamination, primarily nitrate pollution from high-density septic tanks leaching into the shallow aquifer, with chloride contamination in deeper zones.

Key Findings:

- Groundwater monitoring has been inconsistent and project-based since the 1980s. Data is scattered, not standardized, and often held by individuals.
- The water sector operates under outdated laws (1979 Water Act). The National Water Resources Council mandated by the Act has never met.
- The 2006/2007 National Water Resource Policy expired in 2016 and was never fully implemented.
- Weak inter-agency coordination between DWR, NAWEC, and NEA — examples include waste dumping near NAWEC production boreholes.
- The Kotu area is a critical groundwater recharge zone but highly susceptible to contamination.
- The Kotu stream is heavily polluted from the Bakoteh dump site. A new bridge near BB Hotel has completely blocked the stream, altering water flow.
- Rapid urbanization reduces groundwater recharge and contributes to flash flooding.
- The FSTP site is in the Kotu Stream catchment, hydrologically disconnected from the Gambia River — World Bank OP7.50 on International Waterways is deemed inapplicable.

Recommendations:

- FSTP design must ensure zero leakage or leachate into the stream, soil, and aquifer.
- While the 1980 Public Health Act recommends 30 m distance from pollution sources, this is often impractical. Boreholes near the site are primarily for agricultural use.
- The ESIA groundwater monitoring plan should assess existing observation boreholes and consider increasing monitoring density.

6.5.5 Ministry of Health / Regional Health Directorate (Western Region 1)

The Ministry of Health confirmed that a well-designed FSTP is expected to reduce public health burdens compared to the current inadequate system. The country has a robust disease surveillance system with trained field epidemiologists. No cholera outbreaks have been reported since 2005.

Key Findings:

- Main communicable diseases in the area: Malaria (high prevalence), Dengue (newly observed, rare), Yellow Fever (few cases). TB remains a concern.
- The Ministry does not collect specific empirical data on the health impact of the existing Kotu pond. The pond was designed only for wastewater but now receives fecal sludge from across the country.
- Nearest health facilities: Bakao Health Centre and Carifin General Hospital.
- Vector control in Kotu is currently a “demand service” (responding to reported infestations) with no proactive program.
- The Ministry fully supports safe reuse of treated biosolids, aligned with the NDP and SDGs.
- The Ministry is fully committed to integrating the FSTP into its existing sentinel surveillance system.

Recommendations:

- Incorporate education, training, and PPE provision for all workers including truck operators.
- Institute an entomological surveillance program at the FSTP to monitor vector breeding.

- Implement a PPP model ("Build, Operate, Handover") — government management alone is insufficient for long-term sustainability.
- Strengthen existing community health education initiatives emphasizing the entire sanitation value chain.

6.5.6 Kanifing Municipal Council (KMC)

KMC officials had limited prior knowledge of the project. They described the current Kotu sewage site as a "mess" with significant odour affecting hotels, schools, and health facilities. However, KMC deemed the current location "okay" for a modern plant, anticipating that advanced technology will eliminate or greatly reduce odour.

Key Findings:

- The site is consistent with KMC's development plan for a treatment facility. Expansion requires acquiring land from the GT Board.
- KMC's waste management: only 20% of waste is collected due to aging vehicle fleet. They operate a solar-powered compost plant and semi-MRF system.
- Bakoteh dumpsite: described as "horrible" with persistent odour and fire incidents (2018 fatality). Recent 2023 data shows severe groundwater pollution from metallic elements. KMC plans to close it and transform it into a recreational park.
- Roads to the site are poor, dusty (gravel), and muddy in rainy season. Leaking vacuum trucks pollute highways.
- Schools, mosques, health facilities, and hotels along truck routes are exposed to odours and pollution.
- Residents constantly complain about odour. Environmentalists express concern about discharge into the sea changing water quality.

Recommendations:

- Strongly advocates PPP model involving councils and private sector for long-term maintenance.
- Significant youth employment opportunities expected.
- Greatest risk: sustainability due to high machine maintenance costs.
- KMC requires formal written communication from NAWEC, capacity building, expertise, and study tours.
- Public sensitization is crucial to change perceptions and ensure local ownership.
- Community engagement should go through Ward Counsellors and KMC's Community Service unit.

6.5.7 Ministry of Lands / Department of Lands and Surveys

The Department confirmed that the proposed project site (Kotu) is under state license. The Department of Finance's office administers the Acquisition Compensation Act. Internal government transfers (e.g., from GTB to NAWEC) are expected to be quicker than standard compulsory acquisition.

Key Findings:

- Even informal occupants or farmers on government land are entitled to compensation for loss of livelihood, aligning with World Bank's replacement of land policy.
- Cash crops (e.g., cashews) will be valued, and a Resettlement Action Plan (RAP) will cover valuation and compensation.
- Government units capable of managing resettlement: Disaster Management Agency, Physical Planning and Housing, Valuation Unit, and the Ministry itself.
- No existing records specifically identify affected persons; an inventory will be conducted as needed.
- It is unclear if the Physical Planning department has a local plan for the Kotu area.

6.5.8 Ministry of Tourism / Gambia Tourism Board (GTB)

The GTB confirmed that tourism contributes approximately 20% to the national economy, with 80–85% of tourism activities concentrated in the Greater Banjul/West Coast region including Kotu. The majority of tourists (38%) are British, followed by Scandinavian markets. Main motivations are "sun and sea" and bird watching.

Key Concerns:

- Significant tourist complaints about severe odour from the existing plant, making it difficult to breathe in the area.
- Pumping station failures lead to sewage overflows in hotels.
- Constant movement of "sanitary trucks" creates dust pollution and odours due to leakages, negatively impacting businesses (some considered closing).
- Kotu Creek water quality: pollution during malfunctions leads to stagnant, smelling water creating mosquito breeding grounds.
- The current location is "not ideal" unless existing challenges can be effectively mitigated.
- Construction noise could negatively impact bird watchers and informal businesses (food sellers, basket weavers, artists) near Kotu bridge.

Recommendations:

- Divert truck routes away from tourist visibility (bypass route).
- Enforce strict standards for vacuum trucks (annual inspection before licensing, police enforcement) to prevent leakages.
- Implement nature-based solutions and architectural treatments to "hide" the facility visually.
- Relocate displaced informal operators to suitable alternative sites with financial compensation.
- GTB expects involvement in project governance given its role in approving building plans.
- Form a working group comprising GTB, GHA, NAWEC, NEA, KMC, BCC, and private operators.
- Ten-year vision: zero waste management problems, zero odour, efficient waste collection.

6.5.9 Department of Parks and Wildlife Management

The Department confirmed the ecological sensitivity of the project area, particularly the Tanbi Wetland (Ramsar site) located opposite the project site, and the Kotu Stream/Creek as a "very sensitive area."

Key Findings:

- Tanbi Wetland: Any change in ecological character would need to be reported under Ramsar Article 3.1, 3.2. Annual water bird counts are conducted.
- Kotu Creek: historically significant birding area, but bird populations are declining due to human encroachment and invasive weeds.
- Protected species: West African Crepe (rare, fully protected dove unique to The Gambia), Purple Swamp Hen, migratory species (January–February peak).
- Mangroves: highly critical and protected, serving as breeding/nursery grounds for fish species (groupers, Savinellas, Mugal sp.).
- Marine mammals: Bottlenose dolphins, Humpback dolphins, and the endangered West African Manatee (Trichechus senegalensis) present in Tanbi.
- Current area is highly polluted by domestic waste, sludge discharge, and livestock defecation, affecting wildlife and posing health risks to populations consuming local seafood.

Recommendations:

- Buffer distance of 50–100 metres recommended to protect mangrove habitats.
- Construction timing should consider sensitive periods (bird breeding/migration, fish spawning), though birds may find alternative sites.
- Critical recommendation: raise public awareness about water pollution health impacts and ecosystem protection.

6.5.10 Department of Forestry

The Forestry Department confirmed the Kotu Creek area as a vital ecological site due to mangrove presence. The Tanbi Wetland is a designated national park protected under parks and wildlife regulations.

Key Concerns:

- Pollution: any leakage or uncontrolled discharge could negatively impact biodiversity, especially mangroves.
- Tree removal: if expansion requires felling trees (including privately owned cashew plantations), they must be replaced. Felling natural trees requires Forestry Department approval.
- Cleared timber is state property and must be handed over to the department. A legal tariff exists for compensating tree species.
- Mangrove protection is a significant concern.
- Existing threats: illegal waste dumping, encroachment, salt intrusion, firewood harvesting.

Recommendations:

- Support existing mangrove restoration programmes (e.g., those with FAO).
- Use indigenous species (palm trees, coconut trees) for perimeter windbreaks and landscaping.
- A dedicated staff member could be assigned to monitor vegetation during implementation.

6.5.11 NAWEC Water and Sanitation Division

The NAWEC Water and Sanitation Division provided detailed technical information on the current state of the Kotu wastewater system, confirming severe operational challenges since taking over in June 2021.

Current Operational Challenges:

- Western Branch: lack of regular dislodging causes counter-slopes and deposits, leading to network overflows contaminating wetlands and rice cultivation areas.
- Pumping Stations: inlet basket screens are missing, causing frequent pump breakdowns. Only 2 of 4 stations have backup generators. P2 has broken concrete slabs raising H_2S risks. P3/P4 are at ground level, prone to flooding.
- Main challenge: high volume of fecal sludge from vacuum trucks — system was not designed for this.
- Vandalism: cables frequently cut and components stolen at pumping stations.
- No sludge drying beds: dredged sludge is disposed on pond sides.
- No comprehensive emergency response plan for spills, power outages, or extreme flooding (HSE team is developing one).

Proposed Solutions and Transition Plan:

- Strategy: construct FSTP first; trucks continue dumping at current location during construction; once complete, trucks divert to FSTP, allowing pond rehabilitation for hotel/network wastewater only.
- NAWEC prefers Scenario 2 (268 ha, 8 pumping stations, 19 km) over Scenario 1 (643 ha, 11 stations, 35 km) due to implementation feasibility given settlement patterns.
- New FSTP to be operated by a private entity. NAWEC is confident in nature-based solutions (floating treatment system, ultrasound for algae control).
- Tifa plant nursery (147,000 plants, 8,000 m^2) can be accommodated within the existing 64,000 m^2 land area.
- "No project" alternative would lead to severe environmental damage: continuous contamination of Kotu stream, wetland impacts, and tourism sector harm.

6.5.12 National Social Protection Agency

The National Social Protection Agency identified vulnerable groups in the project area and discussed mechanisms for integrating social protection into project implementation.

Key Findings:

- Vulnerable groups: persons with disabilities, elderly, female-headed households, widows, and orphans. Specific data requires checking social registries.
- Economically displaced at high risk: poor farmers (especially women involved in market gardening on GT Board land near Kotu) and informal businesses (arts and crafts vendors).
- Informal Manual Pit Emptiers: identified as extremely vulnerable, using unsafe methods, lacking formal associations and targeted social protection programs.
- The "Families Network" program exists but coverage in specific project areas needs verification.

- The department can coordinate support if the project provides necessary resources (existing budget does not cover such interventions).
- Robust national grievance mechanism exists that can be used by the project: AAKA Centre call center, 123 hotline (operational 8 AM–4 PM).
- Aims for a single national grievance mechanism for all projects with focal points for referrals.

6.5.13 National Centre for Arts and Culture (NCAC)

The NCAC assessed cultural heritage within the project footprint and confirmed that no tangible heritage sites (built structures, wells, sacred ponds) are recorded within the specific Kotu project area based on their regularly updated inventory.

Key Findings:

- No tangible heritage sites recorded in the project footprint.
- Intangible heritage may be present (prayer grounds, festival grounds, storytelling areas).
- Kotu Stream possesses natural heritage and cultural significance — rituals associated with waterways (initiation ceremonies, customs for newly married women) are common.
- Clusters of three or more baobab trees often signify old settlements (80–500 years old) — project team advised to look for these during fieldwork.
- The Gambia is a signatory to the UNESCO Convention 2001 on Protection of Underwater Cultural Heritage.
- The entire Gambia is considered a large archaeological site due to its riverine nature. Areas near rivers/streams are archaeological hotspots.
- Kotu is part of "British Kombo," identified as very old settlements predating Bathurst (Banjul).

Chance Finds Procedure:

Any discovered items during excavation must be professionally retrieved, documented (date, time, location, photographs), and handed over to the NCAC. The NCAC is prepared for emergency intervention and "salvage archaeology" if heritage items are discovered during construction.

Summary of Consultations: Private Sector and Economic Stakeholders

6.5.14 Formal Vacuum-Truck Operators Association

The consultation with the formal Vacuum-Truck Operators Association provided critical operational baseline data on the fecal sludge collection and transport sector.

Operational Baseline:

- Approximately 127–135 registered trucks serving the Greater Banjul Area, with numbers continually increasing.
- Each truck has a crew of 3 workers, totaling approximately 390 workers employed in transportation and discharge.

- Operators work independently, receiving payment directly from households, hospitals, and other clients.
- Dumping fees at NAWEC site: D230 (over 10,000 litres), D175 (under 10,000 litres).
- Household emptying fees: D2,500–D6,000, varying by distance, tank size, and season. No fixed pricing due to bargaining culture and 75–80% poverty rate.
- Operating hours: 8 AM–7 PM, no Sundays or public holidays. Operators request 24/7 access.
- Average discharge time: 25 minutes per truck.

Key Concerns:

- Access road to Pond 2 is in poor condition.
- Illegal dumping drivers: distance, fees, queues, and pond closures. Association claims 95% compliance but acknowledges the problem.
- Health problems: skin infections and injuries among drivers.
- A fatal incident occurred three years prior — a driver died after lying at the mouth of a soakaway and being pulled in.
- PPE provided for approximately 50 people only; not all workers consistently use it. No vaccination program in past 5 years.
- Strong concerns about new facility placement near residential areas and groundwater contamination (minimum 30 m perimeter recommended).

Expectations from the Project:

- Significant improvement for sanitation workers: funding, diverse treatment methods, capacity building.
- Increased earning potential and additional employment opportunities.
- Potential for treated wastewater for agricultural use (market gardening).
- Infrastructure must accommodate projected growth (up to 150 trucks).
- Zone-based pricing system proposed to introduce structure and predictability.

6.5.15 Bird Watchers' Association

The Gambia Bird Watchers' Association (GBWA), with 125 registered members, provided detailed ecological and livelihood information regarding the Kotu Creek area.

Ecological Baseline:

- Kotu Creek is globally recognized as a prime birdwatching destination, historically supporting over 600 bird species.
- Current "toxic" state of water and bird decline attributed to previous management company (Aqua).
- GBWA actively invests in conservation: cleaning the creek, replanting mangroves (fig trees), removing rubbish — often without government support.
- Species of concern: kingfishers, herons, egrets, plovers, sandpipers, Senegal Thick-knee (nocturnal feeder), and the endangered African Finfoot.

- All birds in Gambia are legally protected.

Key Concerns:

- Smell: major concern that offensive odours from the new plant could deter tourists and affect businesses.
- Noise and traffic: increased truck traffic and construction noise anticipated to disturb birds, particularly nocturnal feeders.
- Habitat loss: potential fencing impacting cashew trees and bird habitats.
- Construction timing: strongly recommend avoiding the critical "birding month" (mid-April to mid-May) to protect migrating and nesting birds.

Requests:

- Detailed explanation of project scope and "no-go zones" for construction.
- Active involvement in the project's management plan with monitoring responsibilities and allocated resources.
- Site visit to clarify physical boundaries.

Summary of Consultations: Community-Level Stakeholders

6.5.16 Project-Affected Persons (PAPs)

Two Project-Affected Persons were interviewed at the site designated for the FSTP extension. Their testimonies provide critical information for the Resettlement Action Plan (RAP).

Mr. Lamine Sidibeh:

- Long-term resident of the TDA who operates his residence as a public space to attract tourists.
- Has built a mosque on the property for his association of 125 Muslim bird watchers.
- A wooden bridge (funded by ITC/EU) has been constructed improving access to a golf course and the sea.
- During COVID-19, allowed unemployed tourism workers to temporarily use land for gardening. These include a year-round gardener, a seasonal cassava grower (taxi controller), and a refugee neighbour.
- Temporary occupants have no permanent land rights but will be affected by the project.

Mr. Youssoupha Diédhiou:

- Claims to be the first resident of the area, living there for more than 20 years after fleeing the Casamance war.
- Owns a permanent structure and another shelter where he lives with his family.
- Grows peanuts, rice, potatoes, cassava; has a mango orchard and small cashew plantation.
- Affected by odours from the wastewater ponds, especially when wind blows in his direction.
- Expresses deep concern about relocation — insists government must notify in advance and grant 2–3 years to prepare, as he has nowhere else to go.
- Reports another woman living in a makeshift tent near the discharge point with her daughter.

- His younger brother grows cassava but does not live there. Fewer than 10 other occupants farm on the land but do not reside there.

7 Analysis of Potential Environmental & Social Impacts

7.1 Identification of activities for impact assessment

A description of the Project activities is provided in Section 2. However, impact assessment focuses specifically on those activities that may generate potential positive and/or negative environmental and social impacts.

Development of this Project is expected to cause some impacts, both positive and negative. They are generally grouped into those affecting soil, water resources, air quality, flora and fauna, community and their economic activities, aesthetics and landscape, noise and human health.

