Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL)
Final Report of the Environmental and Social Management Plan (ESMP)
For Omigbo River Channelization/Gully Erosion Intervention Site, Kabba, Kogi State.



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TABLE OF CONTENTS

		Pages
Title Page		i
Table of Contents		ii
List of Tables		vii
List of Figures		ix
List of Plates		x
List of Acronyms and Abbreviations		xi
Executive Summary		xiii
CHAPTER ONE		**1**
INTRODUCTION		**1**
1.1	Background	1
1.2	Description of the Proposed Intervention	3
1.3	Rationale for Kogi State ACReSAL Intervention	7
1.4	Rationale for the ESMP	7
1.5	Objective and Scope of the Consultancy	8
1.6	Approach/Methodology for the ESMP Study	10
1.6.1	Review of Available Literature	10
1.6.2	Field Surveys / Site Inspection and Public/Stakeholder Engagement	11
1.6.3	Public/Stakeholder Identification and Consultations	11
CHAPTER TWO		**12**
INSTITUTIONAL AND LEGAL FRAMEWORK		**12**
2.0	Introduction	12
2.1	Federal / Kogi State Policy, Legal, Regulatory and Administrative Frameworks	12
2.2	Development Financial Institutions (DFIs) Environmental and Social Requirements	17
2.2.1	World Bank Environmental and Social Safeguard Policies Triggered by Kogi State ACReSAL Project	17
2.2.2	World Bank Environmental, Health and Safety (EHS) Guidelines	19
2.2.3	International Conventions and Agreements	19
2.3	Institutional Framework	21
CHAPTER THREE		**23**
DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT		**23**
3.0	Introduction	23
3.1	Overview of Project Location	23
3.1.1	Kogi State	23
3.1.2	Proposed Omigbo River Channelization/Gully Erosion Intervention Site	24
3.1.3	Proposed Project Location with Its Nearest Sensitive Locations to the Project Site	24
3.2.	Relief and Drainage	25
3.3	Climate	28
3.3.1	Rainfall	28

3.3.2 Temperature 28
3.3.3 Relative Humidity 29
3.3.4 Wind Speed and Direction 29
3.4 Geology 30
3.5 Environmental Air Quality Assessment 32
3.5.1 Ambient Air Quality 32
3.5.2 Particulate Matter Concentration 35
3.5.3 Ambient Noise Level 35
3.6 Soil Quality 36
3.7 Physico-Chemical and Microbial Analysis of the Surface and Ground Water Samples 39
3.7.1 Groundwater 39
3.7.2 Surface Water 43
3.8 Biological Environment 44
3.8.1 Vegetation Component 44
3.8.2 Wildlife and Biodiversity (including Birdlife) 48
3.8.3 Aquatic Biodiversity 50
3.8.4 Protected Areas 51

CHAPTER FOUR 52
SOCIO-ECONOMIC CHARACTERISTICS AND CONSULTATION WITH STAKEHOLDERS 52
4.0 Introduction 52
4.1 Socio-Economic Characteristics 52
4.1.1 Data Collection Methodology 52
4.1.2 Overview of Data Collection Methodology 52
4.2 Socio-Economic Assessment 54
4.2.1 Population Characteristics of the Project Area 54
4.2.2 Demographic Characteristics of Sampled Population 55
4.2.3 Respondents' Educational Status 56
4.2.4 Respondents' Occupational Characteristics 57
4.2.5 Respondents' Income Characteristics 58
4.2.6 Respondents' Assets 59
4.2.7 Household Solid Waste Management 61
4.2.8 Sources of Energy 62
4.2.9 Sources of Water 63
4.2.10 Respondents' Standard of Living and Perceived Impact of Proposed Intervention 64
4.2.11 Impact of the Omigbo Gully Erosion/Flood on the Residents 64
4.2.12 Respondents' Health Status and Potential Impact of Proposed Intervention 65
4.2.13 Community Environmental Concerns (CEC) 68
4.2.14 Intervention Project Activities Impact Evaluation 68
4.3 Analysis of the Status of GBV/SEA in the Project Community and Related Issues 69

4.3.1 Gender-Based Violence/Sexual Exploitation and Abuse 70
4.3.2 Measures of Gender Equity at the Proposed Project Community 74
4.4 Social Sensitive Receptor along the RoW of Civil Activities 75
4.5 Grievance Redress Mechanisms in and Around the Intervention Area 76
4.5.1 Grievance Redress Mechanism (GRM) Objective 76
4.5.2 GRM Structure 76
4.5.3 Site Level Grievance Redress Cell (GR Cell) 76
4.5.4 Grievance Focal Points (GFPs) 77
4.5.5 PIU Level GRM 78
4.5.6 Appeals at the Project Steering Committee (PSC) Level 79
4.5.7 GRM for workers 79
4.5.8 Grievance Redress Mechanisms for GBV and SEA/S in the Community and Related Issues 79
4.5.9 Role of Contractor in GRM Complaints Register 80
4.5.10 Reporting and Monitoring 80
4.5.11 Existing GRMin the Project Area 81
4.5.12 Evaluation of the Strengths and Weaknesses of the Existing Grievance Redress Mechanisms in the Project Area 83
4.6 Public Consultation 85
4.6.1 Objectives of the Public Consultation 85
4.6.2 Identified Stakeholders 85
4.6.3 Stakeholders Engagement/Consultation 86
4.6.4 Stakeholders Engagement Plan (SEP) 89

CHAPTER FIVE 90
ASSESSMENT OF THE POTENTIAL IMPACTS AND ANALYSIS OF ALTERNATIVES 90
5.0 Introduction 90
5.1 Impact Assessment Methodology 90
5.1.1 Impact Identification 90
5.1.2 Impact Prediction 90
5.1.3 Impact Evaluation 91
5.2 Potential Impacts of the Proposed Project Activities 92
5.2.1 Potential Positive Environmental Impacts 92
5.2.2 Potential Positive Social Impacts 93
5.3 Potential Negative Impacts of the Proposed Project Activities 94
5.3.1 Pre-Construction Phase: Potential Negative Social Impacts 94
5.3.2 Construction Phase: Potential Negative Environmental Impacts 95
5.3.3 Construction Phase: Potential Negative Socio-Cultural Impacts 100
5.3.4 Operations and Maintenance Phase: Potential Negative Environmental And Social Impacts 101
5.4 Mitigation Measures for the Potential Impact 111
5.4.1 Mitigation Measures for Impact/Risk Evaluation (Pre-Construction) 111
5.4.2 Mitigation Measures for Impact/Risk Evaluation (Construction) 114

5.4.3 Mitigation Measures for Impact/Risk Evaluation (Operation) 120
5.5 Analysis of Alternatives 123
5.5.1 Delayed-Action and Right-Away Action Alternatives 123
5.5.2 Use of Civil Works, Bioengineering and Technological Options 123

CHAPTER SIX 127
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) 127
6.0 Introduction /Objectives 127
6.1 Description of the Proposed Mitigation Measures 127
6.1.1 Pre-Construction Phase Measures 127
6.1.2 Construction Phase Mitigation Measures 128
6.1.3 Operation Phase Mitigation Measures 128
6.1.4 Monitoring of Mitigation Measures during Project Implementation 128
6.1.5 Environmental and Social Mitigation and Monitoring Plan during the Pre-Construction Phase 129
6.1.6 Environmental, Socio-Economic, Public Health Impacts Mitigation and Monitoring Plan during the Construction Phase 141
6.1.7 Environmental, Socio-Economic, Public Health Impacts Mitigation and Monitoring Plan during the Post-Construction/Operation Phase 158
6.2 Occupational Health and Safety/Community Health and Safety Management Plan 162
6.2.1 Occupational Health and Safety 162
6.2.2 Community Health and Safety Management Plan 163
6.3 Institutional Arrangements, Responsibilities and Accountabilities 163
6.3.1 Pre-Construction Phase 165
6.3.2 Construction Phase 166
6.3.3 Operational and Maintenance Phase 167
6.4 Contractor's Plans 169
6.5 Labour Influx, Child Labour and Gender Based Violence (GBV) 169
6.5.1 Labour Influx 169
6.5.2 Child Labour 171
6.5.3 Gender Based Violence (GBV) 171
6.5.4 GBV Risk Management Mechanisms 172
6.5.5 Stakeholder/Citizen Engagement 172
6.5.6 Envisaged Benefits 173
6.6 Fundamentals of Stakeholder Engagement Approach 174
6.7 Training Programmes 175
6.8 Implementation Schedule 176
6.9 ESMP Costing and Cost Analysis 177
6.10 ESMP Disclosures 174
6.11 Environmental and Social Management Obligations of the Contractor 178
6.12 Contractor's Environmental and Social Management Plan (C-ESMP) 178
6.13 Contractor's HSE Officer 179

CHAPTER SEVEN **181**
SUMMARY, CONCLUSION AND RECOMMENDATIONS **181**
7.1 Summary 181
7.2 Conclusion 182
7.3 Recommendations 183

CHAPTER EIGHT **184**
DECOMMISSIONING/ABANDONEMENT **184**

REFERENCES 191

ANNEXURES 192

LIST OF TABLES

Table 1.1	Associated Activities to the Chanellization	4
Table 2.1:	Federal and Kogi State Policies, Legislation, Regulations and Guidelines	12
Table 2.2:	World Bank Environmental and Social Standards Applicable to Kogi State-ACReSAL Omigbo Channelization Site	18
Table 2.3:	International Conventions, Agreements and Protocols to which Nigeria is Signatory and Applicable to the Proposed Kogi State ACReSAL Project	19
Table 2.4:	Gap between National Legislations, Policies and Regulations and the World Bank Policies	20
Table 3.1:	Ambient Air Quality of the Proposed Project Area	33
Table 3.2:	Particulate Matter Constituents within Proposed Project Area	35
Table 3.3:	Noise Level Pattern within the Proposed Project Area	36
Table 3.4:	Physio-chemical and Microbial Characteristics of Soil in the Project Area	37
Table 3.5:	Physico-chemical and Microbial Characteristics of Groundwater Samples from the Project Area	42
Table 3.6:	Chemical Analysis of Surface Water Samples from within the Project Area	43
Table 3.7:	Flora Species in the Project Area	45
Table 3.8:	Fauna Species in the Project Area	49
Table 4.1:	Estimation of Population Size for Kogi State and Kabba-Bunu LGA	54
Table 4.2:	Respondent's Demographic Characteristics	55
Table 4.3:	Environmental Problems Envisaged At Phases of the Intervention Project	68
Table 4.4:	Provisions Restricting Women Access to Health and Other Social Services	71
Table 4.5:	Sexual Exploitation Criminalization	71
Table 4.6:	Criminal Law that Treats Women and Men Unequally	72
Table 4.7:	Are There Legal Obligations To Provide Health Education In School?	72
Table 4.8:	Are There Any Statistical Data Disaggregated By Age And / Or Sex?	72
Table 4.9:	Are There Any Statistical Data Regarding Reported/Unreported Case?	73
Table 4.10:	Measures and Programs for Women	73
Table 4.11:	Measures and Programs for Women with Special Provisions for Their Children	74
Table 4.12:	Measures and Programs for Women in Place of Medical and Legal Issues	74
Table 4.13:	Social Sensitive Receptor along the RoW of Civil Works	75
Table 4.14:	Strengths and Weaknesses of existing Grievance Redress Mechanisms in Project Area	83
Table 4.15:	Summary Table Indicating Stakeholders Engagement/Consultation	86
Table 4.16:	Omigbo River Channelization/Gully Erosion Intervention SEP	89
Table 5.1:	Probability of Occurrence, Consequence Severity, Likelihood Ranking And Risk Matrix	91
Table 5.2:	Potential Impacts of Disruption to Public Utility	98

Table 5.2a:	Summary of Activity Specific Risks and Impacts	103
Table 5.3:	Characterisation and Evaluation of Potential Impacts Pre-Construction Phase	106
Table 5.4:	Characterisation and Evaluation of Potential Impacts Environmental Impacts in the Construction Phase	108
Table 5.5:	Characterisation and Evaluation of Potential Impacts for the Biological Impacts in the Construction Phase	109
Table 5.6:	Characterisation and Evaluation of Potential Impacts for the Socio-Economic Impacts during Construction Phase	109
Table 5.7:	Characterisation and Evaluation of Potential Impacts for the Public Health Impacts during the Construction Phase	110
Table 5.8:	Characterisation and Evaluation of Potential Impacts for Operation Phase	111
Table 5.9:	Mitigation measures for impact/risk evaluation (Pre-Construction)	112
Table 5.10	Mitigation Measures for Impact/Risk Evaluation (Construction)	114
Table 5.11	Mitigation Measures For Impact/Risk Evaluation (Operation)	121
Table 5.12:	Appraisal of the 'No Action' Alternative and Use of Civil Works	125
Table 6.1:	Environmental and Social Mitigation and Monitoring Plan during the Pre-Construction Phase	130
Table 6.2:	Environmental and Social Mitigation and Monitoring Plan during the Construction Phase	142
Table 6.3:	Environmental and Social Mitigation and Monitoring Plan during the Post–Construction/Operation Phase	159
Table 6.4:	Institutional Capacity Strengthening Plan	175
Table 6.5:	ESMP Implementation Schedule	177
Table 6.6:	Cost Estimate of ESMP Implementation and Monitoring	178

LIST OF FIGURES

Fig 1.1:	Intervention Layout	7
Fig. 3.1:	Map of Kogi State Showing the LGA of the Proposed Project Area	24
Fig. 3.2:	Image Map of the Proposed Omigbo River Channelization / Gully Erosion Intervention Site	25
Fig. 3.3:	Contour Map of the Proposed Project Area	26
Fig. 3.4:	Digital Elevation Model of the Proposed Project Area	27
Fig. 3.5:	Drainage Pattern within the Proposed Project Area	27
Fig. 3.6:	Monthly Climate Nature of Kabba and Environment Depicting Average Rainfall and Mean Temperature	28
Fig. 3.7:	Mean Relative Humidity Pattern of Study Area	29
Fig. 3.8:	Average Monthly Wind Speed of the Project Area	30
Fig. 3.9:	Wind Rose of the Study Area	30
Fig. 3.10	Geological Map of the Project Area	32
Fig. 3.11:	Air Quality Sampling Location Map	37
Fig 3.12:	Soil Sampling Location Map	41
Fig. 4.1:	Respondents' Educational Status	56
Fig. 4.2:	Distribution of the Educational Facilities within the Project Area	57
Fig. 4.3:	Respondents' Livelihood Characteristics	58
Fig. 4.4:	Respondents' Total Household Income	59
Fig. 4.5:	Respondents' Prevalence Mode of Transport	60
Fig. 4.6:	Respondents Land and House Tenure	61
Fig. 4.7:	Solid Waste Management	62
Fig. 4.8:	Respondents Sources of Water for Household Uses	63
Fig. 4.9:	Respondents Views on their Present Standard of Living	64
Fig. 4.10:	Impact of the Gully Erosion on the Respondents	65
Fig. 4.11:	Potential Impact of Proposes Intervention on Respondents' Health	66
Fig. 4.12:	Respondents' Health Management and Visit to Health Facility	67
Fig. 4.13:	Distribution of Healthcare Facilities within the Project Area	67
Fig. 4.14:	Measures of Gender Equity at the Proposed Project Community	75

LIST OF PLATES

Plate 3.1:	Degraded Areas within Omigbo River Channelization / Gully Erosion Intervention Site	25
Plate 3.2:	Groundwater Sample Collection and In-situ Analysis	39
Plate 3.3:	Surface water Sample Collection and In-situ Analysis	42
Plate 3.4:	Vegetation Cover at Omigbo	48
Plate 4.1a:	Men at Omigbo Site	53
Plate 4.1b:	Women at Omigbo Site	54
Plate 4.1c:	Trading Stores along A Major Road in the Project Area	58
Plate 4.2:	Typical Building Types in the Project Area	61
Plate 4.3:	Indiscriminate Waste Disposal within the Project Area	62
Plate 4.4:	Electricity Infrastructure within the Project Area	63
Plate 4.5:	Some Water Infrastructure Found Within the Project Area	64
Plate 4.6:	Group Photograph after Meeting with some PAPs	88
Plate 4.7:	Photograph during the Town Hall Meeting Session (2023)	88

LIST OF ACRONYMS AND ABBREVIATIONS

ACReSAL	-	Agro-Climatic Resilience in Semi-Arid Landscapes
AIDS	-	Acquired Immuno-Deficiency Syndrome
ARAR	-	Applicable or Relevant and Appropriate Requirements
BAT	-	Best Available Technology
BOD	-	Biochemical Oxygen Demand
CBO	-	Community Based Organizations
CITES	-	Convention on the Prevention of the international trade in Endangered Species
COD	-	Chemical Oxygen Demand
CSOs	-	Civil Society Organizations
DO	-	Dissolved Oxygen
EA	-	Environmental Assessment
KSME	-	Kogi State Ministry of Environment
ESS	-	Environmental and Safeguard Specialists
EHS	-	Environmental, Health and Safety
EIA	-	Environmental Impact Assessment
EO	-	Environmental Officer
ESIA	-	Environmental and Social Impact Assessment
EMS	-	Environmental Management System
ESMF	-	Environmental and Social Management Framework
ESMP	-	Environmental and Social Management Plan
FEPA	-	Federal Environmental Protection Agency
FGD	-	Focus Group Discussion
FGN	-	Federal Government of Nigeria
FI	-	Financial Intermediary
FMEnv	-	Federal Ministry of Environment
FPMU	-	Federal Project Management Unit
FRN	-	Federal Republic of Nigeria
FRSC	-	Federal Road Safety Commission
GBV	-	Gender Based Violence
GHGs	-	Greenhouse Gases
GPS	-	Global Positioning System
GRA	-	Government Reserved Area
H_2S	-	Hydrogen Sulphide
HIV	-	Human Immuno-Deficiency Virus
HND	-	Higher National Diploma
HSE	-	Health, Safety and Environment
IDI	-	In-Depth Interviews
ITCZ	-	Inter Tropical Continental Zone
IUCN	-	International Union for Conservation of Nature
KII	-	Key Informant Interviews
ISO	-	International Standard Organization

LGA	-	Local Government Area
MDAs	-	Ministries, Departments and Agencies
M & E	-	Monitoring and Evaluation
MoU	-	Memorandum of Understanding
MSDS	-	Material Safety Data Sheet
NAP	-	National Agricultural Policy
ND	-	Not Detected
NEWMAP	-	Nigeria Erosion and Watershed Management Project
NEP	-	National Policy of the Environment
NESREA	-	National Environmental Standards and Regulations Enforcement Agency
NIWA	-	Nigeria Inland Waterways Authority
NPC	-	National Population Commission
NS	-	Not Specified
NTU	-	Nephelometric Turbidity Unit
OND	-	Ordinary National Diploma
OP	-	Operational Policies
PAP	-	Project Affected Persons
PEM	-	Project Environmental Management
PMU	-	Project Management Unit
POI	-	Point of Interest
PPE	-	Personal Protective Equipment
PVC	-	Poly vinyl chloride
RAP	-	Resettlement Action Plan
SEA	-	Sexual Exploitation and Abuse
SEP	-	Stakeholder Engagement Plan
SLM	-	Sustainable Land Management
SSO	-	Social Safeguards Officer
SOP	-	Standard Operation Procedures
SPM	-	Suspended Particulate Matter
SPMU	-	State Project Management Unit
STD	-	Sexually Transmitted Diseases
TC	-	Tropical Continental
TDS	-	Total Dissolved Solids
TM	-	Tropical Maritime
ToR	-	Terms of Reference
TSS	-	Total Suspended Solids
VOC	-	Volatile Organic Compounds
WHO	-	World Health Organization

EXECUTIVE SUMMARY

ES 1 Project Background

The Federal Government of Nigeria (FGN) has embarked on an agro-climatic resilience in semi-arid landscapes (ACReSAL) project with the World Bank. The project will help Nigeria address critical challenges of regional desertification control and landscape management. It is proposed to be supported with initial financing from the World Bank to $700 million.

