ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

FOR

THE PROPOSED

URBAN WATER REFORM &

AKURE WATER SUPPLY AND SANITATION PROJECT

AKURE, ONDO STATE, NIGERIA

By

NATIONAL URBAN WATER SECTOR REFORM PROJECT
DEPARTMENT OF WATER SUPPLY & PPP
FEDERAL MINISTRY OF WATER RESOURCES
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Table of Contents

List of Tables

List of Maps

List of Figures

List of Plates

Appendices

List of Acronyms

AfDB	African Development Bank
AFD	French Development Agency
CBO	Community Based Organizations
CESMP	Construction Environmental and Social Management Plan
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FRN	Federal Republic of Nigeria
FMWR	Federal Ministry of Water Resources
GRM	Grievance Redress Mechanism
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
HIA	Health Impact Assessment
HAP	Health Action Plan
HSE	Health Safety and Environment
HMP	Health Management Plan
ISS	Integrated Safeguards Systems
ISO	International Organization for Standardization
LFN	Law of the Federation of Nigeria
NSCDC	Nigeria Security and Civil Defense Corps
NACA	National Action Committee on Aid
NESREA	National Environmental Standards and Regulations Enforcement Agency
NUWSRP	National Urban Water Sector Reform Projects
ODWC	Ondo State Water Corporation
OS	Operational Safeguards
PDO	Project Development Objectives
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PPAR	Project Performance Assessment Report
PPP	Public-Private Partnership
PMU	Project Management Unit
RAMSAR	Convention on Wetlands of International Importance
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation and Hygiene
RWSSI	Rural Water Supply and Sanitation Initiative
SESA	Strategic Environmental and Social Assessment
UWR	Urban Water Reform
UWSS	Urban Water Supply and Sanitation

EXECUTIVE SUMMARY

Project Background

Nigeria has since early 2000 progress water sector reforms by executing various projects supported and financed by three (3) donors and development partners from 2004 under the National Urban Water Sector Reform Projects (NUWSRP I, II & III). While NUWSRP I & II has ended, the Federal Ministry of Water Resources through the Federal Republic of Nigeria (FGN) recently received a loan from the African Development Bank (AfDB) to support the Urban Water Reform (UWR) under NUWSRP III which runs currently. The NUWSRP III focuses on the provision of basic water services in selected States' capitals of Ondo (Akure), Oyo (Ibadan), Taraba (Jalingo) and Rivers (Port Harcourt). The programme also centers on driving financial viability of installed water utilities. Akure Water Supply and Sanitation Project is now being considered for execution under the NUWSRP III in Ondo State.

Project Development Objectives

The key objectives of the project are:

- to improve access to drinking water in selected areas of Akure
- to improve the financial viability of the water utilities by increasing their revenues; and
- to improve the governance of the water sector.

Project Components

The Project consists of two major components:

- Infrastructures component, focusing on Akure city and comprising:
  - Works for the rehabilitation, extension and densification of the distribution network, including implementation of water meters on the networks and on all connections
  - Works for the transmission systems; and
  - Works for the rehabilitation of production facilities.
- Institutional component comprising:
  - Project Management Support to Water Utilities;
  - Technical Assistance to Water Utilities;
  - Technical Assistance to the State Ministry in charge of water supply.

The under listed project, specific activities are proposed for execution within the Akure water supply project:

- Reconstruct the collapsed Dam's Weir at Owena Ondo Road and then rehabilitate the Headworks to original Designed Capacity to service its catchment towns.
- Supply water to the satellite towns along the route of the transmission main of the Dam Water Supply Project not covered by assistance from the French Development Bank (AFD) for the reticulation of water from the Multipurpose Dam Water Supply Project.
- Provide basic water services in the remaining 50% area of the state capital that cannot be covered by AFD funded project.

Aims and Objectives of the ESMP

The ESMP aims to bring the water reform and sanitation project into compliance with applicable national environmental and social legal requirements and the Bank's safeguards policies and procedures.

The specific objectives include the followings:

- Identify measures to prevent and mitigate undue harm to people and their environment in the development and implementation process, as well as understand and indeed appreciate the beneficial and negative impacts that could emanate from the proposed project and associated activities,
- Define the project mitigation/enhancement measures, monitoring, consultations and institutional strengthening measures to be undertaken during project implementation and operations.

- Ensure the robustness of mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate, or compensate for adverse environmental and social impacts, or to enhance the project beneficial impacts.
- Address capacity-building requirements to strengthen the needed safeguards capacities as necessary.
- Specify to ensure that the environmental and social safeguard measures are part of the project loan agreements to ensure that the project meets the Bank's safeguards requirements and the national legislation.

Existing Policy, Legal and Administrative Frameworks

The regulatory power for all environmental matters is vested in the Federal Ministry of Environment (FMENV). The Environmental Assessment (EA) Department of the ministry is charged with the responsibility of ensuring that all developmental projects are carried out in compliance with relevant environmental laws and regulations including relevant International Regulations and Conventions relating to Environmental and Social Protection in order to ensure environmental sustainability as highlighted in Section 1.4 of the report. The functions of the EA department includes:

- Implementation of the provisions of the Environmental Impact Assessment (EIA) Act of 1992 on development projects.
- Ensure environmental sustainability of development projects through regulation of activities within the oil and gas, mining, infrastructure, agriculture, manufacturing sectors, etc.
- Development of guidelines and standards for environmental quality monitoring, eco-labelling, etc.; and
- Accreditation of environmental laboratories.
- Implementation of Environmental Audit and Environmental Management System (EMS) in Nigeria.

Project Alternatives and Sustainability

The preferred alternative was identified as reconstruction of the collapsed Dam's Weir at Owena Ondo Road and then rehabilitate the Headworks to original Designed Capacity to service its catchment towns along the existing project footprint and area of influence, which implies that minimal environmental impact and economic implications is anticipated in comparison to execution of a new project. On the other hand, if a "Do Nothing" alternative is considered, it would imply continuous inaccessibility to potable water.

A measure of demand for particular levels of water supply and/or sanitation service which is the **Willingness to pay** could be said to exist amongst the populace. This in itself confers on the project a measure of sustainability.

With regard to **Sustainable Cost Recovery, t**he Ondo State Government shall adopt a policy of sustainable cost recovery, rather than full cost recovery, for the financing of its publicly owned water and sanitation agencies, implying that the Ondo State Water Corporation, the Ondo State Environmental Protection Agency, and the Small Towns Water Supply Agency would aim for revenue sufficient to cover their recurrent costs (operating and maintenance) and sustainable long-term cost recovery policies, anticipating all future cash flow needs shall be adopted. Sustainable cost recovery includes operating and maintenance cost.

For Water supply tariff, all water connections shall be metered starting with Industrial and commercial consumers to communal outlets down to domestic consumers.

Beneficial and Adverse Impacts

Positive Impacts

The major positive impacts are related to job opportunities. The direct and indirect job opportunities that will be provided by the project can be considered as a positive aspect. The local people will be directly employed to work at the construction sites. Generally, the potential beneficial impacts include:

- Access to improved drinking water source
- Access to basic sanitation facilities
- Revenue to the utility at the project completion
- Good governance and access to sustainable water and sanitation services

- Broaden AfDB's active portfolio directed at achieving its twin objectives of promoting inclusive growth and supporting the transition to green growth with Water Supply & Sanitation.

Adverse Impacts

Conversely, the proposed development, unfortunately, is also likely to exert negative impacts on the social and physical environment within which it is executed. These impacts can be divided into two, namely:

- Short-term construction related impacts such as environmental impacts on air quality, waste generation, disruption of traffic, and health and safety impacts. Unless good construction management practices are followed, construction activities can cause serious environmental pollution, environmental degradation and health and safety concerns to both workers and the public.
- Long-term and permanent activities of the operation phase leading to recurring but avoidable impacts which consist mainly of waste generation, air quality degradation in the event of use of diesel generators and noise.

Mitigation Measures and Complementary Initiatives

Possible Enhancement Measures

Possible enhancement measures of beneficial impacts of the project should include the following:

- Construction activities should adhere to recommendable best construction practices that make effective and economical use of locally available resources including materials, expertise and labour.
- The production of solid, liquid and hazardous wastes should be minimized.
- Preference should be given to local employment (youth, men and women) and local inputs (food, basic material) should considered to the extent possible.
- Ensure that the poor and other vulnerable groups can continue to safely satisfy their basic water needs.
- Ensure that women are involved in user fee collection and allocation decisions.
- The project should consistently and appropriately provide HIV/AIDS awareness information and protection gears to discourage new infections during the construction works.
- Periodic checks should be constantly conduced on different components of the water production, transmission and distribution system to initiate immediate rehabilitation whenever problems are identified to reduce system leakage losses and downtime during operation phase.

Possible Mitigation Measures

Possible mitigation measures for negative environmental impacts include the following:

- Measures should be taken to avoid hampering drainage of surface water and restoration measures should be taken after construction.
- Water sources should be checked for quality to confirm water quality standards are met.
- Water sources and infrastructures should be designed and constructed to prevent contamination.
- On-site sanitary facilities should be set up for the disposal of wastewater.
- Construction activities should be scheduled appropriately to reduce impact from high noise levels from overlapping noisy activities.
- Areas sensitive to erosion should be well-managed to avoid land degradation.
- Vegetation regeneration should be facilitated at the end of construction works by leveling off the soils and facilitate.
- Water conveyance layout should be design by taking into account ecologically sensitive and protected areas.

Gender Mainstreaming in the Water and Sanitation Reform

To achieve Gender mainstreaming in the water and sanitation sector at all levels, the Ondo State government would take care of all interest groups (men, women, youths, the aged and the physically challenged) by training

and retraining all relevant staff in all the agencies of government that are charged with water and sanitation issues and community committees on mainstreaming gender in water and sanitation projects handled by implementing partners such as donor agencies, NGO's, Civil society organizations and CBOs tailored to fit time constraints and operational needs of those involved. The Government would invest in community sensitization and enlightenment on the need for greater involvement of women in the water and sanitation projects.

Environmental and Social Monitoring Programme

The overall objective of environmental and social monitoring is to ensure that mitigation measures are implemented and that they are effective. Environmental and social monitoring will also enable response to new and developing issues of concern. The activities and indicators that have been recommended for monitoring are presented in the ESMP. Environmental monitoring will be carried out to ensure that all construction activities comply and adhere to environmental provisions and standard specifications, so that all mitigation measures are implemented.

Consultations

Public consultations have been held with local population and relevant stakeholders in the project area during the preparation of the ESMP. Furthermore, applicable standard procedures will be followed for disclosure in line with guidelines of the FMENV.

Responsibilities and Institutional Arrangements

Ondo State Water Corporation (OSWC) will ensure implementation of the project ESMP with the support of its environmental staff. Contractors will be held to account for implementation of their responsibilities in the Project Management Matrix. The institutional arrangements for implementation of the ESMP under the project include the following:

- State EPA/FMEnv
- OSWC
- Environmental steering committee
- Supervision consultant (Lead environmentalist)
- Contractor
- Project Financiers

Estimated Costs

The estimated cost of implementing the ESMP was a total of One Million, Four Hundred and Fifty Thousand, Nine Hundred and Nineteen United States Dollars (USD 1,450,919.00). Table 5 details the cost breakdown for Mitigation Activities as well as Monitoring Measures.

Implementation Schedule and Reporting

The activities related to environmental and social management and monitoring have to be integrated in the overall construction schedule. Most of the environmental management actions are standard or "good housekeeping" measures applicable to construction projects. These have to be observed throughout the construction activities and are shown as an overall activity. The key elements of the implementation schedule are presented in Table 7 of this ESMP.

Conclusion

The proposed project is most desirable because of the obvious environmental, health cum socio-economic benefits. These far out-weigh the negative impacts that could arise in the course of implementation. Potential impacts of sufficient magnitude that could interrupt the execution of the project were not detected. Although some negative impacts may potentially occur due to the activities associated with the proposed project adequate and SMART measures have been provided to address them. Mitigation measures and management plans have been suggested and developed for the negative impacts. Appropriate institutional framework shall be set up to implement the mitigation measures recommended while the proposed monitoring programmes shall be set in motion as soon as possible.

1.0 INTRODUCTION

1.1 Background

Nigeria is the most populous country in sub-Saharan Africa with between 180 and 200 million people. It is estimated that more than 30 % of Nigerians have no access to safe water. The Government of Nigeria have identified a series of challenges facing the water sector to include:

- Increasing population,
- Increasing urbanization
- Low access to services,
- Failure of under maintained infrastructure,
- Poor capacity and performance of service providers.

Thus, since early 2000, Nigeria has worked on water sector reforms, supported by various donors. Different projects aimed at increasing access to water services have included a minimum of three development partners- from 2004 under the National Urban Water Sector Reform Projects (NUWSRP I, II & III). While NUWSRP I & II has ended, the Federal Ministry of Water Resources through the Federal Republic of Nigeria recently received a loan from the African Development Bank (AfDB) to support the URBAN WATER REFORM under NUWSRP III which runs currently. The NUWSRP III focuses on the provision of basic water services in selected States' capitals of Ondo (Akure), Oyo (Ibadan), Taraba (Jalingo) and Rivers (Port Harcourt). The programme also centers on driving financial viability of installed water utilities. Akure Water Supply and Sanitation Project is now being considered for execution under the NUWSRP III in Ondo State.

In order to ensure no harm is caused to people and the environment in the course of the project implementation which would involve civil works, the National Urban Water Sector Reform Project (Department of Water Supply and PPP, Federal Ministry of Water Resources) with the supported of the African Development Bank commissioned the task of preparing this Environmental and Social Management Plan (ESMP).

1.2 Project Development Objectives

The water reform project aims at improving living conditions for the population of Akure town and environs by developing effective and sustainable water supply services.

The key objectives of the project are:

- to improve access to drinking water in selected areas of Akure
- to improve the financial viability of the water utilities by increasing their revenues; and
- to improve the governance of the water sector.

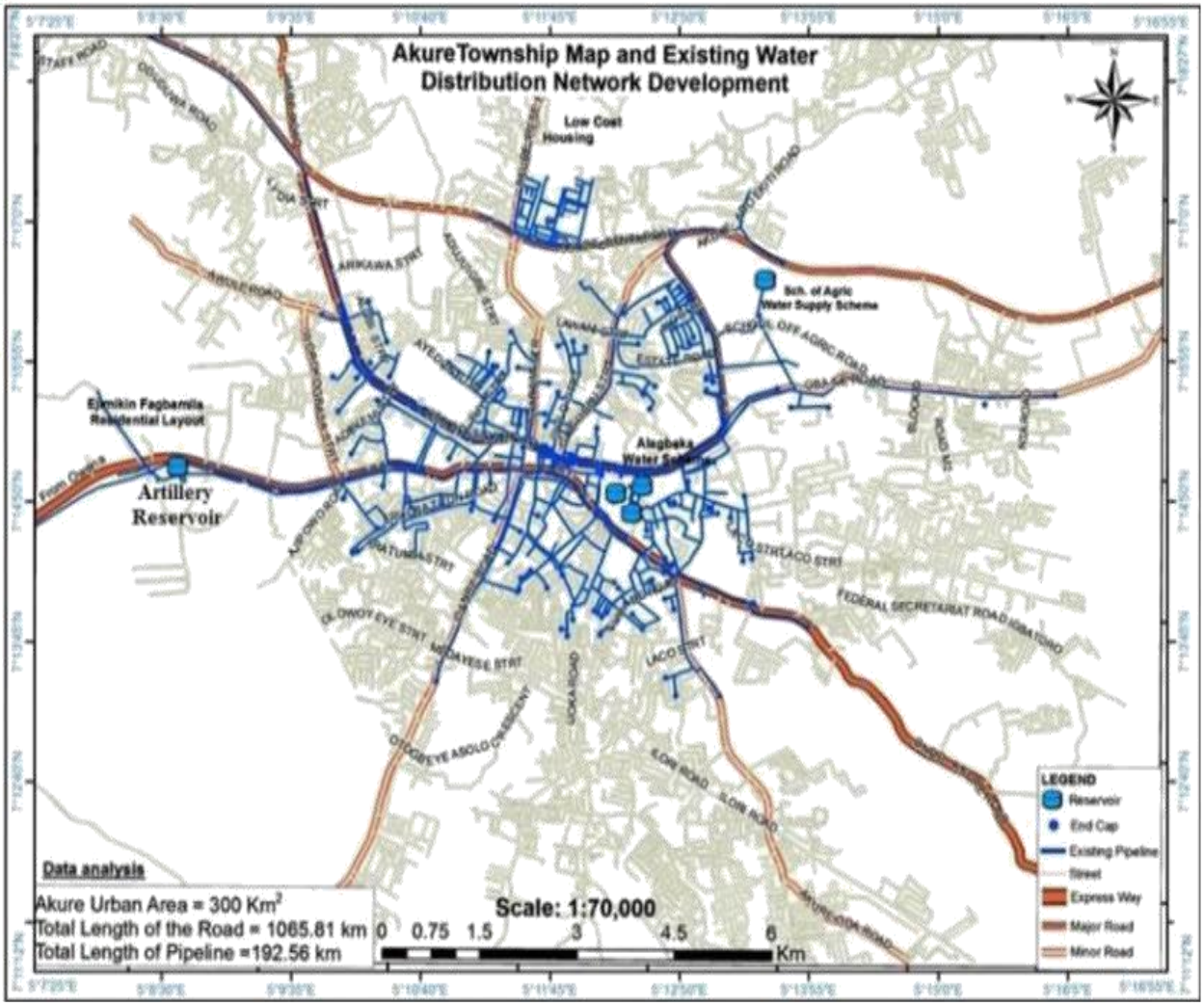
1.3 Project Activity Focus

The project activities, essentially, include the design and implementation of reforms in addition to some minor but urgently needed water supply infrastructure investments such as the rehabilitation of water supply projects for quick improvements in service provision.

The Project consists of two major components:

i. Infrastructures component, focusing on Akure city and comprising:
   - Works for the rehabilitation, extension and densification of the distribution network, including implementation of water meters on the networks and on all connections
   - Works for the transmission systems; and
   - Works for the rehabilitation of production facilities.

ii. Institutional component comprising:
   - Project Management Support to Water Utilities;
   - Technical Assistance to Water Utilities;
   - Technical Assistance to the State Ministry in charge of water supply.