The likely environmental impacts associated with this project will arise from activities associated with the construction works as well as the operation and maintenance of the sewerage system. During rehabilitation the impacts arising are of short duration but can pose a significant impact on the environment if remedial measures are not taken into account. Lack of effective operation and consistent maintenance of the system is likely to impact negatively on the project area and its environs.

During construction of tanks and sewage plant and the general piping system; cement, sand, ballast, gravel, timber, pipes among other materials and their joinery and fittings will be used in great quantities. Trucks and other machinery will also be used. Large skilled and unskilled labour will be employed, and wastes are likely to be generated. Issues that may arise will be sanitary waste from workers, spoilt and damaged construction materials, used containers especially plastic and sandbags. Liquid wastes like oil, grease, paints, sewage sludge and other solvents, nails, timber remains, Injuries and accidents are anticipated.

Decommissioning of the project may occur as a result of various factors such as lack of capital to maintain or non-compliance with approved maintenance and monitoring requirement leading to condemnation and closure. The possible negative aspects associated with construction be they environmental or socio-economic should be mitigated for.

The operations of the facility will generate both positive and negative social economic and environmental impacts. The analysis of these impacts is carried out in this section resulting in development of mitigation measures that shall enhance the positive impacts and reduce the effects of the negative impacts. The impacts from this project have been discussed as those probable during the construction, maintenance and decommissioning phases of the project. This report encourages implementation of mitigation measures that enhance positive impacts.

The possible impacts assessed cover the direct and any indirect effects and positive and negative effects during construction, operation and possible decommissioning. The likely impacts are based on the identification and prediction of the magnitude of any impact caused by the project on (i) a receptor (e.g. human beings and community facilities), or (ii) an environmental resource, and on (iii) any process which is essential to the functioning of human or natural systems. The identified impacts were classified as positive and the negative. These impacts were documented and rated.

Environmental Impact Rating

Rating	Description
0	Low impact
1	Medium impact (Short term)
2	High impact (Long term)

7.2 Description of the identified impacts and proposed measures during construction

This section provides a detailed description of the expected impacts and their predicted characteristics, ultimately concluding on the significance of each during the preconstruction and construction phases. Corresponding management measures to mitigate or enhance the identified impacts are also discussed.

7.2.1 Potential positive Project impacts

The Wastewater Treatment Plant of Kotu shall directly improve access to, sanitation, reduce pollution of the Kotu stream biodiversity and the beach side and hotels connected to the Kotu stream to indirect benefits on health and related socioeconomic development. Specifically, the following positive outcomes will be realized from the implementation of the Project:

The following positive impacts are anticipated during planning, construction and operation phases of the project:

- Connection to the WWTP of areas which have not been served before;
- The proposed activities will avert pollution of the Atlantic Ocean where many hotels are situated since all wastewaters will be adequately treated before allowing it to flow to the stream, and then the ocean.
- The proposed activities will cater for projected increase in volume of wastewater because of increased Greater Banjul Area population in the future.
- Provision of employment opportunities during construction and operation phases. For casual labor, residents will have opportunities which shall boost their daily income.
- Work activities such as surveying, clearing of the land and the construction works proper, employment opportunities will be created for both skilled workers, such as planners and engineers; and for the less skilled manual laborers and security personnel. Communities affected by the works may specifically benefit from employment on the Project, particularly the unskilled, youthful labor that is readily available. Youth employment shall develop and improve skills that may lead to professional interest in the field.
- The rehabilitation will protect the sewer lines from storm water by enhancing storm drains with concrete. The sewer lines shall be protected from exposure and breakages.
- Flushing, cleaning and De silting of the existing sewer line will address the problem of blockages being experienced and also expand the size of the pipes ferrying wastewater.
- The proposed project will centralize wastewater treatment system in Kotu which will make pollution monitoring easy.
- There shall be improved aesthetic value of the Kotu stream due to the pollution control that is currently being experienced in the Kotu stream and the beach side.
- Sludge from the Stabilization ponds is a rich resource that can be utilized by the community around as fertilizers for the farms,
- Installation of electrical/mechanical equipment ranging from blowers, scrappers, compressors, sludge pumps etc. will play a huge role in achieving acceptable sewerage design standards.
- The pollution created by the current practice of wastewater discharge into the Kotu river will stop hence reduction in spread of water borne disease.

- Quality of surface and ground water will improve on public health, and on socio-economic development of the Greater Banjul, taking into consideration that the current treatment process that discharges not well treated sewage into the Kotu river and the ocean will stop.
- The public health of the whole GBA will be upgraded due to improved standard of wastewater management and access to improved sanitation.
- Potential indirect, future income generation and employment effects through tourism development.
- Resource recovery from sludge as a soil amendment in agriculture will improve the fertility of the soil.
- Know-how transfer on wastewater treatment technologies to local companies and specialists
- Prevention of the degradation and/or improvement of the status of the water bodies receiving treated effluent from WWTP.
- A cleaner environment will encourage the development of eco-tourism and other projects in the Kotu area and its rich biodiversity.

7.2.2 Potential negative impacts

Against the background of the above positive impacts, there will be negative impacts emanating from the construction and subsequent operation activities of the facility.

The E&S impacts are separated into five categories in order to comply with the broader ESS structure:

1) Physical Impacts (P)
2) Biodiversity Impacts (B)
3) Social Impacts (S)
4) Impacts on Health & Safety (HS)
5) Climate Change Impacts (CC)

The following subchapters provide a breakdown of predicted impacts and an assessment of their potential significance, on the basis of a comparison of receptor sensitivity and impact magnitude. The assessment highlights where E&S risks might occur and indicates where increased vigilance is necessary for addressing negative impacts. From there, relevant mitigation measures are taken into the ESMP.

Before assessing the Project E&S impacts, the following aspects of land requirements and impact on receiving water bodies are described.

7.2.2.1 Physical Impacts

Physical impacts concern the effects of the project on the land and natural resources. Risks of destroying landscapes, destruction of natural resources, depletion of soil nutrients, created erosion risks, water diversion, depletion and pollution and other resource pollution risks (e.g. air) are assessed in this category.

In the Project, physical impacts will arise through the construction of the WWTP and access roads.

Table 7-1: Potential Physical Impacts

Impact on	Significance	Description of Impact / Risk
Soil	Moderate	• C: Compaction, damage to soil structure. • C: Excavation creates erosion risk at the site and access road. • C&O: Pollution with liquid and solid waste (e.g. faecal, hazardous waste, oils). • O: Risk of pollution with heavy metals through the sludge, in case industries do not pre-treat their effluents to remove heavy metals meeting the trade effluent requirements; and later sludge is used in agriculture or soil improvement.
Water resources	High	O: Malfunctioning of the WWTP caused by: 1) Inappropriate O&M of the plant due to lack of resources. 2) If effluents are too charged before discharging in the sewerage, high organic and/or heavy metals loads may affect the biological treatment of the WWTPs, leading to a decrease in the treatment efficiency.
	Moderate	C: Reduced treatment efficiency of existing WSP as, during construction, only part of the WSP will be operative. • C&O: Pollution with liquid and solid waste (e.g. faecal, hazardous waste, oils). • O: Pollution through the sludge in case of leaching from too high quantities of nutrients in the sludge applied as sludge used in agriculture or soil improvement.
Air / Odour	Minor	• C: Machinery is expected to cause noise short-term disturbance. • O: Noise generated by pumps, blowers and generators. C: Excavation Material. Construction waste from existing sludge and contaminated soil.
Waste generation	Minor	• C: Demolition Material from old replaced pipelines and structures to be dismantled. The WSP is a concrete structure without any electro-mechanical equipment. • C&O: Domestic Waste will increase from plastic from packaging etc. and domestic waste from workers. The volume can be estimated via the number of employees in the C&O phases. Solid waste generation could be 1.3 kg/cap-day. • C&O: Liquid Waste. The drinking water demand will be supplied by the public water supply system. Domestic wastewater will be generated by staff. The water usage can be assumed to be 130 l/person-day. • C&O: Hazardous Waste. Oil and air filters changed during the maintenance of machinery (e.g. excavator etc.), waste fabrics used in maintenance, empty paint and lubricant boxes, fluorescent lamps and wasted printer cartridges, etc. • O: Grit Material from coarse and fine screenings.

C: Construction phase; O: Operation phase

Table 7-2: : Recommended mitigation measures: potential physical impacts (P)

Pre-Construction
• Design of the WWTP in order to meet the effluent discharge standards. • Elaboration of a SMP. • Establish sound construction principles for contractors on soil stabilization requirements in the Works Contract (Employer's Requirements). • Establish environmental clauses for contractors on pollution prevention in the Works Contract (ESHS specifications, ESMP).

• Establish performance guarantees on effluent discharge values for contractors in the bidding documents. • Enforce the pre-treatment of the major industries' discharges into the sewerage prior to the commissioning of the new WWTP. • Planning the construction in phases in order to use some of the existing WSP to treat the wastewater partly during construction. Furthermore, a new anaerobic pond will be constructed.
Construction
Training • Training of works contractors, sub-contractors and workers for environmental good practices for construction works. • Workers shall be trained to respond to emergency spills and taught how to clean up and manage leaks. **Soil** • Excavated material shall be temporarily stored and sorted onsite to maximize material reuse. The material not reused shall be transported offsite to a site agreed by LWSC. Stored material shall be stored safely in designated areas, not dumped into the river or deposited at river slopes. Erosion prevention measures need to be implemented at all sites of earthworks. • Avoid the use of a lot of heavy machinery in areas not designated for construction. • Loosen the soils after completion of construction and plant vegetation around the campsite. • Avoid digging in areas where construction is not intended. Protect / separate non-construction areas. • Vegetate areas where there is no construction planned. • Construction site to be restored and re-vegetated for slope stabilization immediately after the completion of construction. • Avoidance of damage to private properties and minimize environmental damages (e.g. trees, etc.) during construction works. • Rehabilitation of all damages. • Design drainage and other disposal facilities to ensure soil stability and appropriate treatment. Water resources • Control contamination through bonding of storage areas, placing protective layers in areas where oil and other contaminates are handled and conducting continuous monitoring and maintenance of machines to prevent leakage. • Plan emergency response measures in case of accidental oil spills. • Ensure all used oils are stored in drums and disposed of with registered dealers with ZEMA. • Spill kits shall be made available to workers. • Exploitation of water sources for construction works shall be done after consulting the local authority and community. • Construct water pans/dams to tap storm water during rainy season before the commencement of projects. • Water abstraction permits should be obtained. • Good hygienic standards and proper management of sewage.

- Store materials in protected areas to reduce incidences of leakage.
- Leftover construction material should be stored well and protected from elements of weather and erosion e.g. by bunding and covering the storage area
- All chemicals, hydrocarbons and other potentially polluting materials should be stored on an impermeable surface.
- Install proper siting of pit latrines away from water-logged areas.
- Monitor nearby sampling boreholes and shallow wells.

Air / Noise

- Enforcing works contractor maintenance of machines and vehicles (minimization of air pollution). Avoidance of oil and fuel spills, proper storage of oil and fuel barrels.
- Workers' H&S protection (noise protection equipment). Noise generation in habitation zones shall be limited to working hours. Ambient noise monitoring is not required.
- Engage a water bowser to be watering the premises and suppress the dust at least five times a day.
- Equipment used for processes that are likely to generate dust should be enclosed. This includes equipment such as gravel crushers, and gravel screener.
- Adhere to ZEMA and international Regulations and standards on air quality.
- Work within acceptable noise levels of 40 dB (A) during the night and 50 dB (A) during the day.
- The contractor shall use Best Management Practices (BMPs) for blasting, such as a chemical method to shatter the rocks and weaken rock formation, design and use of specific blasting plans, blasting mats, correct charging and micro delay detonations to minimise noise and vibrations.
- All workers will wear appropriate PPE at times including hearing protection.
- Noisy activities should be undertaken between 07-22hrs.
- Use of well-serviced machinery to minimize the sound produced.
- Plantations around the WWTP site.
- Pavement/widening of the access road.
- Restrict vehicle speeds in/along residential areas.

Waste

- Detailed Waste Management Plan (WMP) is to be developed by the works contractor including specification of disposal sites for excavated materials and generated construction waste.
- Set up waste disposal bins in strategic areas on site.
- Put fines for any employees found discarding waste in undesignated areas.
- Engage an authorized and licensed garbage disposal unit.
- The sludge and soil from the facility, in case is contaminated and cannot be reused, needs to be disposed of safely.
- Hazardous wastes will be collected in a temporary hazardous waste storage area, which is surrounded by wire fences, bottom sealed, and protected from precipitation. Materials from demolition could be hazardous and need to be disposed of safely.
- Non-hazardous waste generated at the plant will be regularly removed, temporarily collected and finally disposed of at the city solid waste landfill.
- Domestic wastewater generated to be discharged in the running WSP.
- Close to the river no material deposits should be permitted and no re-fueling / lubrication of vehicles.
- Design (wastewater) drainage system to avoid run-off and spillage.

Operation

- Establish environmental clauses for operators on pollution prevention.

Soil

- Monitoring of sludge treatment and resource recovery as a soil amendment in agriculture => soil improvement / valuable agriculture input.

Water resources

• Compliance with effluent standards to ensure that the status of the recipient water body does not deteriorate.

• Monitoring of the key performance parameters of the WWTP to promptly find out a possible industrial discharge affecting the treatment process.

• In case high concentrations of heavy metals are detected during commissioning, the addition of a treatment unit as required.

• Monitoring of the treated effluent at WWTP (targets on sewage treatment must be met).

Effluent requirement for WWTP

• Monitoring of the receiving water body quality upstream and downstream of the WWTP effluent discharge.

• Domestic wastewater generated to be treated in the WWTP.

Air / Noise

• Providing covers to equipment and containers that are likely to cause odour nuisance (sludge, waste, grit material).

Waste

• Hazardous waste shall be collected in temporary hazardous waste storage areas, which are surrounded by wire fences, bottom-sealed, and protected from precipitation. Hazardous waste will not be stored for more than 180 days. This stored waste will be given to the firms licensed for the collection of hazardous waste.

Hazardous waste collected from the project site will be transferred to licensed intermediate storage areas, and then to hazardous waste landfills or incineration plants for final disposal.

• Grit material is considered non-hazardous and shall be finally disposed of at the solid waste dump. Grease collected in the aerated grit chamber is usually considered hazardous and needs to be stored and disposed of.

7.2.2.2 Potential Biodiversity Impacts

Potential biodiversity impacts are related to the change of ecosystems through project activities. In the case of sanitation projects this concerns modification of flow volume through the discharge of treated effluent in surface water bodies thus potentially impacting aquatic and surrounding habitats. For the project areas, landscape impacts, flora-and fauna (aquatic and terrestrial), and ecosystem services are relevant topics.

Table 7-3: Potential Biodiversity Impacts

Impacts on	Significance	Description of Impact / Risk
Landscape	Moderate	C: New construction in a PUA, semi-rural area.
Natural Habitats	Moderate	C: Project site is near Kotu stream and its moderately rich biodiversity.
Fauna and Flora	Moderate	C: Loss of vegetation when clearing the Site. • O: If WWTP operation fails, effluent impacts the habitat of Kotu stream. C: Loss of habitats for bird, fish and insects due to the construction of the WWTP in Kotu

C: Construction phase; O: Operation phase

Table 7-4: Recommended mitigation measures: potential biodiversity impacts (B)

Pre-Construction
• Establish environmental clauses for contractors on landscape impact mitigation in the Works Contract (ESHS specifications). • Establish performance guarantees on effluent discharge values for contractors in the bidding documents.
Construction
• Training of workers, monitoring and enforcement of good construction and environmental practices for access road construction, digging of trenches, pipelaying and all metal and concrete works. • Avoid noise-generating activities and construction site lighting at nighttime to limit wildlife disturbance. • Stockpiling of removed topsoil for reinstating flora. • Any tree/plant harvested due to the project should be replanted. • Avoid cutting trees and clearing vegetation in areas that shall not be developed. • Planting trees and ornamental plants.
Operation
• Prevent pollution of water with chemicals. • Proper maintenance of all infrastructures including access roads.

7.2.2.3 Potential Social Impacts

Potential social impacts are all impacts that influence the livelihood systems of affected parties, their land use practices, their access to resources, their social and economic relations, etc. Risks to be considered are resettlement, changes in land use pattern, exclusion from social groups, or increase of vulnerability of impacted persons, including landless, old, weak, disabled persons, etc. (there are no groups of indigenous people in Kotu).

Table 7-5: Potential Social Impacts

Impacts on	Significance	Description of Impact/Risk
Land Acquisition and Resettlement	Negligible	Where the land is located belongs to the Gambia Tourism Board and is part of the Tourism Development Area (TDA). Even though some three illegal occupants have been identified, the resettlement issues will be minor.
Risk of exclusion of vulnerable people	Moderate	C&O: Compensation rates/practices or vulnerable assistance not compliant with World Bank ESF and especially ESS5. Risk of arbitrary deviation from international standards resulting in unfair compensation or vulnerable assistance for the PAP.
The influx of Outsiders (Construction Workers)	Minor	• C: Vulnerable groups at risk of experiencing harassment from construction workers. • C: Risk of spread of contagious diseases

C: Construction phase; O: Operation phase

The most significant human settlement within the proposed expansion area is the compound of Mr. Youssoupha Diédhiou, a Casamance refugee who has resided on the site for over twenty years. His occupation includes a permanent residential structure and cultivated agricultural plots, representing a long-established livelihood that predates any formal planning for the FSTP. During stakeholder consultations, Mr. Diédhiou confirmed his dependence on the land for both shelter and food production, and he requested a minimum of two to three years' advance notice before any relocation, along with fair compensation and replacement land of equivalent productive value. His case

constitutes the most clearly documented physical and economic displacement that the project will trigger, requiring a full Resettlement Action Plan (RAP) compliant with World Bank Environmental and Social Standard 5 (ESS5).