The project has five (5) components/phases which include:

A. Dryland Management: Support Strategic Watershed Planning processes, prioritize major investments to address desertification and land degradation in northern Nigeria at the Federal and State levels and complement investments at community level
B. Community Climate Resilience: Improve agro-climatic resilience at community and household levels by promoting locally adapted Sustainable Land and Water Management (SLWM) strategies and through climate-smart approaches to agricultural and natural resource management
C. Institutional Strengthening and Project Management: Improve the enabling institutional and policy foundation for integrated landscape management in Nigeria from ACReSAL activities to longer-term national framework and support overall project monitoring and management
D. Contingency Emergency Response: This is a component that could be used to provide immediate support to an eligible crisis or emergency

The project will collaborate with Federal and State Ministries, Departments and Agencies (MDAs), Local Governments, Communities, and Civil Society Organizations (CSOs). Specifically, the MDAs include those responsible for Planning, Economy, Agriculture, Environment, Water Resources, Finance, Works, Transport, Power, and Emergency Response and those focused on Climate and Hydrological Information or Watershed/Basin regulations.

The ACReSAL project is being operationalised in 19 States in Nigeria's arid and semi-arid areas. These States include Adamawa, Bauchi, Kwara, Niger, Kaduna, Gombe, Sokoto, Nasarawa, Borno, Kebbi, Katsina, Plateau, Benue, Kogi, Kano, Jigawa, Taraba, Yobe, and Zamfara States and are located in the Sahel, Sudan Guinea Savanna and Southern Guinea ecosystem, characterised by dry semi-arid conditions, low precipitation, and sparse vegetative cover.
The environmental and social safeguards concerns will be addressed through two national instruments already prepared under the project: an Environmental and Social Management Framework (ESMF) and a Resettlement Policy Framework (RPF). These framework instruments will, therefore, have to be translated to specifically cost, measurable, and monitorable actions for specific intervention sites through the preparation of site-specific management and action plans.

Kogi State was a beneficiary in the concluded and closed multi-sectoral Nigeria Erosion and Watershed Management Project (NEWMAP), which the World Bank, Global Environment Facility, the Special Climate Change Fund, and the Government of Nigeria financed. During the NEWMAP project activities, the initial studies, including the ESMP to address prioritised degraded land, were carried out. Some

prioritised degraded lands, including the Omigbo Erosion and Flood Watershed site, could not be rehabilitated under NEWMAP. The Kogi State ACReSAL Project Management Unit of the Kogi State Ministry of Environment intends to apply a portion of the proceeds of the ACReSAL credit to update the Omigbo Flood and Erosion ESMP studies before the intervention takes place.

ES 2 Description of the Proposed Intervention

Omigbo river channelization/gully erosion intervention site is located in Kabba town in Kabba Bunu LGA of Kogi State. It is located between latitude 07° 50.010 and 07° 49.147 and longitude 06° 04.697 and 06° 05.032. Omigbo River is a natural river flowing almost through the entire length of Kabba town. Currently,it is about 5km long and during the raining season it overflows its bound and causes flooding resulting in displacement of household living along the river and causes gully erosion due to poor drainage system.The gully is about 10-15m wide and is as deep as 20-25 feet (ft). The gully is still active some section with sediment yield of about 1.5-2.0 tons per season. It is more aggressive during the rainy season with water level rising between 8m and 10m. Also, the project is within urban setting in Kabba. It is not close to any sensitive biodiversity significant location butcharacterized by undulating topography with limited flat terrain. The area is made up of highlands with linear NW-SE ridges and an altitude of about 440m.

The proposed intervention work falls under component A of the ACReSAL project which is focused on dryland management and entails watershed management, landscape investment, and special ecosystems management. Specifically, it shall involve the fullgully heads reclamation of gully I at junction of Kabba-Obajana road by Lisa Palm Hotel and Kabba - Road 06 (Ogaminan Road); Gully II Oparo Road and Kano Road gully including, chanellization of Omigbo stream, contruction of 6 culverts (3 on Ogaminan Road (road 6), 1 on Kabba-Obajana road, 1 on Oparo road and the last 1 on Odo-Afin Road. Resilience activities of tree planting and installation of reinforced rectangular concrete drainages to direct all water flow to the constructed channel and eliminate multi-directional flow from the channel/gully head that causes damage to structures and distrupt retail economic activities during wet season. Other major activities along the channel includes provision of flexible gabion check dams' structures on mid-stream of the gullies to stabilize its longitudinal profile and control water velocity

the current corridor of Gully 1, Gully 1 Finger 01, gully II and gully II finger 01 are well vegetated. There are encroachments into the floodplain and the outlet into the Opa River is an expanded floodplain. However, there is need to provide waterways banks embankment at all sides of both the Omigbo and Opa River to control downstream flooding around this confluence area.

ES 3 Rationale for the ACReSAL Intervention

Although the Omigbo River channel waterway has existed for many years since the town's inception, the river flood became severe over ten years ago when the runoff from the environs increased. Even though the Local and State Governments have carried out several interventions at different times, the problems persisted. Lives have been recorded to be lost, residential buildings collapsed, families displaced, and several properties lost to the gully menace. The situation at the study area during the

peak flow poses a greater danger as the gullies are fast encroaching on the major (Lokoja, Opara and Kano) roads. This poses a grave danger if decisive actions are not urgently taken. In other words, once the gully erosion problem is adequately appraised and appropriate control structures are introduced, the yearly colossal losses will be mitigated. Also, life and property will be safeguarded, and public infrastructures will be protected.

ES 4 Rationale for the ESMP

At project preparation, six Environmental and Social standards framework instruments were prepared: an Environmental and Social Management Framework (ESMF), a Resettlement Policy Framework (RPF), an Integrated Pest Management Plan, a Stakeholders engagement Plan, a Labour Management Procedure and a Security Risk Management Framework. These ESF instruments are frameworks that need to be translated into specific cost, measurable, and monitorable actions for specific site intervention by preparing site-specific management and action plans; thus, the need for the Omigbo ESMP must be balanced.

The civil work activities, considering the nature of the work required to rehabilitate the Omigbo flood watershed, and the World Bank ESS1 Assessment and Management of Environmental and Social Risks and Impacts will apply. The Nigeria EIA Act will also apply due to the envisaged civil works. Thus, there is a need to prepare an Environmental and Social Management Plan (ESMP) to address all environmental and social concerns related to the proposed construction and channelization activities.

Some potential impacts that may arise during the proposed works include the generation of hazardous and construction wastes. Other impacts could arise from noise/air pollution, accidents from the movement of equipment and materials to the site, occupational health & and safety risks, risks associated with labour influx (security threat, gender-based violence (GBV) in particular Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) due to labour influx, increase in STIs/STDs), community health and safety issues, arrangements for employment and accommodation of workers to be engaged in project activities, and issues related to working conditions (including about periods of sickness and quarantine), grievance and disturbance to physical and cultural resources among others.

ES 5 Objective and Scope of the Consultancy Services

The objective of the consulting services is to update the Environmental and Social Management Plans (ESMPs) for projects at Omigbo Channelization sites in Kogi State in line with the World Bank/IDA Environmental and Social framework. ESMP assist in eliminating adverse environmental and social impacts, offsetting them, or reducing them to acceptable levels. The ESMP also includes the measures needed to implement these actions, addressing the adequacy of the monitoring and institutional arrangements for the upper and lower watersheds in the intervention sites.

The ESMP will consist of a well-documented set of mitigation measures, monitoring, and institutional actions to be taken before and during implementation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. It also include the measures required to implement these actions, costing, and responsibility, addressing the adequacy of the monitoring and institutional arrangements in the intervention site.

Summarily, the study aims to achieve the following objectives:

- Potentially screens out environmentally unsound activities.

- Identify all risk/hazards associated with the proposed activities and identify mitigation measures to reduce, offset, or eliminate adverse impacts including costs estimation.
- Propose modified designs to reduce environmental and social impacts.
- Identify feasible alternatives.
- Predict significant adverse impacts.
- Engage and inform potentially affected communities and individuals.
- Influence on decision-making and the development of terms and conditions.

ES 6 Policy, Legal, Regulatory and Administrative Frameworks

National Policy & Legal Regulatory Requirements

- National Policy on the Environment 1989 Revised 1991
- National Erosion and Flood Control Policy 2005
- Environmental Impact Assessment Act No. 86, *1992 (FMEnv)*
- The National Guidelines and Standards for Environmental Pollution Control in Nigeria 1991
- National Guidelines on Environmental Management Systems *(1999)*
- National Air Quality Standard Decree No. 59 of *1991*
- National Environmental Standards and Regulations Enforcement Agency Act (NESREA Act) 2007
- Land Use Act *1978 Modified 1990*
- Endangered Species Act 1985
- FEPA/ FMEnv. EIA Procedural Guidelines 1995
- S.1.15 National Environmental Protection (The Management of Solid and Hazardous Wastes Regulations) 1991
- Public Health Law
- Workmen Component Act 1987 Revised 2010

Kogi State Policy & Regulatory Instruments

- Kogi State Ministry of Environment
- Kogi State Environmental Protection Board
- Kogi State Sanitation & Water Management Board
- Kogi State Town Planning & Land Development
- Kogi State Project Management Unit (Kogi ACReSAL SPMU) ACReSAL

ES 7 World Bank Environmental and Social Standards (ESS) Applicable to Kogi State- ACReSAL Omigbo Channelization Site.

Except for the ESS 7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities) and ESS 9 (Financial Intermediaries) all other World Bank Environmental and Social Standards (ESS) are applicable.

Environmental and Social Standards (ESS)	Description	Applicability to the proposed Kogi State ACReSAL Project	
		Yes	No
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	This overarching standard sets out the Borrower's responsibilities for assessing, managing and monitoring E&S risks and impacts associated with each stage of a program supported by the Bank through Investment Project Financing, in order to achieve E&S outcomes consistent with Bank's ESS.	[x]	[ ]
ESS 2: Labour and Working Conditions	ESS 2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a program by treating workers in the program fairly and providing safe and healthy working conditions	[x]	[ ]
ESS 3: Resource Efficiency and Pollution Prevention and Management	ESS 3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels	[x]	[ ]
ESS 4: Community Health and Safety	ESS 4 recognizes that program activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to program activities.	[x]	[ ]
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	ESS 5 recognizes that program-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. This may cause physical or economic displacement.	[x]	[ ]
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS 6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development.	[x]	[ ]
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	This ESS applies to a distinct social and cultural group identified as "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, indigenous ethnic Minorities etc."	[ ]	[x]
ESS 8: Cultural Heritage	ESS8 sets out measures designed to protect cultural heritage throughout the program life cycle.	[x]	[ ]
ESS 9: Financial Intermediaries	This ESS applies to Financial Intermediaries (FIs) that receive financial support from the Bank	[ ]	[x]
ESS 10: Stakeholder Engagement and Information Disclosure	This ESS recognizes the importance of open and transparent engagement between the Borrower and program stakeholders as an essential element of good international practice.	[x]	[]

ES 8 Biophysical Environment

Air quality concentrations of gaseous parameters measured within and around the project area are relatively low and fall within the Federal Ministry of Environment (FMEnv) limits. Apart from NO that was not detected in any of the sampling locations, the other gaseous parameters such as NO_2, CO, TVOC, SO_2fell withinthe FMEnv permissible limit. Based on the air quality results, it can be deduced that the ambient air quality of the project area is not polluted. The results of the suspended particulate matter at $PM_{0.5}$, $PM_{1.0}$, $PM_{2.5}$, $PM_{5.0}$, and PM_{10}as well the TPM across the

locationfall below the FMEnv limit of 250µg/m^3 for suspended particulate matter.The ambient noise level recorded in the proposed project area shows an average minimum value of 48.5 dB(A) and an average maximum value of 59.4 dB(A). The noise levels were below the FMEnv permissible limit of 90 dBA for 8-hour exposure. The result of the soil analysis shows that the soil is made up of varying percentage compositions of sand, silt and clay. The pH values is slightly acidicbut are within the values of 4.5 to 9.0 for optimal plant growth. Exchangeable anions detected in the soil samples are SO42-, PO43-, Cl- and NO3- and recorded in low concentrations. No heavy metal pollution was recorded in the soil samples. Pb, Ni, Cr, Cd, V and Hg were not detected in the soil samples while Zn and Cu were recorded in trace amounts, below the permissible limits for unpolluted soil. Iron (Fe) recorded the highest concentration with a range of 86.7 mg/kg to 197.8 mg/kg, which could be due to the geological nature of the project area typical of the Precambrian basement complex. Total hydrocarbon content (THC) was recorded in trace amounts in the soil samples with a range of 0.06 mg/kg to 0.92 mg/kg, significantly below the FMEnv limit of 50 mg/kg for mineral oil in the soil. This indicates that the soil environment of the project area is not polluted with hydrocarbon. The fauna of the study area is not IUCN threat status classified.

ES 9 Socio-Economic Characteristics

The 2025 projected population for Kogi State will be roughly 5.7 million while that of Kabba-Bunu LGA will be 0.191 million. There are 52.0%malesrespondentscompared to females (48.0%). The majority of residents in the Omigbo community fall within the 18-45 age range (52.0%), indicating a significant presence of individuals in their prime working and earning years. The representation of residents aged 46-65 years (36.0%) and above 66 years (12.0%) is lower and, potentially suggests a relatively smaller proportion of younger adults in the community's workforce and economic activities. Most residents in Omigbo are married, accounting for 76.0% of the population, potentially contributing to a sense of stability and community cohesion. A few are single (16.0%) or separated (8.0%). The dominant ethnic group in Omigbo community is Yoruba. The predominant religion in the community is Christianity as indicated by 80.0% of the sampled population while Islam accounts for only 20.0%. Household size of less than 5 members is recorded as the highest proportion (52.0%). This was followed by the household size of 11-15 members (4.0%) while households 6-10 and above 16 members account for 36.0% and 8.0% respectively. The educational status of the respondents' shows that the highest proportion of the respondents (36.0%) have secondary school. This is followed by 12.0% of the respondents who are university graduates, and 20.0% finished tertiary school. Those with primary school leaving certificates represent 12.0% while university postgraduates and those who had no formal education account for 16.0% and 4.0% respectively. The primary livelihood source in the Omigbo community is trading/shop-keeping (44.0%). The project might consider initiatives to improve agricultural practices, provide access to modern farming techniques, and enhance market linkages for agricultural products.

ES 10 Consultations: Stakeholders, Expectations of the Project

S/N		Town Hall Meeting (All)	PAPs	Elders	Women	Youth
	Community Name	Omigbo (Kabba)	Omigbo (Kabba)	Omigbo (Kabba)	Omigbo (Kabba)	Omigbo (Kabba)
	Stakeholder engaged	Residents/Business owners in Omigbo Catchment, PAP, Traditional Institution, Religious organization and LGA representative	PAPs	Elders	Women	Youth (Male & Female
	Date	09/08/23	09/08/23	09/08/23	09/08/23	09/08/23
	Location	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound
	Language	**Yoruba and English.**	**Yoruba**	**Yoruba and English.**	**Yoruba and English.**	**P.idgin-English and English**
	Information Shared	Current situation of the Omigbo Flooding.		Flood Situation and Impacts	Gender Issues and Flood impacts	Project Issues over the life time
	Key Stakeholder's concerns	• Immediate implementation of the project • Need to update the design • Youth employment	• Payment of compensation	• Immediate commencement and completion of the project in record time • A solid construction intervention • Poverty alleviate; • Payment of compensation • Proper relocation of affected shrines • Provision of other facilities such as clinic.	• Readiness to work in various capacities during project implementation. • Support for business • Need for formal dumpsite • No GBV/SAE issues	• Sexual affairs with married women by contractors and their worker is not acceptable in the community. • Youth employment • Oppression by the foreigners.
	Response	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns will be looked into.	The consultant and Kogi ACReSAL EO assured the PAP that their compensation will be paid.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns will be looked into.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns will be looked into.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns will be looked into.
	Action	Kogi State ACReSAL	Kogi State ACReSAL	Kogi State ACReSAL	Kogi State ACReSAL	Kogi State ACReSAL
	Time Frame	Immediate/During project implementation	Before civil work commence	Immediate/During project implementation	Immediate/During project implementation	Immediate/During project implementation

ES 11 Stakeholders' Concerns on the Proposed Project Activities (CCPPAs)

On the background to the full community support for the commencement of the full project activities, there are concerns expressed by community stakeholders concerning the phases of the project. The Omigbo community expect these issues to be addressed to ensure smooth initiation and completion of the project. The concerns were properly documented in the ESMP and mitigation measures were provided for those with impacts in the management plan.

During the construction phase, the community expect:

- Peaceful interaction of project workers with members of the community;
- Issues of environmental pollution (air, water, soil and noise) should be addressed in completion;
- Observation and respect of all customs and traditions and avoid any sacrilegious attitude;
- Engagement of able youths as skilled and unskilled labourers in the project activities;
- Prompt report on the discovery of any artefacts or sacred items to the appropriate authorities including community leaders.

During the operation and maintenance phase of the project, the community expressed that the following should be maintained by the concerned authority:

- Effective monitoring of the project to avoid reversal and re-emergence of the food;
- Ensure cleaning of drainage periodically to avoid clogging of from silt;
- Safety measures to be installed and maintained at required spots; and
- Any other support that can improve the overall nature of the environment better than previous.

ES 12 Willingness of Community to Provide Local Support for the project

The community expressed their readiness to give their best advice, skills and other required assistance to the contractor. Specifically, they expressed the following:

i. Qualified youths of the community who can be engaged by the Contractor of the project are prepared to offer services with respect to the level of professionalism required to support the project;
ii. Culinary services will be available for workers and visitors alike by the women; and
iii. Migrant workers from the different of the country can have access to proximate accommodation as the need arise.

ES 13 Summary of Impacts of the project

Positive Environmental Impacts of the Proposed Project Activities

- Minimisation of Flood Activities;
- Rehabilitation of degraded lands and their conversion into productive land use;
- Reducing disaster risks in the project area;
- Improved environment and aesthetics of the area.
- Reduced surface runoff during storm events

Positive Social Impacts of the Proposed Project Activities

- Safety of lives and properties;
- Rehabilitation of degraded lands and their conversion into productive land;
- Improved commercial activities;
- Employment opportunities;

- Securing public infrastructures;
- Improve the environment and aesthetics of the area;
- Increase accessibility to people's homes.
- Improve water supply for domestic uses.