Map 1: Akure Existing Water Distribution Network - to be Densified by 50% of AfDB Support

The under listed project, specific activities are proposed for execution within the Akure water supply project:

i. Reconstruct the collapsed Dam's Weir at Owena Ondo Road and then rehabilitate the Headworks to original Designed Capacity to service its catchment towns.

ii. Supply water to the satellite towns along the route of the transmission main of the Dam Water Supply Project not covered by assistance from the French Development Bank (AFD) for the reticulation of water from the Multipurpose Dam Water Supply Project.

iii. Provide basic water services in the remaining 50% area of the state capital that cannot be covered by AFD funded project.

1.4 Aims and Objectives of the ESMP

The Project Performance Assessment Report (PPAR) under the NUWSRP I that assessed the development effectiveness revealed that the project was classified as Category B in respect to World Band OP/BP 4.01 (Environmental Assessment). To this end, it is reasonable to say that the proposed project is not of higher category as the civil works simply involves rehabilitation of the dam and existing water supply mains, which had been nonfunctional along existing right of way, and thus the ESMP is considered most appropriate.

The ESMP therefore aims to bring the water reform and sanitation project into compliance with applicable national environmental and social legal requirements and the Bank's safeguards policies and procedures.

The specific objectives include the followings:

- Identify measures to prevent and mitigate undue harm to people and their environment in the development and implementation process, as well as understand and indeed appreciate the beneficial and negative impacts that could emanate from the proposed project and associated activities,

- Define the project mitigation/enhancement measures, monitoring, consultations and institutional strengthening measures to be undertaken during project implementation and operations.
- Ensure the robustness of mitigating/enhancing, monitoring, consultative and institutional measures required to prevent, minimize, mitigate, or compensate for adverse environmental and social impacts, or to enhance the project beneficial impacts.
- Address capacity-building requirements to strengthen the needed safeguards capacities as necessary.
- Specify to ensure that the environmental and social safeguard measures are part of the project loan agreements to ensure that the project meets the Bank's safeguards requirements and the national legislation.

1.5 Existing Policy, Legal and Administrative Frameworks

In Nigeria, the power of regulation of all environmental matters is vested in the Federal Ministry of Environment (FMENV). The Environmental Assessment (EA) Department of the FMENV is charged with the responsibility of ensuring that all developmental projects are carried out in compliance with relevant environmental laws and regulations in order to ensure environmental sustainability (Figure 1). The functions of the EA department includes:

1. Implementation of the provisions of the Environmental Impact Assessment (EIA) Act of 1992 on development projects.
2. Ensure environmental sustainability of development projects through regulation of activities within the oil and gas, mining, infrastructure, agriculture, manufacturing sectors, etc.
3. Development of guidelines and standards for environmental quality monitoring, eco-labelling, etc.; and
4. Accreditation of environmental laboratories.
5. Implementation of Environmental Audit and Environmental Management System (EMS) in Nigeria.

Fig 1: Mandate of the EA Department

The State Governments are also encouraged to set up their own Ministries of Environment and/or Environmental Protection Bodies for maintaining good environmental quality in the area of related pollutants under their control and thus there is State Ministry of Environment and Mineral Resources.

The Local Government in the country liaise and cooperate with the Federal and State Ministries of Environment to achieve a healthy or better management of the environment within their domains with the relevant bye-laws.

Nigeria subscribes to a number of International Regulations and Conventions relating to Environmental and Social Protection. In addition, International Development Partners/Agencies such as the African Development Bank and other financial organizations interested in development projects have sets of environmental and social Safeguards instruments and policies which must be complied with by project proponents before these institutions invest in or fund them. To this end, the duty and responsibility for environmental and social protection and management related to projects execution in various sectors of Nigerian economy could be sate to be mandated under:

- Current Federal, State and Local and relevant acts, rules, regulations and standards, and the common law of the Federal Republic of Nigeria (FRN).
- International environmental agreements and treaties ratified by the Federal Republic of Nigeria
- Safeguard Policies of supporting/development partners

Figure 2 presents an overview of the EIA process in Nigeria.

1.5.1 Some Relevant Regulatory Instruments

An outline of some of the relevant regulatory instruments to this ESMP is presented below as they relate to the Federal, State and International arenas.

At the National level:

- National Policy on Environment, 1989 (revised 1999);
- Environmental Impact Assessment (EIA) ACT 86, CAP E12, LFN 2004,
- National Guidelines for Environmental Audit in Nigeria,
- Guidelines and Standards for Environmental Pollution Control 1991,
- National Guidelines on Environmental Management Systems,
- The National Environmental Standards and Regulations Enforcement Agency (NESREA) and Regulations Gazetted as supplementary to NESREA Act.

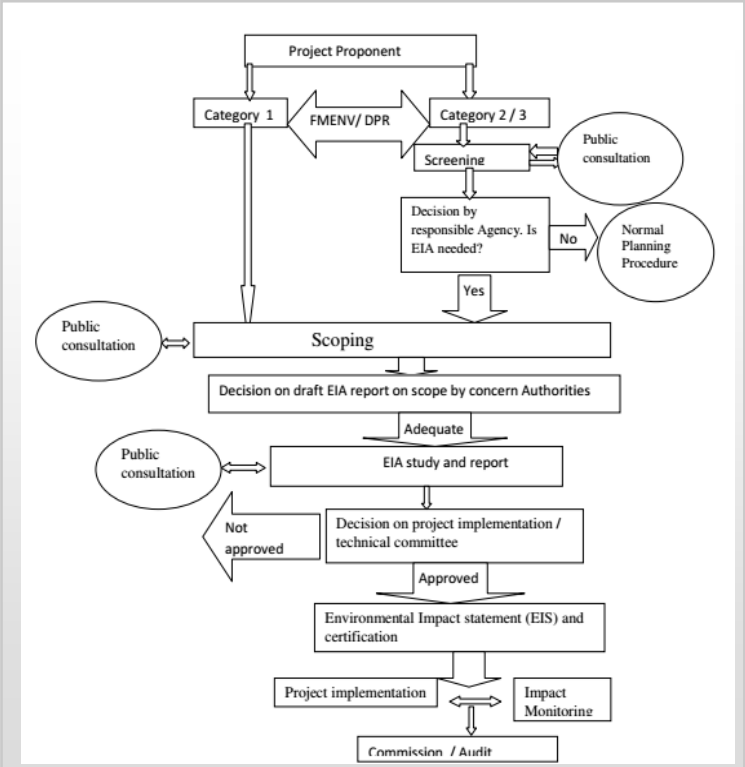


Fig 2: Environmental Impact Assessment Process in Nigeria

At State level:

- Ondo State Waste Management Law, 2002; and Waste Management (Enforcement and Offences) Provisions Regulations, 2002;
- Ondo State Environmental Protection Agency Law, Cap50, Vol. 2;
- Laws of Ondo State, 2006 that ensures the compliance of any development project with Environmental Impact Statement (EIS);
- State planning permits and regulations guiding development;
- Ondo state Ministry of Physical Planning and Urban Development law, 1999 that guides planning principles and practice in the state;
- The Ondo State Water Corporation published in an official gazette no. 17 Vol. 3 of 25th May, 1978 which mandates the establishment, constructing, controlling, managing, extending and developing of Water works activities.

At International Level:

- Conventions, Protocols and Treaties that promote the maintenance of a viable environment and achieving sustainable development endorsed by Nigeria such as Paris Accord, Aarhus, 1998;
- United Nations Guiding Principles on the Human Environment;
- Agenda 21 – United Nations Conference on Environment and Development;
- Voluntary International Standards such as Equator Principles and ISO 26000;
- Guidance on Social Responsibility are Applicable.
- Several international conventions and agreements are considered applicable to the project, including, convention on biological diversity, convention on wetlands of international importance (RAMSAR), convention on conservation of migratory species of wildlife; the Rio de Janeiro Agenda 21, adopted in 1992, and the African convention on conservation of nature and natural resources.

1.5.2 Voluntary International Standards for Project Enhancement

Today the need to make the contribution of nature to livelihoods and economies more visible to enable smarter decisions that account for nature in our economic systems and ensure that it can continue to sustain us have come to the fore and gaining more traction. This has made some forward-looking project proponents to embrace, upfront in project management voluntary international standards which provide frameworks and guidelines to improve governance and transparency. Example of these which could be Certification Schemes, Codes, Standards and Guidelines, Initiatives and International Frameworks area include:

- Equator Principle.
- ISO26000, Guidance on Social Responsibility
- ISO 14007:2016 Environmental management: Determining environmental costs and benefits
- ISO 14008:2019: Monetary Valuation of Environmental Impacts And Related Environmental Aspects

1.5.3 Proposed Project Level Regulatory Mainstreaming and Support

The above levels of environmental and social requirements were taken into account in the preparation of the ESMP. Specifically, it is noteworthy to say here that in addition to the Country System, African Development Bank requires borrowers' clients to comply with safeguards requirements during project preparation and implementation as enshrined in her Integrated Safeguards Systems (ISS) which sets out the basic tenets that guide and underpin the Bank's approach to environmental and social safeguards. The Integrated Safeguards System (ISS) is a cornerstone of the Bank's strategy to promote growth that is socially inclusive, environmentally sustainable. It is suite of tools used for identifying and managing risks, reducing development costs and improving project sustainability, thus benefiting affected communities and helping to preserve the environment.

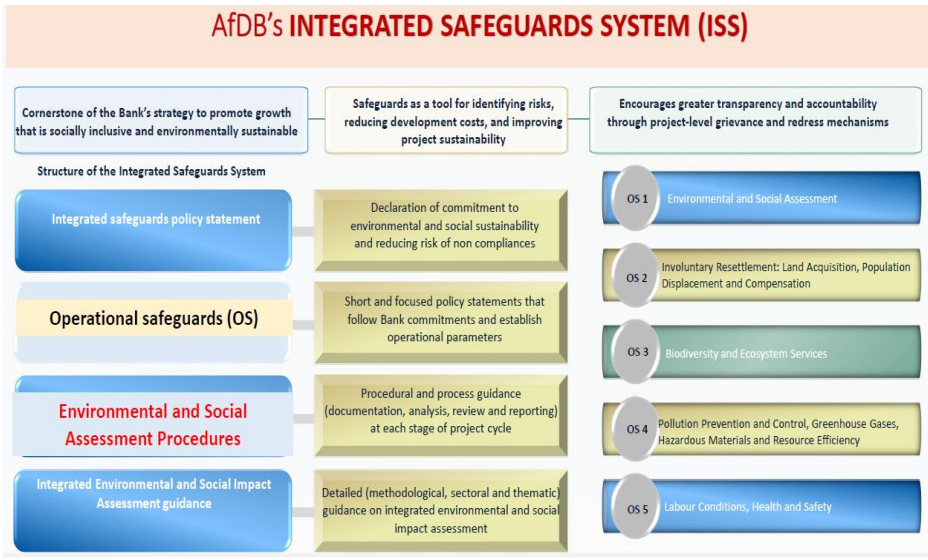


Fig 5: AfDB Integrated Safeguards Systems

At this crucial period when the Bank is updating existing frameworks to support the acceleration of development impacts through the high fives, the ISS would equip the institution and its clients to better understand and address emerging environmental and social challenges that come with these interventions. Since board approval in July 2014, the ISS is now a mandatory requirement for both sovereign and non-sovereign transactions.

The AfDB has a series of five Operational Safeguards (OS), outlined here below:

- OS1 sets out the Bank's overarching requirements for borrowers or clients to identify, assess, and manage the potential environmental and social risks and impacts of a project, including climate change issues. More specifically, OS1 achieves the following: i) Identify and assess risks and impacts, (ii) Avoid and/or minimize, risks and impact, (iii) Provide for stakeholders participation, (iv) Ensure effective management of risks and impacts, and (v) Contribute to capacity building elements.
- OSs 2-5 support the implementation of OS1 and set out specific requirements relating to different environmental and social issues, including gender and vulnerability issues, that are triggered if the assessment process reveals that the project may present certain risks.

The environmental and social assessment covers all relevant direct and indirect cumulative and associated facility impacts identified during the scoping phase, including any specifically covered in OSs 2-5, for which there are specific requirements:

- OS 2: Involuntary Resettlement: Land Acquisition, Population Displacement and Compensation
- OS 3: Biodiversity and Ecosystem Services
- OS 4: Pollution Prevention and Control, Greenhouse Gases, Hazardous Materials and Resource Efficiency
- OS 5: Labour Conditions, Health and Safety

1.6 The Proposed Project Categorization

The Environmental Impact Assessment Act No. 86 of 1992 requires that development projects be screened for their potential impact. Based on the screening, a full, partial, or no Environmental impact assessment may be required. Guidelines issued in 1995 direct the screening process. According to these guidelines, Category I projects will require a full Environmental Impact Assessment (ESIA), Category II projects may require only a partial ESIA, which will focus on mitigation and Environmental planning measures, unless the project is located near an environmentally sensitive area--in which case a full ESIA is required. Category III projects are considered to have "essentially beneficial impacts" on the environment, for which the Federal Ministry of the Environment (FMEnv) will prepare an Environmental Impact Statement.

Also, for AfDB, project screening through OS 1 and in support of OS 2 - 5 leads to categorization of the project. The project categories are guided by considered linkage levels as follows: Category 1, Category II, Category III & Category IV which are not different from the key criteria used by the Federal Ministry of Environment. These include for instance:

Category 1 which includes Bank Operations likely to cause significant environmental and social impacts as they are likely to induce significant and/or irreversible adverse environmental and/or social impacts, or to significantly affect environmental or social components that the Bank or the borrowing country considers sensitive, Category 2 which includes Bank Operations likely to cause less adverse environmental and social impacts less than Category 1 and they are likely to have detrimental site-specific environmental and/or social impacts that are few in number, site-specific, largely reversible, and readily minimized by applying appropriate management and mitigation measures or incorporating internationally recognized design criteria and standards and Category 3 project which include Bank Operations with negligible adverse environmental and social risks directly or indirectly and are unlikely to induce adverse social impacts.

In the light of these criteria, the categorization of the present proposed project is 2 by the Federal Ministry of Environment. It should be noted that earlier the World Bank under the First Nigeria National Urban Sector Reform Project executed projects that tend to address similar challenges, especially for water supply institutions with the project development objectives (PDO) to increase access to piped water networks in selected urban areas, and improve reliability and financial viability of selected urban water utilities, in Kaduna, Kano, and Ogun States. The Project Performance Assessment Report (PPAR) for this project that assessed the development effectiveness revealed that the project was classified as Category B in respect to World Band OP/BP 4.01 (Environmental Assessment).

1.7. Harmonization of Nigeria EA Guidelines and African Development Bank ISS

The Nigeria's ESIA requirements and African Development Bank Integrated Safeguards System have been harmonized as far as possible in order to make the ESIA responsive to the objectives of good practice (Table 1). It should be noted that the principles inherent in the environmental and social standards of the AfDB are in tandem with the FMEnv ESIA procedures and processes.

However, in the event of divergence between the two, FMEnv, on one hand, and AfDB ISS on the other hand, the most beneficial, environmentally and socially speaking, shall take precedence in the execution of the project and utilization of the ESIA instrument for project implementation

Before commencement of an ESIA or ESMP, the **FMEnv** issues a letter of intent on notification by the proponent, calls for public participation, review and mediation. The proposed study has taken into consideration this process and/or procedure and produced this report. In implementation, the report shall be adhered to as it will also ensure

compliance with State Legislations and International conventions ratified by the Federal Government of Nigeria on environmental conservation and protection.

Table 1: A Summary of the Procedure of Nigeria ESIA & AfDB ISS

EIA/ESIA Stages	NIGERIA ESIA	AfDB ESIA	Remarks
Notification/ Project proposal	Required	Required	TOR for concurrence/approval
Screening/ Categorisation	Category I, II, & III	1, 2, &3	Does the project require an ESIA? Corresponds in principle - done with regard to the level of impacts associated with a given project
Scoping (ToR)	Required	Required	What issues and impacts should the ESIA address?
Environmental baseline studies	Required	Required	Data gathering, Laboratory Analysis. Etc.
Assessment of Project Alternatives	Required with project justification	Required	Required for "A"; discussions of alternative for project sites; "do nothing" scenario
Description of Impact Assessment and Mitigation Measures	Required	Required	Ensures socio-environmental factors are carefully managed throughout the project cycle via mitigation, monitoring and institutional measures
Public consultation	Required	Required	All relevant information and the consultation findings taken into account in reaching a decision on the proposed project
Review/Disclosure	Required	Required	EIA/ESIA Report displayed at appropriate locations for relevant public members' comments. FMEnv may call for public session and display by the Bank
Environmental & Social Management Plans (ESMP)	Required	Required	
Monitoring and Auditing	Required	Required	feedback to the ESIA - Project situation versus after the project situation - Monitoring plan with specific indicators, frequency of measurements, estimated costs, institutional responsibilities

1.8 ESMP Preparation Methodology

The following methodology was adopted for preparing the ESMP:

Desktop Research

In the acquisition of baseline information for a study of this nature, the Federal Ministry of Environment (1995) advised that "the baseline study must be developed through a study of existing documents, and where existing data are not relevant or incomplete, it may be necessary to supplement by conducting field survey." Otherwise the information so gathered from the literature could be sufficent in describing the baseline of an areea. Such existing data could be gotten from "maps, reports, studies, research papers, etc."

Thus a review of the existing baseline information and literature material proved to be very helpful in the actualization of this study. It provided that basis for gaining deeper understanding of the road project and the environmental and social conditions that exist along the proposed corridor.

The following documents form part of the materials that were reviewed:

- Nigeria's National laws and/or regulations on environmental assessments,
- African Development Bank Safeguard Systems,
- Other relevant literature

Field Research

Field research was used to verify and complement information gathered from desktop research. The fieldwork covered relevant elements of the ecological and socio-economic environment, including the sensitive ecosystems.

Consultation with Stakeholders and Experts

Experts in relevant fields, leaders of thought in environmental and social matters were consulted via questionnaires and one to one discussion on issues relating to the potential ecological and socio-economic impacts of the proposed project in addition to stakeholders/townhall meetings that saw the attendance of all relevant LGA council Managers (Chairmen), relevant State MDAs, host communities royal fathers and other leaders and other interested stakeholders.