In addition to this permanent resident, the expansion area supports a number of temporary market gardeners, predominantly women, who cultivate vegetables on plots allocated informally through community arrangements. These gardeners rely on the shallow water table and proximity to the stream for irrigation during the dry season. Their activities, while not formalized through legal tenure instruments, represent a critical source of household food security and supplementary income for some of the most economically vulnerable members of the surrounding community. The National Social Protection Secretariat identified these women gardeners as being at particular risk of livelihood disruption from the project, given their limited alternative income sources and the absence of formal documentation that would automatically qualify them for compensation under conventional land acquisition frameworks.

The broader land use context includes the existing Kotu wastewater ponds (operational since the 1980s, originally constructed for the hotel industry), the Bakoteh dumpsite located approximately one kilometer to the northeast, and scattered informal commercial activities along the access roads. The area also features mature trees, including cashew plantations and isolated baobab specimens, some of which may serve as cultural markers of historical settlements dating back several centuries. A mosque constructed by the long-term resident Mr. Lamine Sidibeh, which formerly served as a minor tourist attraction, is located in the vicinity, though its current status and proximity to the direct footprint require confirmation through the detailed RAP census.

The presence of these human settlements and livelihood activities within the proposed expansion area has significant implications for the ESIA. The project must demonstrate that all feasible alternatives to displacement have been exhausted, that affected persons — including those without formal legal title — are identified through a comprehensive census and asset inventory, and that culturally appropriate compensation and livelihood restoration measures are designed in close consultation with the affected households. The Department of Social Protection has recommended that affected persons be cross-referenced with the National Social Registry to ensure that the most vulnerable among them are linked to existing social safety net programs during the transition period.

Table 7-6: Recommended mitigation measures: potential social impacts

Pre-Construction
Systematic inclusion of women in all stakeholder consultations, also at the beneficiary level. • Systematic information and invitation of the Gender Council to participate in SE meetings at the community level. • Establishment and Implementation of functional GRM and documentation. • Awareness raising about the benefits of ecosystem services/resource efficiency. Develop a livelihood restoration plan for the farmers and resettle the two illegal occupants • Ensure that the Contractor is capable to plan and implement H&S measures by putting such requirements (qualifications, experience) in the Prequalification documents. • Establish H&S clauses for contractors on construction workers in the Works Contract (ESHS specifications).
Construction
Provide equitable compensation to landowners in the event of temporary occupation of private lands due to specific works, such as the installation of the outfall pipe. Reinstatement of damages and/or compensation for all construction damages with replacement value to be satisfactory for PAPs. • For works that require unskilled labour, a priority should be given to residents (if available and applicable); • Good practices in signalization of work sites and respect for normal working hours. • Prepare an influx management plan to help mitigate the influx of migrant workers.

• Maximise employment of the local labour force to reduce labour influx.
Operation
• Adequate tariffs for the planned improved sanitation services to be developed for all groups of customers (e.g. social tariffs). • Periodical consultation with residents. • Inclusion of gender equality provisions as same salaries for women as for men, preference for women with equal qualifications and inclusion in decision making.

7.2.2.4 Potential Impacts on Community and Workers Health and Safety

Potential H&S Impacts of the project can occur at the community level and/or at the workers' level. The World Bank ESS4 addresses the health, safety, and security risks and impacts on Project affected communities and the corresponding responsibility to avoid or minimize such risks and impacts, with particular attention to vulnerable people. The World Bank ESS2 addresses workers' safety concerns during the construction and operation of the project facilities. The Project-related H&S risks for residents/communities near work sites are mostly related to traffic of construction machines and work sites e.g. trench etc. that are not signed, not fenced, or otherwise not appropriately secured. The Worker's H&S risks are mainly related to work accidents when handling machines, lack of protective equipment, lack of maintenance of machines and the appropriate hygienic situation at the work sites.

Table 7-7: Potential Impacts on Community and Worker H&S (HS)

Impact on	Significance	Description of Impact / Risk
Community H&S	Moderate	C&O: Livelihood is affected as small-scale farming within the Project site will lose income. • C&O: Access closed as the community currently walks through the land to access areas that lie to the south and west sides of the SP. O: Risk of public health issues in case of malfunctioning of the WWTP discharging large quantities of untreated wastewater used in irrigation downstream and odour generation.
	Minor	C: Safety risks for the communities affected by the work of the facility are related to a temporary increase in traffic on the road. • C: Temporary impact on ambient air quality in the areas affected by the work as a result of emissions from mobile sources and fugitive emissions of dust may pose a health risk. • C: Children at risk of suffering accidents with construction equipment. • C: Malaria and HIV/AIDS spread.
Worker H&S	Moderate	• C: Risk of occupational health effects on workers due to fugitive dust, material handling, noise, mechanical or chemical contact. • C: Risk of transport accidents. • C: Risk of child labour, discrimination in professional life, freedom of association and violation of labour rights. • C&O: Risk of accidents while handling machines, heavy equipment, hazardous substances, including welding, etc
	Minor	C: Negative health impacts due to lack of hygienic

		conditions/sanitation facilities for workers (availability of water points, soap, toilets, etc.).

C: Construction phase; O: Operation phase

Table 7-8: Recommended mitigation measures: community & worker H&S (HS)

Pre-Construction
• Ensure that Contractor is capable to plan and implement H&S measures by adding such requirements (qualifications, experience) in the Prequalification documents. • Establish clauses for works contractor on community and construction workers H&S in the Works Contract (ESHS specifications). • Consider a gravel footway around the fence of the new WWTP. • Require the contractor to make safe or fence off all open excavations, manholes, chambers and sink holes that exist within the vicinity of the existing and future WWTP.
Construction
Works contractor measures for Community H&S • Access road shall be paved. • Develop a Traffic Management Plan taking into account information on peak and off-peak hours on the access road to the Project site. • Instruct drivers for responsible driving and compliance with traffic regulations. • Put traffic signs, construction site signalization and fencing of construction sites. • Put safe access bridges across trenches for pedestrians, especially at house entrances. • At night-time, all barriers and signs will remain at sites, with lighting and / or fluorescent signs placed as required to warn both vehicular and pedestrian traffic. • Use a relatively modern (not obsolete) fleet for the Project needs and implement regular vehicle maintenance and repair programs. • Apply dust suppression measures during dry days. • Use high-quality diesel for all Project related transportation. • Locate diesel-generators and other equipment away from sensitive residents (houses, schools, kindergartens, etc.), considering the wind direction. • Notification of nearby neighbours of potential dust emissions before construction works begin. • Enforce public health and safety regulations. • In consultation with the local health centres, conduct a comprehensive health awareness campaign among the local community and project workers on the dangers of Malaria and HIV/AIDS pandemic. • Provide workers with information on existence of anonymous complaints (Testing, pre- test, post counselling) through referrals. • Promote H&S by supporting programmes which aim at reducing spread of diseases. • Sensitize schools and churches of the dangers of construction sites. • Engage the victim support unit to have talks with the workers and community members on the negatives of GBV and Sexual and other forms of harassment at a place of work. • Formulate and implement an employee's code of conduct, which should define, among others, guidelines and procedures for manage special situations such GBV and Sexual and other forms of harassment. This should be adopted by all contractors during its activities within the project. • Promote programs that will encourage the protection of women and children from sexual abuse. Works contractor measures for Workers H&S • Develop site specific Construction and Operation H&S Management Plans. • Ensure and monitor appropriate hygienic and sanitary situation for workers at work camps and work sites. • Develop site specific WMP, educate workers and sub-contractors, and enforce appropriate waste management measures for inert materials, recyclable materials including packaging, hazardous materials (if applicable) and other construction waste. Prohibit burning of waste. • Ensure appropriate traffic signage and construction site signalization and barriers. • Enforce the wearing of PPE by workers and the respect of Construction H&S plan and manual. • Ensure adequate handling of machines and hazardous substances. • Make firefighting equipment available on construction sites / machines, conduct its regular maintenance.

• Develop an emergency preparedness and response plan for the Project component. • Train all employees and contractors' workers on actions in case of emergency • Develop a safety instruction for drivers, which will outline requirements to drivers and technical conditions of the vehicles and instruct them accordingly. Prohibition of drunk driving, use of mobile phone while driving, mandatory use of safety belts and further provisions, as necessary, to be included. • Provide 24 hours security of all project sites and enhance surrounding communities. • Promote the respect of human rights through an employer's code of conduct.
Operation
• Establish and operate an early warning procedure for the event of water pollution (accidental pollution of the receiving water body by WWTP). • Provide regular trainings for operators. • Develop and implement inspection programs to maintain the mechanical integrity and operability of equipment. • Provide specific PPE and training needed to respond to emergency situations. • Workers will have a clean eating area, good lighting, fire precautions, potable water supply and first aid kits.

7.2.2.5 Potential Climate Change

Project Impacts related to Climate Change (CC) need to be differentiated into:

a) impacts of the project which contribute to CC via emission of greenhouse gases (GHG) (CC1), and;

b) the exposure of the project to effects of CC as increased temperature, increased occurrence of extreme weather events (as dry spells, flash floods, landslides, avalanches) and potentially changes in the water regime (CC2).

The study does not have the objective and means to measure and predict the effects of CC but draw attention to potential impacts and develop appropriate mitigation measures that are commensurate for the Project.

Table 7-9: Potential Climate Change Impacts (CC)

Impact on	Significance	Description of Impact / Risk
Climate CC	Minor	• C: Emissions of construction vehicles (see air pollution). • O: Emission through additional energy/electricity consumption e.g. pumping, blowers (operation). • O: Risk of methane emissions generated in the digester in case the biogas is not burned.
Climate CC2	Moderate	C&O: Flooding of the WWTP due to abnormally high rainfall and flows in the stream near the site.

C: Construction phase; O: Operation phase

Table 7-10: Recommended Mitigation Measures: Potential Climate Change Impacts (CC)

Pre-Construction
• WWTP designed to save energy and resources, minimizing pumping needs and use of energy-efficient equipment and including biogas generation and energy recovery. • WWTP is designed to be resilient against increasing magnitude of flash floods due to CC. The whole plant formation level will be raised to ensure no flooding occurs. The effluent outfall will also incorporate a pump to ensure continued use during high river levels. • OPEX is considered in the criteria for tender evaluation. Employer´s requirements will require that the equipment will be energy efficient.
Construction
• Minimize emissions of construction vehicles (see air pollution) during the construction phase (no unnecessary transports, turn off motors of machines when unused, use of well-maintained machines not obsolete vehicles and machines). • Encourage environmentally friendly behaviour among workers.

7.2.2.6 Negative impacts from GBV, SEA/H and VAC

Women, elderly, people with disabilities and children are vulnerable to exploitation and abuse during the land preparation and construction phases. Workers are in the habit of seeking food, drinks and sanitation facilities in residences within project areas, thus, have opportunities to be in contact with vulnerable groups of people. Sometimes, imported workers are also better off than community members and as a result, may willingly or not, behave in patronizing ways.

Children may be found playing within work sites, employed on the works, or merely asked to carry out errands by workers. Both women and children are at risk of being abused verbally, physically, or sexually, in addition to the risk of worksite accidents. During the Project implementation, relevant information is provided to the affected and interested stakeholders. Disadvantaged and vulnerable groups may also be at risk of being left out during the process of stakeholder consultations due to reasons related to the inability to freely participate without support or intentional omission by male-headed households.

All these risks may lead to conflict, loss of dignity and confidence, physical and psychosocial distress, lack of access to project benefits or appropriate compensation, morbidity, and mortality.

Case Study: Vulnerable Female-Headed Household within the Proposed Expansion Area

Among the Project-Affected Persons (PAPs) identified during the ESIA field consultations, the case of an elderly woman residing within the proposed FSTP expansion area presents one of the most acute vulnerability profiles encountered by the survey team. The woman, who lives alone with her daughter, informed the consultants that she has occupied her current residence for more than seven years, having migrated from Banjul where she experienced extreme destitution, including a period of homelessness during which she slept on the streets. Unable to secure affordable accommodation in the capital and lacking family support networks, she made the decision to settle on the unoccupied land adjacent to the Kotu ponds, where she constructed a modest dwelling and established a small farm that now constitutes her sole means of subsistence.

Her situation exemplifies the intersection of multiple vulnerability dimensions recognized under World Bank Environmental and Social Standard 5 (ESS5) and The Gambia's National Social Protection Policy. She is an elderly woman heading a household without a male breadwinner, residing on land to which she holds no formal legal title, dependent entirely on subsistence agriculture for survival, and with a documented history of extreme poverty and homelessness. The absence of formal tenure documentation places her at particular risk under conventional land acquisition processes, which may fail to recognize her legitimate occupancy rights if the RAP census relies solely on registered titles or lease agreements. ESS5 explicitly requires that such economically displaced persons — regardless of their legal status with respect to the land — receive adequate assistance to restore their livelihoods to at least pre-displacement levels.

The vulnerability of this household is further compounded by her age-related physical limitations, which restrict her capacity to adapt to sudden livelihood disruption, relocate to unfamiliar areas, or compete for alternative income-generating opportunities. Her daughter, as the only other household member, bears the dual burden of caregiving and contributing to the household's food security through farm labor. Any displacement without carefully designed transitional support risks returning this woman to the condition of street homelessness from which she escaped seven years ago — a regression that would constitute a direct violation of the "do no harm" principle enshrined in both the World Bank Environmental and Social Framework and The Gambia's obligations under international human rights instruments.

The Department of Social Protection, during its key informant interview, specifically identified female-headed households, the elderly, and persons with histories of extreme poverty as priority categories for cross-referencing with the National Social Registry and enrollment in the Nafa Quick (National Social Safety Net Program). The ESIA team recommends that this household be classified as a **critically vulnerable PAP** requiring the following enhanced protections within the Resettlement Action Plan: (i) priority allocation of replacement housing of equal or better standard within a location acceptable to her, with secure tenure documentation provided; (ii) a transitional livelihood support package covering the period between displacement and the re-establishment of productive farming on replacement land; (iii) enrollment in the NSNP cash transfer program to provide a safety net during the transition; (iv) allocation of replacement agricultural land of equivalent size and fertility, with access to water for irrigation; and (v) ongoing social welfare monitoring by the Regional Social Welfare Officer for a minimum of two years post-displacement to ensure against regression into homelessness.

This case underscores the critical importance of conducting a comprehensive, household-level vulnerability assessment as part of the RAP census, rather than relying on aggregate community-level data. It also reinforces the necessity of applying the principle articulated in ESS5 that the absence of legal title does not bar a displaced person from entitlement to compensation and assistance. The project's Grievance Redress Mechanism must ensure that this woman and her daughter have accessible, barrier-free channels — including home visits by community development officers — through which to raise concerns, given that elderly women in vulnerable circumstances are least likely to attend formal public meetings or navigate institutional complaint processes independently.

Mitigation

The Contractor intends to recruit construction workforce locally to the extent possible and make compulsory, the signing of the *Contractor's and other employees' Codes of Conduct* (**Annex**) which includes the behavior of workers on site and off the worksites, prohibits unauthorized and illegal substance use, and addresses the prevention of communicable diseases. Furthermore, *Codes of Conduct* for the prevention of GBV, VAC, and SEA/H will be implemented outlining prohibited behaviors and applicable sanctions, including regular monitoring and raising awareness on the Codes of Conduct. Procedures to safely and effectively manage SEA/SH will be included in the grievance mechanism.

Children will not be employed or allowed to participate in project work and shall be prohibited from the works sites. Women will be given equal employment opportunities to those of men, without any impediments placed in their way

NAWEC shall ensure that adherence to the codes of conduct for GBV, SEA/H, VAC are included in bidding documents for contractors.

The GRM specific to SEA/SEA cases should be prepared and implemented with all the required training and sensitization for both workers and the affected communities with the not tolerated actions clearly identified and the sanctions to be applied and the different redress avenues for the victims.

7.2.2.7 Impacts on sites of cultural and historical significance

Religious and culturally sensitive sites such as mosques or other sites may fall within the site in Kotu site's area of influence; however, none has been identified to be likely impacted by activities of Project.

Notwithstanding, during the excavations for the pipes, the ponds and other construction work, there is a possibility of finding archaeological items by chance. These may be disturbed or lost due to lack of knowledge in managing cultural heritage that has been accidentally discovered.

Mitigation

This Project ESMP includes the procedures to apply on chance finds and shall be adopted in the C-ESMP. Workers will be educated on the potential of finding valuable heritage artefacts and the Chance Finds Procedures to follow.

The relevant parties of the discovery will be informed if and when they occur.

7.2.2.8 Impacts from decommissioning after Construction

Workplace hazards including balance of materials, construction wastes, broken and worn-out parts are sometimes left on construction sites at the end of works. These will create risks of injury and accidents to the public and operators of facilities.

Soil that has been excavated may still be open to erosion by wind or rainwater runoff if not properly levelled.

Mitigation

Contractors shall clear all worksites prior to handing over and, where applicable, soil levelled to prevent future erosion.