ES 14: Summary of Main Environmental and Social Safeguards Issues

Environmental and Social Issues	Anticipated Risk/Impact	Probability of Impact and Impact	Mitigation Measures
Air Quality	Increase in dust generation and spread of dust	Prob: 4, Impact: 3 Risk: Medium	▪ Regular damping of unpaved roads or exposed soils/ground to control dust/particulate matter and keep it down. ▪ Limit active construction activities to not more than a total of 500 meters at a time on a 2.0 km road length section to minimize dust. ▪ Locate material stockpile areas as far as practicable away from sensitive receptors.
	Increase in emission of air pollutants from vehicles, plant and equipment, machinery	Prob: 3, Impact: 3 Risk: Medium	▪ Ensure vehicles/machines are switched off when not in use. ▪ Ensure only vehicles required to undertake works are operated on-site. ▪ Ensure all construction vehicles, plant and machinery are well maintained and in full operating condition
Waste Management	Oil and other potential contaminants are not properly collected, managed and/or disposed	Prob: 3, Impact: 3 Risk: Medium	▪ Proper storage, transport and disposal of hazardous wastes (oily wastes, used batteries, fuel drums) in the designated areas by the national authorities
	Construction waste and solid waste generated are not properly managed or disposed	Prob: 3, Impact: 3 Risk: Medium	▪ Recyclable waste (including oil and some construction waste) collected separately and disposed of correctly and/or approved facility as per the regulatory requirements
Noise and Vibration	Public nuisance caused by construction/operation activities	Prob: 4, Impact: 3 Risk: Medium	▪ Install noise reduction devices such as silencers and mufflers as appropriate to mobile plant and equipment. ▪ Limit the active construction site to not more than 500 meters per 2.0 km lengths ▪ Limit work to daylight hours. Schedule noisy construction activities during specific times in the day especially near the sensitive receptors. ▪ Identify and avoid the adjacent highly sensitive receptors to vibrations ▪ Through implementation of SEP, ensure nearby communities should be given advance notice on timing of works, as well as details of the GRM in the event of issues.
Flora and Fauna	New flora and weed species introduced (greening)	Prob: 3, Impact: 3 Risk: Medium	▪ Ensure that any manure or soil applied are free of seeds, and that the seeds used for the catchment rehabilitation are weed free
	Disturbance of fauna and their habitat	Prob: 2, Impact: 2 Risk: Low	▪ Construction activities (such as operation of concrete mixing plants) and use of equipment and in daylight hours
Land	Blockages of drains and waterways due to construction activities	Prob: 3, Impact: 3 Risk: Medium	▪ Proper stockpiling of construction materials, spoils (on flat areas and away from drainage routes

	Erosion and sedimentation caused by construction works	Prob: 3, Impact: 3 Risk: Medium	▪ Silt fences, grassed buffer strips and bioengineering measures to be installed to reduce water velocity. ▪ Avoid long exposure of opened excavated/cut areas
	Borrow pits within road/gully/drainage easement located near to community and left exposed	Prob: 3, Impact: 3 Risk: Medium	▪ Quarry materials (such as the stones and gravel required for the road works) will be sourced from an established quarry. ▪ Project engineer to be advised of selection of suppliers in advance. ▪ Engineer and the local authorities to be advised in advance of areas with road reserve to be excavated for materials ▪ All works sites, particularly excavations, to be appropriately signed and made safe in terms of community.
Social Management	Lack of Stakeholders Engagement	Prob: 4, Impact: 1 Risk: Low	▪ Prepare and Implement the ▪ Stakeholders Engagement Plan (SEP).
	Limited participation and involvement of women, youth, people with disabilities (PWD) and other vulnerable people	Prob: 3, Impact: 2 Risk: Medium	▪ Prepare and implement a robust Gender ▪ Action Plan (GAP)
	Involuntary resettlement, relocation or households or associated impacts	Prob: 4, Impact: 4 Risk: Low	▪ Screening of sub-project and ensure that the sub-project does not result in significant involuntary resettlement or associated impacts.
	Lack of employment for local community due to imported workers	Prob: 3, Impact: 3 Risk: Medium	▪ Ensure that the contractor hire local labour (especially unskilled labour) from the host community
	Lack of involvement of women, youths and other vulnerable people	Prob: 3, Impact: 3 Risk: Medium	▪ Gender and Action Plan developed and ▪ implemented ▪ Compliance with the GRM
Cultural Heritage	Project is likely to be near to an important Archaeological and/or Cultural Heritage	Prob: 3, Impact: 1 Risk: L	▪ Undertake screening of sub-project. ▪ Works to avoid known cultural heritage sites. ▪ Prepare and adopt a Chance-Find Procedure (CFP) in case unknown artifacts discovered during works
Health, safety and security	Health and safety of road users and community	Prob: 3, Impact: 3 Risk: Medium	▪ Training provided to construction workers, adequate signage and warnings to road users to be in place. ▪ Adequate information provided to the host community about the safety measures and emergency protocols
	Prevalence and spread of COVID-19 and communicable disease	Prob: 3, Impact: 3 Risk: Medium	▪ Ensure that Contractor's workers are fully vaccinated, COVID awareness and precautionary measures among workers and community Ensure construction workers observe ▪ Covid-19 prevention measures such as always wearing masks, regularly washing hands, etc
	Risk of increased SEAH and GBV particularly due to influx of workers	Prob:1, Impact: 3 Risk: Low	▪ Implementation of GAP ▪ Code of Conduct to include SEAH and GBV prevention ▪ PMU will request that contractors, suppliers and partners adhere to zero tolerance for

			SEAH and GBV and commit to taking adequate action if faced with SEAH allegations ▪ Contractual arrangements can be terminated if breaches confirmed
	GBV exacerbation by labour influx	Prob: 2, Impact: 3 Risk: Medium	▪ Gender issues to be included in the ESIA/ESMP ▪ Implementation of GAP ▪ Code of Conduct to include SEAH and GBV prevention ▪ PMU will request that contractors, suppliers and partners adhere to zero tolerance for SEAH and GBV and commit to taking adequate action if faced with SEAH allegations.
Labour and working conditions	Poor working conditions and workers health, work related incidents and injuries	Prob: 3, Impact: 3 Risk: Medium	▪ Prepare and implement the OHSMP ▪ Train all staff in emergency preparedness and response. ▪ Keep a First Aid Kit on site and ensure that drinking water is provided. ▪ Personal Protection Equipment (PPEs) are provided to workers

ES 15 Analysis of Alternatives

Three standards were set for the analysis of project alternatives, these are *General Safeguard of Environment and Human Health (General protection mechanisms)*; *Short-Term Usefulness*; and *Long-Term Effectiveness and Permanence*. The result of these analyses produces *No Action, Delayed Action* and *Right Away Action*. Analysis was based on three activities [Biological works only, Civil works only and The Civil works / Biological & the construction of Hard Structures (Technological Option)]. It was concluded that a combination of the Civil and Biological works (Technological Option) will provide a long-term effectiveness that will address the Omigbo River erosion malaise.

ES 16 Environmental and Social Mitigation Measures

Environmental and Social Mitigation Measures were prepared for all the identified potential impacts.

Pre-Construction: Proper awareness/sensitization of the host community on the project and involvement of community during preparation and implementation.

Construction: The expected activities during constructions include: Excavation, Channelization, Concretisation, and Filling; Lining, Gabion drop structures and Re-vegetation.

Some of the recommended mitigation measures include: a distance gap of 30 metres between heavy duty machinery and filling material from the gully channel; avoidance of vibration induced machines; lowering of overhand before using excavator with a boom of at least 25 meters, limiting of civil work to dry season where applicable, tree planting, proper handling of waste, spraying of water to prevent dust, use of PPE, where possible, construction activities should be limited to day time, ensuring that all regulations on wild animals and their related habitats are strictly adhered to, prioritizing GBV/SEA, HIV/AIDS and STD awareness programme and placing speed

limits signboards at strategic locations. COVID-19 regulations / protocols including social distancing, use of facemask and hand-washing should be strictly adhered to. Also, the Contractor and Consultants are expected to hire, to the maximum extent, skilled and unskilled workers from affected local communities in the project area.
Operation: Maintenance operations should be designed according to environmental safety guidelines, periodic checks on ambient environmental quality particularly air and provision of speed limits signboards.

ES 17 Occupational Health and Safety/Community Health and Safety Management Plan

Occupational Health and Safety (OHS)

The OHS plan will address issues such as:

- The proper provision and use of personnel protective equipment (PPE) such as safety boots, respirators, eye protection, hearing protection, gloves, and hardhats;
- Analysis of risks associated with job activities in order to develop standard requirements for PPE on a job-specific and station-specific basis;
- Provision of training on the proper use of PPE and penalties for the improper use of PPE;
- Training on the proper and safe use of all equipment in workshops, garages, the plantation, nurseries, and mills;
- Physical barriers so that unauthorized personnel are not admitted to areas where dangerous equipment is in use;
- Training related to job-specific risks and activities, including:
- Electrical installations (e.g. electric shock on direct contact with conductors and indirect contact with masses powered up, burns, fire and explosion);
- Mechanical equipment (e.g. tool blasting or matter risk, crushing of fingers, wounds, equipment shock);
- Lifting devices (e.g. crushing risk, injury caused by appurtenances, falling, collision); machinery and vehicles (e.g. risk of accident on contact with other materials, collision with or knocking down of persons, obstacle shock, fall by the operator, collision with a vehicle or machine);
- Hand tools, electric or other welding equipment (e.g. risk of injury, electrocution, poisoning, dazzle);
- Workshops and garages (e.g. risk of mechanical injury, shock and collision with machines); Sterilizers and boilers (e.g. risk of burns due to heat and steam from furnace, explosion risk); and
- Power plant, processing lines and workshops (e.g. noise-related risks, electrocution risk) provision of properly trained and equipped first aid personnel including a well-stocked pharmacy, a treatment room with beds, and an ambulance for any worksite injuries.

ES 18 Worker's Training and Orientation Plans on COVID-19 and other Infectious Diseases

The details of the workers training plans follows the comprehensive details as provided by:

- World Health Organisation - WHO https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public
- United States Centre for Disease Control https://www.cdc.gov/coronavirus/2019-

nCoV/index.html

- Nigeria Centre for Disease Control (NCDC) https://covid19.ncdc.gov.ng/report/

ES 19 Training Programmes

S/N	Capacity Needs	Participants	Subject	Resource Person	Duration	Cost (US $)
1	Personnel requires appreciation of WB's, Federal/State environmental policies and standards, as well as, an application of these policies and standards in implementing the World Bank support for Omigbo River Channelization/Gully Erosion intervention.	**SPMU Training** PC, Environmental Safeguards Specialist, Project Engineer, Social Safeguards Specialist, Livelihood Officer and other associated support staff from the Ministry. The estimated number of participants is Ten (10) persons	In-depth consideration of the mitigation measures proffered by the ESMP. Satellite Image interpretation of the Omigbo River Channelization / Gully Erosion Intervention watershed imagery for critical assessment of changes overtime	Environmental Science Specialist (ESMP, Remote Sensing & GIS)	2 days seminar	2,500
2	Training on GBV/SEA, Labour Influx Issues and other Social Safeguards and Livelihood Issues as it affects Omigbo River Channelization/Gully Erosion intervention.	**Community** Omigbo River Channelization/Gully Erosion site monitoring committee members and PAPs. The estimated number of participants is Twenty-Five (25) persons.	GBV/SEA, Labour Influx and Social Livelihoods	GBV/SEA specialist, Social Livelihood Specialist. Environmental specialist	1-day worksh op	2,500
3	Training on Catchment Management Structures, establishment of plant nurseries, planting operation and forest management in a dryland	**Community** Omigbo River Channelization/Gully Erosion site monitoring committee members and PAPs. The estimated number of participants is Twenty-Five (25) persons.	Water-harvesting, Afforestation and restoration of special ecosystems	Environmental Science Specialist (botanist and hydrologist)	2 days seminar	2,000
4	ACReSAL institutional arrangements as it affects Omigbo River Channelization/Gully Erosion intervention site	**Community** Omigbo River Channelization/Gully Erosion site monitoring committee members and PAPs, Contractors and their staff. The estimated number of participants is Fifty (50) persons.	General environmental awareness; seminars that will include ecological and social science principles, as it affects the Omigbo River Channelization/Gully Erosion site. Understanding Environmental Checklist for monitoring contractor's compliance to the mitigation measures proffered in the ESMP.	Environmental science specialist	1-day worksh op	3,000
Total						**10,000**

ES 20 Grievance Redress Mechanism (GRM)

The Kogi State ACReSAL has established a Grievance Redress Framework (Annex 6) following the World Bank's approaches to GRM and FPMU guidelines. The framework has five levels of addressing grievances (Level 1: Community Level of Grievance Redress; Level 2: Local Government/ Community Grievance Redress Committee (LGRC); Level 3: State Grievance Redress Committee (SGRC); Level 4:

National Grievance Redress Committee (NGRC) and Level 5: the Courts). It should be noted that grievances should follow the level sequence based on the demands and outcomes of the issues at hand. However, when the parties involved in grievances have utilized the provisions of the first four levels, they can then utilize the Law Courts (Level 5).

ES 22 Labour Influx and Child Labour

The project may face the problem of an influx of non-local labour and working conditions issues. This may be because skilled labourers might not be available in as required within the community of the project site. The project will take concrete measures to mitigate potential labour influx-related risks such as workers' sexual relations with minors and the potential consequential pregnancies, the presence of sex workers in the community, the spread of HIV/AID, COVID-19, sexual harassment of female employees, child labour and abuse, inadequate resettlement and fear of retaliation, failure to ensure community participation, poor labour practice, and lack of road safety. These risks if and or when they occur at all, require careful consideration to improve social and environmental sustainability, resilience and social cohesion. Hence, the project will include mitigation measures such as: (a) evaluating living conditions of workers' camps and ensuring suitable living conditions; (b) establishing and enforcing a mandatory Code of Conduct for the company, managers and workers, and an Action Plan for execution; (c) ensuring suitable location for these camps; (d) taking countermeasures - indicated in the Social Management Plan - to reduce the impact of the labour influx on the public services; and, (e) devising and implementing a strategy for maximizing employment opportunities for local population, and proper gender balancing.

ES 23 Gender-Based Violence / Sexual Exploitation and Abuse

The stakeholders claimed that GBV/SEA is rare in the area. This is not unexpected as cases of GBV are often denied publicly by under-reporting, However, a literature review of the issue shows that GBV is prevalent in the project area and might include Intimate Partner Violence (IPV), public harassment including, verbal insults, physical abuse, rape, harmful widowhood practices and women and child trafficking. To avoid attachment of the same to the proposed project, a GBV workshop was conducted to sensitize the SPMU, Contractors and consultants' staff on the key principle and specific requirements to address GBV/SEA have been included in the bidding documents ('pre-qualification and 'employers' requirements'). Also, the SPMU has a qualified GBV/SEA specialist who is to manage any GBV/SEA case that might arise in connection with the project activities. Hence, specific measures to reduce and mitigate the risk of GBV/SEA in the project will include:

i) GBV/SEA assessment of the project;
ii) mandatory contractors' code of conduct on sexual harassment;
iii) appointment of NGO to monitor GBV/SEA in ACReSAL project;
iv) community and workers' sensitization on GBV/SEA;
v) provision of referral units for survivors of GBV/SEA;
vi) provisions in contracts for dedicated payments to contractors for GBV/SEA prevention activities against evidence of completion;
vii) contractor and SPMU requirement to ensure a minimum target of female employment with incremental rewards for the obtainment of this target;
viii) Inclusion in the focal NGO's ToR services for managing social risks associated with GBV/SEA in the project;

ix) Building and improving SPMUs, Omigbo community and other relevant stakeholders' capacities to address risks of GBV/SEA by developing and providing guidance, training, awareness, and dissemination of relevant GBV/SEA materials to communities;
x) Strict adherence to the "*Reporting and Response Protocol*" provided in this ESMP to guide relevant stakeholders in case of GBV/SEA incidents;
xi) Identifying development partners and cultivating pragmatic partnerships on GBV/SEA prevention measures and referral services; and
xii) Strengthening consultations and operationalizing GBV/SEA-specific grievance redress mechanisms.

ES 24 Stakeholder / Citizen's Engagement

The Kogi State ACReSAL has been implementing its Citizen/Stakeholders Engagement Plan since the inception of the Project. Major milestones covered in the Omigbo River Channelization/Gully Erosion intervention include:

- Identification of Project stakeholders;
- Summary of past consultation efforts from baseline study and GIS mapping;
- Establishment of site committee
- Stakeholder engagements during ESMP data collection

Other planned consultation efforts to prepare for construction activities include;

- Stakeholder engagement during consultancy services;
- Stakeholder engagement during construction;
- Stakeholder engagement during operations;
- resources for stakeholder engagement;
- monitoring and reporting on stakeholder engagement; and
- Formation of the site monitoring committees for Omigbo River Channelization/Gully Erosion intervention Erosion Site.

ES 25 ESMP Implementation Schedule

S/N	**Mitigation measures for:**	**Mitigation Timeline (Monthly)**								
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th
1.	**Pre-construction phase** i. Land Acquisition									
	ii. Community sensitivity of the project									
2.	**Construction phase** 1. Environmental impacts									
	2. Biological impacts									
	3. Socioeconomic impacts including Labour Influx, Child Labour etc.									
	4. Public health including GBV/SEA									
3.	**Operation and maintenance phase** Air quality, noise and vibration, water quality, traffic & transportation, and health and safety									

ES 26 ESMP Cost Analysis

S/N	ESMP Activities (Monitoring)	Cost Estimate ($) Implementation	Cost Estimate (₦) Monitoring
1	***Pre-construction Phase***	20150	***15,400***
2	***Construction Phase***		
	Environmental Impacts	6110	5100
	Biological Impacts	2130	1700
	Socioeconomic Impacts	14970	9750
	Public Health Impacts	6300	5500
	Sub-Total	29510	22050
3	***Operation Phase***	11300	9400
	Total for Construction Impact Mitigation Implementation and Monitoring	60960	46850
4	***Institutional Capacity Reinforcement Programme***		
	Kogi State ACReSAL including the Officers of the relevant MDAs, Contractors Statff (Implementation)	2,500	4,500
	Community representative capacity building		5,500
5	**Total for Institutional Capacity**	2,500	10,000
Total for Mitigation Implementation and Monitoring		63460	56850
	10% Contingency	6346	5685
Grand Total		69806	62535

Foreign Exchange Rate Used: 757 Naira to 1 United States (U.S.) Dollar

ES 27 ESMP Recommendation

- Implementation of RAP before the commencement of the project.
- Capacity building of the project site committee members, PAP and other stakeholders to ensure effective and efficient contribution;
- Complete compliance with the mitigation measures in the ESMP at all stages of project implementation by all actors in project delivery; and
- Adequate awareness creation including training in the area of water harvesting as this will reduce surface run-off, especially during the rainy season thereby preventing flooding and subsequent erosion.
- Development of water-harvesting measures
- Extensive afforestation program

ES 28 ESMP Disclosures

After a review and clearance by the World Bank, the ESMP will be disclosed at the FMEnv, SME and the host LGA offices as well as at the World Bank website. The purpose will be to inform stakeholders about the project activities, impacts, and anticipated and proposed environmental management actions as well as to obtain the certificate of conformity from the Federal Ministry of Environment.