1.9 Structure of the Report

This report is presented in the following Sections:

1.0 Introduction
2.0 Project Justification
3.0 Project Description
4.0 Description of the Project Environment
5.0 Public Consultations and Public Disclosure
6.0 Potential Impacts
7.0 Environment and Social Mitigation Measures
8.0 Esmp Implementation and Management
9.0 Environmental and Social Monitoring Plan3
10.0 Decomissioning And Abandonment
11.0 Conclusion

2.0 PROJECT JUSTIFICATION

2.1 Introduction

Water is the elixir of life. It is part of a larger ecological system and vital to the essential environment for sustaining all life forms. It is a basic human need and must be managed in the most optimal manner so that consumption and development needs are met. As a scarce and precious resource its usage has to be planned, along with conservation and management measures, on an integrated and environmentally sound basis, keeping in view the socio-economic needs of the State. In the 21st century, efforts to develop, conserve, utilize and manage this important resource in a sustainable manner have to be guided by the State's perspective.

Moreover, Water, as a resource is one and indivisible: rainfall, river waters, surface ponds and lakes and ground water are all part of one system. Planning and implementation of water related projects have many socio-economic aspects and issues such as environmental sustainability, resettlement and rehabilitation of project - affected people and livestock, public health concerns of water impoundment, dam safety etc. Clear guidelines are necessary in these matters.

At the 24th regular meeting of the National Council of Water Resources in Akure, the state capital of Ondo State, the Gov Rotimi Akeredolu of Ondo State, noted that "Lack of access to potable water is the cry of the people and this makes them resort to an individual or private source some of which are not hygienic to the human system. At the moment, most of the major urban water supply schemes, some of which were inherited from the defunct Western Nigeria, have become old and inadequate in their capacities to meet the ever-increasing population and water demand."

Water supply and access is low in the State with only about 8 % of households and 12 % in urban areas getting piped drinking water (Ondo Water Policy). Akure, the State Capital and other major cities like Ondo face significant challenges that include:

- Moribund dams which do not supply water to the communities
- Low operational and financial autonomy of the water utilities;
- Low level of service with a low coverage, aging infrastructure, leaking pipes and daily water shortages;
- An inadequate sector framework, and the absence of accountability mechanisms.

These have sufficiently impinged negatively on adequate water supply and sanitation in the State and indeed the major cities. The proposed Akure Water Supply Project stands to resolve these challenges with the multiple benefits and specifically meet the following key development objectives:

- To improve the living condition of the people living in Akure and environs through the development of effective and sustainable water supply services.
- To improve access to drinking water in selected areas of Akure.
- To improve the financial viability of the water utilities by increasing their revenues; and
- To improve the governance of the water sector.

The Project also aligns with the AfDB's mandate to support modern infrastructure development in Africa and the Bank strategy in the water sector for both Rural Water Supply and Sanitation Initiative (RWSSI) and Urban Water Supply and Sanitation (UWSS) activities.

2.2 Envisaged Sustainability

The general sustainability principles that serve to guide the execution of the proposed project are presented below:

2.2.1 Institutional and Implementation Arrangements

Ondo State Water Corporation will be the Implementing Agencies and the Project contracting authorities. The PIUs will be responsible for the procurement, contracts management and the monitoring-evaluation of activities. The PIU shall prepare a Project Implementation Manual (PIM) describing the implementation and monitoring arrangements, including procurement and financial management arrangements. The States shall be involved in the project monitoring-evaluation via steering committees to be organized at State level. The Federal Ministry of

Water Resources will carry out the overall monitoring of the project as part of its activities to coordinate the reform.

2.2.2 'Sustainability – Project Governance and Political Support

As regards the sustainability of the project outputs will be ensured by activities under the Soft Component. The institutional environment related to the States Water Laws will be gradually set up, and the project will support the reform process embedded in the Water Laws. Improving the organization and internal management capacity of the water companies is one of the main objectives of the project, especially as far as the financial aspects are concerned. Finally, the increase of the number of consumers and their satisfaction for the service provided shall generate financial returns for the utilities.

Institutional risks consist primarily of possible delays in the approval and implementation of the Water Laws. This risk is substantial and shall be addressed by the States and FMWR. There is a risk of political interference on water tariff issues at State level; however, over medium term, the development of a fair tariff policy, with a pro-poor inclination should facilitate political acceptance of the new tariff structure. IEC campaigns shall be used to raise awareness on the tariff setting and benefits of paying bills.

In Ondo State, the uncertainty on the status of the existing contract for the transmission main from Owena treatment plant to Akure may lead to the inability to disburse the funds, as the Guidelines for the procurement of AFD-funded projects in foreign countries cannot allow the financing of the existing contract.

The personal commitment and interest of the Executive Governor and indeed the State Government to solving the traffic problems of the State

2.2.3 Environmental Sustainability

Environmental and social risks are moderate. Nevertheless, potential relocation along the works for transmission mains will require special attention. Therefore, an environmental and social management plan (ESMP) will be prepared by the engineers together with the detailed engineering designs.

As regards 'biodiversity conservation, environment and natural resources management'

- The project will improve water resources management by replacing the direct groundwater abstraction currently conducted with no control by individuals via private boreholes with surface water which supplies the production facilities. Furthermore, the replacement of old pipes and improvement in procedures to detect and repair leaks (currently estimated at over 50%) will preserve water resources.

As regards 'fight against climate change and its impacts'

- The carbon footprint of the project is estimated to be negligible. The water resources in Akure (where the project is concerned) have to date not been identified as being vulnerable to the impacts of climate change.

Furthermore, generally, the project principles shall be

- based on cost reduction, minimization of negative environmental, social impacts and utilization of local skilled labour.
- Environmental, public safety and health given high considerations while appropriate mitigation measures and Environmental and Social Management Plan shall be carefully implemented.
- Comply with statutory regulations and its own corporate guideline on HSE, and at the same time, committed to performance improvement. All project facilities shall be designed and constructed to keep environmental impacts at minimal and acceptable limits.
- Carry out all operations to conform to all relevant international, national and state regulations and Standards on the environment. Handling, storage and disposal of solid and liquid wastes shall be in accordance with the regulatory requirements and the company's relevant Standard Operational Procedures. There shall be minimal or no degradation of air quality since its operation will be driven by electricity.

2.2.4 Technical Sustainability

Technical assistance will be provided under the project to enhance operational capacities of the utilities by AfDB. The technical assistance program will focus on: (1) strengthening the commercial function (client management, billing, collection); (ii) building technical capacities (operation, maintenance); (iii) building financial management capacities; (iv) implementing a change management program. Officials of the States' Ministries in charge of water supply will also benefit from the change management program. The technical assistance will assist the utilities in the preparation of new tariff structures including a pro-poor tariff.

One of the goals of the ongoing national reform is to establish autonomous utilities with required capacities to provide good level of service, operate and maintain water systems adequately and recover costs from tariffs. A way to guide the parties towards the achievement of this goal and to set up the responsibilities of each party is to establish performance contracts which clarify objectives and means. The technical assistance shall be used to draft those performance contracts 'to be entered into between the States and the Utilities. The signing of the performance contracts within a period of 3 years from project inception shall be an Information Undertakings of the AFD's loan.

Furthermore the state can boast of an assemblage of a team professional with impressive relevant experience that would be involved in the implementation of the project and would where necessary source for necessary technical expertise to ensure the sustainability of the project. The state shall employ Best Available Technology in the implementation of the project and adhere strictly to all relevant engineering codes and standards and the support provided by the bank is an additional incentive to comply with all technical guidelines and requirements.

2.2.5 Economic Sustainability and Financial and Economic Viability of the Project

The increase in drinking water supply will have a positive knock-on effect on the economic development of the beneficiary cities. The current situation of intermittent service leads economic agents, institutions and households to develop alternative solutions to access to water (wells, individual boreholes, tanker trucks, bottles), which are far more expensive than the cost of a functional network. The reduction in water-borne diseases (thanks to the improvement in the quality of water consumed) will have a positive impact in terms of increasing working time and reducing health expenditure. The project will also contribute to improving the financial situation of the water companies.

The analysis realized in the prefeasibility studies shows that the project is economically and financially viable. The financial and economic rates of return is estimated at:

	Internal rate of return	**Economic rate of return**	**Economic rate of return if investment costs increase by 10%**
Ondo	7%	9%	8%

The involvement of finance institutions with significant experience and track record in managing similar facilities will provide the required financial and technical support for this project.

With regard to **Sustainable Cost Recovery, t**he Ondo State Government shall adopt a policy of sustainable cost recovery, rather than full cost recovery, for the financing of its publicly owned water and sanitation agencies, implying that the Ondo State Water Corporation, the Ondo State Environmental Protection Agency, and the Small Towns Water Supply Agency would aim for revenue sufficient to cover their recurrent costs (operating and maintenance) and sustainable long-term cost recovery policies, anticipating all future cash flow needs shall be adopted. Sustainable cost recovery includes operating and maintenance cost.

For Water supply tariff the following shall be adopted:

a. All water connections shall be metered starting with Industrial and commercial consumers to communal outlets down to domestic consumers.
b. Tariff policy shall ensure that the time for the return on investment provides adequate comfort for the consumers.
c. Tariff policy shall protect the consumer from bearing the additional cost of the inefficiency of the water supply undertaking.
d. Tariff should be structured according to the population densities to favour the poor

e. Tariffs of the Publicly owned water service providers in the State shall in the minimum, cover the cost of production (including operation and maintenance)

f. Water Tariffs shall be determined by the Ondo State Water Regulatory Agency.

g. All Water Service Providers, whether Public or Private are required to extensive public consultations in form of Stakeholders Public hearings in at least one location in each of the senatorial zones in the State before fixing new water tariffs, which should be approved by the Ondo State Water Regulatory Agency.

h. Public and private water services providers in the State shall for the purpose of fixing tariffs take into consideration, the cost of production which shall at all times be determined and published every six months for public information through newsletter bulletins and press releases.

i. The Tariff policy under the Ondo State Water and Sanitation Policy shall guarantee cross subsidy to accommodate water supply to meet the basic human needs for the poor.

j. The following bodies shall be considered for a specific cubic meter of improved water as free basic water, as would be determined through metering by Ondo State Water Regulatory body. Any other improved water consumed, above the free basic water shall be appropriately paid for-

   i. Orphanages
   ii. Social Homes for the Aged/senior citizens
   iii. Emergency Relief Centres
   iv. Care and Support homes of People living with AIDs, and other vulnerable groups.
   v. Offices of Associations of the physically challenged.
   vi. Privately or publicly owned Kindergartens and Nurseries of pupils Aged 1-12

2.2.6 Social Sustainability –

a. 'Welfare and Reduction Imbalances'

The extension of the water service to un-served neighborhoods will increase the access rate for poorer populations, thereby reducing social inequalities. Selection criteria will be established during the IEC campaigns for the households that benefit from new connections. A balance will also be sought between the need to rapidly increase the revenues of water companies and the need to guarantee access to the service for low-income households, by making social connections and including a pro-poor tariff policy.

b. 'Gender Equality'

By improving water supply conditions close to dwellings, the time spent fetching water will be reduced for women and girls, who have to carry out these chores in low-income families. Mothers will be able to spend more time raising there children or developing income- generating activities. For young girls, school absenteeism and the risk of being exposed to violence on the route of the water chores will be reduced. The selection criteria for the households benefiting from new connections will be defined in order to ensure that women have access to the service.

c. Social Sustainability - Consumer's awareness

Consumer's awareness on benefit of paying bills is a key factor for the sustainability of the project. Hence, Information, Education and Communication (IEC) campaigns shall be organized by the utilities with the support of the Project Management Support and local NGOs or community groups. In addition to the payment of bills, the TEC campaigns shall include collection of data on consumers and marketing on access to connection for households. The latter activities shall provide indications for the establishment of criteria for access to new connection for households. A balance shall be sought between the need to allow the utilities to rapidly increase their revenues and the need to provide access to low income households. It is important for AFDB) to ensure that women and vulnerable people will benefit from the project. IEC campaigns must inform in this respect. The utilities may use the IEC activities as a starting point for the establishment of a sustainable communication program between them and their clients.

2.2.8 Sustainability -Monitoring and Evaluation mechanism

The monitoring-evaluation mechanism will rely on the water utilities, with the support of the Project Management Support. Regular missions will be conducted by AFDB through its agency in Abuja and will be completed with supervision missions from AfDB.

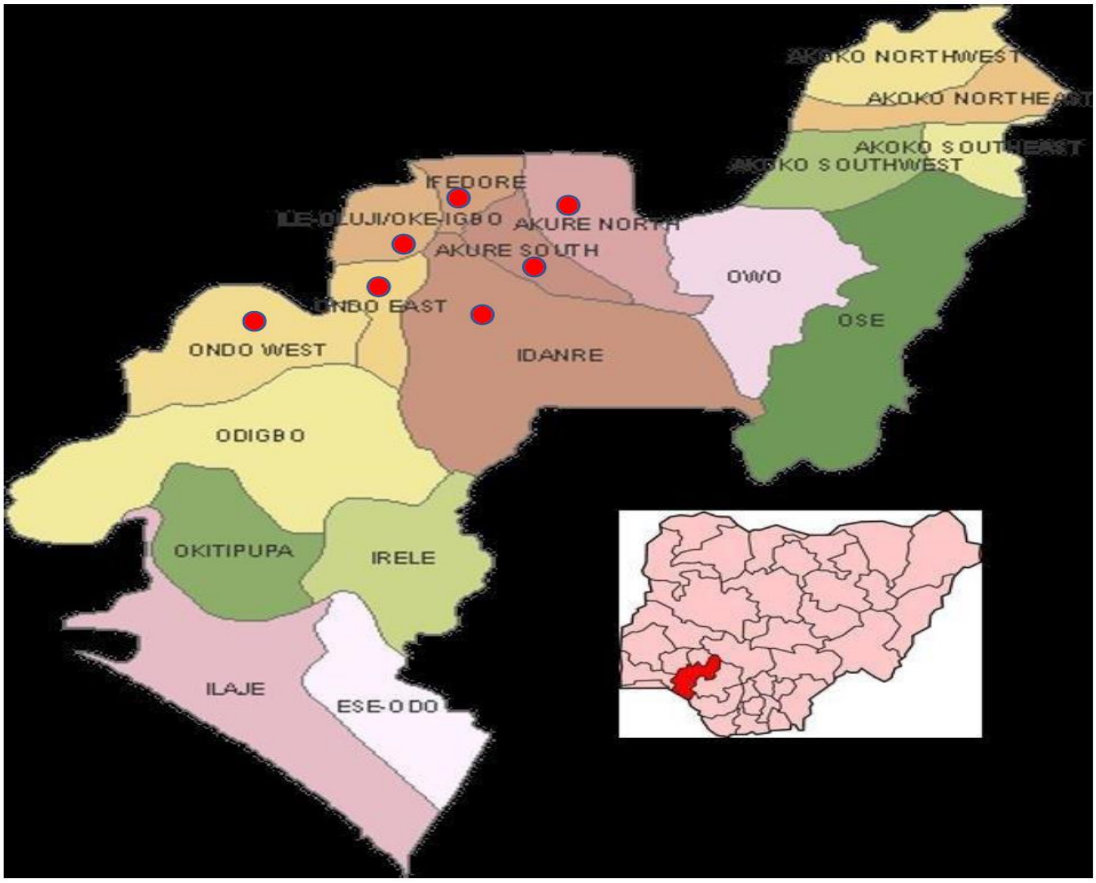
2.3 Project Alternatives

The project alternatives were considered in the light of the current situation of water supply in Akure. A spectrum of feasible alternatives that could reasonably achieve the purpose and goals of the proposed action were considered in terms of technological, economic, social and cultural dimensions. In this way, the least environmentally and socially damaging alternative that still satisfies the purpose and need of the project was identified as the preferred alternative, hence, considered the best project option.

The preferred alternative was identified as reconstruction of the collapsed Dam's Weir at Owena Ondo Road and then rehabilitate the Headworks to original Designed Capacity to service its catchment towns along the existing project footprint and area of influence, which implies that minimal environmental impact and economic implications is anticipated in comparison to execution of a new project. On the other hand, if a Do Nothing alternative is considered, it would denote continuous inaccessibility to potable water.

3.0 PROJECT DESCRIPTION

The Proposed Project Location is in Ondo State, with Akure as the capital, located in South Western part of Nigeria. Akure town is situated within geographic coordinates 070 15' 02.10" Northings, and 0050 11' 43.26" Eastings. Akure is relatively plane, and well over ten metres above sea level. The proposed project is designed to provide portable water to the major towns in six – seven of the local government areas in Ondo State, namely: Ifedore, Ondo east, Ondo west, Akure south, Akure North, Ile Oluji and Idanre Local Government Areas (Map 2). The Dam for the supply is located in Idanre Local Government in Ondo State which lies between longitude 5 01' and 5 45'E and Latitude 7 17' and 8 15'N and the specific location of the Dam along Akure – Ondo Road is indicated in Map 3.