8 Environnemental & Social Management Plan (ESMP)

8.1 ESMP Overview

The ESMP is an integral component of this ESIA. It translates the impact assessment findings into a set of actionable, measurable, and monitorable mitigation, management, and enhancement measures to be implemented throughout the Project lifecycle (pre-construction, construction, operation and maintenance, and decommissioning).

The ESMP has been prepared to support compliance with the applicable national legal framework and to meet international financier requirements, including alignment with the World Bank Environmental and Social Framework (ESF) and the ESS, as applied by AFD, and with relevant EIB requirements where applicable.

The ESMP is designed to:

- Avoid adverse environmental and social impacts where feasible, and minimise impacts where avoidance is not possible (mitigation hierarchy).
- Define clear roles and responsibilities for implementation, supervision, and regulatory oversight.
- Provide monitoring indicators, frequency, and reporting lines to verify performance and enable adaptive management.
- Establish corrective action mechanisms where non-compliance or unanticipated impacts occur.
- Ensure that stakeholder engagement and the Project's grievance mechanism are functional and responsive throughout implementation.

8.2 Applicable Standards and Relationship with the RAP

This ESMP has been prepared in line with the environmental and social requirements applicable to the Project, including national legislation of The Gambia, the World Bank Environmental and Social Standards, and relevant EIB standards as referenced in this ESIA. In particular, ESS5 (Land Acquisition, Restrictions on Land Use and Involuntary Resettlement) is triggered for the Project. A standalone RAP will therefore be prepared, disclosed and implemented in accordance with ESS5 and applicable national requirements.

The ESMP and the RAP are complementary instruments and will be implemented in a coordinated manner. The RAP will define the procedures and measures applicable to land acquisition, compensation, livelihood restoration, eligibility, cut-off dates, consultation, disclosure, and RAP monitoring. The ESMP will address the construction and operational controls required to manage environmental and social risks associated with implementation, including management of temporary access restrictions, traffic and safety arrangements, reinstatement of affected areas, and coordination between civil works and completion of compensation and resettlement measures.

No works giving rise to land acquisition, loss of assets, temporary or permanent restriction of access, or livelihood impacts will commence until the relevant RAP measures have been completed in accordance with ESS5 requirements.

8.3 ESMP Implementation Approach

Implementation of the ESMP will be led by NAWEC and the Project Implementation Team (PIT), with support from the Supervising Engineer and relevant government institutions. Contractors engaged under the Project will be required to prepare, submit, and implement C-ESMPs and associated method statements that are consistent with this ESMP and with the contractual environmental, social, health and safety obligations.

Depending on the nature of the works, the contractor's C-ESMPs and supporting plans may include, as relevant:

- Traffic Management Plan;
- Occupational Health and Safety Plan;
- Waste Management Plan;
- Emergency Preparedness and Response Plan;
- Hazardous Materials Management Plan;
- Labour management procedures and Codes of Conduct, including SEA/SH provisions; and
- site-specific measures for sensitive receptors and RAP-related constraints.

The ESMP will be implemented together with other related management instruments prepared under the Project, including the RAP, the Stakeholder Engagement Plan (SEP), the GRM, and the monitoring and reporting arrangements set out in subsequent chapters of this ESIA.

8.4 ESMP Matrix for General Construction and Operation Measures

Table 8-1: List of Environmental and Social Management and Mitigation measures

Domain	Impact	Mitigation Measures	Monitoring Measures	Parameters to be monitored	Location	Frequency	Responsibilities	Cost estimate (USD - $)
Preconstruction								
Soils / Topography	Soil compaction, increased erosion vulnerability, and loss of topsoil	Minimize clearance footprint; stockpile topsoil separately; immediate stabilization of exposed soils	Check if the required design is implemented.	Soil stabilization measures. - International design standards.	Project site	After every review during pre-construction	GWASAP PIU and contractor	Part of Contractor budget
Kotu Stream (Hydrology)	Reduced infiltration capacity; increased surface runoff to stream	Retain vegetation buffers; phase clearance; install temporary drainage	Introduce revised industrial effluent limit discharges. - Sample effluent industries from industries. - Apply penalties when necessary.	Wastewater quality of the effluent	Project site	During pre-construction and every quarter	GWASAP PIU and contractor	10,000
Kotu Stream (Ecology)	Potential removal of fringe vegetation including cashew trees and mangrove-adjacent habitat	Demarcate 50-100m mangrove buffer (no-go zone); tree replacement at 3:1 ratio; Forestry Dept approval	Verify the implementation of the designs. - Check applicable clauses are included in tenders and contracts.	Environmental clauses	Project site	During pre-construction and every quarter	GWASAP PIU and contractor	10,000
Surrounding Communities	Physical and economic displacement of PAPs (Mr. Youssoupha Diédhiou, temporary gardeners)	LRP with advance notice, fair compensation, replacement land, livelihood restoration	Verify the implementation of Livelihood Restoration Plan	The objectives of the LRP	Project site	Before work starts	GWASAP PIU and contractor	To be included in the LRP budget
Tourism Sector	Reputational concern among tourism operators about proximity of industrial facility	Proactive communication strategy; stakeholder working group (GTB, GHA, GWASAP); design disclosure	Check the contractor´s capabilities to plan and implement H&S measures Bidder's references and policies.	- No. of grievances/law suites.	Project site	During pre-construction and every quarter	GWASAP PIU and contractor	Part of the GRM and communication budget
Vulnerable Groups	Risk of excluding women, elderly, disabled, and informal workers from project planning and benefit sharing	Targeted consultations (women-only FGDs, home visits); inclusive RAP design; integration with National Social Protection	Check the contractor´s capabilities to plan and implement H&S measures Bidder's references and policies.	The objectives of the LRP and number of grievances/law suites.	Project site	During pre-construction and every quarter	GWASAP PIU and contractor	To be included in the LRP budget
Cultural Heritage	Risk of disturbing undiscovered archaeological remains	Chance Finds Procedure; NCAC on standby for salvage archaeology;	Chance Finds Procedure in C-ESMP; pre-construction survey for baobab	Environmental clauses	Project site	During pre-construction and before the work	GWASAP PIU and contractor	Part of Contractor budget

	(Kotu = "British Kombo," predating Banjul)	contractor awareness training	clusters; NCAC emergency response					
8.5 Construction Phase Matrix								
Air Quality	Dust generation (PM10, PM2.5) affecting adjacent residents and tourism facilities	Regular watering of access roads; cover stockpiles; speed limits (15 km/h); wheel washing	Check noise levels at the site and around the site. - Monitor air quality. - Record the number of complaints every month and compare it with the next reporting month after carrying out mitigation measures.	Air Quality Solid particulates in the air.	Project site	During construction and every quarter	GWASAP PIU and contractor	15,000
Noise & Vibration	Nuisance to adjacent residents, schools, and disruption of tourist experience (especially birdwatching)	Restrict noisy works to daytime (08:00-18:00); acoustic enclosures for generators; maintain mufflers	Check noise and vibration levels at the site and around the site. - Monitor noise and vibration level. - Record the number of complaints every month and compare it with the next reporting month after carrying out mitigation measures.	Decibels at the site and around the site. - Sound levels	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of Contractor budget
Soils / Topography	Soil contamination from accidental hydrocarbon spills or cement washout	Bunded fuel storage (110% capacity); spill kits; designated concrete washout areas; drip trays	- Check if the required design is implemented.	Soil stabilization measures. International design standards.	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of Contractor budget
Kotu Stream (Water Quality)	Increased turbidity, pH alteration, and localized drawdown discharging to stream	Dry-season scheduling; sediment traps/silt fences; controlled dewatering with settlement tanks; 50m exclusion zone	- Introduce revised industrial effluent limit discharges. - Sample effluent. - Apply penalties when necessary.	Wastewater quality of the effluent	Project site	During construction and every quarter	GWASAP PIU and contractor	15,000
Groundwater	Direct contamination pathway to vulnerable shallow aquifer (already nitrate-impacted)	Full containment of hazardous materials; lined excavations; groundwater monitoring wells (upstream/downstream)	- Introduce revised industrial effluent limit discharges. - Sample effluent. - Apply penalties when necessary	Groundwater quality	Project site	During construction and every quarter	GWASAP PIU and contractor	15,000
Kotu Stream (Ecology)	Mangrove damage, displacement of 350+ bird species, smothering of	50-100m mangrove buffer; no heavy works mid-April to mid-May (peak	- Introduce revised industrial	Wastewater quality of the effluent	Project site	During construction	GWASAP PIU and contractor	10,000

	oyster beds/shrimp nurseries	migration); downward amber lighting; silt curtains	effluent limit discharges. - Sample effluent. - Apply penalties when necessary.			and every quarter		
Traffic & Road Safety	Increased congestion, road degradation, and accident risk (especially for pedestrians/children)	Traffic Management Plan; designated truck route bypassing tourist areas; flagmen at junctions; off-peak deliveries	Traffic Management Plan part of the C-ESMP Check the contractor´s capabilities to plan and implement H&S measures	Number of traffic disturbances or accidents occurred Number of complaints received	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of the contractor budget
Surrounding Communities	Community safety risks, communicable diseases, potential sexual exploitation and abuse (SEA/SH)	Code of Conduct; SEA/SH Action Plan; confidential GRM (toll free number 1266); site fencing; community awareness	Check the contractor´s capabilities to plan and implement H&S measures	Bidder's references and policies. - No. of grievances/law suites.	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of the GM and contractor and PIU budget
Occupational Health & Safety	Construction activities (trenching, heavy lifting, electrical)	Comprehensive OHS Plan; mandatory PPE; daily toolbox talks; trained safety officer; emergency response plan	Check the contractor´s capabilities to plan and implement H&S measures	Bidder's references and policies. - No. of grievances/law suites.	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of the contractor budget
Livelihoods	Temporary loss of access for oyster harvesters, fishers, and market gardeners	Maintain alternative access points; advance notice to users; temporary livelihood support for affected women	Develop a Livelihood Restoration Plan	Implementation of the Livelihood Restoration Plan Number of grievances	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of LRP budget
Socio-Economic	Local employment creation; skills transfer; income generation for youth and women	Local content requirements (min. 40% local labor); skills training; fair wages; female employment targets	Check the contractor´s capabilities to plan and implement H&S measures	Number of workers created for the local communities' members	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of the contractor budget
Cultural Heritage	Destruction of undiscovered sub-surface archaeological remains or baobab tree settlement markers	Chance Finds Procedure in C-ESMP; pre-construction survey for baobab clusters; NCAC emergency response	Chance Finds Procedure in C-ESMP; pre-construction survey for baobab clusters; NCAC emergency response	Environmental clauses	Project site	During construction and every quarter	GWASAP PIU and contractor	Part of the contractor budget
Operation Phase Matrix								
Air Quality (Odour)	Odour emissions (H_2S, NH_3) causing severe nuisance to tourism sector and surrounding residents	Enclosed reception with biofilter; 500m buffer; real-time H_2S monitoring (<0.5 ppm); SLA with hotels	Check noise levels at the site and around the site. - Monitor air quality. - Record the number of complaints every month and	Air Quality Solid particulates in the air Smell around the site	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget

			compare it with the next reporting month after carrying out mitigation measures.					
Air Quality (Odour)	Major improvement in ambient air quality; enhanced destination attractiveness	Pond rehabilitation with Floating Treatment System (Typha); regular desludging schedule	Check noise levels at the site and around the site. - Monitor air quality. - Record the number of complaints every month and compare it with the next reporting month after carrying out mitigation measures.	Air Quality Solid particulates in the air Smell around the site	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Air Quality (GHG)	Methane and CO_2 emissions contributing to climate change	Methane capture/flaring if feasible; optimize aerobic processes; composting of biosolids	Verify the implementation of the climate-resilient design. Implement climate-resilient design.	- (Minimized) energy consumption. - No. of protection measures against flooding.	Project site	During Operation and every six months	NAWEC/NEA	Part of NAWEC and NEA budget
Noise	Continuous operational noise affecting adjacent receptors and wildlife	Acoustic enclosures for blowers/pumps; operational hours restrictions for trucks; planted noise buffers	Check noise and vibration levels at the site and around the site. - Monitor noise and vibration level. - Record the number of complaints every month and compare it with the next reporting month after carrying out mitigation measures.	Decibels at the site and around the site. - Sound levels	Project site	During Operation and every six months	NAWEC/NEA	Part of NAWEC and NEA budget
Kotu Stream (Water Quality)	Improved water quality if compliant (BOD_5 ≤30 mg/L, TSS ≤50 mg/L); risk of degradation if system fails	Multi-stage treatment; continuous effluent monitoring; automatic shut-off; emergency retention lagoon; PURA oversight	- Introduce revised industrial effluent limit discharges. - Sample effluent. - Apply penalties when necessary.	Wastewater quality of the effluent	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Kotu Stream (Water Quality)	Significant reduction in fecal contamination, BOD, and pathogen loading to Kotu Stream	Separation of fecal sludge from network wastewater; pond rehabilitation	- Introduce revised industrial effluent limit discharges. - Sample effluent.	Wastewater quality of the effluent	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget

			- Apply penalties when necessary.					
Groundwater	Nitrate, pathogen, and organic contamination of already-stressed shallow aquifer	Full HDPE lining of all ponds/units; leak detection system; monitoring well network; trigger-response framework	- Introduce revised industrial effluent limit discharges. - Sample effluent. - Apply penalties when necessary	Groundwater quality	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Kotu Stream (Hydrology)	Untreated overflow to Kotu Stream during extreme rainfall events	Design for 1-in-100-year flood; emergency overflow lagoon; climate-proofed freeboard; early warning system	- Introduce revised industrial effluent limit discharges. - Sample effluent. - Apply penalties when necessary.	Wastewater quality of the effluent	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Kotu Stream (Ecology)	Recovery of mangrove health, avifauna diversity (350+ species), and aquatic fauna (oysters/shrimp)	Maintain effluent standards; support GWASAP mangrove restoration; community-based biological monitoring	- Introduce revised industrial effluent limit discharges. - Sample effluent. - Apply penalties when necessary.	Wastewater quality of the effluent	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Traffic & Road Safety	Visual intrusion, dust, noise, odour, and accident risk along tourist and residential routes	Dedicated bypass route; sealed trucks (annual inspection); operating hours restrictions near hotels; parking facility	Traffic Management Plan part of the C-ESMP Check the contractor´s capabilities to plan and implement H&S measures	Number of traffic disturbances or accidents occurred Number of complaints received	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Tourism Sector	Odour, traffic, and visual impacts vs. stream improvement	Integrated tourism-environment strategy; GTB working group; destination marketing; "no detectable odour" standard	Check the contractor´s capabilities to plan and implement H&S measures Bidder's references and policies.	- No. of grievances/law suites.	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Livelihoods (Soakaways Emptiers)	Risk of livelihood loss for informal manual soakaway emptiers lacking transport to FSTP	Livelihood Restoration Plan; formalization training; licensing support; transition stipends; FSTP employment priority	Implementation of the LRP	Number of grievances and affected persons compensated	Project site	During Operation and every six months	NAWEC/NEA	Part of NAWEC and NEA budget
Livelihoods of Operators	Increased operating costs for vacuum truck operators (D175-D230 per load); potential illegal dumping	Affordable, zone-based pricing; 24/7 access; adequate capacity (150+ trucks/day); enforcement	Implementation of the LRP	Number of grievances and affected persons compensated	Project site	During Operation and every six months	NAWEC/NEA	Part of NAWEC and NEA budget

Surrounding Communities	Risk of vector-borne diseases (flies/mosquitoes) and airborne pathogens	Vector control program; sealed handling; regular cleaning; buffer zone maintenance	Community Health and Safety Plan well implemented Monitor the implementation of good practices and adequate construction methods	No. of non-compliance Cases, and the number of complaints received Quality of the water discharged in the Kotu Stream	Project site	During Operation and every six months	NAWEC/NEA	Part of NAWEC and NEA budget
Surrounding Communities	Reduced waterborne disease burden; reduced pathogen exposure for 201,044 stream-side residents	Sentinel health surveillance; community health education	Community Health and Safety Plan well implemented Monitor the implementation of good practices and adequate construction methods	Quality of the water discharged in the Kotu Stream	Project site	During Operation and every six months	NAWEC/NEA	Part of NAWEC and NEA budget
Occupational Health & Safety	Exposure to pathogens, hazardous gases (H_2S, methane), confined spaces, and mechanical hazards	Gas detectors; confined space entry permits; mandatory vaccinations (Hep A/B, Typhoid, Tetanus); PPE; showers	C-ESMP implemented Monitor the implementation of good practices and adequate construction methods	Number of accident or near misses	Project site	During Operation and every quarter	NAWEC/NEA	Part of NAWEC and NEA budget
Socio-Economic	Permanent employment for skilled and semi-skilled workers	Local recruitment priority; skills training; fair labor conditions; youth employment targets	Local recruitment plan implemented Number of unskilled workers hired and upgraded	Number of local workers hired Number of complaints		During Operation and every year	NAWEC/NEA	Part of NAWEC and NEA budget

8.6 Summary of ESMP

The ESMP presented in this Chapter provides the operational measures required to manage the environmental and social risks and impacts identified in this ESIA. The indicative ESMP budget covers mitigation, monitoring, supervision, and management measures and should be read together with the financing arrangements defined under contractor contracts, NAWEC operational budgets, and the standalone RAP budget where applicable. The RAP will cover compensation, livelihood restoration, consultation, disclosure, and RAP monitoring measures in accordance with ESS5.