CHAPTER ONE

INTRODUCTION

1.1 Background

Nigeria experiences a diverse climate that ranges from arid in the north to tropical in much of the south and is listed among the countries most exposed to climate risks. Temperature increases of 0.03°C per decade were observed between 1901 and 2016, with more robust increases occurring over the last 30 years of 0.19°C per decade. It is also projected that the duration of heat waves will increase, with the most significant increases in the north. Projections indicate increased precipitation in all areas of Nigeria, but the number of days with extreme rainfall will also increase. Climate change is profoundly affecting Nigeria's economy. It is estimated that 2-11 per cent of Gross Domestic Product (GDP) could be lost due to a decline in agricultural productivity and activities related to agriculture. A drop of 10 to 25 per cent in agricultural productivity and a shrinking of GDP by 4.5 per cent by 2080. Agricultural yield has already fallen by 50 per cent in some parts of the north.

The country faces a high-water scarcity hazard level, with droughts expected to occur on average every five (5) years, with potentially increased frequency due to climate change. Water scarcity threatens food security, livelihoods, and productivity, exacerbating fragility and increasing violence risk. In addition, seasonal variability in rainfall has affected groundwater recharge, surface water availability for irrigation, power generation, navigation, and other economic activities. Persistent water shortages, especially in the extreme north, will exacerbate land degradation, desertification, and habitat loss. Inaction (business-as-usual) could cost the country an estimated 6 to 30per cent of GDP by 2050, affecting the livelihoods of millions of households. Better environmental and water resources management and resilience against disaster and climate risks (largely water-related) are needed to sustain economic growth and protect the most vulnerable.

In realising the preceding, the Federal Government of Nigeria (FGN) has embarked on an agro-climatic resilience in semi-arid landscapes (ACReSAL) project with the World Bank. The project will help Nigeria address critical challenges of regional desertification control and landscape management. It is proposed to be supported with initial financing from the World Bank to $700 million.

The project has four (4) components which include:

A. Dryland Management: Support Strategic Watershed Planning processes, prioritize major investments to address desertification and land degradation in northern Nigeria at the Federal and State levels and complement investments at the community level

B. Community Climate Resilience: Improve agro-climatic resilience at community and household levels by promoting locally adapted Sustainable Land and Water

Management (SLWM) strategies and through climate-smart approaches to agricultural and natural resource management

C. Institutional Strengthening and Project Management: Improve the enabling institutional and policy foundation for integrated landscape management in Nigeria from ACReSAL activities to longer-term national framework and support overall project monitoring and management

Contingency Emergency Response: This is a component that could be used to provide immediate support to an eligible crisis or emergency

The project implementation arrangement is designed to collaborate with Federal and State Ministries, Departments and Agencies (MDAs), Local Governments, Communities, and Civil Society Organizations (CSOs). Specifically, the MDAs include those responsible for Planning, Economy, Agriculture, Environment, Water Resources, Finance, Works, Transport, Power, and Emergency Response and those focused on Climate and Hydrological Information or Watershed/Basin regulations.

The ACReSAL project is being operationalised in 19 States and FCT in Nigeria's arid and semi-arid areas. These States include Adamawa, Bauchi, Kwara, Niger, Kaduna, Gombe, Sokoto, Nasarawa, Borno, Kebbi, Katsina, Plateau, Benue, Kogi, Kano, Jigawa, Taraba, Yobe, and Zamfara States and are located in the Sahel, Sudan Guinea Savanna and Southern Guinea ecosystem, characterised by dry semi-arid conditions, low precipitation, and sparse vegetative cover.

Kogi ACReSAL will trigger environmental and social risks that will be addressed through two national safeguards instruments already prepared under the project. The safegards instruments includes Environmental and Social Management Framework (ESMF) and a Resettlement Policy Framework (RPF). These framework instruments will, therefore, have to be translated to specifically cost, measurable, and monitorable actions for specific intervention sites through the preparation of site-specific management and action plansto manage associated project risks and triggered hazards.

ESMF: In general, this ESMF specifies the procedures to be used for preparing, approving and implementing (1) environmental/social assessments (ESAs,) and/or (2) environmental/social management plans (ESMPs, or alternately both an EMP and SMP) for individual civil works packages developed for each project. ESMPs are essential elements for Category B projects.

RPF: The RPF applies when land acquisition leads to the temporary or permanent physical displacement of persons, and/or loss of shelter, and /or loss of livelihoods and/or loss, denial or restriction of access to economic resources due to project activities. It sets out the resettlement and compensation principles, organisational arrangements, and design criteria to be applied to meet the needs of project-affected people. It specifies the contents of a Resettlement Action Plan (RAP) for each package of investments.

ESMP is site-specific and consists of a well-documented set of mitigation, monitoring, and institutional actions to be taken before and during implementation to eliminate all adverse environmental and social impacts, offset them, or reduce them to acceptable levels. Each ESMP also includes the measures needed to implement these actions, addressing the monitoring and institutional arrangements adequacy for the upper and lower watersheds in the intervention site.

GBV/SEA: This involves the mainstreaming of Gender Based Violence and Sexual Exploitation and Abuse risks under the project activities.

Kogi State was a beneficiary in the concluded and closed multi-sectoral Nigeria Erosion and Watershed Management Project (NEWMAP), which the World Bank, Global Environment Facility, the Special Climate Change Fund, and the Government of Nigeria financed. During the NEWMAP project activities, the initial studies, including the ESMP to address prioritised degraded land, were carried out. Some prioritised degraded lands, including the Omigbo Erosion and Flood Watershed site, could not be rehabilitated under NEWMAP. The Kogi State ACReSAL Project Management Unit of the Kogi State Ministry f Environment intends to apply a portion of the proceeds of the ACReSAL crediot to update the Omigbo Flood and Erosion ESMP studies before the intervention takes place.

1.2 Description of the Proposed Intervention and Corridor

The proposed intervention work (Fig 1.1) falls under component A of the ACReSAL project which is focused on dryland management and entails watershed management, landscape investment, and special ecosystems management. Specifically, it shall involve the fullgully heads reclamation of gully I at junction of Kabba-Obajana road and Kabba - Road 06 (Ogaminan Road); Gully II Oparo Road and Kano Road gully including, chanellization of Omigbo stream, contruction of 6 culverts (3 on Ogaminan Road (road 6), 1 on Kabba-Obajana road, 1 on Oparo road and the last 1 on Odo-Afin Road. Resilience activities of tree planting and installation of reinforced rectangular concrete drainages to direct all water flow to the constructed channel and eliminate multi-directional flow from the channel/gully head that causes damage to structures and distrupt retail economic activities during wet season. Other major activities along the channel includes provision of flexible gabion check dams' structures on mid-stream of the gullies to stabilize its longitudinal profile and control water velocity. Reinforced concrete structures of sufficient capacity will be provided at the upstream regions of gully/waterway I and gully/waterway II to harness the flow from upstream Kabba/Obajana, Oparo and Road 6 roads, respectively. These channels transverse flows away from the built-up areas of the site to the mid-stream and downstream. Flexible materials will be introduced at the midstream and downstream to protect the gully/waterway and reduce flow velocity/bed slope stabilization using flexible check dams at strategic chainages. The velocity across different section of the channells will be reduced from $6m^{3/s}$ to $3m^{3/s.}$ At the downstream, flexible materials with

rigid/reinforced concrete retaining wall structures and waterways banks embankment will be introduced to protect the waterway walls further reduce flow velocity to less than $2m^{3/s}$, and protect against likely erosion resulting from scouring at the outlet discharging point area of Omigbo River into the Opa River and to control downstream flooding around this confluence area of the Omigbo channel and the Opa River. Table 1.1 shows the associated activities of the gully.

Table 1.1 Associated Activities to the Chanellization

S/n	Associated Work	Location
1	Culverts	road 6, Kabba-Obajana road, Oparo Road and Odo-Afin Road
2	Tree planting	Along the flood plain of Omigbo Channel
3	Reinforced concrete structures	Upstream
3	Reinforced rectangular concrete drainages	All through the Gullies
4	Gabion check dam structure	On the Channels (Mid Stream)
5	Drop structures to dissipate energy and reduce flow velocity.	Side Drains
6	Constructions of drains at Kano Street and correction of wrongly termination drains aat Oparo	Kano Street and Oparo Street

Corridor Description:

There are three independent Gullies and two gully fingers. Gully 1 corridor start from near the junction of Kabba-Obajana road and Kabba - Road 06 (Ogaminan Road) 7^0 50' 19" N and 6^0 05' 09". The gully 1 an average width, depth, slope, length and area of 31m, 5m, 1.890%, 2443m, 50,909.7 m^2 respectively. The gully is more or less an urban storm channel with healing gully characteristics that has vegetation with economic trees along its corridor and floodplain. The gully has two (2) major stormwaters receiving chanells on Road 06 (Ogaminan Road) where culverts have been proposed. The vegetation along the channel is dense with undergrowth and mature trees that serve of breakers to the flow of water and also promote infiltration. Gully I has one finger (Gully 01 finger 1) with its gullyhead at 6°5.041'E, 7°50.212'N. Finger 01 of gully 1 has an average width, depth, slope, length and area of 20m, 6 m, 4.080%, 520 m, 8633.74 m^2. The gully was caused by the abrupt termination of a major concrete culvert receiving flow from the upstream.

Gully II corridor start from coordinates 6°4.632'E, 7°50.112'N. The average width, depth, slope, length and area are 27m, 5 m, 1.408%, 2375 m, 44109.3 m2. It is situated at Oparo road, which is a paved road is developing into higher dimension scale gully due to an abruptly terminated existing concrete double cell circular

culvert. The culvert collects runoff from some part of Kabba/Obajana road, Police Headquarter Road, other link roads and its environs. The culvert is undersized in addition to being wrongly terminated

Gully II – Finger I start from 6° 4.804'E, 7° 50.059'N, coordinates. It has an average width, depth, slope, length and area of 25 m, 4m, 1.52%, 297m, 1960.5 m2 is located along Kano Road which is highly populated with structures on both sides. The finger at that area was caused by the abruptly terminated drainage, which conveys flow from side drainages and undersized concrete singer cell circular culvert provide along Kano Road. The concrete drain is undersized and not in good condition. The flow from Gully I – Finger I discharges into Gully 1. The flow transverses to meet Gully II, where they finally discharge into Opa River.

Gully III with gully head coordinates 6° 4.447'E, 7° 49.005'N has an average width, depth, slope, length and area: 10m, 3.5m, 1.54%, 500 m, 7798.9 m2 respectively. It is a tributary of Opa River.

It must be stated that the current corridor of Gully 1, Gully 1 Finger 01, gully II and gully II finger 01 are well vegetated. There are encroachments into the floodplain and the outlet into the Opa River is an expanded floodplain. However, there is need to provide waterways banks embankment at all sides of both the Omigbo and Opa River to control downstream flooding around this confluence area.

Channalization Activities

The project construction activities for the Omigbo River channelization/gully erosion site will consist of:

a. Installation of reinforced rectangular concrete drainage in Waterway I from Chainage CH 0+600 to CH 2+443;
b. Installation of reinforced rectangular concrete drainage in Waterway I Finger I from Chainage CH 0+000 to CH 0+500;
c. Installation of gabion flexible retaining wall, as embankments on the banks of the riverbanks, in Waterway I from CH0+600 to CH0+000, the outfall;
d. Installation of reinforced rectangular concrete drainage in Waterway II from Chainage CH 1+175 to CH 2+375;
e. Installation of gabion flexible retaining wall combined with concrete retaining wall as embankments on the banks of the riverbanks in Waterway II from CH1+175 to CH0+000, the outfall (Opa River);
f. Installation of not less than 800 mm diameter boulders along the bed of Waterways I and II to stabilize the bed slopes, placed at some sections and intervals;
g. Installation of 3 m width of 7 Nos. Flexible gabion check-dams across Waterways I and II to stabilize the bed slopes, placed at some sections and intervals;
h. Installation of gabion flexible retaining wall combined with reinforced concrete retaining wall as embankments on the banks of the riverbanks in Waterway III from CH0+002 to CH0+500 to the outfall (Opa River);

i. Installation of reinforced rectangular drainage at the right side of Lokoja/Obajana road from Chainage CH0+150 to CH1+700 to harness flows from the road and its environs;
j. Installation of reinforced rectangular drainage at the right side of Oparo road from Chainage CH0+825 to CH1+700 to harness flows entering the road and the ones generated within environs;
k. Installation of reinforced rectangular drainage at the left side of Road 6 from Chainage CH0+000 to CH2+750;
l. Installation of reinforced rectangular drainage at both sides of Road 5 from Chainage CH0+000 to CH0+874;
m. Installation of reinforced rectangular drainage at the right side of Road 7 from Chainage CH0+000 to CH0+125;
n. Installation of reinforced rectangular drainage at both sides of Kano Road from Chainage CH0+000 to CH1+419;
o. Installation of reinforced rectangular drainage at both sides of Odo-Aofin Road from Chainage CH0+000 to CH0+150;
p. Construction of seven (7) nos counter dams (varying width each) at Waterway I and II from CH0+600 and CH1+175, respectively, to the outfall. This is to ensure the stabilization of the gully bed and banks;
q. Construction of culverts at some junctions to transmit flow from one drainage to another;
r. Construction of cover slabs at entrances to aid accessibility;
s. Reconstruction of undersized culverts along the waterway, failed and undersized drainage channel along Kano Road, and
t. Initiation of Climate Resilience activities such as Tree planting, Rain harvesting, afforestation, Nurseries

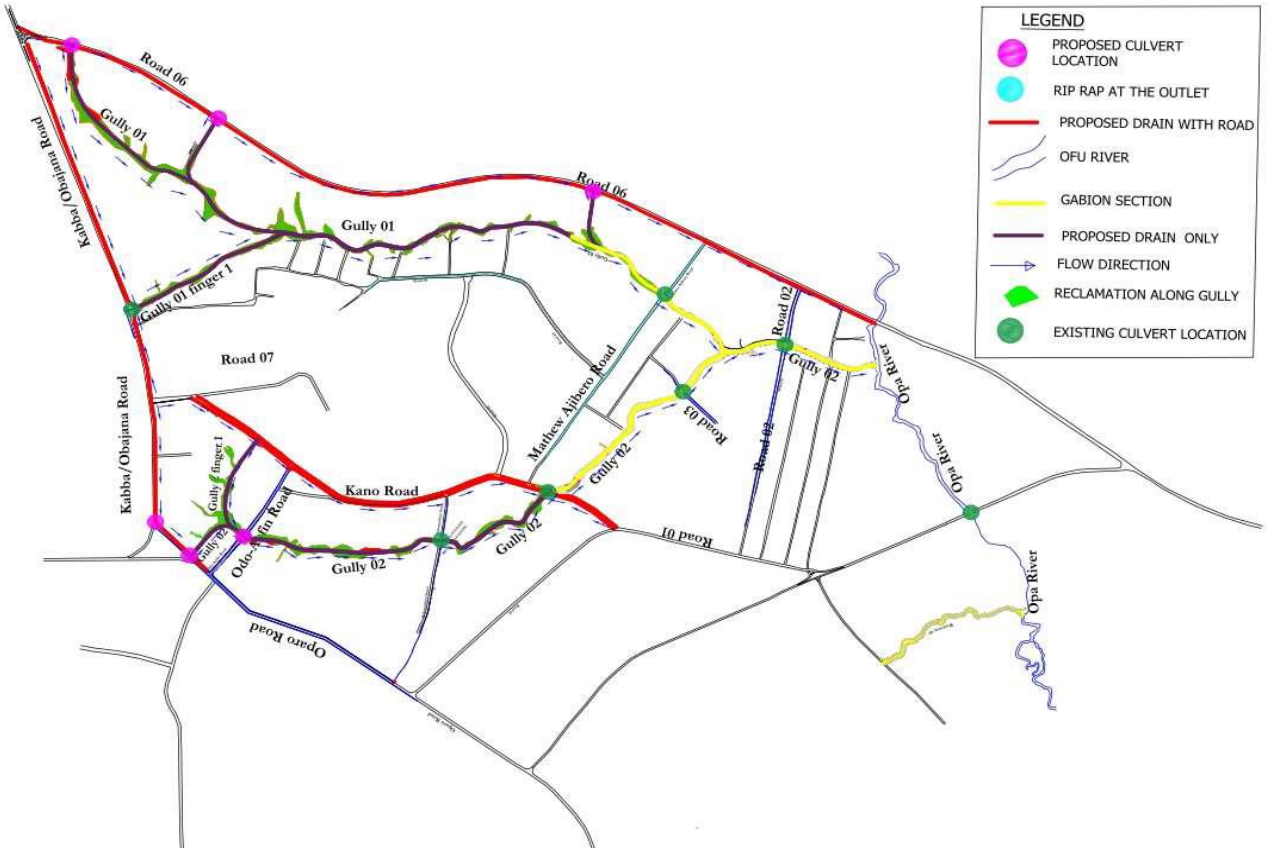


Fig 1.1: Intervention Layout

1.3 Rationale for Kogi State ACReSAL Intervention

Although the Omigbo River channel waterway has existed for many years since the town's inception, the river flood became severe over ten years ago when the runoff from the environs increased. Even though the Local and State Governments have carried out several interventions at different times, the problems persisted. Lives have been recorded to be lost, residential buildings collapsed, families displaced, and several properties lost to the gully and flood menace. The situation at the study area during the peak flow poses a greater danger as the gullies are fast encroaching on the major (Kabba-Obajana, Opara and Kano) roads. This poses a grave danger if decisive actions are not urgently taken. In other words, once the gully erosion and flooding problems are adequately appraised and appropriate control structures are introduced, the yearly colossal losses will be mitigated. Also, life and property will be safeguarded, and public infrastructures will be protected.

1.4 Rationale for the ESMP

At project preparation, six Environmental and Social standards framework instruments were prepared: an Environmental and Social Management Framework (ESMF), a Resettlement Policy Framework (RPF), an Integrated Pest Management Plan, a Stakeholders engagement Plan, a Labour Management Procedure and a Security Risk Management Framework. These ESF instruments are frameworks that need to be translated into specific cost, measurable, and monitorable actions for

specific site intervention by preparing site-specific management and action plans; thus, the need for the Omigbo ESMP must be balanced.

The civil work activities, considering the nature of the work required to rehabilitate the Omigbo flood watershed, and the World Bank ESS1 Assessment and Management of Environmental and Social Risks and Impacts will apply. The Nigeria EIA Act will also apply due to the envisaged civil works. Thus, there is a need to prepare an Environmental and Social Management Plan (ESMP) to address all environmental and social concerns related to the proposed construction and channelization activities.

Some potential impacts that may arise during the proposed works include the generation of hazardous and construction wastes. Other impacts could arise from noise/air pollution, accidents from the movement of equipment and materials to the site, occupational health & and safety risks, risks associated with labour influx (security threat, gender-based violence (GBV) in particular Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) due to labour influx, increase in STIs/STDs), community health and safety issues, arrangements for employment and accommodation of workers to be engaged in project activities, and issues related to working conditions (including about periods of sickness and quarantine), grievance and disturbance to physical and cultural resources among others.