Map 9: Ondo State in Nigeria with Proposed Project Local Government Area

Map 56: The Proposed Project Location (Dam Reservoir)

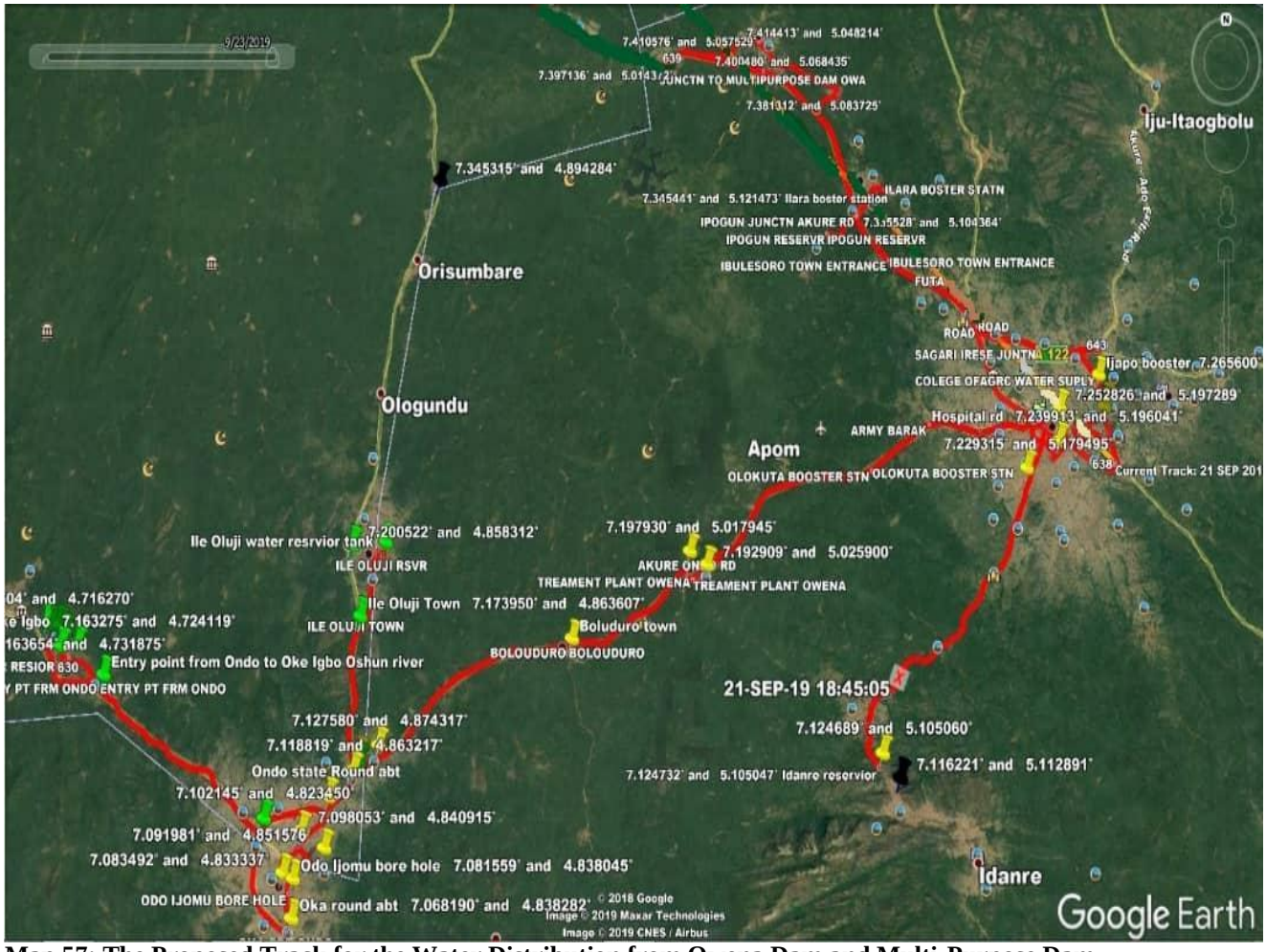
3.1 Proposed Project Activities

The specific project activities include the rehabilitation, extension and densification of the distribution network, including implementation of water meters on the networks and on all connections, the transmission systems; the rehabilitation of production facilities. In a simple manner, the project includes installation of water metres, construction transmission systems for reticulation, and rehabilitation of production facilities especially the dam at Owena.

The main technical characteristics of the Akure Water Supply Project includes design/development, rehabilitation/construction, Operation & Maintenance with decommissioning phases with the following specific project components:

1. 'Hard' component (works for the rehabilitation of production facilities, Works for the transmission systems, Works for the rehabilitation, extension and densification of the distribution network, including implementation of water meters on the networks and on all connections) and
2. A 'soft' component (Project Management Support to Ondo State Water Corporation; a Technical assistance to Improve the financial viability of Ondo State Water Corporation, Support improvements in the governance of the water sector in the Ondo State and Build capacity of Ondo State Water Corporation).

With regard to Distribution Network Routes of Proposed Water Supply, the proposed AfDB support covers Owena-Road scheme to be rehabilitated under the current scheme with a capacity of 10,000 m^3/day and distributed to existing water reservoirs in Ondo Town and Idanre. The AFD will work to rehabilitate the Owena Multi-purpose Dam and commissioned with an installed capacity of 60,300 m^3/day. These will be distributed to Akure City only with AFD taking responsibility for 50% and AfDB understating the remaining 50% (Map 5).



Map 57: The Proposed Track for the Water Distribution from Owena Dam and Multi-Purpose Dam

4.0 DESCRIPTION OF THE PROJECT ENVIRONMENT

A strategic approach was adopted in establishing the environmental and social baseline status of the study area. This involved obtaining the environmental characteristics through field data gathering exercise (observation, onsite measurements and sample collection) as well as laboratory analysis of collected samples.

4.1 Project Location

Ondo State is located in the South Western part of Nigeria. The State lies within latitudes 5o 8o 15' North and longitudes 4o 45'6' East. It is bordered in the Northwest by Ekiti and Kogi States- West-Central by Osun State; North east, East Central by Edo State; Southwest by Ogun State and Southeast by Delta State.

The Southern coastline rests on the Atlantic Ocean with considerable territorial waters offshore, and is rich in aquatic and mineral resources of significant importance.

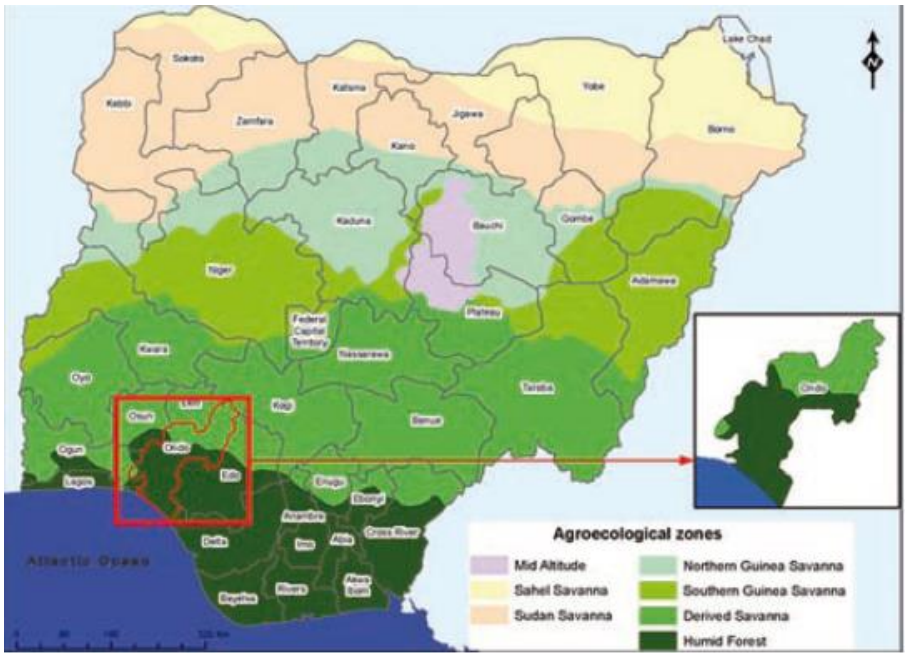
4.2 Climate

Biophysically, the climate of the project area is humid tropics (i.e. semi-hot equatorial). It is controlled by latitudinal locations, prevailing (seasonal) winds and nearness to the Atlantic Ocean. The climate conditions in the state follow the pattern in South Western Nigeria, where the climate is influenced mainly by the rain-bearing South West monsoon winds from the ocean and dry Northwest winds from the Sahara /desert. High temperatures and high humidity also characterize the climate, which facilitate the growth of tropical crops and high forest.

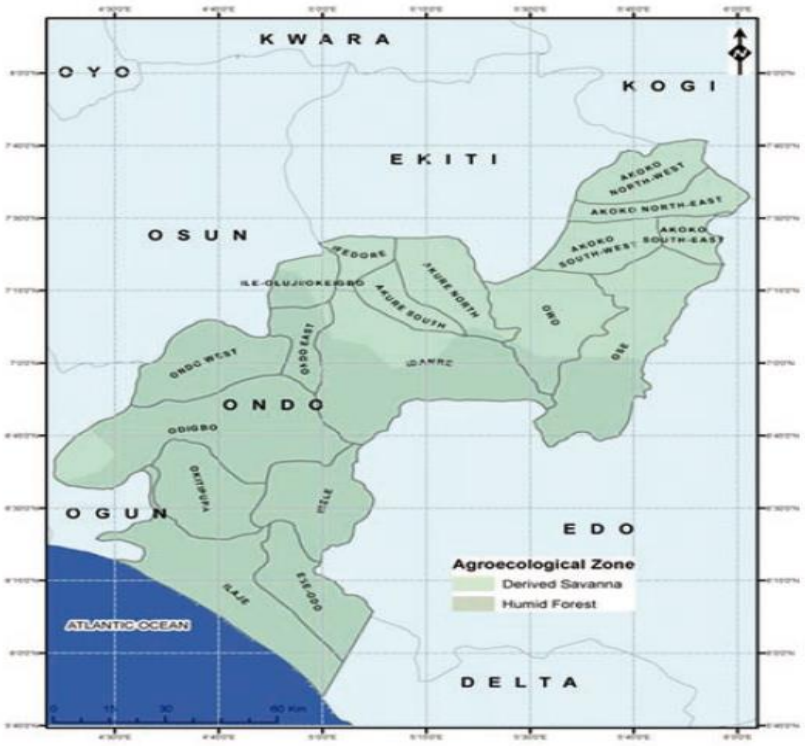
There are two distinct seasons, the raining season which last for about seven months (April to October) while the main dry season lasts generally from late October to March. The amount and pattern of the season remain the most important climatic factor in agriculture production possibilities in Ondo State (Map 6). In general terms, the State is well endowed with high rainfall that varies from about 2540mm a year in the South-eastern strip to 2032mm along the remaining coastline, 524mm in the middle part, and 1270mm along the Northern part made up mainly of the four Akoko humidity of about 30 percent. E

Owena town found in Ondo State South-Western part of Nigeria falls within the subequatorial region which is characterized by a monsoon climate. The temperature is relatively high throughout the year with an annual daily range of 27 Celsius, with a marked seasonal change in rainfall and relative humidity. Owena like every other tropical area of Nigeria has an abundant annual rainfall of over 1500metrs

With regard to Climate and bioclimate analysis of the State, Omonijo and Matzarakis (2011) made it known that the area shows total mean cumulative rainfall in humid forest zone within the study period range is about 1320 mm while that of derived savannah zone is about 1840 mm (Map 7). The frequency diagram of rainfall shows that the percentage of rain days in a class of 1 mm to 10 mm is 54.8 % and 46.1 % in humid forest zone and derived savannah zone respectively; while the class of greater than 10 mm to 20 mm accounted for 15.2 % in humid forest zone and 25.7 % in derived savannah. The class of greater than 20 mm to 50 mm accounted for 27.4 % of the rain days in each of the zones, while the class of greater than 50 mm to 90 mm accounted for 2.6 % and 0.8 % in humid forest zone and derived savannah zone of Ondo State respectively. The total number of rainday within the study period is 1402 (34.9 %) and 1030 (25.7 %) in humid forest zone and derived savannah zone respectively; 43.6 % of the total amount of rainfall was recorded in the months of May to July in humid forest zone while 43.4 % was recorded in the same period in derived savannah zone of the State. In all, 85 % and 84.8 % of the accumulated rainfall was recorded in the months of May to October in humid forest zone and derived savannah zone respectively.



Map 58: Nigeria showing Ondo State with Agroclimatological Zones Omonijo and Matzarakis (2011)



Map 59: The Two Ecoclimatic Zones and Local Government Areas, Omonijo and Matzarakis (2011)

4.3 Air Quality and Noise Level

With regard to air quality, NO2, SO2, CO, H2S and VOCs concentrations are below instrument detection limit (<0.001 mg/m3) in the project location and thus largely below the set limits. Noise level also ranged between 31.3 – 52.6 dB(A) far lower than permissible noise levels of 90 dB(A) for 8-hour working period in industrial location.

4.4 Vegetation

The area is highly vegetated. The vegetation of the area is predominantly secondary forest, with patches of primary forest especially in the rural and outskirts of the town. Map 8 shows the Owena Dam and the reservoir with the ticket vegetation around the project environment

Map 6: The Owena Dam and the Surrounding Environment

4.5 Topography and Geology

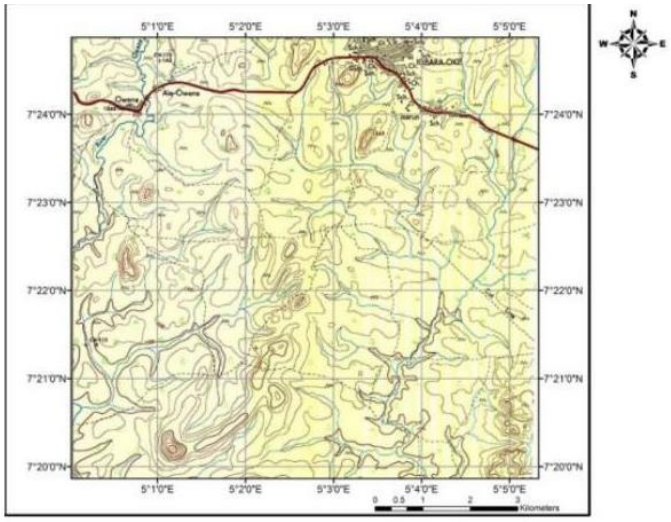
The State has a variety of land and forms from the coastline around Ilaje and Ese-Odo LGAs, the land rises to an undulating landscape with considerable elevations in the Idanre hills, in Idanre LGA, Oka Hill in Akoko – South West LGA. The main water body that drains the area is the Owena River with several small rivers which are tributaries to the Owena River. **Map 9: shows the Topography and Drainage Pattern of the Study Area**.

The proposed project area forms part of the Nigerian Basement Complex, with latitude 5º10’’,5º5’0’’E and longitude 7º24’0’’, 7º20’0’.’ The area is a region with a maximum of 420 meters elevation. The study area forms part of the crystalline rocks of the Basement Complex (Precambrian to lower Proterozoic in age) outcrop over a large area of Nigeria in three broad shields and are separated by Mesozoic and Cenozoic to recent sedimentary basins.

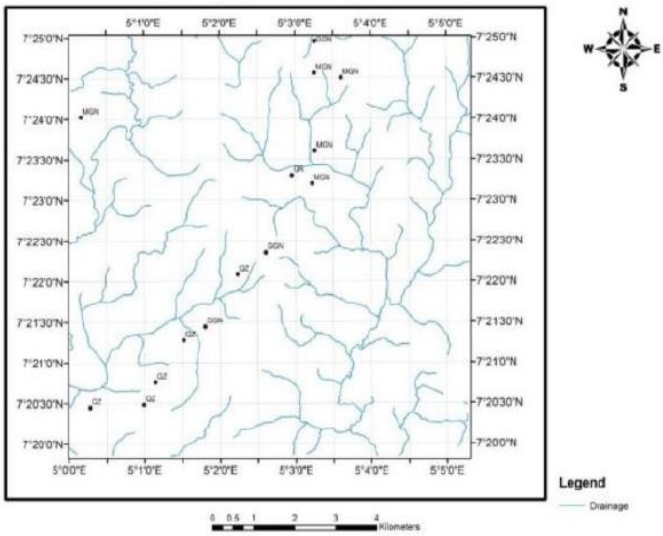
With regard to Local geology of study area Igbara Oke and Owena area are underlained by Precambrian rocks typical of the Basement Complex of Nigeria which has experienced many Orogenic events.

The main lithologic units in the study area include; migmatite, granite-gneiss, granites, and quartzite. These rocks have undergone polycyclic deformation thereby causing the deformation of both micro, meso and mega structures as displayed on Map 9. (Ayanwola and Bamisaiye, 2018).