The implementation arrangements for the ESMP are presented in Chapter 9, which defines the institutional roles and responsibilities for implementation and supervision. The monitoring and reporting requirements are presented in Chapter 10, which sets out the indicators, reporting procedures, and audit arrangements applicable to the ESMP. The grievance procedures applicable to ESMP implementation are presented in Chapter 11, which establishes the Project Grievance Redress Mechanism for affected communities and workers, including SEA/SH-sensitive complaints.

Chapter 8 should therefore be read together with Chapters 9, 10 and 11, as well as with the standalone RAP. Taken together, these instruments provide the complete environmental and social management framework for the Project.

9 Implementation arrangements

This Chapter will look at the process of implementation of the ESMP developed for the Project. It is the result of the review of the literature as well as the outcome of the consultations with the various stakeholders and findings noted in the previous sections. It identifies their potential roles and responsibilities in the process, as well as assessing their capacity development needs to take on the responsibilities.

9.1 Stakeholder role and responsibilities for the ESMP implementation

1. **The Ministry of Petroleum, Energy and Mines (MoPEM)**

The Ministry of Petroleum, Energy and Mines (MoPEM) is the implementing agency for the GWASAP Project through its NAWEC Project Implementation Unit (PIU) located in Fajara. During the project life cycle, the coordinator will implement its environmental and social due diligence. The Team Leader will also be responsible for monitoring, evaluation and disclosure, supported by an Environmental Safeguards Specialist (ESS) and a Social Safeguards Specialist (SSS).

The PIU's responsibilities in relation to the ESMP shall:

- Work with the technical and procurement specialists to ensure that contract documents contain environmental and social safeguard clauses that contractors must fully implement;
- Coordinate internal monitoring and evaluation of the ESMP;
- In collaboration with the Ministry's other Projects, coordinate project-related grievance resolution activities;
- Where applicable, facilitate project-related activities of partner-collaborating stakeholders;
- Coordinate and participate in relevant environmental and social due diligence training;
- Coordinate public engagement and disclosure.

During operation of the facility at the end of the project period, the Management of NAWEC Water and Sewerage Division will be responsible for all day-to-day operational issues supervised by the various heads of the Division.

2. **NEA**

As The Gambia's authority responsible for the coordination of all environmental issues and enforcement of national environmental laws, the NEA is responsible for assessing and issuing Environmental Approval for the project. It is responsible for the overall monitoring of the ESMP implementation in accordance with section 31 of the EIA Regulations, 2014. In this regard, the NEA shall routinely monitor, guide, and audit the progress of the ESMP implementation to ensure compliance.

In addition, the NEA shall provide technical support and participate in training and sensitization of stakeholders to enhance their understanding of the environmental and social safeguard requirements.

3. **Other stakeholders**

Although the implementation of the ESMP will be the overall responsibility of the MoPEM, and more specifically, PIU and the Management of NAWEC Water Division, other stakeholders will also play important technical advisory and regulatory roles. The participation of these partners may have to be initiated by the PIU or NEA as the coordinating, implementing, and oversight bodies, respectively.

Other relevant stakeholders include the DOF, Department of Parks and Wildlife Management (DPWM), DWR, NRA, BAC, Department of Physical Planning and Housing (DPPH), Department of Lands

and Surveys (DLS), Department of Labor, Department of Social Welfare, Women's Bureau, the Alkalolu (traditional heads/community leaders of the project's host communities), and the residents.

On an ad hoc basis as may be required, other institutions may be called upon for specific support, particularly in various training programs and in preventing and managing complaints and conflicts.

4. Contractors

The construction Contractor has the key role in the implementation of the construction phase of the ESMP, particularly regarding environmental, public and worker protections and will develop and implement the C-ESMP. It is responsible for all environmental and social mitigation expenses during construction and shall insure all its workers. It is essential that during planning, all measures are budgeted for by the contractors.

Where subcontractors are approved, the main Contractor has the responsibility of ensuring that environmental and social safeguard measures are filtered down to the level of the subcontractor, who consequently has equal responsibility to fully abide by the C-ESMP and related laws.

The Contractor should hire, on top of the technical staffs, E&S Specialists, OHS Specialist. These staff will be in charge of all environmental, social, gender, GRM, OHS for both workers and affected communities during project implementation.

Relevant training shall also be provided by the Contractor for its workers, and the community providing relevant information through the appropriate means, such as the village heads, meetings, posters and signage.

5. Supervising Engineer for the Project

The Supervising Engineer will ensure the integration of the construction phase mitigation measures and environmental and social clauses into the bidding documents; ensure that the Contractors obtain all the necessary approvals and integrate the relevant measures in the work breakdown structure or execution plan.

In collaboration with the PIT, the Supervising Engineer will ensure that contract documents contain environmental and social safeguard clauses spelling out the expectations of Contractors with regards to their mitigation responsibilities. Contractors must fully implement these clauses.

6. The World Bank

During the project implementation period, the WB will review reports and assess activities to ensure compliance with its Environmental and Social Standard. Where necessary, actions for timely remediation will be recommended to ensure alignment with its standards and international good practice.

9.2 Capacity building needs

The current staffing of the PIU is made up of engineers, E&S Specialists, Procurement Specialist, etc. Given that the GWASAP needs to be strengthened in both numbers and specialists; a dedicated Social Safeguards Specialist (SSS) and Environmental Specialist with strong background on Occupational Health and Safety are equally needed. Meanwhile, the staff's knowledge of ESIA and general environmental and social management will need to be enhanced.

It will make the resources necessary to carry out the training activities. Periodic follow-up capacity building activities for staff who are recruited after the end of this project will be carried out with financing from Gambia Government funds.

Table 9-1: Capacity building budget

Capacity need	Participants	Subject	Resource person	Duration	Cost (US $)
WB ESF safeguard frameworks- and specifically the ESMP	Team Leader and the various support staff (7 staff)	Principles and application of the ESMP documents	An international E&S Specialist	5 days	35,000.00
Occupational health and safety – general	The various categories of employees and staff of the Project	Preparation and management of health and safety plan	Occupational Health and Safety Consultant	5days	Included in above budget
Gender-Based Violence; Sexual Exploitation and Abuse; Sexual Harassment and Violence Against Children	The various categories of PIT staff	Implementation of the MOPE GRM	GBV Consultant	5 days	Included in above budget
Total					**35,000.00**

The cost ($35,000) includes training, accommodation, and travel costs. It shall be borne by the PIT under its relevant management cost.

10 Monitoring & Reporting of ESMP Implementation

10.1 Monitoring

Environmental and social monitoring shall be carried out to ascertain that the mitigation measures in the ESMP and other contractual agreements are effectively and efficiently implemented. Monitoring shall also ensure that any necessary remedial action is carried out and reported. Alternative or additional measures will be considered where monitoring activities identify inherent changes to the Project activities or sites with new potential impacts and risks.

Issues to be monitored include activities that have been identified earlier to have significant negative impacts on the environment and socioeconomic parameters, and their corresponding mitigation actions. Routine monitoring may also identify new issues that have arisen due to changes (for example, at the sites, or in project design or activities) that will need alternative mitigation measures. Appropriate mitigation will therefore be developed accordingly.

Based on the monitoring plan outlined in Table X, the environmental and socio-economic parameters that may be affected by the identified potential significant risks and impacts will be evaluated against the mitigation measures for compliance.

During the works, the Contractor will monitor its employees and activities internally through the Supervising Engineer whilst the GWASAP PIU, through the ESS and SSS and Supervising Engineer, shall in turn monitor the Contractor for compliance. The NEA, with support from the EIA Working Group and other relevant institutions identified in the ESMP, will monitor for compliance with the ESMP and requirements under environmental laws of The Gambia.

According to its *Environmental and Social Framework,* the WBA experts on E&S safeguards may also carry out independent monitoring, in addition to the usual evaluation of monitoring results sent by NAWEC. The WB shall assist NAWEC as necessary, to ensure non-compliances are addressed and that all commitments are complied with.

10.2 Reporting

Reporting of environmental and social standards form part of the Project's reporting requirements and should be considered alongside other Project components to ensure financial and human resources are adequately planned for and allocated.

The PI U responsible for coordinating implementation of the GWASAP Project, under the Direction of NAWEC Water Division, will consolidate all relevant information for reporting to the WB whilst the NEA produces internal reports as part of its mandate. As necessary, the NEA or other institutions may write to NAWEC about issues requiring remedial action and during emergency incidents.

The NEA, according to the NEMA, 1994, requires that NAWEC prepares and submits annual reports on the Project's compliance with provisions of the Act, including the ESMP. Throughout the Project implementation period, NAWEC shall submit to the WB periodic reports on the implementation of E&S safeguards plans (ESMP, RAP, etc.) in compliance with the frequency agreed in the Project documents. (monthly, by the 15th of the month after the reporting period).

10.3 Environmental audit

According to national requirements, an environmental audit is required twelve months after commencement of Project implementation, and thereafter, upon request by the NEA as deemed necessary. Therefore, an Environmental and Social Audit shall be undertaken by a certified independent auditor, midterm through the Project.

10.4 Budget for implementation of the ESMP

The project component for Implementation Management, Monitoring and Evaluation shall cover expenses of the PIU with regards to implementation and monitoring of the ESMP.

Where the Contractor is responsible for implementing any measure, the cost of such activity is expected to form part of the Contractor's fees; thus, the resources for mitigation measures such as personal protective equipment, maintenance of machinery, cost of waste disposal, and other measures should feature as part of the Contractor's scope of work.

During operation, at the end of the project, routine monitoring will be part of the operational budget of NAWEC's Water Division. Other institutions with legal roles for monitoring and enforcement, such as the NEA, shall cover their own expenses for monitoring during the operation phase.

No estimate is given for the decommissioning phase because the facilities are not expected to be decommissioned at the end of the project. The NAWEC will source or seek funding for such decommissioning activities when that time comes. The proposed budget for implementation of the ESMP is $591,600.00 as indicated in Table 33.

Table 10-1: Estimated budget for the GWASAP Project ESMP implementation

No	Activity	Time frame	Budget (US$)
1	Implementation of ESMP measures including public sensitization and GRM activities	During Project implementation (before and during works)	350,000.00
2	Capacity enhancement program	(8 sessions in 2 years for NAWEC staff only)	40,000.00
		Other relevant stakeholders during implementation	35,000.00
3	Monitoring	Project implementation period	73,000.00
4	Operational budget for GRM process	During Project implementation (before and during works)	36,000.00
5	Environmental and Social Audits	Annually during project implementation of the medium-term component (2 years)	90,000.00
		TOTAL	**591,600.00**

11 Grievance Resolution Mechanism (GRM)

11.1 Purpose

A Grievance Mechanism is necessary for addressing the concerns of the affected persons. It is anticipated that some of these concerns may include eligibility criteria, and compensation entitlements for loss of livelihood or use of land, complaints from project workers or from affected community members. The grievance mechanism will be also able to safely and ethically manage allegations related to Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH), including the development of clear procedures clearly mainstreamed in every phase of the GM. An appropriate response protocol is implemented by NAWEC for other projects under implementation. For the sake of efficiency, GWASAP project should be aligned to those Grievance Mechanism process rather than developing a new one.

The project-level GM mechanism for addressing grievances includes the following principles:

- Provision for the establishment of a grievance redress committee (see GRC members below)
- Multiple grievance uptake locations and multiple channels for receiving grievances which are adapted to the different groups, including the most vulnerable and confirmed by them during consultations as safe and accessible.
- Fixed service standards for grievance resolution, include adjudication process and management of claims related to Gender-Based Violence (GBV), including SEA/SH and Violence Against Children (VAC) Prompt and clear processing guidelines (including reviewing procedures and monitoring system)
- A time frame for responding to grievances and a relevant notification system for the cases of SEA/SH.
- A reliable and effective reporting and recording system. A separate procedure is required that enables efficient, safe, and ethical reporting for SEA/SH complaints as described in section.
- Procedure for assessing the grievance and keeping all relevant parties informed, including GBV survivors for SEA/SH-related complaints.
- Grievance escalation model.

The Grievance Mechanism was designed with the objective of solving disputes at the earliest possible time before they escalate. The World Bank ESS 5 emphasizes that the affected parties and interested parties should be heard and as such, they must access a fair, transparent, and accessible means to address their concerns and views related to the project. Furthermore, the mechanism should be effective in addressing concerns at project-level so that future incidents including those related to SEA/SH are reduced, and grievances are not referred through the court system for resolution, especially since the court system may not be financially accessible to all and may add cost and time burdens. However, all affected persons will have access to use the court system if they prefer. In addition, in situations where a grievance falls within the penal code, specific coordination should be established with relevant authorities on the matter.

For issues regarding SEA/SH and VAC-related claims, please see the procedures set forth below and the Response Protocol, which will be developed prior to the beginning of activities.

11.2 Resources and Responsibilities for Implementing Stakeholder Engagement Activities

11.2.1 Human Resources and Implementation

The NAWEC will appoint a community liaison officer (CLO) to conduct stakeholder outreach during project implementation and respond to any grievances or complaints that may arise. The CLO will act as key points of contact to bring project grievances from affected persons, stakeholders, construction workers, residents, and community members to the Grievance Redress Committee (GRC). The CLOs will be responsible for making sure the recommendations of the GRC are implemented during ESMP and RAP implementation and directing contractors to make any appropriate adjustments to their work. The CLO will also verify that it has been implemented and reach out to the complainants to ensure there are no outstanding issues to address, and the complainant is satisfied. For SEA/SH related complaints, there will be a separate protocol related to follow-up that is currently being developed. The contractor shall take actions to address grievances in line with the ESMP, areas of responsibility as per the Code of Conduct, and national law.

11.2.2 Management Functions and Responsibilities

During the implementation phase of GWASAP, the mechanism for grievance redress will include:

- Provision for the establishment of a grievance redresses committee (already completed by NAWEC with a sitting allowance budgeted for the GRC members Multiple grievance uptake locations and multiple channels for receiving grievances [NAWEC hotline 1266, NAWEC website and Facebook, NAWEC WhatsApp, NAWEC PIU office, Alkalo/VDC]) which are adapted to the different groups, including the most vulnerable who may not have access to communication technology, electricity, may be illiterate or have disabilities.
- Fixed service standards for grievance resolution, include adjudication process
- Prompt and clear processing guidelines: including reviewing procedures and monitoring system (see flow chart on GM chapter)
- A time frame for responding to grievances
- A reliable and effective reporting and recording system (grievance register, complaints logbook – both hard copy and e-copy) (See annex for grievance log for non-SEA/SH complaints)
- Procedure for assessing and responding to the grievance
- For SEA/SH cases, a protocol to refer GBV survivors to appropriate care and managing sensitive data to be developed and successively annexed to this document once it has been approved by the Bank.

11.3 Roles and responsibilities

a. **The Grievances Redress Committee (GRC)**: (the membership of the GRC is below **Project Level Grievance Mechanism**) will be responsible for receiving and resolving grievance in a fair, objective, accountable, effective, timely and accountable manner. All concerns or complaints raised by project affected persons (PAPs) in the communities during all phases of the project lifecycle. The broad Responsibilities of the GRC include:

- Developing and publicizing the grievance management procedures
- Receiving, reviewing, investigating, and keeping track of grievances
- Adjudicating grievances

- Capacity building of all actors working in the GM, and among contractors and community of how the GM works
- Monitoring and evaluating the fulfillment of agreements achieved through the grievance mechanism.

Community liaison officer (CLO): The NAWEC will appoint the community liaison officer (CLO)**.** His contact information will be published and communicated via public announcements and information sharing about the project, (radio, television, newspapers, mosques, etc.), to conduct stakeholder outreach during project implementation and respond to any grievances or complaints that may arise. The CLO will act as the key point of contact to bring project grievances from project affected people, construction workers, residents, and community members to the GRC. The CLO will be responsible for making sure the recommendations of the GRC are implemented and directing NAWEC during ESMP implementation, and contractors to make any appropriate adjustments to their works. The contractor shall take actions to address grievances in line with contracts arrangements, relevant signed codes of conduct, as well as national law.

In addition to the community liaison officer, the project will make available grievance forms in every village (Alkalo or VDC) as an accessible venue for filing a grievance. In collaboration with the communication team, NAWEC Hotline will be also available to receive complaints anonymously. Every end of month, NAWEC liaison officer will collect forms filled out to submit them to the GRC.

For illiterate persons, NAWEC liaison officer or VDC will assist them to write and submit complaints. To be sure that adequate confidentiality will be kept, the Project will issue a form to be filled out by the VDC, liaison officer and other Project's staff agreeing to confidentiality and ethical and accurate depiction of the grievance.
This is in addition to Codes of Conduct which will be signed by all workers in the project, including the Consultant and NAWEC.

b. The contractor: During the implementation, contractors will work in the respect of the World Bank standards on Environmental, Social, Health and Safety (ESHS) and Occupational Health and Safety (OHS) in the workplace and on their relationship with affected communities. The application of these Codes of Conduct will help ensure the Project meets its ESHS and OHS objectives, as well as preventing and/or mitigating the risks of GBV and VAC on the project and in the local communities. Contractors should make sure these Codes of Conduct are adopted by those working on the project and are meant to:

- Create awareness of the ESHS and OHS expectations on the project
- Create common awareness about GBV and VAC and ensure a shared understanding that they have no place in the project; and create a clear system for identifying, responding to, and sanctioning GBV and VAC incidents as per GM dedicated procedures on SEA/SH complaints to be further developed.