1.5 Objective and Scope of the Consultancy

The objective of the consulting services is to update the Environmental and Social Management Plans (ESMPs) for Omigbo Channelization sites in Kogi State in line with the World Bank/IDA guidelines. ESMP assist in eliminating adverse environmental and social impacts, offsetting them, or reducing them to acceptable levels. The ESMP also includes the measures needed to implement these actions, addressing the adequacy of the monitoring and institutional arrangements for the upper and lower watersheds in the intervention sites.

The consultant is expected to develop an ESMP consisting of a well-documented set of mitigation measures, monitoring, and institutional actions to be taken before and during implementation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. It should also include the measures required to implement these actions, costing, and responsibility, addressing the adequacy of the monitoring and institutional arrangements in the intervention site.

Tasks of the Consultant include the following:

i. Detailed description of the project, which will clearly identify the specific environmental and social issues related to it, including all risks and health and safety aspects.
ii. Description of the project location and sensitive environmental and social features. It includes a map of sufficient detail, showing the project site and the area that may be affected by the project's direct, indirect, and cumulative impacts. (i.e. area of influence)

iii. Analysis of the alternatives considered, justification and environmental and social foundations of the project location. Consider all types of alternatives related to overall approach and project design, including the "no action" alternative

iv. Identifying the policy, legal and administrative framework relevant to the project. Review the local material/labour availability, operational and policy/legal requirements etc.

v. Describe the existing status of the sub-watershed and gullies;

vi. Identify the environmental and social issues/risks associated with the existing conditions;

vii. Select and measure appropriate baseline indicators (for example, m^3/sec of runoff collected in the sub-watershed during a heavy hour-long rainfall);

viii. Develop a plan for mitigating environmental and social risks associated with construction and operation in the gully in consultation with the relevant public and government agencies; Identify feasible and cost-effective measures that may reduce potentially significant adverse environmental and social impacts to acceptable levels;

ix. Develop a time-bound plan for mitigating environmental and social risks associated with sub-watershed management in consultation with the relevant public and government agencies; Identify feasible and cost-effective measures that may reduce potentially significant adverse environmental and social impacts to acceptable levels;

x. Identify monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed and the mitigation measures described above (in a-e);

xi. Provide a specific description of institutional arrangements: the agencies responsible for carrying out the mitigation and monitoring measures (e.g., for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting, and staff training) and the contractual arrangements for assuring the performance of each implementing agency;

- Define technical assistance programs that could strengthen environmental management capability in the agencies responsible for implementation;
- Provide an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and
- Provide the expected capital and recurrent cost estimates and sources of funds for implementing the ESMP and inform accordingly the design consultants so that these costs are duly taken into consideration in the designs.
- The consultant shall also document how to manage risk related toGender Based Violence (GBV) particularly Sexual Exploitation and Abuse (SEA) taken cognisance of (i) labour influx implications (ii) Security issues, , (iii) project GBV accountability and response framework etc;

The following socio-economic issues shall be addressed in the ESMP:

- A summary of the impacted communities for the project: location, access, population (number, demographic and social characteristics); economy (employment rate, income distribution); services (types, capacity, and adequacy) and housing. Concern

is the ability to provide work force, service new development and absorb and adjust to growth (worker/family).

- A summary of the views of the population including vulnerable groups, determined through thoroughly documented discussions with local communities. These meetings and discussions must be documented and should show how issues and problems raised are or will be resolved (note that a Resettlement Action Plan (RAP) could be developed for the Site, and this is covered under separate TORs).
- Cultural: Summarize the possible effects of the project on historical/archaeological sites, heritage/artefacts, native religious or harvest sites of the affected communities and identification or development of mechanisms for handling chance findings.

Information will be gathered from field surveys and secondary data sources (interviews, structured questionnaires, in-depth interviews and focus group discussions).

1.6 Approach/Methodology for the ESMP Study

The approach and methodology for the ESMP involved the following:

- desktop study; review of design reports and literature;
- reconnaissance visits and site inspections;
- public/stakeholder consultations and involvement;
- data collation, analysis and reporting;
- identification and assessment of environmental and social impacts;
- mitigation measures;
- monitoring and management plan.

1.6.1 Review of Available Literature

Information from relevant documents from the project proponents, and other documents on the projects were of immense help to the ESMP study. Key documents reviewed for this study include:

- The initial Omigbo ESMP prepared under NEWMAP
- ACReSAL - Environmental and Social Management Framework (ESMF);
- Resettlement Policy Framework (RPF);
- Integrated Pest Management Plan;
- Stakeholders' Engagement Plan;
- Labour Management Procedure;
- Security Risk Management Framework;
- ACReSAL Project Appraisal Document (PAD);
- ACReSAL Project Implementation Manual (PIM);
- Intervention design; and
- All information collected in the past for the preparation of ESMP for NEWMAP/ACReSAL or related projects in the state

1.6.2 Field Surveys / Site Inspection and Public/Stakeholder Engagement

The first field surveys for the proposed intervention were carried out in September 2020. The visits include inspections of the proposed intervention areas to confirm the environmental and social issues and conditions to be affected or are likely to develop from the implementation of the project. This enable the consultant to appraise the project area of influence, the nature of the biophysical environment to be affected (especially current land and water use), the relevant baseline data was also obtained. The socio-economic characteristics of the environment to be potentially impacted by the project including the neighbouring rural communities, current infrastructural status in the project area wereobtained. The second field survey for the proposed intervention was carried out in August 2023. This exercise was used to update the biophysical and socio-economic data acquired in 2020. The exercise also involves consultation with relevant stakeholders to obtain their comments and update their concerns on the proposed project concerning the potential environmental and socio-economic issues while also assuring them on the progress made to address the issue in a more holistic manner by the ACReSAL project.

1.6.3 Public/Stakeholder Identification and Consultations

The project proponents were engaged to understand the project scope, design and implementation and to obtain relevant project documents. Key primary and secondary stakeholders were also be consulted to obtain their comments and concerns on the proposed project concerning the potential environmental and socio-economic issues. Details of consultations are provided in Chapter 4 of the report.

CHAPTER TWO
INSTITUTIONAL AND LEGAL FRAMEWORK

2.0 Introduction

This chapter discusses Nigeria's national policy, legal, regulatory and administrative frameworks that steer the environmental sustainability of developmental activities in the country. The chapter also provides a detailed discussion of the local laws and policies on such developmental activities. Specifically, Kogi State policies, legislation, regulations and guidelines on environmental issues that are applicable to the proposed projects by the Kogi State ACReSAL are focused in the chapter. Also, the World Bank Environmental Standards (ES) were ascertained and those that applied by the proposed Kogi State ACReSAL project in Omigbo Channelization intervention are discussed. In summary, a number of national and local environmental guidelines applicable to the operations of the project in Kogi State are specifically discussed in the chapter.

2.1 Federal / Kogi State Policy, Legal, Regulatory and Administrative Frameworks

Projects of environmental concerns such as those within the scope of the ACReSAL project are expected to meet the requirements laid by governmental administrative frameworks from the federal to the state levels. The Federal and Kogi State policies, legal and administrative machinery that are relevant to the project are presented in detail in Table 2.1.

Table 2.1: Federal and Kogi State Policies, Legislation, Regulations and Guidelines

Federal Policies				
S/N	**Policy Instrument**	**Year**	**Provision**	**Relevance to the Proposed Project**
1	National Policy on the Environment	1989 revised 1991, 1999 and 2017	This describes both the conceptual and theoretical framework and strategies for achieving sustainable development in Nigeria. The policy identifies key sectors requiring the integration of environmental concerns and sustainability with development. The goal of the policy is to achieve sustainable development and seeks in particular to: i. Enhance the quality of the environment; ii. Promote the sustainable use of natural resources; iii. Restore and maintain the ecosystem and ecological processes and preserve biodiversity; iv. Raise public awareness and promote understanding of linkages between environment and development; and v. Cooperate with government bodies and other countries and international organizations on environmental matters	The National Policy on the Environment is relevant to the proposed project as it provides the frameworks for the Ministry of Environment's participation in the project through approval of the environmental and social safeguards documents and monitoring activities to ensure sustainable project activities.

2	National Erosion and Flood Control Policy	2005	This addresses the need to combat erosion in the country through the procedure outline in the National Action Plan for Flood and Erosion and Technical Guidelines.	The policy is the platform under which the ACReSAL project could address flood issues such as being experience in Omigbo catchment.
3	Agricultural Promotion Policy-The Green Alternative and the National Agricultural Technology and Innovation Policy (NATIP)	(APP-2016-2020) and (2022-2027).	The policy develops the framework for facilitating business alliances, promotion of greater farmers-agri-business linkages, and support for critical infrastructure in the value chain development. The policy thrust promotes climate-smart agriculture through the following strategies: i. Increasing public awareness on climate-smart agriculture; ii. Improving management of land, water, soil and other natural resources; iii. Strengthening of Institutional linkages and partnerships for ensuring climate-smart agricultural governance, policies, legislations and financial mechanisms; iv. Conducting Environmental impact assessment on major agricultural programs; v. Promoting the use of renewable energy with the involvement of the private sector; vi. Government facilitating the production and use of soil maps to improve land use and management practices; and vii. Government promoting the increased adoption of global best practices in handling climate change, including the aspects of adaptation, mitigation and carbon credit	The policies are relevant to component 4 of the ACReSAL project especially on climate climate-smart approaches to agricultural and natural resource management.
3	National Gender Policy	*2006*	The goal of the National Gender Policy is to build a just society devoid of discrimination, harness the full potential of all social groups regardless of sex or circumstance, promote the enjoyment of fundamental human rights and protect the health, social, economic and political well-being of all citizens in order to achieve an equitable rapid economic growth; evolve an evidence-based planning and governance system where human, social, financial and technological resources are efficiently and effectively deployed for sustainable development.	The policy is relevant to the project as it provides guidelines on a non-discriminatory approach to development.
4	National Policy on Climate Change	*2012*	The strategic goal of the Climate Change policy is to foster low-carbon, high-growth economic development and build a climate-resilient society through the attainment of the following objectives: i. Implement mitigation	The policy is applicable as it compliments ACReSAl component four on Climate Resilience: Improve agro-climatic resilience at community and household levels by promoting locally adapted Sustainable Land and Water Management

			measures that will promote low carbon as well as sustainable and high economic growth; ii. Enhance national capacity to adapt to climate change; iii. Raise climate change-related science, technology, research, and development to a new level that enables the country to better participate in international scientific and technological cooperation on climate change; iv. Significantly increase public awareness and involve private sector participation in addressing the challenges of climate change; and v. Strengthen national institutions and mechanisms (policy, legislative and economic) to establish a suitable and functional framework for climate change governance. The policy elaborates on adaptation and mitigation programs and actions in key sectors including energy, agriculture, water, transport and human settlement.	(SLWM) strategies and through climate-smart approaches to agricultural and natural resource management
Federal Legal/Regulatory Instrument				
1	Environmental Impact Assessment Act, Cap E12,	LFN 2014	The EIA Act sets out the general principles, procedures and methods to enable the prior consideration of environmental impact assessment on certain public or private programs. It further provides that before a decision is taken to undertake or authorize the undertaking of any activity, those matters that may likely or to a significant extent affect the environment or have an environmental effect on those activities shall first be taken into account. There are nineteen thematic areas of mandatory study activities. The drivers of deforestation and forest degradation for which mandatory study is required include agriculture, infrastructure, logging and conversion of forest to other land use, mining and housing. Environmental sensitivity and the area coverage of a program are some of the criteria for an EIA	Relevant to ACReSAL project development of safeguard's instrument and implementation especially, the ESIA and ESMPs of which the Omigbo ESMP is not an exception.
2	The National Guidelines and Standards for Environmental Pollution Control in Nigeria	1991	These represent the basic instrument for monitoring and controlling pollution in Nigeria	Relevant to the proposed Omigbo construction activities which have the potential for polluting the environment if necessary guidelines and mitigation measures outlined in this ESMP are not adhered to.
3	National Guidelines on Environmental	*(1999)*	This establishes the requirements for an Environmental Management	Relevant to ACReSAL project development of safeguard's instrument

	Management Systems		System (EMS) in all organizations/facilities in Nigeria.	and implementation especially, the ESIA and ESMPs of which the Omigbo ESMP is not an exception.
4	National Air Quality Standard Decree No. 59 of	*1991*	This defines the levels of air pollutants that should not be exceeded to protect public health.	Relevant to the proposed Omigbo construction activities which have the potential for polluting the environment if necessary, guidelines and mitigation measures outlined in this ESMP are not adhered to.
5	The National Environmental Standards and Regulations Enforcement Agency Act (NESREA Act)	*2007*	This makes provision for solid waste management and its administration and prescribes sanctions for offences or acts, which run contrary to proper and adequate waste disposal procedures and practices.	Relevant to ACReSAL project development of safeguard's instrument and implementation especially, the ESIA and ESMPs of which the Omigbo ESMP is not an exception. It is also relevant for monitoring the bio-physical components of the environment.
6	Child Rights Act	*2003*	The Act serves as the legal documentation and protection of Children's rights and responsibilities in Nigeria. It also serves as legislation against Human trafficking since it forbids children from being "separated from parents against their will, except where it is in the best interests of the child.	Relevant to ACReSAL and indeed Omigbo construction activities and project implementation especially for child trafficking for labour activities in construction site.
7	Employee's Compensation Act	*2010*	The Act makes provisions for compensations for any death, injury, disease or disability arising out of or in the course of employment; and for related matters.	Relevant to protect the right of workers at all levels and stages in the case of unforeseen circumstances of death and disability
8	Land Use Act	*1978 Modified 1990 and 2004*	This is the primary legal means to acquire land in the country. The Act vests all land in the territory of each state in the federation in the Governor of the State and requires that such land shall be held in trust and administered for the use and common benefit of all Nigerians in accordance with the provisions of this Act	Relevant to the project in the sense that there will be need to acquire land on the right of way of the Omigbo channel
9	Criminal Code		The Nigerian Criminal Code makes it an offence punishable with up to 6 months imprisonment for any person who: • Violates the atmosphere in any place so as to make it noxious to the health of persons in general dwelling or carry-on business in the neighbourhood, or passing along a public way: or • Engages any act which is, and which he knows or has reason to believe to be likely to spread the infection of any disease dangerous to life, whether human or animal.	The code is relevan to the project as it spelt out punishment for any act that could put the larger community in health crises. It is binding on the contractor not to engage in any act or process that could geopadize the health of the people.
10	Endangered Species Act	1985	This provides for conservation and management of wildlife in Nigeria and the protection of some of her endangered species from extinction as a result of over exploitation.	Relevant to Omigbo channelization project by ensuring the protection of endanger species of flora and fauna. The Omigbo channel traverse vegetated areas within an urban setteing and could habour some rare species.
11	FEPA/ FMEnv. EIA Procedural guidelines	1995	These indicate the steps to be followed in the EIA process throughout program life cycle.	Ensure proper steps are followed in the preparation and approval of environmental inpact assessment documents.
12	S.I.15 National Environmental	1991	Regulates the collection, treatment, and disposal of solid and hazardous	Protect the environment from the use of hazardous material especially during

	Protection (The Management of Solid and Hazardous Wastes Regulations)		waste for municipal and industrial sources and give the comprehensive list of chemicals and chemical waste by toxicity categories	construction phase.
13	S.I.9 National Environmental Protection (The NEP (Pollution Abatement in Industries and Facilities Generating Waste) Regulations)	1991	These are the imposed restrictions on the release of toxic substances and requirements of Stipulated Monitoring of pollution to ensure that permissible limits are not exceeded during and after the program.	Relevant as it imposed restrictions on the release of toxic substances.
15	National Health Act	2014	It provides a legal framework for the regulation, development, and management of Nigeria's Health System	Relevant as it provides basic regulation on the management of Nigeria's health including the health of the workers who will work on the Omigbo channelization project
16	Environmental Sanitation Edits, Law and Enforcements		This deals with the general environmental health and sanitation. Implementation and enforcement in the state.	Relevant as it affect the general environmental management of the project area
17	Workmen Compensation Act	1987 Revised 2010	This provides for occupational health and safety.	It is relevant as workers will be involved and their safety need to be safeguarded
18	Violence Against Persons (Prohibition) Act	2015	The Act was necessitated as a result of agitations for protection of persons against different forms of violence. The Act has strengthened advocacy against rape, female genital mutilation, partner battery, stalking, harmful widowhood practices while prohibiting all forms of violence, including physical, sexual, psychological, domestic, harmful traditional practices and discrimination against persons. It also provides maximum protection and effective remedies for victims and punishment of offenders. The Act is a key instrument for addressing GBV in Nigeria.	Relevant as it protect both the contractor and the workers from both internal and external violence.
Federal Institutional Framework				
1	The Federal Ministry of Environment (FMEnv)		The FMEnv is the government agency charged with the responsibility to administrate and enforce environmental laws in Nigeria. The FMEnv prohibits public and private sectors from embarking on major developmental programs or activities without due consideration, at early stages, for environmental and social impacts. In addition to the EIA Act, the Ministry has produced sectorial including sectorial guidelines on infrastructure development which will be duly considered in the implementation of this program	The project is domiciled in the Ministry, The Ministry will provide approval for the safeguards instrument prepared, will be involved in monitoring activities and provide the leadership in mainstreaming environmental activities into the project.
2	Federal Ministry of Agriculture and Rural Development		The Federal Ministry of Agriculture and Rural Development (FMARD) has the responsibility of optimizing agriculture and integrating rural development for the transformation of the Nigerian economy, to attain food	Will ensure the land reclaimed is put to proper use sustainably.

			security and position Nigeria as a net food exporter for socio-economic development.	
3	The Federal Project Management Unit (FPMU) ACReSAL		The Federal Project Management Unit (FPMU) headed by a Federal Coordinator hosted by FMEnv is responsible for the overall coordination of the project	The general coordination of the ACReSAL project.
Kogi State Policy & Regulatory Instruments				
1	Kogi State Ministry of Environment		• This Ministry is saddled with the responsibility for environmental management including degradation prevention and pollution reduction	The Kogi-State ACReSAL is domicile in the Ministry and the Ministry will be involved in monitoring activities
2	Kogi State Environmental Protection Board		• This arm of government is responsible for environmental protection, proper waste management and disposal.	Will be involved in environmental monitoring activities
3	Kogi State Sanitation & Water Management Board		• This board is saddled with the overall environmental sanitation and water management responsibilities with a special focus on potable water.	Ensure compliance with sanitation regulations at the project site and the sustainable use of water resources during the phases of the project
4	Kogi State Town Planning & Land Development		• • This agency is charged with the responsibility for land use allocation, gazette management and acquisitions and public land acquisition projects.	Ensure setback are maintained and project put the setback to sustainable use
5	Kogi State Project Management Unit (Kogi ACReSAL SPMU) ACReSAL		The Kogi State Project Management Unit (Kogi-SPMU) headed by the State Coordinator and hosted by the Ministry of Environment is responsible for the coordination of ACReSAL projects in Kogi State. The coordinator is thus directly responsible for coordinating activities of the Site intervention, including the implementation of this ESMP.	The Kogi ACReSAL SPMU is the proponent.

2.2 Development Financial Institutions (DFIs) Environmental and Social Requirements

The commitments of DFIs to Environmental and Social Governance in program financing are embedded in developed standards known as safeguards policies. This includes the ESS of World Bank and IFC performance Standards amongst others.