Map 10 indicates the Source Edge Detector (SED) Showing the Dip and Strike Direction (areas dipping towards each other is valley while those dipping away are high hill) while Map 9 shows that Lithology profile of Some Traverse of the Study Area

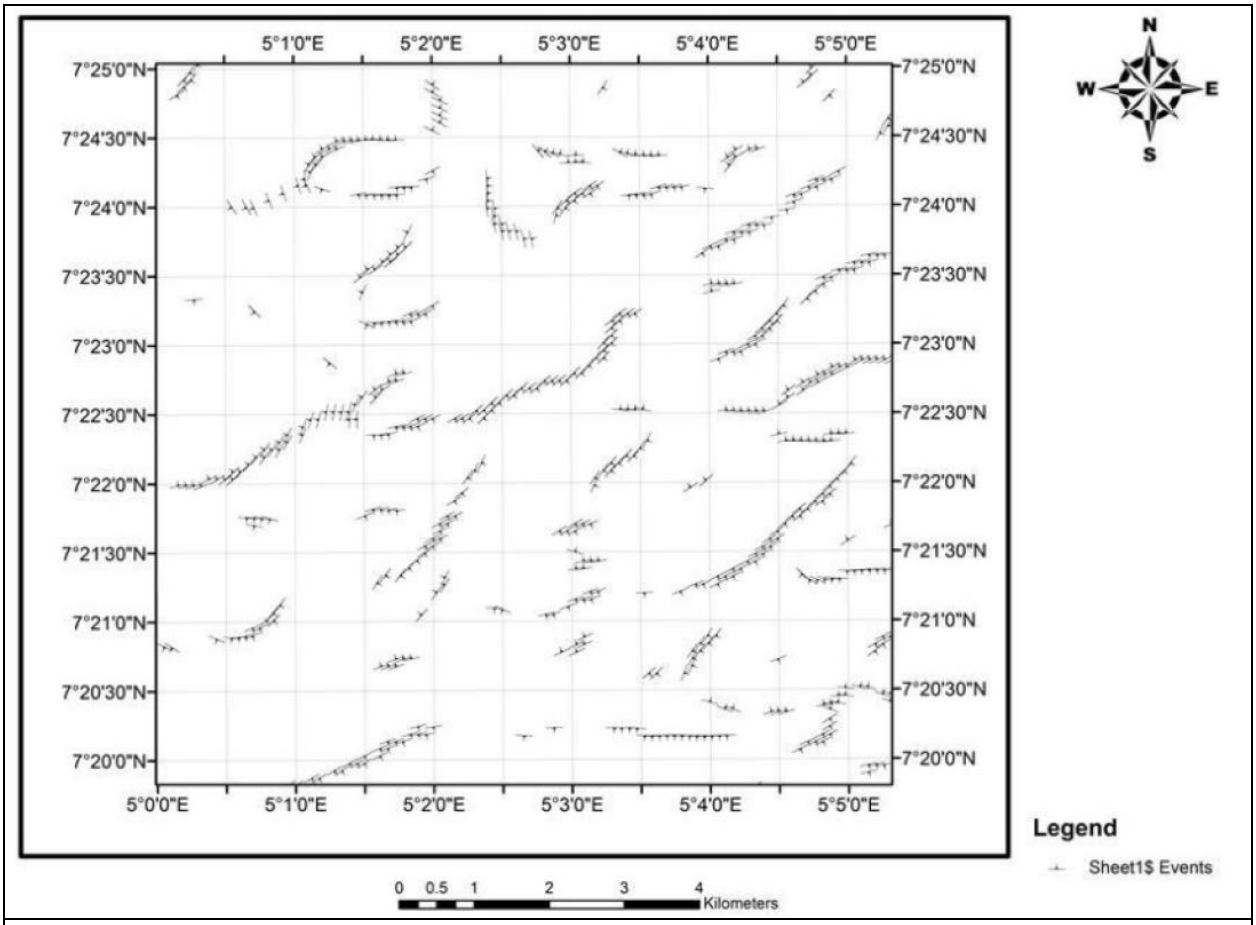


Topography

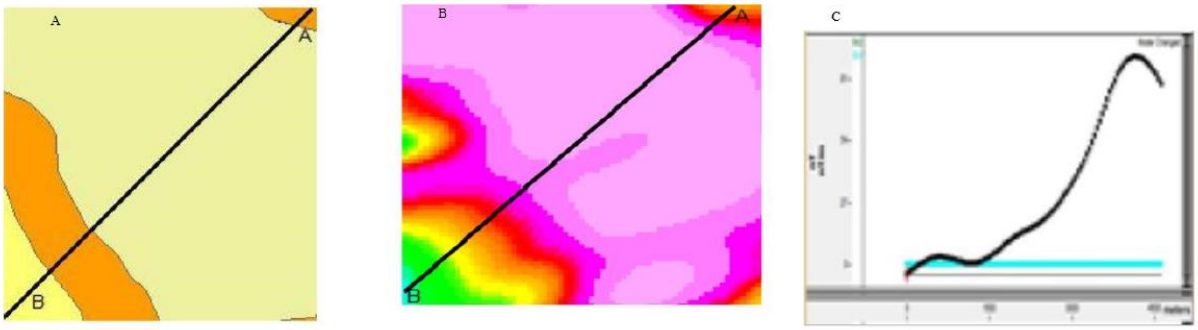


Drainage pattern.

Map 60: Topography and Drainage Pattern of the Study Area



Map 61: Source Edge Detector (SED) Showing the Dip and Strike Direction (areas dipping towards each other is valley while those dipping away are high hill).



(A) is the geologic map along traverse AB cutting across three rock type. (B) is the magnetic map, and (C) represent the profile map along AB. Point A is located on migmatites which has high magnetic susceptibility with positive anomaly, while point B is having low magnetic susceptibility due to the presence quartzite. AB falls on the western part of the study area.

Map 62: Lithology profile of Some Traverse of the Study Area

4.6 Water Supply and Owena Dam

The Owena dam was designed to be a major source of domestic water supply to the people of Ondo, Akure and its environs. It was constructed in 1966 and can be regarded the biggest reservoirs in the State (Table 2). The dam is supplied with water from the Owena River and it covers an appropriate surface area of 7.8 km2. The main water body that drains the area is the Owena River.

Table 2: The Water Bodies/Dam in Ondo State

Name	Surface Area (ha)	Location
Awara Dam	N.S.	Ikara
Egbe Dam	650.0	Egbe
Ero Dam	450.0	Otun-Ekiti
Erusu Dam	N.S.	Erusu
Ogbese Dam	N.S.	Ogbese
Owena Dam	1 450.0	Owena

The Owena reservoir is in the suburb of Owena town in Ifedore Local Government Area, Ondo-State, Nigeria. The first reservoir was constructed in 1966 by the state government as water supply scheme for Akure and its environs but the water supply became insufficient due to the rapidly increasing population. Consequently, the state government came up with the design of the second Owena reservoir; 14km upstream of the first Owena river water supply scheme. In 1976, the project was taken over by the Federal Government of Nigeria through the Benin-Owena River Basin Authority, wherewith it was reviewed in its design in addition to the supply of portable, fisheries exploitation, irrigation of agricultural lands and hydro-electric power generation. The reservoir is about 300m long and 9m in its deepest part, and it impounds about 36.25 million cm3 gross capacity of freshwater and the catchments area controlled by the reservoir is 790km2 (Fapohunda and Godstates, 2007).

The old Owena Water Supply Scheme, completed as far back as 1960 has a design capacity to supply 10 million litres of water to some towns and villages in the present Ondo and Ekiti States of Nigeria. The Ondo State Government in 1976, commissioned the design of the Owena River Dam with the objective of supplying raw water from the resulting reservoir for the existing water scheme, but taken over by the Federal Government of Nigeria (through Benin-Owena River Basin Development Authority) and converted it to a multipurpose use in line with the functions of the River Basin Development Authorities. The design was reviewed to include in addition to provision of potable water, usage for irrigation of 3,000 hectares of farmland, fisheries, as well as genera- tion of hydro-electric power. The dam, sited on the Ow- ena River about 14 km upstream of the old Owena water scheme, was designed to create an impoundment of 36.25 million cm3 gross capacity, covering an area of approxi- mately 7.38 km2 at the normal water level.

Table 3: The Current Status of the Dam Environment

S/N	The Project Environment	Co-Ordinates	Remarks Based on Field Observations
1	 **Owena Ondo Dam**	N07.19795 E005.01797	A failed dam, requires total reconstruction
2	 **Owena Ondo Water Treatment Plant**	N07.19260 E005.02082	1)Requires complete Rehabilitation 2)A waste management plan will be needed to ensure the sludge is well managed
3	 **Water Cooperation Sign**	N07.23423 E005.10701	Requires Complete Renovation
4	 **Owena Grammar School**	N07.19746 E005.01797	Closest Infrastructure to the Ondo Owena Dam

4.7 Water Quality

The main water body that drains the area is the Owena River with several small rivers, which are tributaries to the Owena River. The physicochemical characteristics of water from the dam lake for dry and wet seasons revealed high level of significant difference ($p < 0.05$) between wet and dry seasons' values for all parameters except turbidity and calcium. This observation is typical of the characteristics of dams within the geographical region. Spatial variation was, however, low in most of the water quality parameters as revealed in the calculated values of coefficient of variation, implying that the water to have similar physicochemical characteristics, influenced by the same lithology. Wet season, compared to the dry season's data, has higher colour units and this can be attributed to runoff into water bodies with high-entrained suspended particles and coloured substances predominantly of organic origin.

However, there were low conductivity and TDS values measured reflective of freshness of the water. The mean pH of the water samples ranged from very slightly acidic value of 6.23 to slightly basic value of 7.52 and hardness values that ranged from 62.67 - 96.00 mg/LCaCO3. With regard to heavy metals concentration in mg/L, studies showed the order of Fe > Ni > Cu > Mn > Cr > Zn > Pb > Cd and that their presence in natural waters is a combination of contribution from weathering of rocks and minerals, dumpsite leachates, sewage effluents and farming activities. High level of iron content in the Nigeria water is assumed to have no identifiable point source though traceable to it naturally occurring in soils and could manifest in surface waters that flow over them. Studies revealed the microbial values of the dam water body represent high bacteria load compared to the recommended standards for drinking water requiring treatment before consumption.

4.8 Soils

The soils are mostly well-drained, with a medium texture and have high agricultural value for plants. That is, the soil in the region is exceptionally clayed-texture with combine good drainage and good properties of moisture and nutrient retention. The soils are medium to high productivity with good potential for both food and non – food agricultural production.

4.9 Ecological Diversity

The ecological diversity and its endowment with mineral and natural resources, despite its relatively small land mass is unique. However, the state is strongly susceptible to ecological damage and sever degradation if not carefully protected and managed. More importantly, the coastal zone of the state constitutes part of the Niger delta wetlands that is of global significance and this is where endangered species should be protected. Apart from being described as having the longest coastline in the federation, it has beaches that are generally muddy unlike other coastlines. Both are being eroded at an alarming rate of between 30 and 90 meters per annum.

4.10 Socioeconomics

Ondo state covers an area of 15,500 km2 (6,000 sq mi) with a population of over 4.6 million and density of 319.9/km². Ondo State consists of 18 local government areas (Akoko North, Akoko North-West, Akoko South-East, Akoko South-West, Akure North, Akure South, Ese Odo, Idanre, Ifedore, Ilaje, Ile Oluji/Okeigbo, Irele, Odigbo, Okitipupa, Ondo East) of which seven are affected by the proposed project in terms of distribution of the water while the primary rehabilitation of the major dam and equipment is located in one (Idanre).

The proposed project is intended to supply water to the under listed major towns:

- Akure - largest city and capital of the State
- Ondo - the second largest city in the State.
- Idanre – a historic town located at the foot of the scenic Idanre Hill, which is of unique cultural and environmental significance, and attracts many tourists.
- Owena – located in Ondo East LGA.

Other major cities in the state include Okitipupa, Ikare, Owo, Ode-Aye, Igbotako, Ilutitun, Ile-Oluji, Ore, Ifon, Igbara-Oke, Irele, Oka, Igbokoda, Isua, Bolorunduro, Igbekebo, Iju,Ita-Ogbolu, Oke-Igbo, Ido-Ani, Ikun, Ilara, Ijare and Oke-Agbe only.He ethnic Profile the state has Yoruba Sub-ethnic groups of Akoko, Akure, Ikale, Ilaje, Ondo, Owo with minorities such as Ijaw and Apoi.

In terms of economic profile, the state is basically, agrarian with large scale production of crops like Cocoa, Yam, and huge forest reserves of about (sq km) 2008.which produces timbers for furniture, etc. Agriculture and agro products include: Cocoa, Palm produce, Kola nut, Coffee, Cashew, Rubber, Timber, Maize, Yam, Plantain, Cocoyam, Cassava, Rice, Banana. Thus occupation are mainly Farming, Trading, Logging, Fishing, Crafting, Public service

Akure town as well as Ondo and Idanre, to which the bulk of the water will be supplied are commercial centres with the presence of government and administrative offices, private sector businesses that include mobile network services, banks, media houses, schools and hospitals, etc. The population of Akure is well over two hundred thousand people. The outskirts and rural areas adjoining Akure town are largely agrarian with some timber lumbering activities.

A variety of food crops is produced in Ondo State. Notable amongst them are cassava, yam, maize and coco-yam. The minor ones include rice, melon, sweet potato, plantain, cowpeas and groundnut. The State also produces a wide range of vegetable crops such as okro, pepper and tomatoes, and has the potentials to produce such crops as banana, citrus fruits, pineapple and pawpaw. Table 3 outlines the mineral raw materials and agro raw materials found in the proposed project location.

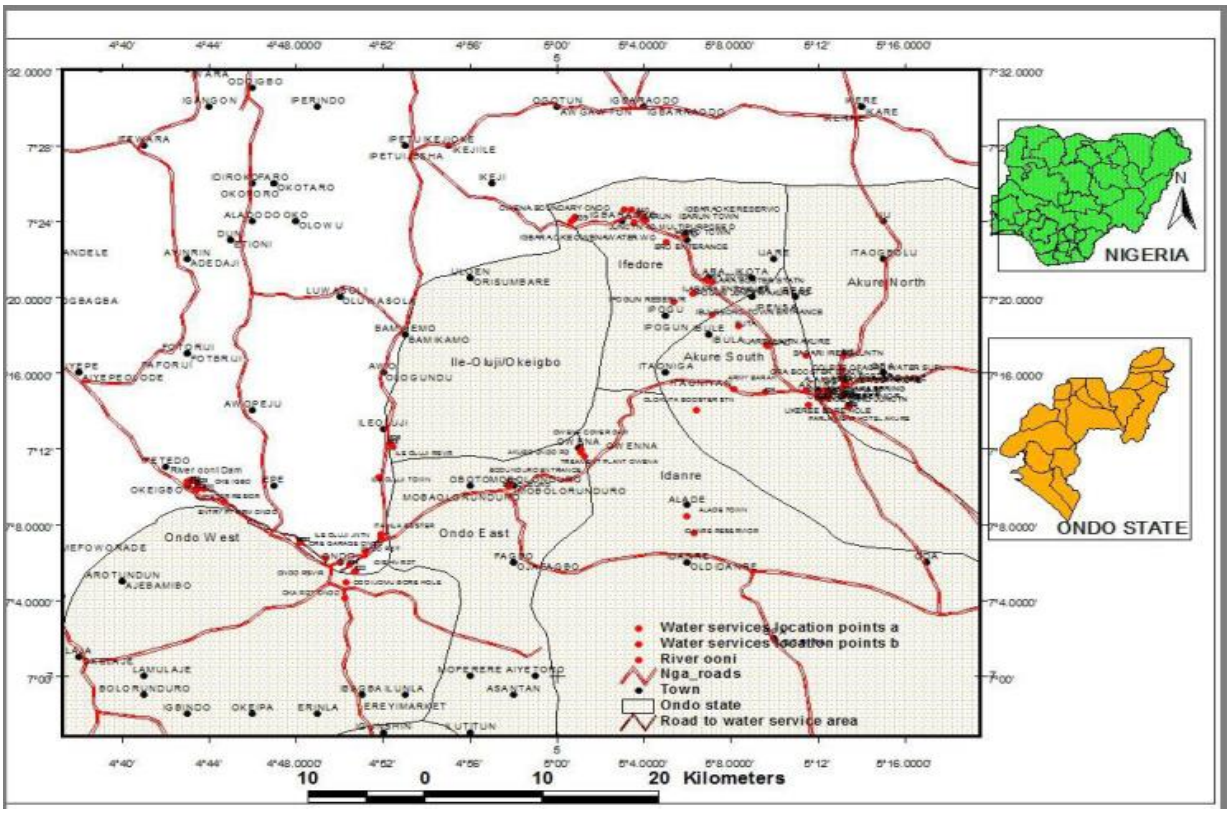
Table 4: Mineral Raw Materials & Agro Raw Materials in Proposed Project LGAs			
S/N	**LGA**	**MINERAL RAW MATERIALS**	**AGRO RAW MATERIALS**
1	Akure North	Ball clay	Cassava, Livestock, Cocoa, Cocoyam, Kolanut, maize, Plantain, Oil palm, Banana, Timber, Rice, Poultry, Piggery, Orange, Guava, Mango, Bamboo, Cashew
2	Akure South	Ball clay, Charnockite, Granite, Gabbro	Cocoa, Livestock, Vegetable, Cocoyam, Yam, Coffee, Plantain, Banana, Orange, Maize, Mango, Piggery, Oil palm, Cassava, Rice, Bamboo, Timber, Cashew.
3	Idanre	Granite, Ball clay, Charnockite	Cocoa, Cocoyam, Maize, Oil palm, Plantain, Banana, Cassava, Livestock, Piggery, Yam, Vegetables, Poultry, Timber, Rice
4	Ifedore	Ball clay, Granite, Charnockite	Cocoa, Cocoyam, Maize, Oil palm, Plantain, Banana, Cassava, Livestock, Vegetables, Yam, Piggery, Poultry, Rice, Timber
5	Ile-Oluji/Okeigbo	Ball clay, Charnockite, Granite	Cocoa, Cocoyam, Maize, Oil palm, Plantain, Banana, Cassava, Livestock, Vegetables, Yam, Rice, Piggery, Poultry, Timber
6	Ondo East	Ball clay, Charnockite, Granite	Cassava, Cocoyam, Maize, Oil Palm, Piggery, Vegetables, Yam, Timber, Rice, Poultry, Plantain, Banana
7	Ondo West	Ball clay, Charnockite, Granite	Cocoa, Cocoyam, Maize, Oil palm, Plantain, Banana, Cassava, Livestock, Vegetables, Yam, Piggery, Poultry, Timber, Mango, Tomatoes, Cashew, Guava

4.11 Overview of Ondo State Water Corporation's Water Supply Infrastructures

Ondo State Water Corporation has thirty-three (33) water supply schemes serving Ondo State. These 33 schemes have a combined theoretical installed capacity of around 111,500 m^3/day from surface, spring or ground raw water. Ondo State Water Corporation also operates 597 km of distribution network, 70 storage reservoirs, 627 standpipes and serves 17,446 connections, among them, 15,804 are domestic customers.

Borehole Water Supply has not proved to be effective in the riverine areas of State due to the peculiar nature of, the area. The water is either saline or have high iron contents.

In 1996, when Ekiti State was created out of the Old Ondo State, the number of Schemes dropped to 24 but as at February 2014, the number has increased to 45 -all having a combined designed capacity of 105,757.63 m3/day to serve the present estimated Ondo State population. Map 6 presents the distribution network of Water infrastructure in the proposed project area LGAs.



Map 63: Distribution of Water Infrastructure in the Project Area

However, while of these Schemes are not functioning and therefore need rehabilitation attention, the combined designed capacity is grossly less than the total average estimated water demand of 362,440m3/day for Ondo State. The implication of this is that the present installed capacity can only cover about a third of the State population assuming all the water schemes are functioning at their designed capacities. This gives an estimated water demand shortage of about 256,683m^3/day. Therefore, a considerable effort is required to bridge this gap to ensure adequate provision of potable water.

In terms of demand projections ending in 2026, for drinking water is expected to grow by at least six times, i.e. from 200 to 1,200 Ml/day based on conservative assumptions:

a) At a 'normal' growth rate of 3% per year, the population of Ondo State is expected to roughly have doubled by 2026;

b) The current average unit consumption of around 30 litres per person per day could rise to at least 60 litres over 25 years – a deliberately cautious assumption, and

c) Today's coverage of 30% to 40% should be set to possibly reach 80%-100% by 2020 – another prudent objective.

The total water demand for Ondo State by the year 2026 is estimated as:

- Domestic Demand 910,000M litr. /day and
- Industrial Demand 290,000M litr./day.