One code of conduct will be enforced and monitored for compliance.

The code of conduct will be explained and displayed in the work sites, workers and affected communities will be sensitized prior to works start and during all the Project implementation life (Sensitization campaign every month for the affected communities and every week for workers). Every new worker will receive a training on these subjects before they start working and will receive a copy to be signed. The contractor liaison officer will work closely with NAWEC/Consultant safeguards team to notify the GRC of all complaints and special cases which affect the codes of conduct.

11.4 Objectives

The key objectives of the GM are:

- Record, categorize and prioritize the grievances according to severity and immediacy of the issue, and provide timely, fair, accountable resolution to grievances at the project level
- Settle the grievances via consultation with all stakeholders (and inform stakeholders of the solutions, obtain their views on the outcome, and ensure they understand possible next steps to escalate if they are not satisfied with the outcome)
- Forward any unresolved cases to the relevant authority if relevant
- Regularly analyze grievances to assess if there are systemic issues in the project that should be addressed to mitigate the same types of issues being reported.
- To be responsive and transparent with the complainant by relaying information about the status, progress and results of the case and receive feedback from them and record this feedback.
- Have a systematic and clear record of tracking the resolution of complaints (both for SEA/SH and non-SEA/SH cases – both having separate procedures for record keeping)

The GM operates within the existing legal, cultural and community context framework of The Gambia. However, the GM process includes taking into consideration WB procedures and recommendations. The details of each level of Grievance Mechanism are described as follows.

11.5 Community Level Grievance Mechanism

Local communities have existing traditional and cultural grievance mechanisms. It is expected that some minor disputes at the community level may be resolved using these mechanisms, without the involvement of the Project, contractor(s), and or Government representatives at local and national level. This does not hold true for allegations related to sexual exploitation and abuse and community sensitization should really reinforce this point. The extended family, village and/or chiefs may be involved at this level. For example, if there is a complaint that the contractor recruited someone to work in the project from among community members, but a person may feel that the process was unclear or unfair. This can be dealt with at the local level by explaining what the process was and if necessary, making commitments to address a concern if some community members were not aware of the process by engaging in a community consultation. Also, if the contractor wants to compensate the community for using their sand, gravel or because of the impact of its activity is causing a disturbance, (i.e., dust dispersion), those grievances can be solved at the community level, without the GRC, if the community so chooses, bearing in mind that the World Bank's Operational Policies apply as it relates to fair compensation.

11.6 Project Level Grievance Mechanism

Many projects related grievances during the works are minor and site-specific. Often, they revolve around nuisances generated during construction such as noise, dust, vibration, workers disputes, etc. They can be resolved easily on site.

However, regarding disputes that include differences between households over land, or boundaries, even on issues triggered indirectly by the Project during its lifecycle, the GM will involve Chiefs, Alkalo, the Project, landowner(s) concerned, and if required, the representative from the Ministries of Local Government and land and the one of Petroleum and Energy.

Composition and membership of the GRC:

A Project Liaison Officer who is situated within NAWEC will be designated to receive, review, record, and address project related complaints. Two times per week, the safeguards team will collect complaints to submit to the GRC.

The GRC meets at least once per month, depending on the number and type of complaints received as well as the urgency of the complaint, it may meet on an ad hoc basis.

The Alkalo, VDC and Contractor Liaison Officer will contact the GWASAP project safeguards team in case a complaint is not resolved within one week. After receiving the alert, the Project Grievance Redress Committee will review available information and verify the claim. The complainant will be notified that further information is being collected and keep those person/persons informed about the status.

These complaints will be submitted to the Project Grievance Redress Committee. It is represented by its permanent member:

- Rep Brikama Area Council
- Baboucarr Corr, NAWEC safeguards team
- Chief Kombo Central
- Rep Chief Kombo North
- Rep Chief Kombo South
- Forestry Department, Ministry of Environment, Natural Resources and Climate Change
- GWASAP Project Coordinator
- National Environmental Agency, Ministry of Environment, Natural Resources and Climate Change
- TANGO (NGO)
- Lands and Survey Ministry of local Government and Lands

11.7 Procedures

The community will be informed and sensitized about the use and existence of the GM (through radio notices, TV, communities, community signage, Imam/religious leaders) of the various uptake options where complaints can be submitted (for example, to the Alkalo, VDC, the NAWEC office, the NAWEC website, hotline, and social media).

Notices and signage will be erected at all sites providing the public information on the Project and summarizing the GM process, including contact details of the relevant Project Liaison Officer, Contractor Liaison Officer or Community Liaison Officer. Everybody will be able to lodge a complaint at multiple uptake locations and the methods (grievance forms submitted to the Project, in person, telephone, email, NAWEC website, hotline) or via the contractor or VDC. All possible complainants should be free to lodge a complaint in one or as many of the uptake stations note above.

A Complaints Register will be at the GWASAP project office but also with contractors, VDC or Alkalo, who will log the: i) details and nature of the complaint (include categorization of sensitive/urgent, non-sensitive); ii) the complainant name and their contact details if known; iii) date the complaint was received; iv) corrective actions taken in response to the complaint; v) the date the response was made available to the community (without identifying personal details) and the complainant; vi) the resolution; vii) the response of the complainant if response was acceptable to them or not; viii) the name of the person who received the complaint and location/method the complaint was lodged. This information will be included in NAWEC's GWASAP progress reports to the WB.

Escalation of Grievances: if the complaint is not resolved to the satisfaction of the aggrieved party by the Grievance Redress Committee, it will then be referred by the NAWEC Project Coordinator to the National Steering Committee (NSC).

The NAWEC National Steering Committee (NSC) is composed of:

- Chair, Permanent Secretary Ministry of Petroleum and Energy

- Permanent Secretary of Ministry of Women Affairs
- National Environmental Agency
- PCU Ministry of Finance and Economic Affairs
- Ministry of Finance and Economic Affairs
- Managing Director of NAWEC
- NAWEC WASIB Project Coordinator
- Director of Petroleum, Water and Electricity Regulation at Public Utility Regulation Authority
- Permanent Secretary Ministry of Lands and Local Government
- Permanent Secretary Office of the President
- Permanent Secretary Ministry of Women's and Social Welfare

The NSC (will meet at least once per quarter) will be required to address the concern within 30 days if the request for escalation was made.

Should measures taken by the National Steering Committee fail to satisfy the complainant, the aggrieved party is free to take his/her grievance to the Gambia judicial court (District Tribunals or Magistrates Court).

11.8 Procedures for management of SEA/SH-related complaints

11.8.1 Step I: Uptake

The Children's Act protects all the children in The Gambia without discrimination. The best interest of the child should be the primary consideration in any matter that affects or concerns a child. Everyone has a duty to report to either the Police or Department of Social Welfare, any case of child abuse or the violation of the right of any child that he or she knows about. It is against the law to sexually abuse or exploit a child in any form or even encourage it, to keep a brothel or allow a child to be in your brothel (The children's Act 2005).

A complainant who wishes to lodge a SEA/SH-related grievance may use any trusted channel available to her or him to file a complaint with the project GM. The project will identify secure, confidential, and accessible entry points through which survivors will feel safe and comfortable making reports (e.g., telephone service provider, community-based structure, Community-based focal points, or Regional Monitors for SEA/SH cases etc.). Complainants may also use contractor grievance processes to file SEA/SH claims, but once filed with the contractor, the claims will be referred for verification to the project GM operator (The Social Safeguards Specialist) since they all work together.

A complaint intake form will be developed to be completed by the project GM operator through the various uptake channels listed above after having obtained the survivor's verbal consent to proceed with the grievance. The GM operator, however, will still obtain written consent from the survivor with the help of the community-based focal point to fill out the complaint intake form and to share information with the appropriate service providers if necessary. If the complainant has not yet been referred for services, the intake actor will confirm whether the survivor wishes to receive support, and if so, obtain the survivor's consent to be referred for appropriate care and connect the survivor with locally available providers or arrange for remote support where needed. Medical, psychosocial, and legal aid services should at least be made available, other services as well if possible (e.g., socio-economic, security and legal). The project will map GBV services available. The hard copies of the intake and verification forms will be stored in a safe and secure locker whilst the soft copies will be stored on the computer of the GM Operator and locked with a password.

If the survivor chooses to be referred for services only and not to file a complaint, then the survivor's wishes must be respected; the service provider can then ask if the survivor consents to share basic

case information to assist the project to track the cases that choose not to access the GM. The survivor always retains the right to be referred for services whether there is a link established between the project and the incident in question.

Where selected, the actors are usually trained on how to receive and refer SEA/SH cases in accordance with survivor care principles, how to apply active listening techniques, and how to escalate complaints to the GM Operator safely and confidentially as they are illiterates. Any information collected about a survivor, or the alleged perpetrator must be recorded and maintained separately from other grievance documentation, in a secure and lockable space, with strictly limited access.

Where a complaint is referred to the national level, the laws and procedures of the Judiciary System of the Gambia will be followed.

11.8.2 Step II: Sort and process

Once the complaint has been formally received by the GM operator, with informed survivor consent, the GM focal point will verify that the complainant has been offered the opportunity to receive services, and if not, ensure that the survivor is referred for necessary services upon obtaining the survivor's informed consent.

The complaint will then be triaged as a SEA/SH complaint and the coordinator for the verification structure notified that a SEA/SH complaint has been received and will need review. The GM focal point will also notify the appropriate Consultant and NAWEC focal point, who in turn will inform the World Bank project lead, within a 24-hour period that a SEA/SH complaint has been received. The GM focal point need only share the nature of the case, the age and sex of the complainant (if known), whether there is a link with the project, and whether the survivor has been referred for services. **Absolutely no identifying information for the survivor or the alleged perpetrator may be shared with either the** Consultant, NAWEC **or WB focal points.**

11.8.3 Step III: Acknowledge receipt

The GM focal point should ensure that the complainant receives a document acknowledging formal receipt of the SEA/SH grievance within three days of the complaint being filed. Delivery of the acknowledgement to the complainant will depend upon how the complaint was initially received; if, ideally through a service provider, then all communication with the survivor can be done through the service provider.

11.8.4 Step IV: Verification process

The verification process for a SEA/SH grievance will be handled by a separate structure established through the GM operator. The verification structure will be in the form of a committee, number of members to be determined before starting of the project activities.

These members will be specially trained in the management and review of SEA/SH complaints, the importance of a survivor-centered approach, as well as guiding principles for survivor care and management of SEA/SH data and claims. If permitted by the survivor, a representative from a service provider will participate in the verification committee in order to provide advocacy on behalf of the survivor and ensure that survivor care principles are respected throughout the process.

Once convened, the verification committee will review available information about the SEA/SH claim in question, the nature of the claim, and whether there is a link with the project. The committee will also make its recommendations to the alleged perpetrator's employer or manager as to appropriate disciplinary sanctions per the code of conduct, type of incident, and the appropriate labor laws and regulations. Potential disciplinary sanctions for alleged perpetrators can include, but are not limited to, informal or formal warnings, loss of salary, and suspension or termination of employment. The committee must complete the verification process and render its decision within ten calendar days of receipt of the complaint.

It should be noted that the objective of the verification process is to examine only whether there is a link between the project and the reported SEA/SH incident and to assure accountability by recommending appropriate disciplinary measures. The verification process establishes neither the innocence nor the guilt of the alleged perpetrator as only the judicial system has that capacity and responsibility. In addition, all final decisions regarding disciplinary actions will rest solely with the employer or manager of the alleged perpetrator; the verification committee can make only its recommendations.

Members of the verification committee will be chosen in accordance with the following principles of:

- Competence in their capacity to perform the committee's work;
- Transparency in the choice of the committee members in accordance with clearly defined criteria
- Confidentiality of all involved parties, which must be respected by committee members; and
- Impartiality of its chosen members, who can participate and perform their work without conflicts of interest.

11.8.5 Step V: Monitor and evaluate

Monitoring of the SEA/SH complaints will be important to ensure that all complainants are offered appropriate service referrals, that informed consent is obtained in all cases for both filing of grievances and service referrals, and that all grievances are handled safely and confidentially, and in a timely manner. The project GM operator should exchange information in a safe and ethical way information with service providers in order to ensure safe and confidential sharing of case data as well as appropriate closures of SEA/SH cases.

11.8.6 Step VI: Feedback to involved parties

Once the verification process has been concluded, the result of the process shall be communicated first to the survivor within 14 calendar days, ideally through the service provider if applicable, to allow the survivor and relevant advocates the appropriate amount of time to ensure adequate safety planning as needed. Once the survivor has been informed, the alleged perpetrator can be informed of the result as well.

If either party disagrees with the result, s/he is permitted to appeal the verification committee's decision via the GM appeals process and must file an appeal within 14 days of receipt of the verification result.

A SEA/SH Response protocol and GBV mapping will be developed and when ready, it will be annexed to the GM.

Flowchart of the NAWEC Grievance Mechanism:

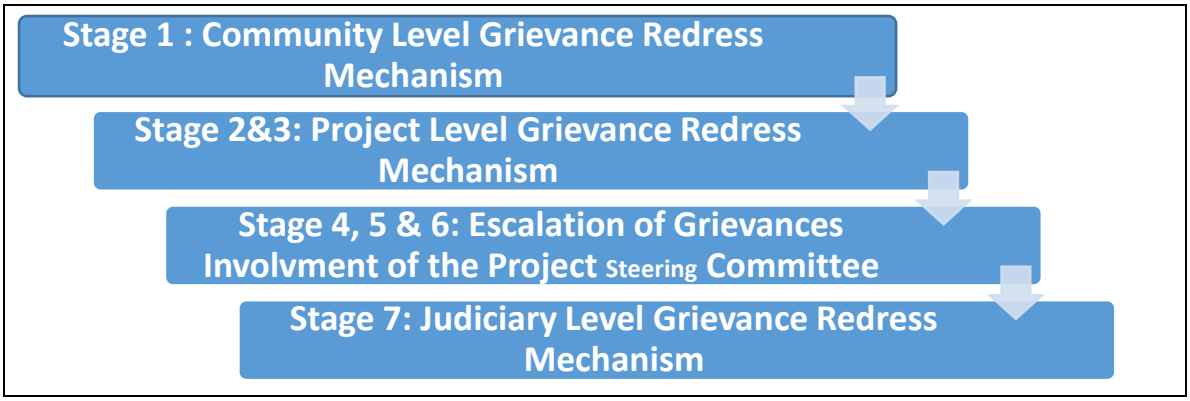


Figure 11 : The GM process

Stage	Process	Duration
1	The CLO will collect all complaints two times per week, he will also endeavor to resolve it immediately. Where AP is not satisfied, the CSS or CLO will refer the AP to the Project's Liaison Officer (PLO). For complaints that were satisfactorily resolved by the CSS/CLO, he/she will inform the Focal Point who will log the grievance and the actions that were taken. Before construction starts, the complainant will address his/her complaint directly to the project via the Project Liaison Officer (or Alkalos or VDCs who will be the representative of the Project Contact Person or Community Liaison Officer) who will submit the case to the GRC.	Anytime
2	On receipt of the complaint, the Project CLO will endeavor to resolve it immediately. If unsuccessful, he/she then notifies GWASAP Project Coordinator	Immediately after logging grievance
3	The WASIB Project Coordinator will endeavor to address and resolve the complaint and inform the aggrieved party via the Grievance Redress Committee. If it is a land-related issue, the Project Coordinator and the GRC will advise the NAWEC Managing Director, to engage the Ministry of Land and Local Government. The GWASAP Project Coordinator will also refer to the NAWEC MD other unresolved grievances for his/her action.	
4	If the matter remains unresolved, or complainant is not satisfied with the outcome at the project level (GRC), the GWASAP Project Coordinator or NAWEC MD, will then refer the matter to the National Steering Committee (NSC) for a resolution.	1 week
5	If it remains unresolved or the complainant is dissatisfied with the outcome proposed by the NSC, he/she is free to refer the matter to physical planning or the Ministry of Local Government and lands if it is land matters.	Anytime
6	Land related issue; NAWEC MD may seek the assistance of the Physical Planning MD and Permanent Secretary of Ministry of Lands and Local Government.	Immediately after stage 3
7	If the issue remains unresolved through the Minister of Lands' decision, then the ultimate step will be for the Courts or Land Court respectively	Anytime

	to deliberate. Any such decisions are final.	

12 Conclusion

The GWASAP most significant positive impacts are the elimination of untreated discharge to the Kotu Stream, recovery of mangrove and aquatic habitats, improved public health for 201,044 stream-side residents, and the long-term enhancement of the Kotu Creek ecotourism destination. During implementation, there shall be income generation and improved livelihood from temporary, skilled and unskilled employment during the construction works, and in the long-term for the operation and maintenance of the wastewater treatment plant.

Despite the potential benefits, the GWASAP is also likely to create adverse environmental and social impacts if not properly managed.

Potential biophysical impacts include localized air emissions, risks of groundwater contamination, vegetation clearing, disturbance to fauna and avifauna, soil contamination, and risks associated with improper waste handling and also pollution of sensitive areas like the Kotu stream.

Potential social impacts that may occur on the social and human environment include public and occupational health and safety risks including accidents at worksites, communicable diseases, discrimination against vulnerable groups, sexual abuse and harassment, exploitation and child employment. There is potential involuntary resettlement from loss of income and livelihood.

The ESIA has identified these risks and proposes appropriate mitigation and management measures in accordance with the environmental legislation of The Gambia and the WB environmental and social standards.