2.2.1 World Bank Environmental and Social Standards Triggered by Kogi State ACReSAL Project

The World Bank's Environmental and Social Standards are the cornerstones of the Bank's support for sustainable poverty reduction. The main objective of these policies is to prevent and mitigate undue harm to people and their respective environment during or as a result of the developmental processes. These policies also provide

guidelines for the Bank and the borrower staff in the identification, preparation, and implementation of programs and programs. Table 2.2 provides the World Bank Environmental and Social Standards triggered by ACReSAL and those applicable to the Kogi State ACReSAL Omigbo Channelization site.

Table 2.2: World Bank Environmental and Social Standards Applicable to Kogi State-ACReSAL Omigbo Channelization Site

Environmental and Social Standards (ESS)	Description	Applicability to the proposed KogiState ACReSAL project	
		Yes	No
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	This overarching standard sets out the Borrower's responsibilities for assessing, managing and monitoring E&S risks and impacts associated with each stage of a program supported by the Bank through Investment Project Financing, to achieve E&S outcomes consistent with the Bank's ESS.	[x]	[ ]
ESS 2: Labour and Working Conditions	ESS 2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a program by treating workers in the program fairly and providing safe and healthy working conditions	[x]	[ ]
ESS 3: Resource Efficiency and Pollution Prevention and Management	ESS 3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels	[x]	[ ]
ESS 4: Community Health and Safety	ESS 4 recognizes that program activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to program activities. Then movement and use of heavy machines, and influx of labour may increase exposure to health and safety risks and impacts in the community. Additionally, because of project activities including excavation, topsoil removal, and vegetation clearing, the communities may experience an acceleration or intensification of the effects of climate change. Security risks due to construction activities resulting in the influx of labour, the possible presence of expatriates, presence of armed security personnel.	[ ]	[X]
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	ESS 5 recognizes that program-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. This may cause physical or economic displacement.	[x]	[ ]
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS 6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development.	[x]	[ ]
ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	This ESS applies to a distinct social and cultural group identified as "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, Indigenous ethnic Minorities etc."	[ ]	[x]
ESS 8: Cultural Heritage	ESS8 sets out measures designed to protect cultural heritage throughout the program life cycle.	[x]	[ ]
ESS 9: Financial Intermediaries	This ESS applies to Financial Intermediaries (FIs) that receive financial support from the Bank	[ ]	[x]
ESS 10: Stakeholder Engagement	This ESS recognizes the importance of open and transparent	[x]	[]

and Information Disclosure	engagement between the Borrower and program stakeholders as an essential element of good international practice.		

2.2.2 World Bank Environmental, Health and Safety (EHS) Guidelines

The World Bank Group EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The EHS Guidelines are designed to assist managers and decision-makers with relevant industry background and technical information. This information supports actions aimed at avoiding, reducing, and controlling potential EHS impacts during the construction, operation, and decommissioning phase of a project.

The applicable World Bank Group EHS Guidelines to the ACReSAL project are:
General Environmental, Health and Safety (EHS) Guidelines (2007)

- EHS Guidelines for Forest Harvest Operations (2007)
- EHS Guidelines for Annual Crops Production (2016)
- EHS Guidelines for Perennial Crops Production (2016)
- EHS Guidelines: Environmental Wastewater And Ambient Water Quality; Stormwater Management (2007)

2.2.3 International Conventions and Agreements

Several international regulations, protocols, treaties and conventions have been signed by countries of the World. The conventions are aimed at halting environmental degradation and protecting human health against possible adverse effects. Expectedly, Nigeria subscribes to a number of these International Regulations and Conventions that are related to Environmental Protection. Table 2.4 shows some of the international conventions, agreements and protocols to which Nigeria is a signatory and applicable to the Kogi State ACReSAL project sites.

Table 2.3: International Conventions, Agreements and Protocols to which Nigeria is Signatory and Applicable to the Proposed Kogi State ACReSAL Project

International conventions, agreements and protocols	**Applicable to ACReSAL**		**Applicability**
	Yes	No	
Both the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol for Control of Substances that deplete the ozone layer.	[x]	[ ]	Construction works activities may extend to the vegetation cover area.
Basel Convention on the prevention of transboundary movement of hazardous wastes and their disposal.	[x]	[ ]	Hazardous chemicals might be used as pesticides
Convention on the prevention of the international trade in endangered species (CITES).	[ ]	[x]	No endangered species(s) of any kind was identified in the program area.
Convention on Biodiversity.	[x]	[ ]	Agricultural activities may extend to forest areas. This will disturb biodiversity in the area.
Convention on climate change.	[x]	[ ]	Proposed activities will result in both systemic and cumulative environmental change; thereby contributing to a sustained increase in temperature.
Convention on Desertification.	[x]	[ ]	Proposed activities may result in deforestation.
Convention on Persistent Organic Pollutants.	[x]	[ ]	Organic pollutants may be used for agricultural activities.
World Health Organization (WHO) Health and Safety Component of EIA, 1987.	[x]	[ ]	Proposed activities may be injurious to man and the environment

Table 2.4: Gap between National Legislations, Policies and Regulations and the World Bank Policies

Category	Nigerian Law	World Bank ESS	Measures to Filling the Gaps
Assessment and Management of Environmental and Social Risks and Impacts	Nigeria require the preparation of an EIA to address all environmental and social risk issues for all developmental project	The World Bank ESS 1 also stipulated the preparation of an ESIA for its developmental-assisted project. For proper Assessment and Management of Environmental and Social Risks and Impacts	The World Band and the Nigeria Law on the management of the environment are similar and clearly documented
Labour and W**orking Conditions**	The labour and working conditions are stated in various acts, policies, legislations and regulation guidelines.	The World Bank ESS 2 properly document the Labour and Working Conditions to be used for its assisted projects.	The ESMP has synchronized the various Policies, Legislation, Regulations and Guidelines on Labour and working conditions.
Resource Efficiency and Pollution Prevention and Management	The Nigeria Resource Efficiency and Pollution Prevention and Management and stated in various acts, policies, legislations and regulation guidelines.	The World Bank ESS 3 Resource Efficiency and Pollution Prevention and Management documented the approaches to be used for resource efficiency and pollution prevention to be used for its assisted projects.	The ESMP has synchronized the various Policies, Legislation, Regulations and Guidelines on Resource Efficiency and Pollution Prevention and Management. In any case, both the World Bank and the Nigeria legislation have adequate guidelines for managing pollution.
Community Health and Safety	Community Health and Safety are also well documented in various acts, policies, legislations and regulation guidelines.	The World Bank ESS 4: Community Health and Safety properly documented the activities to ensure the community health and safety	The ESMP has synchronized the various Policies, Legislation, Regulations and Guidelines on Community Health and Safety. Both the World Bank safeguards and the Nigeria legislation safeguard the community health and safety of the people in project areas.
Category	**Nigerian Law**	**World Bank ESS 5**	**Measures to Filling the Gaps**
Minimization of resettlement	No requirement to consider all options of project design in order to minimize the need for resettlement or displacement	Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs	Design of footprints of project-related activities, will be undertaken so as to minimize resettlement.
Information and Consultation	It is lawful to revoke or acquire land by the governor after issuance of notice. No consultation is required.	PAPs are required to be meaningfully consulted and participate in the resettlement process	PAPs shall be meaningfully consulted and engaged in the resettlement process
Timing of Compensation	The law is silent on timing of payment	This requires that compensation implementation will take precedence before construction or displacement	Compensation and resettlement implementation to take place before construction or displacement
Livelihood restoration	Makes no proscription on livelihood restoration measures	It requires that vulnerable PAPs have to be rehabilitated	Livelihood restoration measures will be put in place for vulnerable PAPs
Grievance Process	The land use and allocation committee appointed by the Governor is vexed with all disputes/grievances and compensation matters	This requires that a grievance redress mechanism be set early constituting the representative of PAPs and, prefers local redress mechanism. The law court is the last resort when available mechanism or outcome is unsatisfactory to PAP	A grievance redress committee (GRC) shall be established early and existing local redress process shall be considered to address issues of project induced grievances. PAPs or their representatives shall be members of the GRC.
Community land with customary right	Compensation in cash to the community, chief or leader of the community for the benefit of the community	Land for land compensation or any other in-kind compensation agreed to with the community	Land for land compensation or any other in-kind compensation agreed to with the community
Agricultural land	Entitled to alternative agricultural land[1]	Land for land compensation	Land for land compensation
Fallow land	No compensation	Land for land compensation	Land for land compensation

[1] Nigerian Land Use Act 1978, (2004 LFN)

Statutory and customary right Land Owners	Cash compensation equal to the rent paid by the occupier during the year in which the right of occupancy was revoked	Recommends land-for-land compensation or other form of compensation at full replacement cost.	Recommends land-for-land compensation or other form of compensation at full replacement cost.
Land Tenants	They are entitled to compensation based upon the amount of rights they hold upon land.	Are entitled to some form of compensation whatever the legal recognition of their occupancy**.**	Are entitled to some form of compensation whatever the legal recognition of their occupancy**.**
Squatters	These are not entitled to compensation for land, but are entitled to compensation for crops.	These are to be provided with resettlement assistance in addition to compensation for affected assets; but no compensation for land	Are to be provided resettlement assistance in addition to compensation for affected assets; but no compensation for land
Owners of "Non-permanent" Buildings	Cash compensation based on market value of the building (that means depreciation is allowed)	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.
Owners of "Permanent" buildings, installations	Resettlement in any other place by way of reasonable alternative accommodation or Cash Compensation based on market value.	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.	They are entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.
Biodiversity Conservation and Sustainable Management of Living Natural Resources	The Nigeria laws on Biodiversity Conservation and Sustainable Management of Living Natural Resources well documented in various acts, policies, legislations and regulation guidelines.	The World Bank ESS 6 properly document the Biodiversity Conservation and Sustainable Management of Living Natural Resources within the princint of its project area.	The approach of the Nigeria National legistlations and policies and that of the World Banl ESS 6 are similar in the biodiversity conservation and sustainable management of the living natural resources.
Cultural Heritage	Although there are legistlations to safeguards cultural heritage in Nigeria, the implementation of such legistlations and policies is very weak.	The World Bank ESS 8 properly documented the steps to take for chance find as well as to safeguards Cultural and historical sites and heritage.	The Kogi State ACReSAL will follow the World Bank ESS 8 on the implementation of the cultural heritage.
Stakeholder Engagement and Information Disclosure	The Nigeria EIA act and other legislations and policies required proper Stakeholder Engagement and Information Disclosure	The World Bank ESS 10 mandated Stakeholder Engagement and Information Disclosure on all assisted project by the World Bank.	The Nigeria Laws and the World Bank ESS 10 Stakeholder Engagement and Information Disclosure are similarand continuous through the project life cycle.

2.3 Institutional Framework

ACReSAL involves many federal and state ministries, departments and agencies (MDAs), local governments, communities, and the civil society. This is because effective implementation of projects requires inter-ministerial coordination, collaboration, and information sharing at all levels of government. Thus, each component, sub-component and activity is to be implemented through relevant federal and state MDAs. The various MDAs include those responsible for planning, economy and finance, works, agriculture, water resources, forests, transport, power, emergency response, as well as those focused-on climate and hydrological information or watershed/ basin regulation. However, the Kogi State government has the primary responsibility for land management and land allocations of the project site.

The Federal Ministry of Environment (FMEnv) is the lead implementing agency for ACReSAL with Federal Ministries of Agriculture and Water Resources supporting as implementing agencies. The Federal Project Management Unit (FPMU) headed by a

Federal Coordinator hosted by FMEnv is responsible for the overall coordination. The Kogi State Project Management Unit (Kogi-SPMU) headed by the State Coordinator and hosted by the Kogi State Ministry of Environment is responsible for the coordination in Kogi State, including the implementation of this ESMP. Both the federal and state levels coordinating units have environmental officers responsible for the mainstreaming of environmental issues into the ACReSAL sub-projects

CHAPTER THREE

DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT

3.0 Introduction

This section describes the characteristics of the existing biophysical environment of the project area. The data were extracted from both primary and secondary sources. The primary data source includes a one-season field sampling obtained through the environmental baseline survey of air quality and noise, surface and groundwater sampling, soil sampling and land use and terrestrial flora and fauna studies conducted and subsequent analysis of the field samples (soil, groundwater and surface water) at the University of Lagos Central Laboratory, Lagos. Secondary data sources (desktop studies/literature review) include review of published literature, maps and textbooks related to the proposed project area. The biophysical environment baseline information pertinent to the proposed intervention project area includes:

i. Location;
ii. Relief and drainage;
iii. Climate;
iv. Geology;
v. Air Quality and Noise;
vi. Soil;
vii. Hydrology of the Area;
viii. Vegetation; and
ix. Wildlife and biodiversity

3.1 Overview of Project Location

3.1.1 Kogi State

Kogi State is one of the states in the North-Central zone of Nigeria with a total landmass of approximately 29,833km^2. The State lies geographically within latitude $6^0$32'57.7" N to $8^0$43'56.8" N over the equator and $5^0$19'26.8" E to $7^0$51'43.1" E of the Greenwich Meridian (Fig. 3.1). The State is bordered in the north by the Federal Capital Territory Abuja, Niger, Nasarawa State; to the west by Kwara, Ekiti, Ondo and Edo States; to the south by Delta and Anambra States; and to the east by Anambra, Enugu and Benue States respectively. Kogi State has a population of 3,314,043 (NPC 2006 census). It is popularly known as the *Confluence State* because of the meeting of River Niger and River Benue. Lokoja, the state capital was the first administrative capital of modern-day Nigeria. The predominant ethnic groups in Kogi State are Igala, Ebira and Okun. Agriculture is the mainstay of the economy. Some of the noticeable produces are coffee, cocoa, palm oil, cashews, groundnuts, maize, cassava, yam, rice and melon. The State is also rich in mineral resources such as coal, limestone, iron and tin. The State is home to the largest iron and steel industry in Nigeria known as Ajaokuta Steel Company Limited and one of the largest cement factories in Africa, the Obajana Cement Factory.

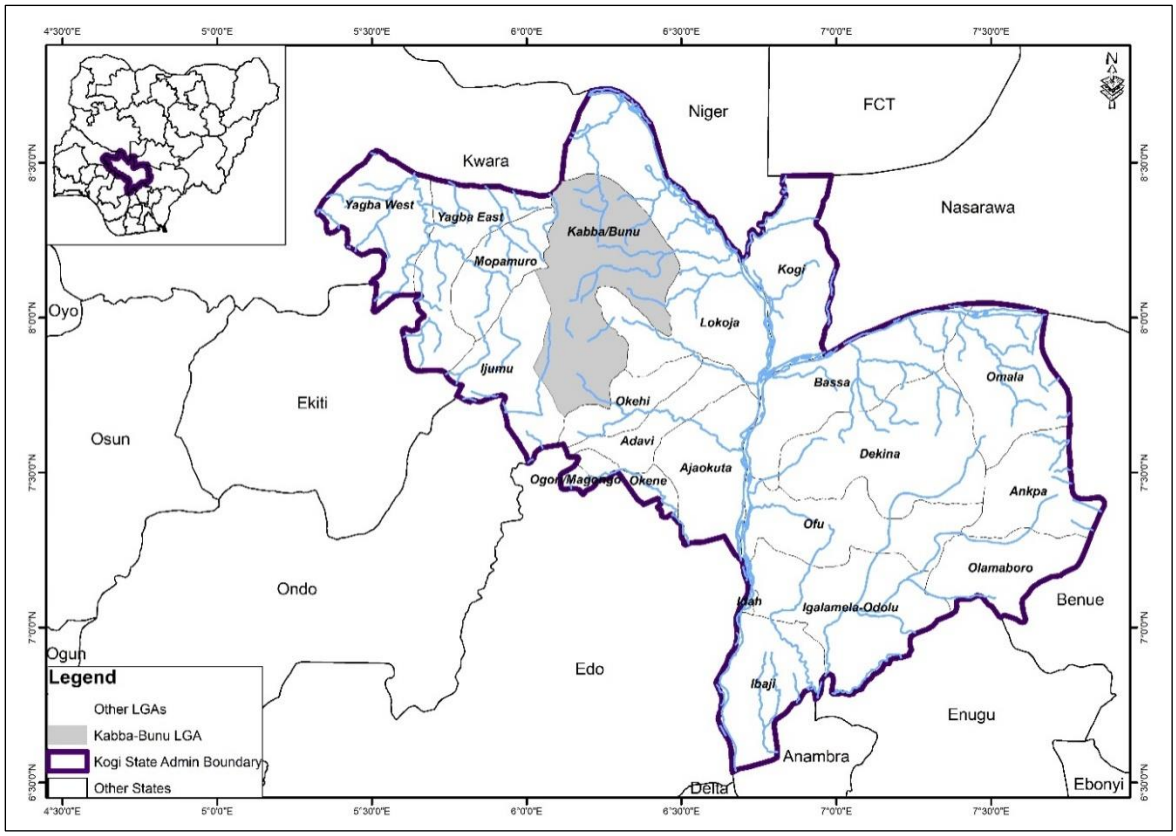


Fig. 3.1: Map of Kogi State showing the LGA of the Proposed Project Area

3.1.2 Proposed Omigbo River Channelization/Gully Erosion Intervention Site

Omigbo river channelization/gully erosion intervention site is located in Kabba town in Kabba Bunu LGA of Kogi State. It is located between latitude 07° 50.010 and 07° 49.147 and longitude 06° 04.697 and 06° 05.032. Omigbo River is a natural river flowing almost through the entire length of Kabba town. It is about 5km long and during the raining season it overflows its bound and causes flooding resulting in displacement of household living along the river and causes gully erosion due to poor drainage system.

The gully is about 10-15m wide and is as deep as 20-25 feet (ft). The gully is very active with sediment yield of about 1.5-2.0 tons per season. It is more aggressive during the rainy season with water level rising between 8m and 10m.Fig. 3.2 reveals the gully scar of Omigbo River Channelization / Gully Erosion Intervention while the current state of the gully is shown in Plate 3.1.

3.1.3 Proposed Project Location with its Nearest Sensitive Locations to the Project Site

The project is basically within urban setting in Kabba. It is not close to any sensitive biodiversity significant location. There are no rare or threatened biodiversity within the watershed.