Depending on expansion assumptions for the network, the total demand could range between 650 and 2,300 Ml/day by 2026. With regard to Safe Water Supply Coverage Targets, the initial target is to improve water service coverage from 33% in 2016 to 52% by the year 2018. This has not been realized but rather the situation is worsening.

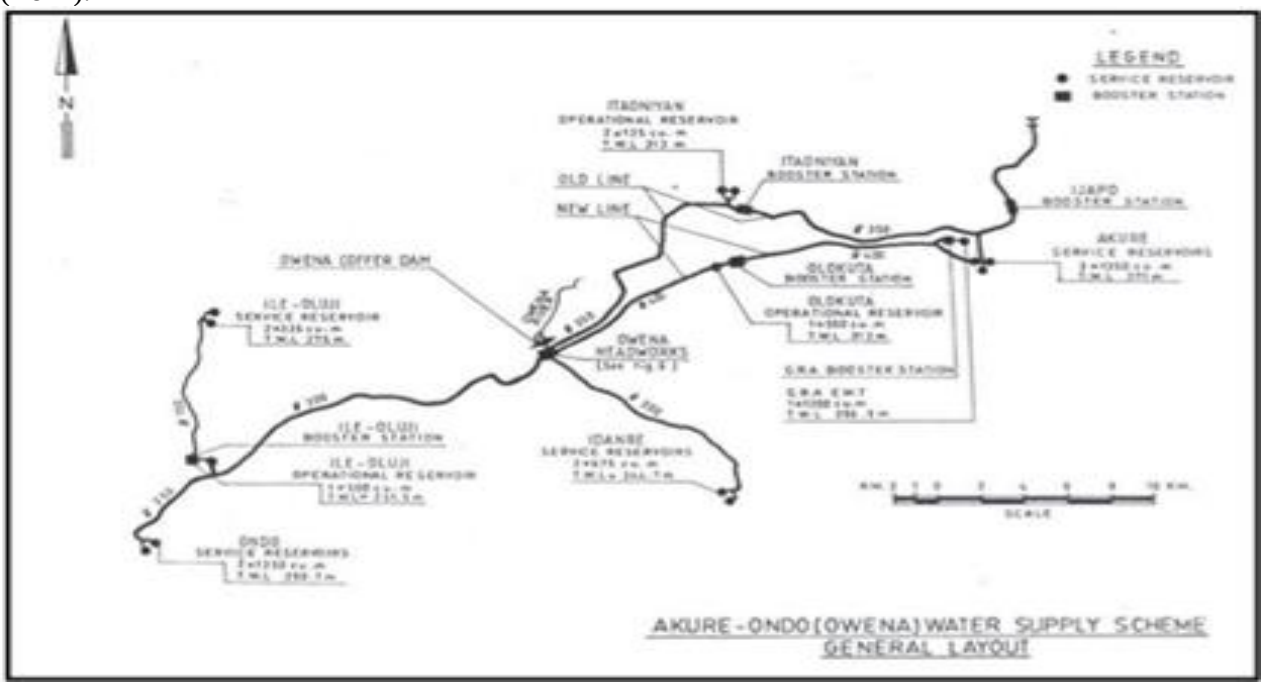
There is also the extension of service coverage to 70% of the population by the year 2020 and 100% of the population in the year 2026 and then 4. Sustain 100% full coverage of water supply and wastewater services for the growing Population beyond the year 2026. The Safe Water Supply Coverage Targets for Ondo State for the period of 2010 to 2020 is shown in the Table 4.

Table 5: Projected Population for Ondo State for the period 2016 to 2026

Description	2016	2018	2020	2022	2024	2026
	Coverage Population					
Urban	1,514,135	1,957,214	2,060,312	2,168,841	2,283,087	2,403,351
Small Towns	1,135,601	1,467,910	1,545,234	1,626,631	1,712,315	1,802,513
Rural	1,135,601	1,467,910	1,545,234	1,626,631	1,712,315	1,802,513
Total	3,785,338	4,893,034	5,150,780	5,422,102	5,707,717	6,008,377
	2016	**2018**	**2020**	**2022**	**2024**	**2026**
	Coverage Population					
Urban	1,133,172	1,518,189	1,518,189	1,826,469	2,163,016	2,529,950
Small Towns	440,373	772,617	1,138,642	1,369,852	1,622,262	1,897,462
Rural	440,373	772,617	1,138,642	1,369,852	1,622,262	1,897,462
% Average Targets	34%	52%	70%	80%	90%	100%

4.11 Owena-Ondo Road Scheme (Proposed Dam Rehabilitation Area)

Owena-Ondo Road scheme was commissioned in 1965 and upgraded in 1990, the treatment plant has an installed capacity of 19,300 m3/day deriving raw water from the Owena river. The dam (called Conffer Dam) was designed to be a major source of domestic water supply to the people of Ondo, Akure and its environs and is the biggest reservoir in the State. The dam is supplied with water from the Owena River and it covers an appropriate surface area of 7.8 km2 (Map 8). The main water body that drains the area is the Owena River. The Coffer Dam collapsed due to heavy flooding in the year 2012. After this event, raw water was abstracted from the Owena river by the old intake built in 1965. The scheme has not produced any water since 2017 due to collapsed power supply line alongside damaged operational pumps and leakages form water treatment plants (Box1).



Map 65: Owena Road Water Scheme General Layout (Castalia – January 2018)

The Status of Transmission Line and Boaster Stations from Owena Road Treatment Plant is as listed:

- An Old Line-: about 27.5 km long of 350mm diameter AC pipes, connecting the vandalized Ita Oniyan Booster Station. This line is presently abandoned due to age and disrepair.
- New Line –about 23.8km long of 400mm diameter AC pipes, connecting Olokuta Booster station. The line is over 40 years old and there are leakages and bursts at various locations.
- The water distribution network has 5 services tanks with a combined capacity of 6,050 m3 (3x 1,350 m3 Nepa Area, 1,000 m3 SSS Quarter, 1,000 m3 Army Barracks).
- 4 booster stations (Ita-Oniyan Booster Station: 1 x 177 m3/h + 2 x 122 m3/h, the station is vandalized and abandoned, Olokuta
- Booster Station: 2 x 490 m3/h, the power installation is vandalized and the transformer not in a good state, Ijapo Booster
- Station 2 x 104 m3/h, the power supply is unreliable,
- GRA Booster Station: 2 x 125 m3/h, not working
- 193 km of pipes the total length of the operational distribution network is 77 km. The AC pipelines were laid in the 5,444 connections (4,222 households among them 282 were active in 2016, 780 commercials among them 4 were active in 2016, 442 institutions among them 56 were active in 2016. The network is in poor condition (Intermittent service when it is functional, Low pressure as some pipes are undersized, Control valves are buried, some inoperable, some faulty (Leakage, Illegal connections, No bulk meter, No District Metering Area, No customer metering).

5.0 PUBLIC CONSULTATIONS AND PUBLIC DISCLOSURE

Public participation in the preparation of the ESMP included stakeholder consultations and communication by the proponents. The consultation included a two-way process in which ideas about the project and concerns of stakeholders and the project designers were shared and considered mutually by affected populations and other stakeholders (Plate 1 and Appendix 2). Communication included the dissemination of information from the project proponent to the concerned public about the project and other relevant issues. The following is a summary of the stakeholders:

- All identified stakeholders and affected persons showed signs of being fully aware of the project.
- Majority of the stakeholders are largely awaiting the effective commencement and completion of the project.
- The local Government officials expressed deep appreciation for the project and are ready to support every effort aimed at realizing the goal of adequate water supply and improved sanitation.
- It is a welcome development as it will ease off the problem of inadequate water supply in Akure and other towns and villages in Ondo State
- Most traditional rulers, religious and community leaders expressed appreciation for the project and will very much liked to be carried along in the overall project planning and execution as it affects their various communities.
- Everyone should be carried along so as to identify with the project. The production of written document containing information on the project would be useful
- It is a project both men and women want to support and would be glad to be given roles to play especially for the women who are major users of water.
- It is a good project and we are interested in how we will be affected.
- The project will lead to employment of people in the communities which would further add colour to the project. The youth should be given special consideration as they would be helpful as line traces to forestall vandalization of pipes and other equipment.
- If people are to pay for the water supplied that will be good to sustain the project. However, the rate should not be too high so as to guarantee payment. It should be affordable and the system of payment should be easy and fraud proof.
- How will those displaced be treated or compensated? Any method adopted should ensure they are given prompt and adequate attention.
- How will safety be assured? Monitoring committees should be established in each community whose responsibility it would be to ensure safety of the project.
- Every effort should be made to ensure sustainability of the project and avoid recurrence of failure which happened to similar projects in the past.

A Stakeholder Engagement Plan has been developed geared towards a robust stakeholder's involvement in the throughout the life cycle of the project covering the development and implementation stages.
With regard to Public disclosure, the ESMP is expected to be disclosed in-country at designated locations as directed by the Federal Ministry of Environment to the general public and in the Bank website for review and comment.

Plate 1: Delegates at Stakeholders Meeting

6.0 POTENTIAL IMPACTS

The Water Sector plays a strategic role in the socio-economic development of Akure and affected communities. A range of positive environmental and social impacts is envisaged from the project from the implementation of the project. Some of these are a function of the objectives of the project, while others are a function of the way in which the project is designed to meet its objectives.

6.1 Potential Positive Impacts

The successful implementation of the projects will have numerous socioeconomic benefits including:

- Better access to safe drinking water and sanitation facilities leading to improved standard of living; and changes in exposure to both communicable and non-communicable diseases especially in the satellite towns;
- The project will contribute to increase in local development and employment as the local population are expected to be employed during the construction phase and after construction due to water related investments;
- Improved sanitation will also be promoted with its attendant enhancement in the health of the people such as reduced incidence of water borne diseases like malaria, cholera, gastrointestinal disorders etc.;
- The project is expected lead into reduced time allocated to water supply for women and children due to closer drinking water sources, and reduced efforts associated with water transportation especially he associated satellite towns to be affected by the project. This would lead to:
  - increased productivity in particular for women as a result of saving time wasted in fetching water;
  - better opportunity for girls to attend schools instead of spending their time fetching water;
  - reduced risk of exposure to HIV/AIDS and Sexually Transmitted Infections (STIs) during fetching water far from their households, especially women and girls who are more vulnerable;
- The program is expected to contribute to rural communities well-being around the satellite town's associated with improved services, stability, work opportunities, settlements, health, empowerment, education and training. Such benefits would serve as catalyst to sustainable management of water resources; and
- Empowerment of communities especially the satellite owns by giving them responsibility for planning, implementation and management of their water supply systems and improved public sanitation;
- The program will enhance measures to maximize the use of groundwater and rainwater for climate adaptation and development, to deal with the increased extremes, highs and lows, which are expected as result of climate change; and
- No resettlement or land acquisition is anticipated as the project works would largely be within existing project footprint.

6.2 Potential Negative Impacts

- Disturbance of quality of life due to nuisances such as noise during construction;
- Dust and traffic related to construction works;
- Occupational health and safety of workers during construction;
- Disturbance of land and water uses, which can lead to social conflicts; his is expected o be minimal though.
- Soil resources (soil compaction, mixing of soil horizons, soil erosion may also result from inadequacies in backfilling construction works and improper drainage of storm water);
- Ecosystems (probable encroachment into ecologically sensitive and protected areas, drainage of wetlands etc); and
- Flora and fauna (limited removal of the vegetation cover and disturbance of wildlife habitats along the utility RoW).

During the decommissioning phase, the likely impacts include:

- Physical disturbance arising from equipment removal techniques
- Soil erosion resulting from improper reinstatement of excavated soil
- Air quality degradation and noise generation in the course of excavation to remove entrenched equipment and the breaking down of buildings/structures
- Hazards/risks and accidents
- Waste management problems
- Social misfit/miscreants taking over the site.

6.3 Possible Sources of Environmental and Social Impacts

Though the project is largely expected to align along the existing footprint the under listed environmental and social impacts are anticipated during implementation and operation due to the following reasons:

- The civil works for new structures will sometimes involve construction on virgin land thereby affecting the forests, animals and other natural resources;
- The rehabilitation works may require demolition of existing infrastructure and will generate rubble and waste that will need to be disposed of properly;
- Both new envisaged civil works and the rehabilitation works may require new land;
- Civil works for new structures as well as rehabilitation works will affect the communities both physically (air and water pollution, nuisance and contamination etc.); and socioeconomically (land use, income generation, mobility and community association);
- The water supply services may require additional water abstraction, resulting in changes in ground and surface water regimes, both inside and outside the project impact areas;
- Additional use of and easy access to water could result in increases in waste water generation;
- WATER supply activities and other civil works may cause water stagnation and sanitation problems;
- The increase in numbers of people within the project location/areas will result in depletion of natural resources, pollution of public waters and degradation of soils. Consequently, several environmental components may be affected in one way on another by such activities; and
- The increase in interaction of different types of people will result in social and health problems caused by various diseases transmitted among these people and arising from high pressure on social and health services such as medical services.

6.4 Irreversible Changes

No long-term losses of significant resources are anticipated with the project. The project will not generate nor lead to significant demands on natural resources of the immediate or surrounding area nor disturb archaeological sites.

6.5 Cumulative /Secondary Impacts

Cumulative impacts are changes to the environment that shall be caused by the proposed project activities in combination with other past, present and future human activities. Cumulative impacts arising from this project will be minimal because of the large. The rehabilitation activities rather than embarking on new civil works will ensure minimal level of cumulative impacts bearing in mind the baseline status of the various locations.

6.6 Environmental justice

This project will serve the entire public and are not meant for a particular section of the society. No particular neighborhood would be affected by the physical environmental impacts differently than another.

7.0 ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES

For the anticipated potential negative impacts, the ESMP has provided mitigation principles for preventing, minimizing or managing various environmental and social impacts as an integral part of projects planning and management.

Specifically, to ensure effective management of all identified safeguard issues, the ESMP provides an idea of clauses that should be incorporated into contracts with construction companies. Examples include: Construction contracts should (select or develop guidelines and procedures to be applied to each facet of the construction—site clearing, construction, drainage, fuel and material usage, quarry site management, construction camp and work site operating procedures, including worker safety and include incentives for adhering to guidelines and penalties for violating them), maintenance agreements, etc.

7.1 Negative Residual Impact after Mitigation

Residual Effects can be considered as those that remain significant following the application of mitigation measures, although they are likely to have been reduced in magnitude as a result of the mitigation measure implemented.

During construction, after administration of the mitigation measures only noise level is expected to remain moderately negative. Construction, which will last for about 24 months, is one-off event. Thus, the noise will cease after this period. No residual impacts were identified during operation except best practice is neglected.

Possible Enhancement Measures

Possible enhancement measures of beneficial impacts of the project should include the following:

- Construction activities should adhere to recommendable best construction practices that make effective and economical use of locally available resources including materials, expertise and labour.
- The production of solid, liquid and hazardous wastes should be minimized.
- Preference should be given to local employment (youth, men and women) and local inputs (food, basic material) should considered to the extent possible.
- Ensure that the poor and other vulnerable groups can continue to safely satisfy their basic water needs.
- Ensure that women are involved in user fee collection and allocation decisions.
- The project should consistently and appropriately provide HIV/AIDS awareness information and protection gears to discourage new infections during the construction works.
- Periodic checks should be constantly conduced on different components of the water production, transmission and distribution system to initiate immediate rehabilitation whenever problems are identified to reduce system leakage losses and downtime during operation phase.

Possible Mitigation Measures

Possible mitigation measures for negative environmental impacts include the following:

- Measures should be taken to avoid hampering drainage of surface water and restoration measures should be taken after construction.
- Water sources should be checked for quality to confirm water quality standards are met.
- Water sources and infrastructures should be designed and constructed to prevent contamination.
- On-site sanitary facilities should be set up for the disposal of wastewater.
- Construction activities should be scheduled appropriately to reduce impact from high noise levels from overlapping noisy activities.
- Areas sensitive to erosion should be well-managed to avoid land degradation.
- Vegetation regeneration should be facilitated at the end of construction works by leveling off the soils and facilitate.
- Water conveyance layout should be design by taking into account ecologically sensitive and protected areas.

8.0 ESMP IMPLEMENTATION AND MANAGEMENT

The Environmental & Social management Plan (ESMP) stands to provide a framework for systematic coordination of the responsibilities associated with managing the identified impacts with a view to ensuring environmental friendliness of the proposed project. The successful implementation of the ESMP depends on the commitment of the water sector and related institutions, and the capacity within the institutions to apply or use the framework effectively, and the appropriate and functional institutional arrangements, among others. Hence, the key ESMP areas relevant to successful implementation were included in the ESMP, namely: institutional arrangements, capacity building, environmental and social monitoring (Table 7).

While the ESMP provide the overall assessment and Management Plan for the project, it expected that the coordinating government agencies should demand specific actionable plans to be implemented during the construction phase in a form of Construction Environmental and Social Management Plan (CESMP). To ensure that the above operational safeguards are duly observed, the CESMP shall come with attachments of the following specific plans to be adhered to by the Contractor; and monitored as described in the ESMP:

- Waste Management Plan (WMP);
- Traffic Management Plan (TMP);
- Erosion Control Management Plan;
- Water Resources Management Plan;
- Biodiversity Management Plan;
- Risk and Emergency Response and Management Plan;
- Human Resources Management Plan;
- Contractor Management;
- Resource Energy Efficiency
- Physical Cultural Resources Management (PCR) Plan;

8.1 Gender mainstreaming in the water and sanitation sector

To achieve Gender mainstreaming in the water and sanitation sector at all levels, the Ondo State government would take care of all interest groups (men, women, youths, the aged and the physically challenged) by implementing the following programme of actions:

a. The Ondo State Government shall train and retrain all relevant staff in all the agencies of government that are charged with water and sanitation issues and community committees on mainstreaming gender in water and sanitation projects.
b. Capacity building programmes on gender mainstreaming in organizations, community projects and general administration should be handled by implementing partners such as donor agencies, NGO's, Civil society organizations and CBO's
c. Membership and leadership positions of WASHCOMS shall be equitably spread among the various interest groups.
d. Capacity building programmes should be provided for all interest groups, particularly for such involving women, youths, and the physically challenged. The trainings should be tailored to fit time constraints and operational needs of those involved. In particular, the Ondo State Government shall ensure that more women and youths are trained in project management, particularly of such technical areas like Sanitation centres, pump and water system management, repair and maintenance to ensure they benefit from the opportunities available in such areas. *Women groups and bodies would be encouraged to send bids for Water and sanitation contracts, particularly in male dominated areas such as drilling.*
e. Programme design in Ondo state would incorporate careful review of project's benefits and opportunities available to women. Planning would articulate possible negative impact of project thereby seeking out ways of mitigating the negative effects. Projects should also spell out benefits and opportunities available to women.
f. Provision of software or hardware and other equipment for water and sanitation agencies or implementing partners would be gender sensitive in Ondo state
g. The Ondo state Government would invest in community sensitization and enlightenment on the need for greater involvement of women in the water and sanitation projects.