This will be guided by the Project ESMP and the Contractor's ESMP (C-ESMP), to be developed by the contractor to specify and guide all mitigation measures related to the construction. These instruments will detail mitigation measures, labor management procedures, health and safety provisions, waste management arrangements, traffic management plans, pollution prevention measures, biodiversity protection strategies, and groundwater monitoring protocols.

NAWEC will ensure that the contractors' agreements stipulate the ESMP requirements, and that efficient monitoring and reporting takes place to ensure compliance.

Stakeholder engagement will continue throughout construction and operation to promote transparency, foster community ownership, and provide accessible grievance redress mechanisms. Capacity building and targeted training will be undertaken to ensure that all relevant stakeholders are equipped to fulfil their responsibilities under the ESMP.

In conclusion, provided that the recommended mitigation and monitoring measures are effectively implemented, the residual impacts of the GWASAP Project are expected to be limited and manageable. The long-term environmental, social, and public health benefits are expected to substantially outweigh the impacts associated with the Project, and therefore, the Project presents a preferable option compared to the "no-project" alternative.

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Annex 1. Procedures for Sample Collection and Analysis

Procedures for Water Quality Sampling and Analysis

Material and Methods

A. Day prior to sampling

- Rinse polyethylene sample bottles three times with tap water once with chromic acid (35ml of unsaturated Na2 Cr2O2 per litre of conc.H2SO4g), three times with tap water, once with 1:1 Nitric acid and then three times with distilled water in that order for the chemical parameter other than Ammonia, Nitrate, Nitrite, and Phosphorus

- Bottles for Ammonia, Nitrate, Nitrite and Phosphate should be rinsed three times with the tap water, once with chromic acid, three times with tap water and three times with distilled water in that order.

B. Preparation of standards

- Check stock of pH buffer standards or refresh new stock when appropriate
- Check stock of EC Standards or prepare new stock when appropriate
- Calibrate meters (pH, Conductivity, Turbidity Meter)

C. Documentation and field checklist

1. Itinerary and list of sampling points with respective sample numbers
2. List of parameters to be analyzed
3. Map of The Gambia
4. Marker pens
5. Sample labels
6. Sample Bottles
7. Standards operating procedures for sampling
8. Samplers
9. Sample container and ice bergs up top of cooler carry to the laboratory for chemical analysis.

Water quality laboratory analysis: water samples in three methods

1. Physio-chemical analysis
2. Chemistry/Chemical analysis and
3. Microbiological analysis

- Physio-chemical analysis: physical parameters like EC, turbidity, temperature, pH, salinity, colour and odor are analyzed on site by using YSI meter and Turbidity meter.

- Chemical analysis: chemical parameters like nitrate, iron, sodium, sulphate, copper, fluoride, ammonia and some heavy metals (Arsenic and Mercury) by using Spectrophotometer in the dark room in the laboratory.

- Hardness, Chloride, Calcium, Magnesium and Alkalinity are determined by Titration methods.

- Microbiological analysis to determine Total and Fecal Coliforms by using ENDO BROTH MEDIA to indicate their presence in the water sample.

1. YSI METER-used to read physical parameters
2. Chemical parameters- use spectrophotometer
3. Microbiology- Membrane Filter method using incubator
4. Titration method - 10ppm of wastewater sample pipetted and transferred into 250cm of volumetric flask and diluted with distilled water
5. Three drops of N1 solution and shake.
6. Transferred into burette for titration
7. Titration for hardness, calcium, magnesium, alkalinity and chloride

Soil sampling methodology

Introduction

The rationale for testing the quality of the soil is to assess the level of potential contamination of the well by chemicals or waste in the soil that could leak into the water table. This is particularly relevant at the borehole drilling sites where contaminated soil could enter the well, or at the sites of reservoirs and contaminating the treated water. Additionally, the treated water can get contaminated by chemicals or waste when the pipe breaks along the corridor allowing contaminated soil into the pipeline. It is in this regard that soil samples were collected from well heads and along the corridors.

Specifically, samples were collected from the proposed site of the water treatment plant in Sifoe; site of a shallow borehole (F10); site of a deep borehole (DSA 1 in Sukuta); and at the site of the reservoir at the BWTP. In addition to these, soil samples were collected from eight other sites along the proposed line corridors.

Methodology

1. Site Description

Soil sampling was conducted at two types of locations within the Project area:

- Pre-determined sampling sites: Four of the locations proposed to host project facilities. These sites are generally square in shape and range in size from 50 x 50meters to 150 x150 meters.
- Linear sampling sites: These sites were sampled along the routes of proposed pipelines using an adaptive stratified sampling method. Sampling was conducted by walking along the pipeline routes and taking samples whenever there was a noticeable change in land use, or a potential contamination point. This ensured that various land-use types and areas with potential environmental concerns were represented in the samples.

2. Sampling Design

Soil sampling was conducted at pre-determined locations and along pipeline routes using different methodologies.

2.1 Sampling at Pre-Determined Sites

- Four subplots were established at each sampling site.
- Each subplot was circular with a radius of 5.64 meters.
- One subplot was placed at the center of the site, while the other three were located 12.2 meters from the center at 120-degree angles to ensure uniform spatial representation (see Figure 1).
- At each subplot, two soil subsamples were collected at two depth intervals:
    - o 0-20 cm (topsoil)
    - o 20-50 cm (subsoil)
- For each depth interval, the four subsamples were thoroughly mixed to create a composite, from which approximately 750g was taken for analysis.

2.2 Alternative Sampling Method for Linear Sites (Pipeline routes)

- Due to variations in terrain and space constraints, an adaptive sampling (which adjusts soil sampling locations based on observed terrain and land use changes) approach was implemented along the pipeline routes.
- Sampling points were chosen to best represent the different land uses, ensuring a diverse representation of the area.
- At each sampling site, where the circular plot layout was feasible, it was used. However, where space constraints prevented this, subsamples were collected in a straight line at 12.2-meter intervals. The topsoil (0-20 cm) and subsoil (20-50 cm) were sampled separately, and the four subsamples from each layer were thoroughly mixed to create a composite sample.

Schematic Layout of the Sampling Subplots (adapted from The ICRAF Land Degradation Surveillance Framework Field Manual)

3. Sample Collection

- Prior to sample collection, loose surface debris was removed from the sampling points.
- Soil samples were extracted using a stainless-steel soil auger to maintain consistent volume and depth.
- Approximately 750 grams of soil were placed in labeled plastic sample bags.
- Each sample bag was labeled with the following information:
    - o Site Name
    - o Depth Interval
    - o Date of Collection
- Soil samples were stored in a cool, dry location immediately after collection for preservation.
- Samples were transported to the lab within two days for analysis.

4. Vegetation Sampling

Where available, vegetation data were collected from the four subplots established at each of the six sampling sites. The following parameters were recorded:

- Species Identification: All plant species within each subplot were identified and recorded.
- Height Measurement: The height of individual plants was measured using a clinometer.
- Diameter at Breast Height (DBH): For plants with a height of 3 meters or more, DBH was measured at 1.3 meters above ground level.
- Trees Under 3 Meters: For plants under 3 meters in height, species identification was recorded, and crown length and crown width were measured to assess the tree structure.
- Woody and Palm Vegetation Crown Cover: The total crown cover of woody and palm vegetation (trees and shrubs) was visually estimated for the plot.
- Herbaceous Cover: The percentage cover of herbaceous plants was also visually estimated for each plot.

<u>PROCEDURES FOR SOIL SAMPLE ANALYSIS</u>

1. Take approximately 250 grams of soil sample
2. Place it in an oven safe container (metal or glass) for 24 hours at 225°F / 105 °C.
3. Once the soil is dry, select the soil dilution method 1:2 for further testing

Here is the dilution factor formula:

4. Concentration in dry soil = 1:2 soil dilution sample result multiplied by the dilution factor (x3).
5. Soil sieving

Sieving the soil will help to remove large stones or pieces of organic matter (since it can interfere with weight and dilution factors of soil solution).

To prepare a soil solution using 1:2 dilution method, one needs:

Scale, spatula, cleaning bottle, 2 x plastic beakers, soil extractor solution

6. Take a plastic beaker, place it on the scale and tare the scale (to zero out the weight of the beaker)
7. Using the spatula measure 20 g of soil
8. Add 40 g (ml) deionized water - making total weight of sample (inside the beaker) 60 g for 1:2 dilution
9. Add 5 drops of the soil extractor solution Ammonium Acetate
10. Stir the soil paste obtained for 1 minute and let it rest for 5 minutes

Soil solution is now ready to be analyzed

Annex 2. Stakeholder Consultations

Annex 3. Land Allocation of WWTP in Kotu

Annex 5. Decommissioning Action Plan

Although it is unlikely that the infrastructure for the GWASAP Project will be decommissioned and abandoned due to sustainable need for wastewater treatment and the possibility of upgrade to suite prevailing technological situation and demand. However, if government policy will at any time require the infrastructure decommissioning in the future, an assessment of the existing infrastructure shall be undertaken, and specific decommissioning requirements shall be determined.

This process shall involve stock taking of existing components of the infrastructure at the time. On completion of the assessment, an appropriate decommissioning plan shall be developed by NAWEC. This Plan shall be approved by the NEA and other relevant regulatory authorities before the commencement of decommissioning activities.

The decommissioning plan shall specify all activities that will be undertaken during the decommissioning and abandonment of the project. A Waste Management Plan (WMP) shall be included adopting the waste hierarchy of reduce, reuse, recycle, recover and dispose. NAWEC shall take advantage of the reuse and recycling opportunities identified for majority of the components of the infrastructure such as water pipes, pumps, valves, generators, electrical equipment, furniture, scraps, treatment plants etc. while all waste not fit for reuse or recycling shall be evacuated by an approved waste contractor for disposal. NAWEC shall ensure adequate monitoring of waste handling/disposal and shall present waste documentations to NEA upon request. The activities that will be undertaken during decommissioning and abandonment of the project shall include:

- Stakeholder identification and consultation particularly along the pipeline corridors;
- Excavation of pipes as well as dismantling and removal of other components;
- Demolition of buildings and elevated water tanks;
- Evacuation of all pipes from the corridors as well as dismantled materials, debris and waste;
- Site reclamation including ground stabilization, levelling and revegetation.

Significant potential E&S risks and impacts that may arise during the decommissioning phase may include soil erosion; waste generation; soil and water contamination; loss of employment for operational staff; increased susceptibility of surrounding communities to vector borne and water borne diseases amongst others.

The management actions to avoid or minimize these impacts shall be included in the Decommissioning Plan. Other potential likely impacts which may not have been envisaged at this stage including but not limited to new legislations and changes in site conditions shall also be included.

Annex 6.

Annex 7. Chance Find Procedures

This Chance Find Procedure shall be applied in case previously unknown culturally valuable materials are unexpectedly discovered during the implementation of the Project:

- In the case of chance find of any material with possible archaeological, historical, paleontological, religious, or other cultural value, all work at and around the find, feature or site must immediately stop.
- The discovery will be clearly demarcated and secured from unauthorized access, and all found remains will be left where they were found**.** If necessary, artefacts will be protected and measures to stabilize the area will be implemented.
- Notify the Project Manager/PCU of the findings who in turn will immediately notify the National Council for Arts and Culture for the necessary, assessment, recording and determination of the next course of action.
- Restart construction and public works only upon authorization of the relevant authorities (the National Council for Arts and Culture under the Ministry of Tourism and Culture).
- Relevant findings will be recorded in the Banks' supervision reports.
- These procedures must be referred to as standard provisions in construction contracts.

REPORTING FORM

Location of Find	Date of Find	Person who identified Find

GPS coordinates	Zone	X	Y
Multiple coordinates in case of a polygon: 1. 2. 3. 4.			

Description of initial Find

Photo record **Insert at least 1 Jpeg photo as example of cultural heritage site**

Was work stopped in the immediate vicinity of the Find? Yes No

Was an archaeologist/official from the NCAC contacted? Yes No
If Yes, state the name of the reporting archaeologist/official:
Detailed description of Find: (e.g. approximate size of site (area, length, height), description of site and vegetation, description of artefacts and number amongst others

IMPACT ASSESSMENT

Is site destroyed? Yes No
Can further impacts to the chance find be avoided? Yes No
Avoidance and mitigation measures:

Outline the different avoidance and mitigation measures:
Impact to find (avoidance and mitigation outcome):
Outline the course of action taken and the reason for choosing these measures:

Date completed form lodged	**Person who lodged form**	**Signature**

Report form validated by: Name …….
Position…… Date ……

Signature………..

Annex 8. Code of Conduct for implementing ESHS and OHS Standards Preventing Gender Based Violence and Violence Against Children

IMPLEMENTING ESHS AND OHS STANDARDS

PREVENTING GENDER BASED VIOLENCE AND VIOLENCE AGAINST CHILDREN

a) COMPANY CODE OF CONDUCT

The company is committed to ensuring that the project is implemented in such a way which minimizes any negative impacts on the local environment, communities, and its workers. This will be done by respecting the environmental, social, health and safety (ESHS) standards, and ensuring appropriate occupational health and safety (OHS) standards are met. The company is also committed to creating and maintaining an environment in which gender-based violence (GBV) and violence against children (VAC) have no place, and where they will not be tolerated by any employee, sub-contractors, supplier, associate, or representative of the company.

Therefore, to ensure that all those engaged in the project are aware of this commitment, the company commits to the following core principles and minimum standards of behavior that will apply to all company employees, associates, and representatives, including sub-contractors and suppliers, without exception:

General

1. The company—and therefore all employees, associates, representatives, sub-contractors, and suppliers—commits to complying with all relevant national laws, rules, and regulations.
2. The company commits to full implementing its 'Contractors Environmental and Social Management Plan' (C-ESMP).
3. The company commits to treating women, children (persons under the age of 18), and men with respect regardless of race, colour, language, religion, sexual orientation, political or other opinion, nationality, ethnicity, or social origin, property, disability, birth, or other status. Acts of GBV and VAC are in violation of this commitment.
4. The company shall ensure that interactions with local community members are done with respect and non-discrimination.
5. Demeaning, threatening, harassing, abusive, culturally inappropriate, or sexually provocative language and behaviour are prohibited among all company employees, associates, and its representatives, including sub-contractors and suppliers.
6. The company will follow all reasonable work instructions (including regarding environmental and social norms).
7. The company will protect and ensure proper use of property (for example, to prohibit theft, carelessness, or waste).

Health and Safety

8. The company will ensure that the project's occupational health and safety (OHS) Management Plan is effectively implemented by company staff, as well as sub-contractors and suppliers.
9. The company will ensure that all person's on-site wear prescribed and appropriate personal protective equipment, preventing avoidable accidents and reporting conditions or practices that pose a safety hazard or threaten the environment.
10. The company will:
    i. Prohibit the use of alcohol during work activities.
    ii. Prohibit the use of narcotics or other substances which can always impair faculties.
11. The company will ensure that adequate sanitation facilities are available on site and at any worker accommodations provided to those working on the project.

Gender Based Violence and Violence Against Children

12. Acts of GBV or VAC constitute gross misconduct and are therefore grounds for sanctions, which may include penalties and/or termination of employment, and if appropriate referral to the Police for further action.
13. All forms of GBV and VAC, including grooming are unacceptable, regardless of whether they take place on the work site, the work site surroundings, at worker's camps or within the local community.
    i. Sexual Harassment—for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct, of a sexual nature, including subtle acts of such behavior, is prohibited.
    ii. Sexual favours —for instance, making promises or favourable treatment dependent on sexual acts—or other forms of humiliating, degrading or exploitative behaviour are prohibited.
14. Sexual contact or activity with children under 18—including through digital media—is prohibited. Children are incapable of giving consent. A mistaken belief about a child's age or any purported consent from the child is not a defence.
15. Unless there is full consent[5] by all parties involved in the sexual act, sexual interactions between the company's employees (at any level) and members of the communities surrounding the workplace are prohibited. This includes relationships involving the withholding/promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered "non-consensual" within the scope of this Code.
16. In addition to company sanctions, legal prosecution of those who commit acts of GBV, or VAC will be pursued if appropriate.
17. All employees, including volunteers and sub-contractors are highly encouraged to report suspected or actual acts of GBV and/or VAC by a fellow worker, whether in the same company or not. Reports must be made in accordance with project's GBV and VAC Allegation Procedures.
18. Managers are required to report and act to address suspected or actual acts of GBV and/or VAC as they have a responsibility to uphold company commitments and hold their direct reports responsible.

Implementation

To ensure that the above principles are implemented effectively the company commits to ensuring that:

19. All managers sign the project's 'Manager's Code of Conduct' detailing their responsibilities for implementing the company's commitments and enforcing the responsibilities in the 'Individual Code of Conduct'.
20. All employees sign the project's 'Individual Code of Conduct' confirming their agreement to comply with ESHS and OHS standards, and not to engage in activities resulting in GBV or VAC.
21. Displaying the Company and Individual Codes of Conduct prominently and in clear view at workers' camps, offices, and in in public areas of the workspace. Examples of areas include waiting, rest and lobby areas of sites, canteen areas and health clinics.
22. Ensure that posted and distributed copies of the Company and Individual Codes of Conduct are translated into the appropriate language of use in the work site areas as well as for any international staff in their native language.
23. An appropriate person is nominated as the company's 'Focal Point' for addressing GBV and VAC issues, including representing the company on the GBV and VAC Compliance Team (GCCT) which is comprised of representatives from the client, contractor(s), the supervision consultant, and local service provider(s).
24. Ensuring that an effective GBV and VAC Action Plan is developed in consultation with the GCCT which includes as a minimum:
    i. **GBV and VAC Allegation Procedure** to report GBV and VAC issues through the project Grievance Mechanism (Section 4.3 Action Plan);

[5] **Consent** is defined as the informed choice underlying an individual's free and voluntary intention, acceptance, or agreement to do something. No consent can be found when such acceptance or agreement is obtained using threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defence.

ii. **Accountability Measures** to protect confidentiality of all involved (Section 4.4 Action Plan); and,
iii. **Response Protocol** applicable to GBV and VAC survivors and perpetrators (Section 4.7 Action Plan).