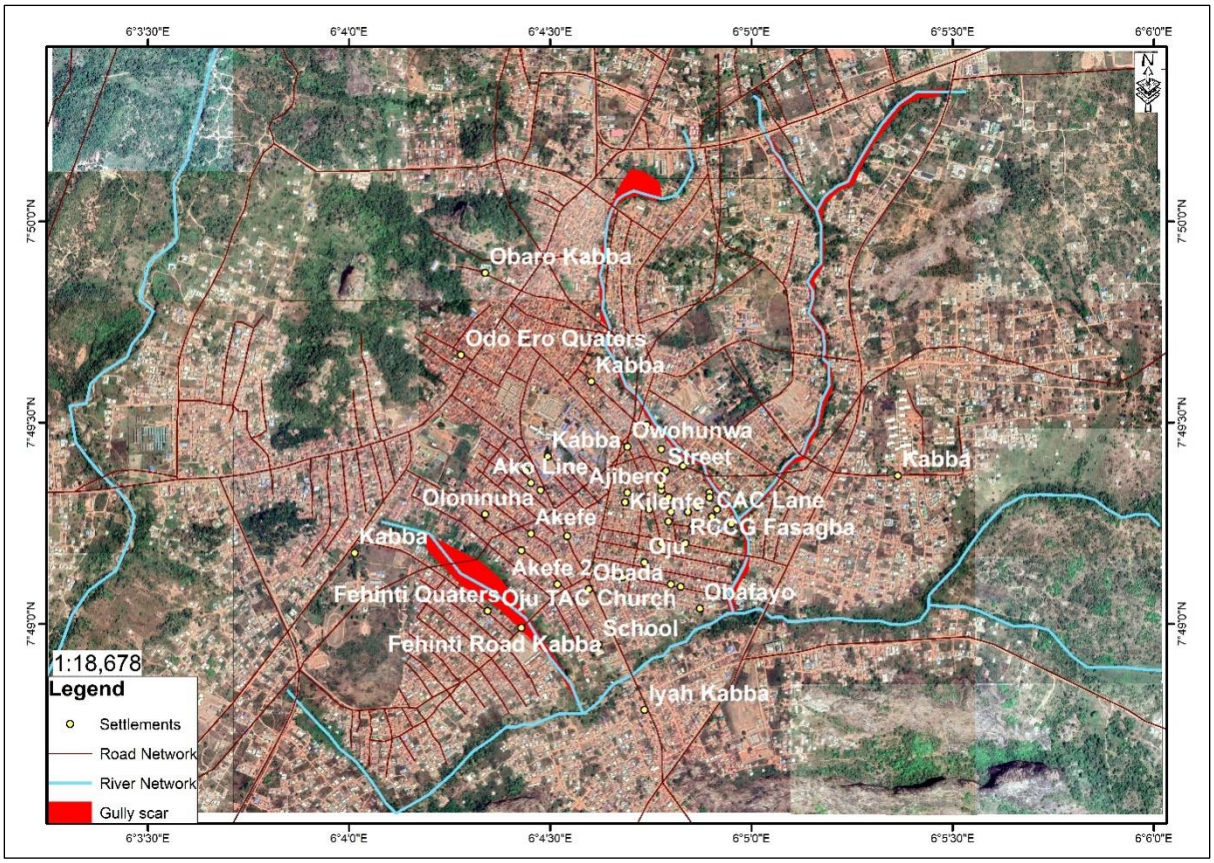


Fig. 3.2: Image Map of the Proposed Omigbo River Channelization / Gully Erosion Intervention Site



Plate 3.1: Degraded Areas within Omigbo River Channelization / Gully Erosion Intervention Site

3.2. Relief and Drainage

Relief

The Project area is characterized by rugged topography with limited flat terrain. As shown in Fig.3.4, the Kabba environslopes steeply from upland area of 540 meters in northwest towards the south-eastern direction with elevation of 389 meters. As depicted

by the contour lines (Fig.3.3), there are about four hills (mountain peak) in the northwest of Kabba. The rugged terrain nature of the area with its steep slope will invariably cause the swift flow of rain/storm water across the community with eventual erosion action. In other words, a river flowing down a steep /rugged train has potential energy to cause erosion impact along its course as the case of study area. As shown in the Fig. 3.4, greater section of the Kabba town falls within elevation of 413 to 431 meters. The terrain nature of the area has provided natural gravity needed for engineering design of the drainage channel for the gully erosion control.

Drainage

The Kabba and its immediate environment drainage network is shown in Fig.3.3; as shown, the community is drain by a number of streams along which the gully erosion sites are developed. One of these streams is Opa River which drains the community from its north/northeast to southern part where it forms a confluence before empting into the Kabba River. The second stream (Fehinti River) drains the south-western section of the community, it also empties its load into the Kabba River. Based on this hydrological network, the study area therefore has two major catchments- the Fehinti and Opa River Catchments.

The impacts of these eroded materials from community streams is directly on the Kabba River which drains the area from the east to south-western direction before linking the River Osse. Invariably, the indirect impacts of the eroded materials and impurities that may emerge from the construction activities during project implementation will be on the River Osse. Therefore, monitoring activities for surface water pollution assessment should be carried out on both Rivers Kabba and where it forms confluence with River Osse.

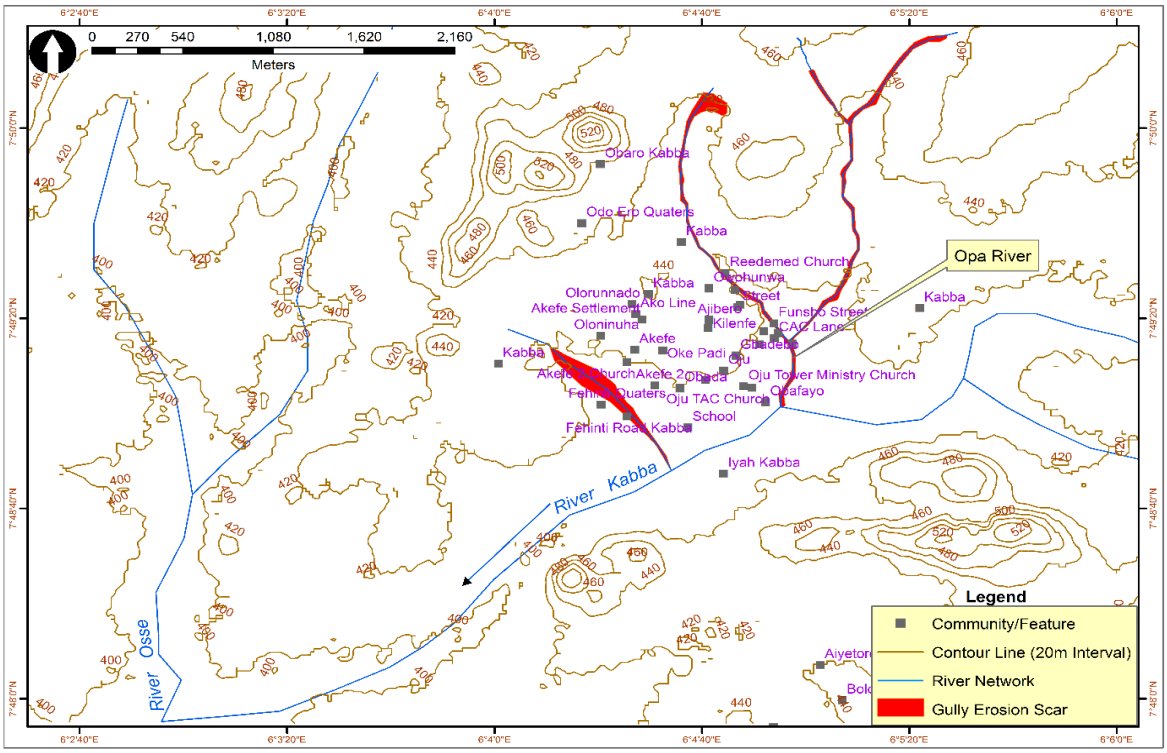


Fig. 3.3: Contour Map of the Proposed Project Area

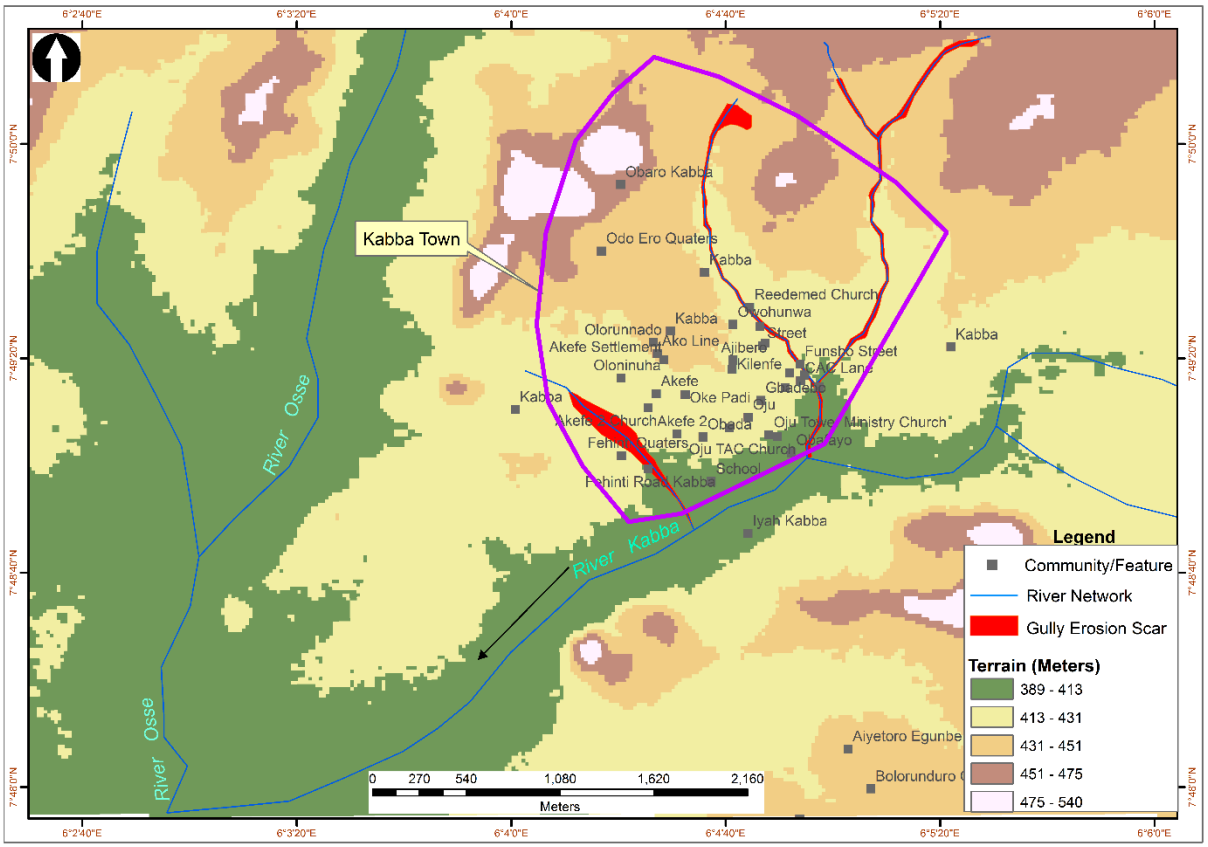


Fig. 3.4: Digital Elevation Model of the Proposed Project Area

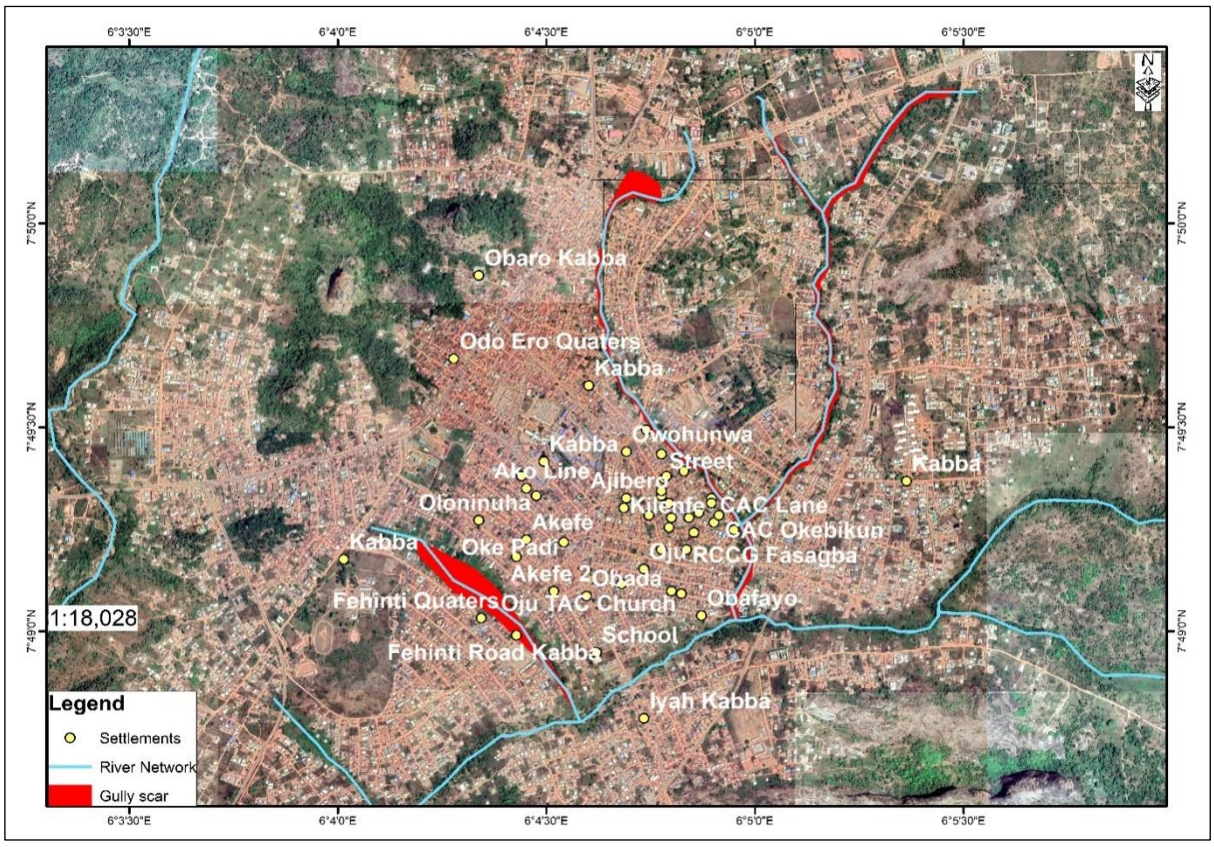


Fig. 3.5: Drainage Pattern within the Proposed Project Area

3.3 Climate

The climate of Kabba just like that of other parts of Kogi State is generally described as monsoonal in character and expressed as contract between a dry season and a wet season. These two regimes of the climate are very dependent on the two prevailing air masses blowing over the country at different times of the year; the dry north-easterly air mass of Saharan origin, and the humid maritime air mass blowing from over the Atlantic. Overall, elements that define climate include rainfall, temperature, relative humidity, wind speed and direction and each of these are described in the following subsections.

3.3.1 Rainfall

Rainfall is the main governing climatic element of Kabba. The rainfall regime is principally controlled by the two major air-masses: the moist tropical maritime (TM) with its associated westerlies and the dry tropical continental air mass (TC) with its associated easterlies. As indicated in Fig. 3.6, rainfall between the months of April and October accounts for over 90% of the total rainfall of the area with annual volume of 1,668 mm. During the rainy season, the wettest months are between July and September depicting double maxima. This area thus experiences 7-8 months of rainfall, which consequently increases the propensity of the area to overland runoff. This eventually leads to flooding and gully erosion.

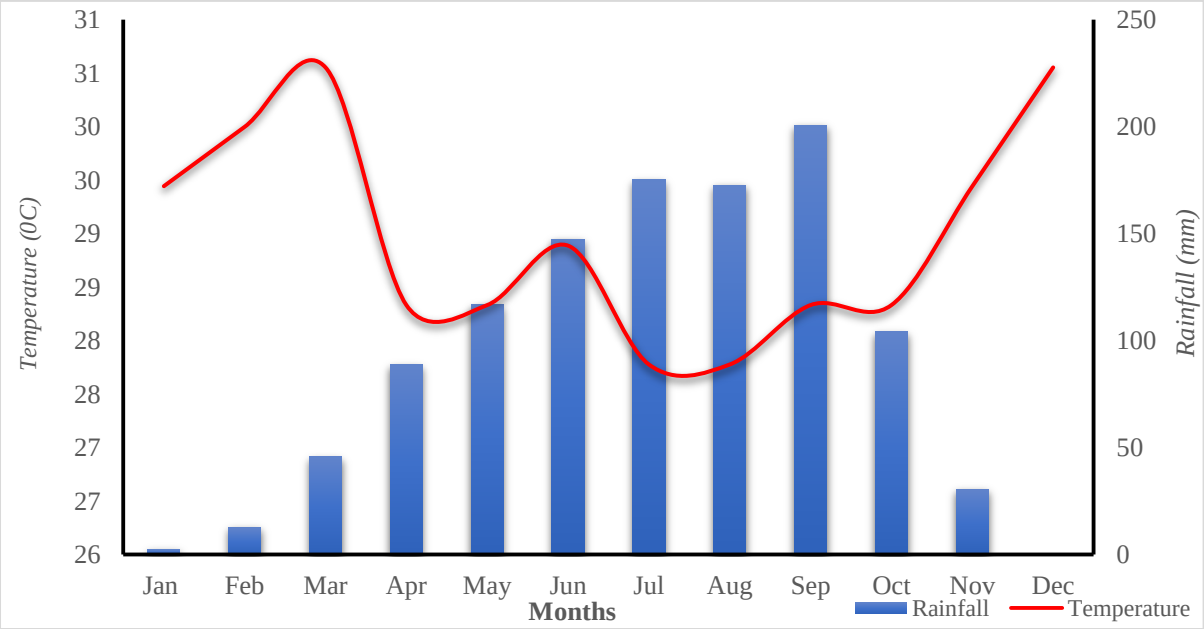


Fig. 3.6: Monthly Climate Nature of Kabba and Environment Depicting Average Rainfall and Mean Temperature

3.3.2 Temperature

Temperature of Kabba mirrors that of a tropical area which is high and relatively stable though with indications of seasonal fluctuations. The temperature is usually higher during the dry season and lower during the wet season. The average temperature of the area ranges from 28° C in the wet season to as high as 31° C in the dry season (Fig. 3.6). Usually, average temperature rises from November to peak in

March and fluctuates all through the wet season before rising again towards the end of the year (as shown in Fig. 3.6). The area indicates low temperature in June and October.

3.3.3 Relative Humidity

The relative humidity (RH) is generally at its maximum around dawn between 05.00 and 07.00 hours and generally at its lowest in the afternoon between 15.00 and 16.00 hours. Due to its proximity of the River, the area enjoys ample of average humidity ranges between 55% and 85% through the year but the months of May to November have higher relative humidity which ranges from 71.8% to 83.3% (Fig. 3.7). Instantaneous RH could rise as high 90% depending on other weather factors and meteorological events such as rainfall. This RH trend corresponds with that of rainfall.