Table 6: Environmental and Social Management Plan (ESMP)

S/N	Potential Issue/Activity	Potential Impact	Mitigation measures	Implementation schedule	Responsibility	Costs ₦	Costs USD
			Pre-construction phase				
1	**Social Impacts** Temporary land take for construction sites and contractor camps, equipment & machine yards/Store for construction materials Installation of temporary site layout involving clearing and removal of soil	• Temporary land uptake and displacement of land owners	• Minimize acquisition of additional space • Prepare and conduct a resettlement action plan for farmers	Before construction works	• Contractor • Environmental specialists & ODWC PMU	•3,800,000	•10,000
2	**Social Impacts** Off-site risky behavior of construction workers such as patronage of night clubs, potentially subjects the communities to high rates of social vices.	• Induced influx of criminals (burglars, rapists etc) into the community. • Gender Based violence	• Provision of community police posts • Gender violence redress unit	Before construction works	• NSCDC • ODWC PMU (redress mechanism)	•7,600,000 •13,300,000	•20,000 •35,000
3	**Health Impacts** Construction workers are often exposed to occupational hazards They are often involved in risky behavior such as patronage of commercial sex workers and night joints that predisposes them to high rates of infectious diseases.	• Communicable diseases & non-communicable diseases • Injuries, accidents • Infections	• Conduct Health Impact Assessment (HIA) and subsequent Health Action Plan (HAP)/Health Management Plan (HMP) • Adequate HSE trainings to staff, provision of PPE • Seminars on protection from infection and construction of small health clinic	Before construction works	• ODWC Safeguard unit • Contractor HSE, • Ministry of Health and other CBOs such as UNICEF-WASH	•38,000,000 •5,700,000 •28,500,000	•100,000 •15,000 •75,000
4	**Environmental Impacts** Mobilization of materials to site can create disturbance, social and environmental stress.	• Traffic congestion can impact on socio-economic activities including markets. • Disruption of Jumaat and markets on the roads • Induced road accidents • Noise and fugitive dusts while offloading materials • Degradation of unpaved Roads by heavy trucks, chain-track wheeled machines	• Limit movement to off traffic peak periods like very early or late in the night • Avoid movement during Friday Jumaat or major market periods • Adequate maintenance of vehicles to be in good working conditions and ensure drivers comply with all traffic rules • Personal protective wears Control dusts by applying water • Move heavy machines and materials in dry season to avoid damage to roads. Always move chain-track wheeled machines on low bed 18 tyre trucks	Before construction works	• ODWC PMU and the contractor	•3,800,000	•10,000
5	**Environmental Impacts** Oil, grease from moving equipment & machines	• Environmental (soil and water) pollution • Environmental degradation	• Regular maintenance of vehicles to prevent leaking oil and grease • Identify a waste collection point, sort the waste into		• Contractor and environmental specialists	•3,800,000 •5,700,000	•10,000 •15,000

Table 6: Environmental and Social Management Plan (ESMP)

S/N	Potential Issue/Activity	Potential Impact	Mitigation measures	Implementation schedule	Responsibility	Costs ₦	Costs USD
	Waste generated from construction workers camp	from indiscriminate waste disposal	categories and register with state waste collection scheme		• State ministry of environment		
		Construction Phase (Clearing of project site, Excavation of site and Laying of pipes)					
1	**Social Impacts** Transportation & Traffic can create socio-economic distress	• Blockage of access routes by machines	• Provide alternative routes where access is blocked	During construction	• Contractor	•3,800,000	•10,000
2	**Social Impacts** Social conflicts may arise from violation of culture. Rapid cultural change may result from entrants of strangers into the communities. Construction works may inadvertently destroy cultural heritages	• Social conflicts between workers and aggrieved members of the community • Gender Based Violence: on women/vulnerable groups, succumbing to sexual harassments due to poverty. • Social dislocation and social resistance/ Disruption of social network • Impacts on known & unknown physical heritage	• Regular orientation of staff to respect the culture of the people. • Corresponding awareness plus punishments for wrongful acts. Enlightenment for women and vulnerable groups on available opportunities to seek redress. • Organised stakeholders groups such as Water User Association. Give them sense of belonging through sensitization • Project activities must avoidance collision path with cultural heritages	During construction	• Environmental specialists & ODWC PMU (GRM unit)	•1,900,000 •1,900,000 •3,800,000	•5,000 •5,000 •10,000
3	**Health Impacts** Unprotected sex or influx of commercial sex workers into the camp increases STDs	• Sexually transmitted diseases HIV/AIDS and STDs • Pathogenic/Waterborne diseases (Cholera, Dysentery etc.)	• Emphasis on protective sex, codes of conduct on sexual activity with communities • Labour management plan, codes of conduct on Hygiene and sanitation in the communities	During construction	• State ministry of health, NACA outreach centre	•4,560,000	•12,000
4	**Environmental Impacts** Loss of vegetation and biodiversity from land clearing	• Loss of habitats and biodiversity. Disturbance of wildlife during construction	• Avoid sensitive habitats and felling of trees; where such is unavoidable, adequate management measure must be taken.	During construction	• Environmental specialists & ODWC PMU	•1,900,000	•5,000
5	**Environmental Impacts** Dust, noise, cement, oil/grease contamination from civil works/ machines	• Environmental degradation from (Noise, dust, cement, concrete, oil and grease)	• Adequate wetting of work area, use of mufflers on machines, adequate maintenance of P&P, Wearing of PPE by workers	During construction	• Environmental specialists & ODWC PMU	•9,500,000	•25,000
6	**Environmental Impacts** Cut off walls; excavation/filling with Cement bentonite produce some environmental impacts	• Underwater noise/vibration and disturbance of fish and benthic organisms.	• Apply best practices in all engineering works to minimize vibration	During construction	• Environmental specialists & ODWC PMU		
7	**Environmental Impacts** Pollution/ improper spoil disposal construction wastes	• Quantum of materials dredged from the river and generated from construction wastes	• Waste management plan of action. Identify proper disposal sites like burrow pits. Prompt waste collection and disposal, Treatment of toxic wastes (batteries, oil, grease and paints)	During construction	• Environmental specialists & ODWC PMU, State Environmental	•38,000,000	•100,000

Table 6: Environmental and Social Management Plan (ESMP)

S/N	Potential Issue/Activity	Potential Impact	Mitigation measures	Implementation schedule	Responsibility	Costs ₦	Costs USD
					Protection Agency. State Waste management agency		
Operational and Maintenance Phase (Water abstraction, Discharge of effluent)							
1	**Social impact** Social change	• Cultural constraints on social and economic change	• Enlightenment campaign on modern approach to agriculture without affecting cultural values	Operational and Maintenance Phase	• ODWC PMU, Social Development Specialist		• 5,000
2	Disruption of Access	• Disruption of existing access due to new channels blocking the accustomed routes to farms, markets, and water points	• Good drainage design and construction to avoid disruption	Operational and Maintenance Phase	• Contractor, ODWC PMU, Social Development Specialist, PMU		• 15,000
3	Gender based violence might increase	• Impacts on women/vulnerable groups; gender-based violence sexual harassment because of poverty status.	• Training and enlightenment for women and vulnerable groups on available opportunities to seek redress	Operational and Maintenance Phase	• ODWC PMU, Social Development Specialist		• 30,000
4	**Health & Safety impacts** Settlements with close proximity to the dam might be affected when operation commences	• Disruption of settlements & associated impacts & health hazards	• Appropriate education on safety and hygienic practices. (Insecticide treated mosquito nets - ITMN – Targeted at 2000 families) proper handling of human waste and hygienic practices.	Operational and Maintenance Phase	• ODWC PMU Ondo State Ministry of Health		• 200,000
5	**Health & Safety impacts** Communicable and non-communicable diseases may arise from the irrigation scheme	• Extended malaria season, increased schistosomiasis, changes in pattern of other diseases. Inadequate water, sanitation and hygiene reducing project benefits	• Training on Use of Mosquito nets hygiene and sanitation. Equip existing health centers with personel and drugs where new facilities cannot be established	Operational and Maintenance Phase	• ODWC PMU Ondo State Ministry of Health		• 10,000
6	**Environmental Impacts** Flooding after construction as the water table begins to rise	• Hazards to works from floods Barriers to fish passage and other impacts-	• Early warning system and flood control and Training on planting of cover crops for farmers	Operational and Maintenance Phase	• ODWC PMU, SSRBDA		• 100,000
7	**Environmental Impacts** Sludge management from water treatment plan can contaminate groundwater, fishing ground and even put the farmers at risk if not well managed	• Contamination of surface and groundwater with alum if not treated can cause Hazards to farmers • Impact on fish pollution	• Training on safe handling and application of agro-chemicals	Operational and Maintenance Phase	• ODWC PMU • State Environmental Protection Agency		• 50,000
8	Climate Change and Green House Gas Emission	• Significant reductions in Rive r flow, or groundwater level due to excessive abstraction, may result in	• Undertake evaluation of in stream flow requirements (IFR) for river downstream of works. • Monitor local climatic changes.	Operational and Maintenance Phase	• ODWC PMU • State Environmental Protection Agency		100,000

Table 6: Environmental and Social Management Plan (ESMP)

S/N	Potential Issue/Activity	Potential Impact	Mitigation measures	Implementation schedule	Responsibility	Costs ₦	Costs USD
		localised climate change downstream due to drying of wetlands etc. • Flooding of plant • GHG Emission	• Consider reduction in abstraction rates during low rainfall months when rainfall and aquifer recharge is low • Determine flooding risk and select site and/or design plant as appropriate. •				
• Decommissioning and Closure							
	Dismantling and movement of item, cabins, camps, fence, clearance, etc	• Solid waste generation	• Clean-up in compliance with relevant national and international guidelines, involving the removal of the waste, etc • Wet surface when the need arises • Follow FMEV guidelines on waste management	Operational and Maintenance Phase	• ODWC PMU • State Environmental Protection Agency		100,000
	Dismantling and movement of item, cabins, camps, fence, clearance, etc	• Visual Aesthetics •	• Clean-up in compliance with relevant nollow FMEV guidelines on waste management • Follow FMEV guidelines on waste management All existing structures shall be removed at the end of the project's lifecycle. • Trees and other flora in line with the site's original character shall be planted. • Return site to its original state as best possible	Operational and Maintenance Phase	• ODWC PMU • State Environmental Protection Agency		3,000.00
	Dismantling and movement of item, cabins, camps, fence, clearance, etc	• Loss of job /Emotional disturbances • Injury/fatalities in workforce /public	• Assist staff that are likely to loss job in skill acquisition • Assist in setting small scale business • Counsel worker who losses job. • Give enough notice	Operational and Maintenance Phase	• ODWC PMU • State Environmental Protection Agency		100,000.00
	Total					**432,000,000**	**1,200,000.00**

8.1 ESMP Implementation Responsibilities

Table 7 outlines the roles and responsibilities of applicable institutions and stakeholders.

Table 7: ESMP Responsibilities

S/No	Category	Roles
1	National Urban Water Sector Reform Project	– Implementing agency has the mandate to ensure effective implementation and compliance of all socio-environmental requirements
2	PMU Safeguards Unit	– Directly take responsibility and implement the ESMP and all safeguards actions
		– Works closely with Ministry of Environment for a coordinated response on the environmental and social aspects of project development.
3	Federal Ministry of Environment/NESREA	– Lead role -provision of advice on screening, scoping, review of draft EA/ESMP report (in liaison with State Ministry of panel, Project categorization for EA, Applicable standards, Environmental and social Environment), receiving comments from stakeholders, public hearing of the project proposals, and convening a technical decision-making liability investigations, Monitoring and evaluation process and criteria.
4	Ondo State Water Corporation	– Construct, control, manage, extend and develop such new Water works
		– Extend and develop such existing Water Works as it may be considered necessary for the purpose of providing wholesome, potable water for the consumption of the Public and for domestic, trade, commercial, industrial, institutional, scientific and other uses in various parts of the State.
		– Ensure that the water is supplied to the Consumers thereof at reasonable charges and in potable quality and adequate quantity
5	State Government MDAs(Ministry of Lands, Survey and Urban Development, Ministry of Environment. Other MDAs	– Compliance overseer at State Level, on matters of Land Acquisition and compensation and other resettlement issues,
		– Come in as and when relevant areas or resources under their jurisdiction or management are likely to be affected by or implicated sub-projects.
		– Required to issue a consent or approval for an aspect of a project; allow an area to be included in a project; or allow impact to a certain extent or impose restrictions or conditions, monitoring responsibility or supervisory oversight
6	AfDB	– Assess implementation
		– Recommend additional measures for strengthening the management framework and implementation performance.
7	Local government	– Liaise with the PMU to ensure adequacy and provide approval for such sites.
8	Trade Union/CSOs/CDA	– Assist in their respective ways to ensure effective response actions,
		– Conduct scientific researches alongside government groups to evolve and devise sustainable environmental and social strategies and techniques,
		– Provide wide support assistance helpful in management planning, institutional/governance issues and other livelihood related matter, Project impacts and mitigation measure, Awareness campaigns
9	The General Public	– Assisting in their respective ways to ensure effective response actions, institutional/governance issues and other livelihood related matter, Project impacts and mitigation measure, Awareness campaigns
		– Ensuring safe use of volunteers in a response action, and actually identifying where these volunteers can best render services effectively

8.2 Measures for Strengthening Organizational Capability

The HSE Unit of Ondo state water corporation shall ensure that all identified members of the implementation team are trained prior and during implementation of ESMP. To enhance the respective roles and collaboration of the relevant stakeholders, areas of capacity building have been identified in the environmental and social management planning; monitoring and environmental audit; annual environmental report preparation and other reporting requirements; public participation techniques, urban flood risk management and urban drainage management etc.

9.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

The ‘mitigation and monitoring plan’ to both monitor and evaluate the implementation of mitigation measures and the project performance on environmental and social baseline conditions has been included as an integral part of the ESMP which is outlined in the Table 4.

Table 8: Environmental & Social Monitoring Plan

Proposed activity	Monitoring indicators	Implementation schedule	Responsibility	Frequency	Cost (USD)	Cost (₦)
Pre-construction Phase						
Land Acquisition for Contractors camp	➢ Is a non-controversial campsite identified with people's consent? ➢ Has resettlement action plan been prepared and conducted? ➢ Are project affected persons identified for compensation ➢ Are the project community provided with adequate security posts ➢ Has Gender-based Violence and Grievances Redress unit been established? ➢ Have Health Impact Assessment (HIA) and subsequent Health Action Plan (HAP)/Health Management Plan (HMP) been conducted? ➢ Do the construction workers have adequate HSE trainings and provided with PPEs? ➢ Have seminars on protection from infection and construction of small health clinic		• ODWC, Contractor • ODWC PMU with Social Development Specialist • ODWC PMU with Social Development Specialist • ODWC PMU • ODWC PMU • ODWC PMU • ODWC PMU, HSE and contractor • Conduct ODWC PMU, Ministry of Health, State NACA	Weekly	• 2,631.58 • 10,526.32 • 5,263.16 • 2,631.58 • 5,263.16 • 5,263.16 • 5,263.16 • 5,263.16	• 1,000,000 • 4,000,000 • 2,000,000 • 1,000,000 • 2,000,000 • 2,000,000 • 2,000,000 • 2,000,000
Mobilization of materials and equipment to site	➢ Is movement of materials limited to off peak traffic periods like very early or late in the night? ➢ Is movement schedules done to avoid Friday Jumaat or major market days ➢ Are trucks being used in good working conditions? Do their drivers comply with all traffic rules? ➢ Are workers provided with personal protective wears ➢ Are heavy track-wheeled machines transported on low-bed 18 tyre trucks? ➢ Are other materials in containers well fastened to flatbed trucks? ➢ Are materials moved on dry days to avoid damage to roads? Are vehicles maintained on a regular basis to prevent leaking oil and grease? ➢ Have waste site been identified and certified by State ministry of	Before commencement of civil works	• ODWC PMU with Social Development Specialist • ODWC PMU with Social Development Specialist • ODWC PMU with Environmental Specialist • ODWC PMU with Environmental Specialist • ODWC PMU with Safeguard Specialist • ODWC PMU with Safeguard Specialists • ODWC PMU, Ondo State Environmental Protection Agency	Weekly	• 2,631.58 • 2,631.58 • 2,631.58 • 2,631.58 • 5,263.16 • 5,263.16 • 2,631.58 • 5,263.16 • 2,631.58	• 1,000,000 • 1,000,000 • 1,000,000 • 1,000,000 • 2,000,000 • 2,000,000 • 1,000,000 • 2,000,000 • 1,000,000