25. That the company effectively implements the agreed final GBV and VAC Action Plan, providing feedback to the GCCT for improvements and updates as appropriate.
26. All employees attend an induction training course prior to commencing work on site to ensure they are familiar with the company's commitments to ESHS and OHS standards, and the project's GBV and VAC Codes of Conduct.
27. All employees attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the project's ESHS and OHS standards and the GBV and VAC Code of Conduct.

I do hereby acknowledge that I have read the foregoing Company Code of Conduct, and on behalf of the company agree to comply with the standards contained therein. I understand my role and responsibilities to support the project's OHS and ESHS standards, and to prevent and respond to GBV and VAC. I understand that any action inconsistent with this Company Code of Conduct or failure to act mandated by this Company Code of Conduct may result in disciplinary action.

Company name: .....

Signature: .....

Printed Name: .....

Title: .....

Date: .....

b) Manager's Code of Conduct

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

Implementation

1. To ensure maximum effectiveness of the Company and Individual Codes of Conduct:
   i. Prominently displaying the Company and Individual Codes of Conduct in clear view at workers' camps, offices, and in public areas of the workspace. Examples of areas include waiting, rest and lobby areas of sites, canteen areas and health clinics.
   ii. Ensuring all posted and distributed copies of the Company and Individual Codes of Conduct are translated into the appropriate language of use in the work site areas as well as for any international staff in their native language.
2. Verbally and in writing explain the Company and Individual Codes of Conduct to all staff.
3. Ensure that:

i. All direct reports sign the 'Individual Code of Conduct', including acknowledgment that they have read and agree with the Code of Conduct.
ii. Staff lists and signed copies of the Individual Code of Conduct are provided to the OHS Manager, the GCCT, and the client.
iii. Participate in training and ensure that staff also participate as outlined below.
iv. Put in place a mechanism for staff to:
    a) report concerns on ESHS or OHS compliance, and;
    b) confidentially report GBV or VAC incidents through the Grievance Mechanism (GM)
v. Staff are encouraged to report suspected or actual ESHS, OHS, GBV or VAC issues, emphasizing the staff's responsibility to the Company and the country hosting their employment, and emphasizing the respect for confidentiality.

4. In compliance with applicable laws and to the best of your abilities, prevent perpetrators of sexual exploitation and abuse from being hired, re-hired, or deployed. Use background and criminal reference checks for all employees.
5. Ensure that when engaging in partnership, sub-contractor, supplier or similar agreements, these agreements:
    i. Incorporate the ESHS, OHS, GBV and VAC Codes of Conduct as an attachment.
    ii. Include the appropriate language requiring such contracting entities and individuals, and their employees and volunteers, to comply with the Individual Codes of Conduct.
    iii. Expressly state that the failure of those entities or individuals, as appropriate, to ensure compliance with the ESHS and OHS standards, take preventive measures against GBV and VAC, to investigate allegations thereof, or to take corrective actions when GBV or VAC has occurred, shall not only constitute grounds for sanctions and penalties in accordance with the Individual Codes of Conduct but also termination of agreements to work on or supply the project.
6. Provide support and resources to the GCCT to create and disseminate internal sensitization initiatives through the awareness-raising strategy under the GBV and VAC Action Plan.
7. Ensure that any GBV or VAC issue warranting Police action is reported to the Police, the client, and the World Bank immediately.
8. Report and act according to the response protocol (Section 4.7 Response Protocol) any suspected or actual acts of GBV and/or VAC as managers have a responsibility to uphold company commitments and hold their direct reports responsible.
9. Ensure that any major ESHS or OHS incidents are reported to the client and the supervision engineer immediately.

Training

10. The managers are responsible to:
    i. Ensure that the OHS Management Plan is implemented, with suitable training required for all staff, including sub-contractors and suppliers; and,
    ii. Ensure that staff have a suitable understanding of the CESMP and are trained as appropriate to implement the CESMP requirements.
11. All managers are required to attend an induction manager training course prior to commencing work on site to ensure that they are familiar with their roles and responsibilities in upholding the GBV and VAC elements of these Codes of Conduct. This training will be separate from the induction training course required of all employees and will provide managers with the necessary understanding and technical support needed to begin to develop the GBV and VAC Action Plan for addressing GBV and VAC issues.
12. Managers are required to attend and assist with the project facilitated monthly training courses for all employees. Managers will be required to introduce the trainings and announce the self-evaluations, including collecting satisfaction surveys to evaluate training experiences and provide advice on improving the effectiveness of training.
13. Ensure that time is provided during work hours and that staff prior to commencing work on site attend the mandatory project facilitated induction training on:
    i. OHS and ESHS; and,
    ii. GBV and VAC required of all employees.
14. During civil works, ensure that staff attend ongoing OHS and ESHS training, as well as the monthly mandatory refresher training course required of all employees to combat increased risk of GBV and VAC.

Response

15. Managers will be required to take appropriate actions to address any ESHS or OHS incidents.
16. With regard to GBV and VAC:
    i. Provide input to the GBV and VAC Allegation Procedures (Section 4.2 Action Plan) and Response Protocol (Section 4.7 Action Plan) developed by the GCCT as part of the final cleared GBV and VAC Action Plan.
    ii. Once adopted by the Company, managers will uphold the Accountability Measures (Section 4.4 Action Plan) set forth in the GBV and VAC Action Plan to maintain the confidentiality of all employees who report or (allegedly) perpetrate incidences of GBV and VAC (unless a breach of confidentiality is required to protect persons or property from serious harm or where required by law).
    iii. If a manager develops concerns or suspicions regarding any form of GBV or VAC by one of his/her direct reports, or by an employee working for another contractor on the same work site, s/he is required to report the case using the GM.
    iv. Once a sanction has been determined, the relevant manager(s) is/are expected to be personally responsible for ensuring that the measure is effectively enforced, within a maximum timeframe of 14 days from the date on which the decision to sanction was made
    v. If a Manager has a conflict of interest due to personal or familial relationships with the survivor and/or perpetrator, he/she must notify the respective company and the GCCT. The Company will be required to appoint another manager without a conflict of interest to respond to complaints.
    vi. Ensure that any GBV or VAC issue warranting Police action is reported to the Police, the client, and the World Bank immediately
17. Managers failing address ESHS or OHS incidents or failing to report or comply with the GBV and VAC provisions may be subject to disciplinary measures, to be determined and enacted by the company's CEO, Managing Director, or equivalent highest-ranking manager. Those measures may include:
    i. Informal warning.
    ii. Formal warning.
    iii. Additional Training.
    iv. Loss of up to one week's salary.
    v. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
    vi. Termination of employment.
18. Ultimately, failure to effectively respond to ESHS, OHS, GBV and VAC cases on the work site by the company's managers or CEO may provide grounds for legal actions by authorities.

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

Company name: .....

Signature: .....

Printed Name: .....

Title: .....

Date: .....

c) Individual Code of Conduct

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

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

I agree that while working on the project I will:

1. Attend and actively partake in training courses related to ESHS, OHS, HIV/AIDS, GBV and VAC as requested by my employer.
2. Will always wear my personal protective equipment (PPE) when at the work site or engaged in project related activities.
3. Take all practical steps to implement the contractor's environmental and social management plan (C-ESMP).
4. Implement the OHS Management Plan.
5. Adhere to a zero-alcohol policy during work activities, and refrain from the use of narcotics or other substances which can always impair faculties.
6. Consent to Police background check.
7. Treat women, children (persons under the age of 18), and men with respect regardless of race, colour, language, religion, sexual orientation, political or other opinion, nationality, ethnicity, or social origin, property, disability, birth, or other status.
8. Not use language or behaviour towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
9. Not engage in sexual harassment—for instance, making unwelcome sexual advances, requests for sexual favours, and other verbal or physical conduct, of a sexual nature, including subtle acts of such behaviour (e.g., looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; giving personal gifts; making comments about somebody's sex life; etc.).
10. Not engage in sexual favours—for instance, making promises or favourable treatment dependent on sexual acts—or other forms of humiliating, degrading or exploitative behaviour.
11. Not participate in sexual contact or activity with children—including grooming or contact through digital media. Children are incapable of giving consent. A mistaken belief about a child's age or any purported consent from the child is not a defence.
12. Unless there is the full consent[6] by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered "non-consensual" within the scope of this Code.
13. Consider reporting through the GM or to my manager any suspected or actual GBV or VAC by a fellow worker, whether employed by my company or not, or any breaches of this Code of Conduct.

Regarding children under the age of 18:

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

[6] **Consent** is defined as the informed choice underlying an individual's free and voluntary intention, acceptance, or agreement to do something. No consent can be found when such acceptance or agreement is obtained using threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defence.

15. Not invite unaccompanied children unrelated to my family into my home unless they are at immediate risk of injury or in physical danger.
16. Not use any computers, mobile phones, video, and digital cameras or any other medium to exploit or harass children or to access child pornography (see also “Use of children's images for work related purposes” below).
17. Refrain from physical punishment or discipline of children.
18. Refrain from hiring children for domestic or other labor below the minimum age of 14 unless national law specifies a higher age, or which places them at significant risk of injury.
19. Comply with all relevant local legislation, including labor laws in relation to child labor and World Bank’s safeguard policies on child labor and minimum age.
20. Take appropriate caution when photographing or filming children (See Annex 2 for details).

Use of children's images for work related purposes

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

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

Sanctions

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

1. Informal warning.
2. Formal warning.
3. Additional Training.
4. Loss of up to one week’s salary.
5. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
6. Termination of employment.
7. Report to the Police if warranted.

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

Company name: .....

Signature: .....

Printed Name: .....

Title: .....

Date: .....

Project Staff Code of Conduct

Implementing ESHS and OHS Standards

Preventing Gender Based Violence and Violence Against Children

I, _____, acknowledge that adhering to environmental, social health and safety (ESHS) standards, following the project's occupational health and safety (OHS) requirements, and preventing gender-based violence (GBV) and violence against children (VAC) is important, but also dealing with the complaints received from People Affected by the Project (PAP).

MOBSE considers that failure to follow ESHS and OHS standards, or not respecting PAP privacy in dealing with their complaints received via letter, phone calls, emails or social media constitute acts of gross misconduct and are therefore grounds for sanctions, penalties, or potential termination of employment. Prosecution by the Police f those who commit GBV, VAC or do not respect privacy of the PAP may be pursued if appropriate.

I agree that while working on the project I will:

1. Attend and actively partake in training courses related to ESHS, OHS, HIV/AIDS, GBV and VAC as requested by my employer.
2. Will always wear my personal protective equipment (PPE) when at the work site or engaged in project related activities.
3. Take all practical steps to implement the contractor's environmental and social management plan (CESMP).
4. Implement the OHS Management Plan.
5. Adhere to a zero-alcohol policy during work activities, and refrain from the use of narcotics or other substances which can always impair faculties.
6. Consent to Police background check.
7. Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic, or social origin, property, disability, birth, or other status.
8. Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
9. Not engage in sexual harassment—for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct, of a sexual nature, including subtle acts of such behavior (e.g., looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; giving personal gifts; making comments about somebody's sex life; etc.).
10. Not engage in sexual favors—for instance, making promises or favorable treatment dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior.
11. Not participate in sexual contact or activity with children—including grooming or contact through digital media. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense or excuse.
12. Diligently treat complaints received from PAP by respecting their privacy.
13. Unless there is the full consent[7] by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of

[7] **Consent** is defined as the informed choice underlying an individual's free and voluntary intention, acceptance, or agreement to do something. No consent can be found when such acceptance or agreement is obtained using threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defence.

actual provision of benefit (monetary or non-monetary) to community members in exchange for sex; such sexual activity is considered "non-consensual" within the scope of this Code.

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

Regarding children under the age of 18:

15. Wherever possible, ensure that another adult is present when working in the proximity of children.
16. Not invite unaccompanied children unrelated to my family into my home unless they are at immediate risk of injury or in physical danger.
17. Not use any computers, mobile phones, video, and digital cameras or any other medium to exploit or harass children or to access child pornography (see also "Use of children's images for work related purposes" below).
18. Refrain from physical punishment or discipline of children.
19. Refrain from hiring children for domestic or other labor below the minimum age of 14 unless national law specifies a higher age, or which places them at significant risk of injury.
20. Comply with all relevant local legislation, including labor laws in relation to child labor and World Bank's safeguard policies on child labor and minimum age.
21. Take appropriate caution when photographing or filming children (See Annex 2 for details).

Use of children's images for work related purposes

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

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

Sanctions

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

1. Informal warning.
2. Formal warning.
3. Additional Training.
4. Loss of up to one week's salary.
5. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
6. Termination of employment.
7. Report to the Police if warranted.

I understand that it is my responsibility to ensure that the environmental, social, health and safety standards are met. That I will adhere to the occupational health and safety management plan. That I will avoid actions or behaviors that could be construed as GBV or VAC. Any such actions will be a breach this Individual Code of Conduct. I do hereby acknowledge that I have read the foregoing Individual Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to ESHS, OHS, GBV and VAC issues. I understand that any action inconsistent with this Individual Code of Conduct or

failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Company name: .....

Signature: .....

Printed Name: .....

Title: .....

Date: .....

Annex 9. Potential Procedures for Addressing GBV and VAC

Accountability Measures to maintain confidentiality can be achieved through the following actions:

1. Inform all employees that confidentiality of GBV/VAC survivors' personal information is of utmost importance.
2. Provide the GCCT with training on empathetic and non-judgmental listening.
3. Take disciplinary action, including and up to dismissal, against those who breach survivor's confidentiality (this is unless a breach of confidentiality is necessary to protect the survivor or another person from serious harm, or where required by law).

GBV and VAC Allegation Procedures should specify:

1. Who survivors can seek information and assistance from.
2. The process for community members and employees to lodge a complaint through the GM should there be alleged GBV or VAC.
3. The mechanism for how community members and employees can escalate a request for support or notification of violence if the process for reporting is ineffective due to unavailability or non-responsiveness, or if the employee's concern in not resolved.

Financial and Other Supports to survivors can include:

1. No/low interest loans.
2. Salary advances.
3. Direct payment of medical costs.
4. Coverage of all medical costs related specifically to the incident.
5. Upfront payments for medical costs to later be recouped from the employee's health insurance.
6. Providing or facilitating access to childcare.
7. Providing security upgrades to the employee's home.
8. Providing safe transportation to access support services or to and from accommodation.

Based on the rights, needs, and wishes of the survivor, survivor support measures to ensure the safety of the survivor who is an employee can include[8]:

1. Changing the perpetrator or survivor's span of hours or pattern of hours and/or shift patterns.
2. Redesigning or changing the perpetrator or survivor's duties.
3. Changing the survivor's telephone number or email address to avoid harassing contact.
4. Relocating the survivor or perpetrator to another work site/ alternative premises.
5. Providing safe transportation to and from work for a specified period.
6. Supporting the survivor to apply for an Interim Protection Order or referring them to appropriate support.
7. Taking any other appropriate measures including those available under existing provisions for family friendly and flexible work arrangements.

Leave options for survivors that are employees can include:

1. An employee experiencing GBV should be able to request paid special leave to attend medical or psychosocial appointments, legal proceedings, relocation to safe accommodation and other activities related to GBV.
2. An employee who supports a person experiencing GBV or VAC may take care givers leave, including but not limited to accompanying them to court or hospital, or to take care of children.

[8] It is critical that a survivor centered approach be adopted. The survivor should be fully involved in the decision making. Except for exceptional circumstances the perpetrator should be required to take appropriate actions to accommodate the survivor (e.g. move, change hours, etc.), rather than the survivor changing.

3. Employees who are employed in a casual capacity may request unpaid special leave or unpaid care givers leave to undertake the activities described above.
4. The amount of leave provided will be determine by the individual's situation through consultations with the employee, the management and the GCCT where appropriate.

Potential Sanctions to employees who are perpetrators of GBV, and VAC include:

1. Informal warning
2. Formal warning
3. Additional Training
4. Loss of up to one week's salary.
5. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
6. Termination of employment.

Referral to the Police or other authorities as warranted.

Annex 10. Grievance Logbook excluding SEA/SH cases

Case no.	Date Claim Received	Name of Person Receiving Complaint	Where/how the complaint was received	Name & contact details of complainant (if known)	Type of grievance (land/compensation, contractor, project/E&S issue, community conflict, etc.)	Content of the claim (include all grievances, suggestions, inquiries)	Was Receipt of Complaint Acknowledged to the Complainant? (Y/N – if yes, include date,	Expected Decision Date	Decision Outcome (Include names of participants and date of decision)	Was Decision communicated to complainant? Y/N If yes, state when and via what method	Was the complainant satisfied with the decision? Y/N State the decision.	Any follow up action?