Table 9: Environmental & Social Monitoring Plan

Proposed activity	Monitoring indicators	Implementation schedule	Responsibility	Frequency	Cost (USD)	Cost (₦)
	Environment? ➢ Are the waste generated sorted and certified as non-hazardous?		• ODWC PMU, Ondo State Environmental Protection Agency • ODWC PMU, Ondo State Environmental Protection Agency			
Construction Phase						
Clearing of project site, Excavation of site and Laying of pipes	➢ Increase runoff or raise flood levels upstream or downstream and cause soil erosion? ➢ Amount of sediments in the water body which is closest to the activities location increased? ➢ Cause poor drainage and increase the risk of water-related diseases? ➢ Violate ambient air quality standards? ➢ Is there regular orientation of staff to respect the culture of the people? ➢ Build or rehabilitate any structures or buildings? ➢ Result in social changes for example in traditional lifestyles, demography or employment? ➢ Result in deterioration of security? ➢ Is there corresponding awareness of punishments for wrongful acts by workers? ➢ Are women vulnerable groups and aggrieved people enlightened of available opportunities to seek redress? ➢ Are there enough emphasis on protective sex, codes of conduct on sexual activity with communities? ➢ Has there been a labour management plan, codes of conduct on Hygiene and sanitation in the communities? ➢ Is there assurance that sensitive habitats are avoided and no felling of trees will be done? And where such is unavoidable, is there adequate	During construction work	• Contractor, PMU, Social development specialists • Contractors, ODWC, PMU, Social development specialists • ODWC, PMU, Social development specialists • Contractor, ODWC, PMU, • ODWC, PMU, Environmental safeguard specialists • Contractor, ODWC, PMU • Ondo State Min of Environment, State EPA • Ondo State Min of Environment, State EPA • ODWC, PMU, Contractor, Environmental safeguard specialists • Ondo State Min of Environment, State EPA	Weekly	• 2,631.58 • 2,631.58 • 2,631.58 • 5,263.16 • 2,631.58 • 5,263.16 • 2,631.58 • 7,894.74 • 2,631.58 • 5,263.16 • 2,631.58 • 2,631.58	• 1,000,000 • 1,000,000 • 1,000,000 • 2,000,000 • 1,000,000 • 2,000,000 • 1,000,000 • 3,000,000 • 1,000,000 • 2,000,000 • 1,000,000 • 1,000,000

	management measure in place? ➢ Are all equipment, machines and vehicles serviced and tested for best						

Table 9: Environmental & Social Monitoring Plan

Proposed activity	Monitoring indicators	Implementation schedule	Responsibility	Frequency	Cost (USD)	Cost (₦)
	performance? ➢ Is there provision such as regular wetting of work area to avoid dusts? Or use of mufflers on machines and equipment to arrest deafening noise? Is there adequate maintenance of P&P and enforcement of PPE by workers? ➢ Are the construction works carried out under best practices in all engineering works to minimize vibration? ➢ Proper treatment of toxic wastes like batteries, oil, grease and paints? ➢ Is there plan for prompt evacuation of dredged materials to identified burrow pits and wastelands around? ➢ Is there assurance that **NO** project activity will infringe on cultural heritages in the area? ➢ Expose people to traffic accidents ➢ Have waste management plan of action been prepared in collaborations with Ondo ministry of environment on proper waste handling, proper waste collection and disposal arrangement with organized waste collectors?		• ODWC, State Waste management authority • ODWC, PMU, Environmental safeguard specialists			
Insertion of Positive cut-off wall in the embankment Flood Risk Mitigation Measures	➢ Have environmental accountability trainings been conducted? ➢ Have environmental and social studies been carried out and plans prepared? ➢ Have environmental and social monitoring mechanisms been established? ➢ Is there effective feedback from project affected persons? ➢ Have environmental, social, health and broader impacts been identified and mitigation measures designed? ➢ Lead to mechanical injuries at the workplace? ➢ Result in water borne diseases due to poor sanitation facilities and poor	Operation phase	Environmental Specialist, ODWC PMU Social Development Specialist, ODWC PMU, M&E Specialist, ODWC PMU Communication Specialist, ODWC PMU	Bi-monthly	32,894.74	12,500,000

Table 9: Environmental & Social Monitoring Plan

Proposed activity	Monitoring indicators	Implementation schedule	Responsibility	Frequency	Cost (USD)	Cost (₦)
	waste disposal such as dysentery, cholera, malaria and other communicable diseases?					
Operation and Maintenance Phase (Water abstraction, Discharge of effluent)						
Water abstraction, Discharge of effluent	➢ Depend on water supply from an existing water body or from water diversion structures such as dams? ➢ Involve a new surface/groundwater discharge or discharge relocation? ➢ Cause an increase in flow or pollutant loading at an existing facility? ➢ Discharge water or generate runoff to any water bodies? ➢ Harvest or exploit a significant amount of water resources? ➢ Result in production of solid or liquid waste, or result in waste production, during construction or operation? ➢ Affect the quality and/or quantity of surface waters or groundwater? ➢ Result in production of solid or liquid waste, or result in waste production, during construction or operation? ➢ Increase runoff or raise flood levels upstream or downstream and cause soil erosion? ➢ Amount of sediments in the water body which is closest to the activity's location increased? ➢ Cause poor drainage and increase the risk of water-related diseases?	During operation	Environmental SpecialistODWC PMU Social Development SpecialistODWC PMU M&E Specialist, ODWC PMU Communication Specialist, ODWC PMU	Monthly		
Owena-Ondo Dam safety (Emergency Spillway and dam structure rehabilitation with cut of wall)	➢ Have environmental accountability trainings been conducted? ➢ Is the ESMP prepared adhered to? ➢ Is there effective feedback from project affected persons? ➢ Increase runoff or raise flood levels upstream or downstream and cause soil erosion? ➢ Amount of sediments in the water body which is closest to the activity's	During operation	Environmental Specialist ODWC PMU Social Development Specialist ODWC PMU M&E Specialist, ODWC PMU Communication Specialist, ODWC PMU	Bi-monthly	31,578.95	12,000,000

Table 9: Environmental & Social Monitoring Plan						
Proposed activity	**Monitoring indicators**	**Implementation schedule**	**Responsibility**	**Frequency**	**Cost (USD)**	**Cost (₦)**
	location increased? ➢ Cause poor drainage and increase the risk of water-related diseases?					
Flood Risk Mitigation Measures	➢ Have Standard Operating Procedures for best environmental practices been established? ➢ Does the contractor have a safe-works procedure? ➢ Is there an emergency planning framework?	During operation	Environmental Specialist ODWC PMU Social Development Specialist ODWC PMU M&E Specialist, ODWC PMU Community Development Specialist, ODWC PMU Disaster Risk Management Specialist, ODWC PMU Contractor Communication Specialist, ODWC PMU	Bi-monthly	13,157.89	5,000,000
Owena-Ondo Dam safety (Emergency Spillway and dam structure rehabilitation with cut of wall)	➢ Have Standard Operating Procedures for best environmental practices been established? ➢ Does the contractor have a safe-works procedure? ➢ Is there an emergency planning framework?	During operation	Environmental Specialist ODWC PMU Social Development Specialist ODWC PMU M&E Specialist, ODWC PMU Community Development Specialist, ODWC PMU Disaster Risk Management Specialist, ODWC PMU Contractor	Bi-monthly	13,592.11	5,165,000
Decommissioning and Closure Phase						
Removing the infrastructure, Restoring the site	➢ Follow FMEV guidelines decommissioning and waste management ➢ Trees and other flora in line with the site's original character shall be planted. ➢ Return site to its original state as best possible ➢ Assist staff that are likely to loss job in skill acquisition ➢ Assist in setting small scale business ➢ Counsel worker who losses job. ➢ Give enough notice		Environmental Specialist ODWC PMU Social Development Specialist ODWC PMU M&E Specialist, ODWC PMU Community Development Specialist, ODWC PMU Disaster Risk Management Specialist, ODWC PMU Contractor	Weekly		40,000.00
Total					**251,750.00**	**95,665,000.00**

9.1 Mitigation Measures Enhancement Plan

A Mechanism for enhancing the mitigation measures have been developed as outlined Table 10 based on the following criteria: locating the project so as not to affect environmentally sensitive locations; using construction, operation and restoration methods or processes which reduce environmental and social impacts; designing the whole project carefully to avoid or minimize environmental and social impacts; and introducing specific measures into the project design, construction, decommissioning and restoration that will reduce or compensate for adverse effects.

This enhancement plan is expected to lead to Net Benefit or New Benefit based on the genuine implementation of the ESMP at the proposed site of activities and/or area because adverse impacts have been limited in scope and scale, and there is improved management of the environment and social features leading to a net or new benefit to the biophysical and social-economic environment cum health aspect.

Table 10: Mechanism for Enhancing the Mitigation Measures

S/No	Issue	Codes of Conduct by SPMU & Contractor
1	Land Use	➢ Plan distribution route alignment to minimize loss of resources and compensation of affected persons and assets. ➢ Demarcate RoW to avoid encroachment and enforce relevant regulations.
2	Resettlement	➢ Ensure adequate mitigation for any of involuntary resettlement in consonance with the RAP
3	Material sites & Use	➢ Inform people living at/near the sites that the sites have been selected for materials exploitation. ➢ Plan access to sites and control/restrict access with the use of barricades such as fencing. ➢ Control earthworks and ensure proper management of excavation activities ➢ Rehabilitate before abandonment
4	Slope Stability	➢ Extract carefully and secure the top soil within 25 cm from the surface. ➢ Keep optimum balance in extraction and filling of soil works. ➢ Geo-hazardous assessment and mapping ➢ Use designated disposal site and avoid sidecasting of spoil ➢ Provide proper drainage ➢ Use bio-engineering on exposed slopes
5	Pollution/Vehicular ar Emission	➢ Water at regular intervals during the day for dust during construction near homes and settlements ➢ Enforce speed limit of vehicles and construct the road according to volume and size of traffic movement. ➢ Enforce speed limit of vehicles. ➢ Maintain traffic size movement. ➢ Discourage use of horns.
6	Wildlife	➢ Avoid as much as possible areas with high biodiversity. ➢ Ensure efficient movement of machinery and other traffic. ➢ Control poaching activities and regulate movement of labor force and their dependents, if any into the forest area. ➢ Forestry Department should be involved in monitoring the activities of the construction workers and officials to minimize wildlife harassing, trapping and poaching.
7	Stream diversion/ blocking and water quality	➢ Avoid and diversion and blocking ➢ No Water logging ➢ Avoid contamination of surface water bodies resulting from runoffs ➢ No siltation of surface water resulting from uncontrolled runoff from storage piles of construction
8	Changes in hydrology /impeded Drainage, Soil erosion	➢ All pavement and drainage structures be done properly, using a mixture of concrete structures and vegetation (bioengineering) ➢ Control earthworks and install erosion control measures ➢ It is strongly recommended that the cross drainage outlets must be channeled to the confirmed natural drains. ➢ If horizontal slope exceeds 5%, construction of flow control device necessary every 20m
9	*Landscaping and Trees Planting program/* Aesthetics	➢ Landscape all disturbed areas (pits, deviations, embankments, camp and material mining sites) using native species of grasses that can withstand the weather phenomena. ➢ Maintain the landscapes ➢ Use minimum and efficient use of wood products for construction. ➢ Initiate plantation at damaged and damage prone areas. ➢ Increase liability of local forest user groups. ➢ Avoid protected areas or densely forested areas and where such damage cannot be avoided but can be minimized through re-plantation of indigenous species and greenery development.
10	*Traffic and Road Safety Plan*	➢ Install warning signs and speed bumps during construction ➢ Provide parking bays for heavy goods vehicles and public transport vehicles

22

		➢ Enforce speed limits and the Highway Code ➢ Carry out awareness and educational campaigns on road safety. ➢ Ensure that all road users and operators are educated about the road use and behavior on the road both during construction and operation near the site. ➢ Ensure adequate signage especially during construction is placed strategically for traffic management, diversions and alternative routes by motorists. ➢ Carry out special sensitization programmes where there are schools that require students to cross the road corridor
11	*STI & HIV/AIDS Awareness and Prevention*	➢ Sensitization and awareness campaign in the communities near the dam ➢ Preventive measures like use of condoms, voluntary testing ➢ Carry HIV/AIDS & STI with drug and substance abuse sensitization and awareness activities
	Disposal of Construction Wastes	➢ Selected spoil dumping sites should be used. ➢ After disposal, the area should be leveled and compacted. ➢ Conserve the soil by planting indigenous plants including grasses. ➢ Wastes could also be used as leveling materials along the roadside ➢ Sufficient measures will be taken in the construction camps i.e. provision of garbage bins and sanitation facilities. If septic tanks are installed, waste will be cleared periodically
12	Garbage or Solid Wastes/ Disposal of Sanitary Wastes	➢ Dispose-off periodically from labour camps ➢ The Contractor to develop waste management plans and provide appropriate facilities for their operations ➢ Prepare signed agreements with landowners where spoil earth is to be disposed indicating conditions and responsibilities for restoration and management, ➢ The spoil disposal sites should be approved by the regulators before dumping commence ➢ Consider re-use of used/waste asphalt concrete for public access roads in the neighbouring urban areas ➢ Proper sanitation area needs to be demarked. ➢ Check for hygiene of work force.
13	Construction Camps (Public health and occupational safety)	➢ Sufficient measures will be taken in the construction camps i.e., provision of garbage bins and sanitation facilities. ➢ If septic tanks are installed, waste periodically. ➢ Special attention shall be paid to the sanitary condition of camps. ➢ Garbage will be disposed of periodically. ➢ Sensitization campaign on STDs & AIDS will be mandatory at the camps and in the community.
14	*Roadside Amenities*	➢ Consider provision of roadside amenities and truck parking at designated sites. ➢ However concrete sites and size of locations have not yet been identified and agreed upon with the appropriate authorities. ➢ The intention is for the project to compact and pave the sites and in collaboration with the local authorities who should prepare a site physical plan and operate the sites where facilities such as kiosks will be built. ➢ Amenities to be included at these sites shall include solid waste bins, potable water sources, rest places, restaurants, toilet facilities, shops/kiosks and HIV/AIDS, STIs, and drug abuse information booths, etc.
15	Climate Change and GHG emission	➢ Ensure pavement improvements is able to account for adaptation measures that does not have favour for higher temperature ➢ Enhance resilience to precipitation and flooding and factor in the broader impact of dam rehabilitation disruptions to determine whether or not adaptation makes good economic sense. ➢ Do appropriate greenery with local species of plants Ensure adequate road maintenance to reduce changing climate where there had been civil works that rendered the earth bare ➢ Ensure continual management of the greenery
16	**Hazard Management**	➢ A safety manual and procedures for public, occupational and dam safety shall be developed and adhered to. ➢

9.2 ESMP Implementation Budget and Schedule

To effectively implement the environmental and social management measures suggested as part of the ESMP, necessary budgetary provisions shall be made by Ondo State Water Corporation (ODWC) for the project components. Tentative budget for each of the project shall include the environmental management costs other than the good engineering practices, cost of environmental and resettlement monitoring. All administrative costs for implementing the ESMP shall be budgeted for as part of the costing as presented in Table 11. The ESMP Implementation Schedule is outlined in Table 12.

Table 11: Summary of Indicative Budget for Implementing the ESMP

Item	Responsibility	Cost Breakdown	Cost Estimate (NGN)	Cost Estimate ($)
Mitigation	Contractor, ODWC PMU,		382,660,000.00	1,007,000.00
Management	ODWC	5% of Mitigation Cost	19,133,000.00	50,350.00
Monitoring	PMU, 0DWC	25% of Mitigation Cost	95,665,000.00	251,750.00
Sub- total			497,458,000.00	1,309,100.00
Contingency		5% of subtotal	24,82,900.00	65,455.00
Total			**522,330,900.00**	**1,450,919.00**
The exchange rate used is $1 to ₦360				

Table 12: ESMP Implementation Schedule

S/N	Activity Description	Responsible	Pre-Construction	Construction	Post Construction (Operation)
1	Disclosure of Environmental Assessment Report	PMU*			
2	Allocating Budget for ESMP	PMU			
3	Appointing Support Staff of ESMP	PMU			
4	Review and Approval of Contractor's ESMP and Safety Plan	PMU			
5	Finalizing site and layout plan of construction plan	PMU			
6	Finalization of Borrow and Excavation Areas	PMU			
7	Implementation of Mitigation Measures	PMU			
8	Supervising ESMP Implementation	PMU			
9	Environmental Auditing	PMU			
10	Monitoring & Reporting on ESMP Implementation	PMU			
11	Environmental Training	PMU			

***PMU. Though other parties may, carry out works has the accountable responsibility**

9.3 Record Keeping

Good records are the paper trail that will prove that the ESMP is working as intended. Keeping records of inspection of maintenance programme for mitigation measures, training programme, etc will be useful to demonstrate that the ESMP is being complied with or not. The type of records from the various management and monitoring programmes include:

- Completed forms, checklists and maintenance logs
- Identified problems and corrective actions undertaken
- Monitoring data / results

Some other types of records will also be valuable for assisting with the implementation and review of the ESMP such as: Incident forms (especially pollution incidents and response, accidents, etc.), Internal and external communications regarding the ESMP (e.g. with waste management), Results of internal or external assessments and compliance visits and Quarterly reports on the ESMP implementation submitted to the AfDB.

10.0 DECOMISSIONING AND ABANDONMENT

Decommissioning covers the project cessation of operations and the removal of equipment to obtain a state of passive safety and restore the environment to a benign one. This phase though quite unlikely should be discussed for completeness of this ESMP.

Thus, as part of the planning for the proposed project, it is important to put in place plans to recover and/or restore the project site to its original state after the project is closed or decommissioned. This requires the good understanding of all the environmental and social components of the project on the ecosystem during its lifespan. It is therefore environmentally and socially wise to take into cognizance, this component during the planning stage.

At the completion of the life of the project, the PMU shall follow regulatory standard procedures for decommissioning to be developed. A decommissioning team shall plan and implement the guidelines for decommissioning to ensure that the best and practicable methods available to clean up the project site have been used.

11.0 CONCLUSION

The study has indicated that the establishment of the proposed project will not severely and negatively impacts the existing environmental, social and health as well as safe conditions of the people, locally, nationally or internationally.

The proposed project is most desirable because of the obvious environmental, health cum socio-economic benefits. These far out-weigh the negative impacts that could arise in the course of implementation. Potential impacts of sufficient magnitude that could interrupt the execution of the project were not detected. Although some negative impacts may potentially occur due to the activities associated with the proposed project adequate and SMART measures have been provided to address them. Mitigation measures and management plans have been suggested and developed for the negative impacts. Appropriate institutional framework shall be set up to implement the mitigation measures recommended while the proposed monitoring programmes shall be set in motion as soon as possible.

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Appendix 2: Delegates at the Stakeholders Meeting

ATTENDANCE SHEET OF THESTAKE HOLDERS' MEETING FOR THE ESIA, ESMP & RAP

PREPARATION FOR AKURE WATER SUPPLY

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PREPARATION FOR AKURE WATER SUPPLY

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PREPARATION FOR AKURE WATER SUPPLY

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Appendix 2: Delegates at the Stakeholders Meeting

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