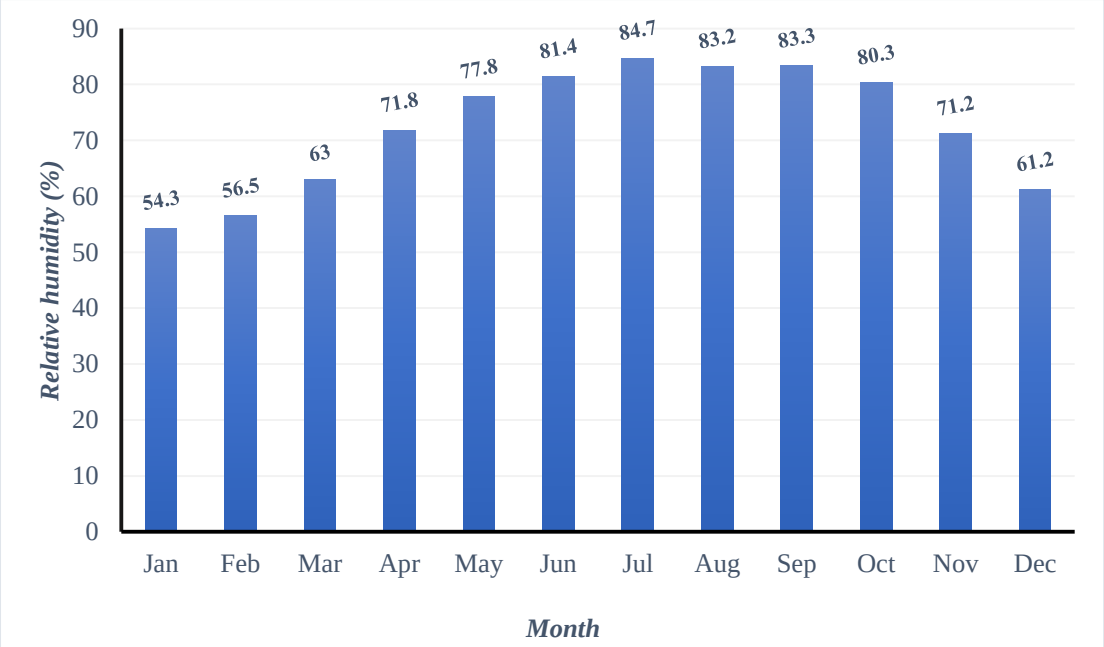


Fig. 3.7: Mean Relative Humidity Pattern of Study Area

3.3.4 Wind Speed and Direction

Strong winds in Kabba and Environs are particularly south south-western (SSW) in direction indicating the influence of the north-east trade which usually heads south-westerly towards the Atlantic Ocean. Mild winds are mostly southwards parallel with the direction of flow of the Niger River. Generally, the wind direction indicates the influence of the air mass and the River over the area. This shows that wind pattern varies with seasons rising from the onset of the wet season and falls during the dry season (Fig. 3.8). The wind rose for the project area is depicted in Fig. 3.9.

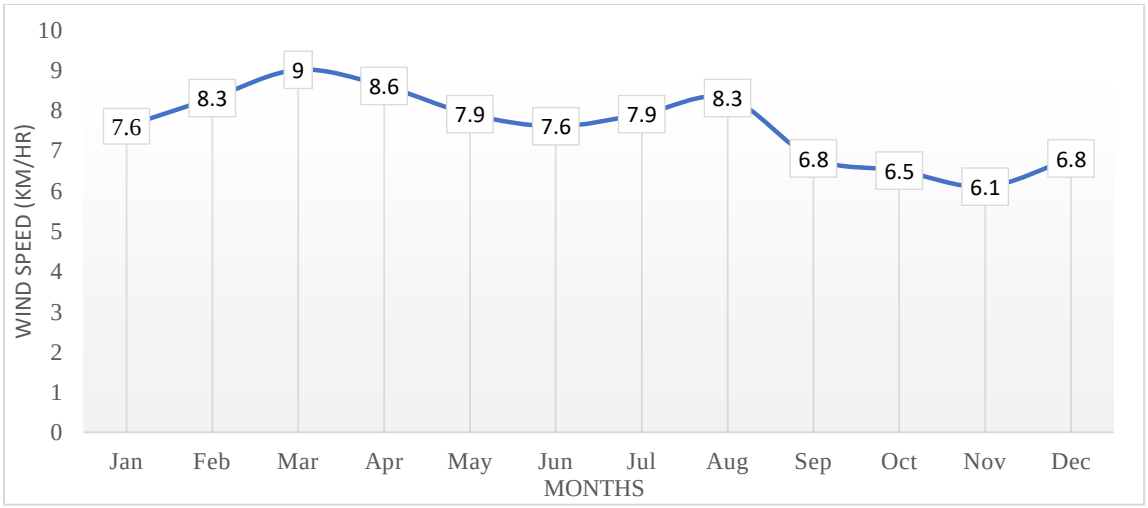


Fig. 3.8: Average Monthly Wind Speed of the Project Area

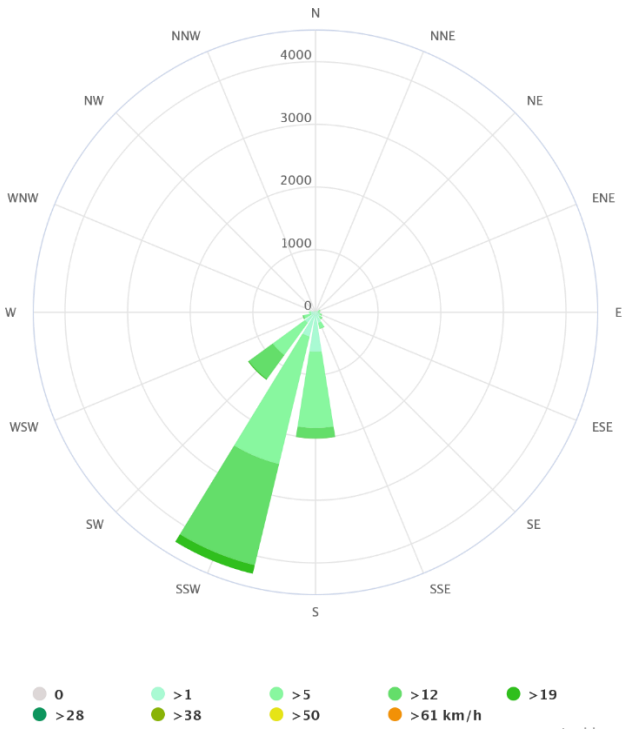


Fig. 3.9: Wind Rose of the Study Area

In all, the climate conditions of the project, the environment is conducive for civil work activities with less climatic discomfort but the channel size considering the issue of high rainfall variability needs to be adequate to carry the large runoff from the rainfall not only for the present amount but also for probable future increase due to climate change.

3.4 Geology

The geology of Kogi State comprises two main rock types, namely, the basement complex rocks of the Precambrian age in the western half extending slightly eastwards beyond the lower Niger Valley and the sedimentary rocks in the eastern half.

The Project area is dominantly underlain by the Precambrian basement complex. However, part of the area is underlain by cretaceous sediments which are unconformable overlie the basement complex. Migmatite covered about half of the study area outcropping at the southwest, west, northwest and central part of the area. The south and the southeast parts of the area are underlain by undifferentiated older granite, mainly porphyroblastic granite, granite gneiss with porphyroblastic gneiss and fine-grained biotite granite. The northern part of the study area is made of ridges of cretaceous sediments of the southern Bida Basin (Lokoja Sub-Basin). The ridges are dominantly composed of Feld spathic sandstone and siltstone which are separated by the biotite hornblende gneiss. Thick alluvial deposit occurs around the river along Ohie road close to Kabba School of Agriculture drainage system.

The rocks of the basement have been affected by medium pressure Barrovian metamorphism. The attitudes of tectonic structures in the Nigerian basement have been documented in terms of orientation and magma-induced veins and dykes such as quartz veins and pegmatites. Deformation of the Nigerian basement complex occurred in two phases, a ductile phase, which is responsible for the formation of planar structures (foliations) and a brittle phase resulting in jointing and fractures, many of which have been filled with quartzo-feldspathic veins, dolerite dykes, pegmatite and aplitic veins and dykes. The major lithological units include the migmatites, granite gneiss, charnockite, granite, and other felsic and mafic intrusives.

The Basement rocks show great variations in grain size and in mineral composition. The rocks are predominantly quartz gneisses and schists consisting essentially of quartz with small amounts of white micaceous minerals. In grain size and structure, they vary from very coarse-grained pegmatite to medium grained gneisses. The rocks of the basement complex in the area have been subjected to intense regional metamorphism resulting in the absence of minerals of high metamorphic grade. Magmatisation is widespread throughout the area reflected by rapid alternation of granite, biotite gneiss which grade into one another. Selective granitisation has resulted in biotite-rich layers in the gneisses being converted into porphyritic granite, while the leucocratic bands have been converted to aplitic granite. Minor folds are very common in the gneiss and schists and from all available evidence, the basic geological structure of South-western Nigeria is a complementary anticliriorium and synclinorium with northwards plunging axes. In all, the geology of the project location shows that the project might encounter some metamorphic formation that requires heavy duty equipment for deformation. This ESMP will not recommend rock blasting as civil works and construction activities will take place near human habitation and sub-urban environment. It is expected that the project, when completed will to the aesthetic and enhance accessibility along the Omigbo channel through levelling and rehabilitation of the deformed and weathered rocks.

3.5 Environmental Air Quality Assessment

3.5.1 Ambient Air Quality

A pre-calibrated air quality meter (GrayWolf AdvanceSense TM) and the GrayWolf Particle Counter were used to measure the in-situ air quality parameters within and around the project site. The parameters measured included Nitrogen dioxide (NO_2), Hydrogen Chloride (HCl), Nitrogen (II) Oxide (NO), Total Volatile Organic Carbon (TVOC), Carbon dioxide (CO_2), Sulphur dioxide (SO_2), Carbon Monoxide (CO), Air temperature, Humidity and Particulate Matter (PM 0.5-10). Ambient noise levels in the study area were also determined using an Extech Integrated Sound Meter. A total of ten (10) sampling locations plus one control point was surveyed for the in-situ air quality and noise level monitoring in the study area (Fig. 3.11). The sampling locations were randomly selected to cover the area of influence of the gully site and the locations of potential sensitive receptors.

A control point was established at a location of over 2km away from the gully site (Fig. 3.10). At each of the sampling locations, in situ measurement was taken within 10-minutes log-time and the results were recorded in minimum, maximum and average values (Table 3.1). The results of the particulate matters measured at each of the sampling locations are provided in Table 3.2.

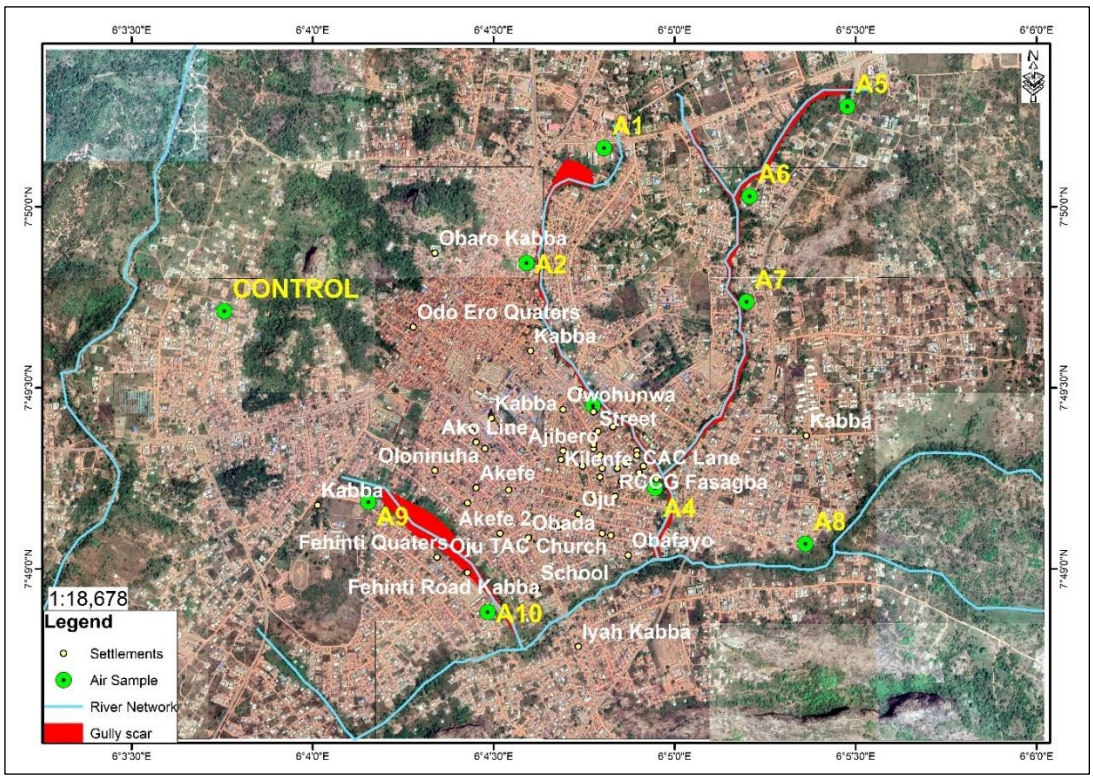


Fig. 3.10: Air Quality Sampling Location Map

Table 3.1: Ambient Air Quality of the Proposed Project Area

Location	X	Y		NO_2 (ppm)	HCI (ppm)	NO (ppm)	TVOC (ppm)	CO_2 (%)	SO_2 (ppm)	CO (ppm)	T (°C)	RH (%)
A1	6.08008	7.83602	Ave	ND	ND	ND	0.01	0.01	ND	1.0	31.2	84.4
			Min	ND	ND	ND	0.01	0.01	ND	1.0	30.1	82.1
			Max	ND	ND	ND	0.01	0.01	ND	1.2	33.5	85.5
A2	6.07651	7.83074	Ave	0.01	0.01	ND	0.01	0.02	0.01	1.0	32.5	75.8
			Min	0.01	0.01	ND	0.01	0.01	0.00	1.0	30.1	75.4
			Max	0.01	0.01	ND	0.02	0.02	0.02	1.0	33.4	76.4
A3	6.07958	7.82418	Ave	0.01	ND	ND	ND	0.01	ND	ND	32.1	85.4
			Min	0.01	ND	ND	ND	0.01	ND	ND	32.4	80.4
			Max	0.02	ND	ND	ND	0.01	ND	ND	33.1	88.2
A4	6.08243	7.82039	Ave	ND	0.01	ND	0.02	0.02	0.01	ND	32.2	85.6
			Min	ND	0.01	ND	0.01	0.01	0.01	ND	30.1	75.1
			Max	ND	0.01	ND	0.03	0.02	0.03	ND	33.5	88.6
A5	6.09128	7.83795	Ave	ND	ND	ND	0.01	0.02	0.02	1.0	33.4	76.4
			Min	ND	ND	ND	0.01	0.01	0.01	1.0	32.2	72.4
			Max	ND	ND	ND	0.01	0.02	0.03	2.0	33.4	77.8
A6	6.08679	7.83381	Ave	0.01	0.01	ND	ND	0.01	ND	1.6	31.5	78.1
			Min	0.01	0.01	ND	ND	0.01	ND	1.0	30.1	77.1
			Max	0.01	0.01	ND	ND	0.01	ND	2.0	32.1	80.4
A7	6.08664	7.82896	Ave	ND	ND	ND	0.01	0.01	0.01	ND	32.2	78.4
			Min	ND	ND	ND	0.01	0.01	0.01	ND	31.2	75.1
			Max	ND	ND	ND	0.01	0.01	0.01	ND	33.4	80.1
A8	6.08936	7.81782	Ave	0.01	0.01	ND	0.01	0.02	ND	1.0	32.1	75.6
			Min	0.01	0.01	ND	0.01	0.01	ND	1.0	30.1	72.5
			Max	0.01	0.01	ND	0.02	0.02	ND	1.0	32.4	78.9
A9	6.06923	7.81975	Ave	0.01	ND	ND	ND	0.01	ND	ND	32.4	79.4
			Min	0.01	ND	ND	ND	0.01	ND	ND	30.1	64.5
			Max	0.02	ND	ND	ND	0.01	ND	ND	32.5	85.1

A10	6.07472	7.81468	Ave	ND	0.01	ND	0.02	0.01	0.02	1.1	32.5	75.8
			Min	ND	0.01	ND	0.01	0.01	0.01	1.0	30.1	75.4
			Max	ND	0.02	ND	0.02	0.01	0.04	1.5	33.4	76.4
Control	6.06259	7.82853	Ave	ND	ND	ND	ND	0.01	ND	ND	32.4	82.1
			Min	ND	ND	ND	ND	0.01	ND	ND	32.1	80.1
			Max	0.02	ND	ND	ND	0.01	ND	ND	33.1	84.5
FMEnv Limits				0.06	NS	NS	0.16	NS	0.1	10	NS	NS

***Source**: Field Survey, NS = Not Specified; ND = Not Detected*

The air quality result shows that the concentrations of gaseous parameters measured within and around the project area are relatively low and fall within the Federal Ministry of Environment (FMEnv) limits. The measured NO_2 values ranged from below the detection limit of 0.01 ppm to 0.02 ppm and fall below the FMEnv maximum permissible limit of 0.06 ppm for NO_2 in ambient air. NO was not detected in any of the sampling locations. SO_2 ranged from below detection limit of 0.01 ppm to 0.04 ppm and fall within the FMEnv limit of 0.1 ppm. The measured CO values were also below the FMEnv maximum permissible limit of 10 ppm. Its concentration ranged from below the detection limit of 0.1 ppm to 2.0 ppm. Similarly, TVOC was recorded in low concentration, below the FMEnv limit of 0.16 ppm. Based on the air quality results, it can be deduced that the ambient air quality of the project area is not polluted.

3.5.2 Particulate Matter Concentration

The Particulate Matter (PM) constituent within the immediate surroundings of the Omigbo River Channelization/Gully Erosion site was measured at ten (10) locations randomly, plus a control point outside the proposed project area (Fig. 3.11). As indicated in Table 3.2, the result shows that the average values of $PM_{0.5}$ ranges between 0.01 and 0.06 µg/m^3, $PM_{1.0}$ varies between 0.01 and 0.20 µg/m^3, $PM_{2.5}$ lies within 0.05 and 1.10 µg/m^3 while $PM_{5.0}$ and PM_{10} exhibits a range between 1.00 and 4.50 µg/m^3 and 1.00 and 6.00 µg/m^3 respectively. The TPM across the location ranges between 8.89 and 34.5 µg/m^3. The measured TMP values fall below the FMEnv limit of 250µg/m^3 for suspended particulate matter.

Table 3.2: Particulate Matter Constituents within Proposed Project Area

Location	X	Y	$PM_{0.5}$	$PM_{1.0}$	$PM_{2.5}$	$PM_{5.0}$	$PM_{10.0}$	TPM
			µg/m^3					
A1	6.08008	7.83602	0.05	0.07	1.00	1.30	2.00	20.5
A2	6.07651	7.83074	0.06	0.04	0.06	1.00	1.56	32.5
A3	6.07958	7.82418	0.04	0.08	0.05	1.00	2.10	8.89
A4	6.08243	7.82039	0.06	0.04	0.06	1.45	2.00	23.5
A5	6.09128	7.83795	0.03	0.01	0.08	1.30	3.40	21.8
A6	6.08679	7.83381	0.05	0.03	0.14	2.30	5.00	18.0
A7	6.08664	7.82896	0.01	0.04	1.10	4.50	6.00	22.0
A8	6.08936	7.81782	0.02	0.10	0.06	1.20	1.00	19.5
A9	6.06923	7.81975	0.03	0.20	0.10	2.00	2.50	22.8
A10	6.07472	7.81468	0.04	0.08	0.11	2.30	2.40	34.5
Min			0.01	0.01	0.05	1.00	1.00	8.89
Max			0.06	0.20	1.10	4.50	6.00	34.5
Control	6.06259	7.82853	0.01	0.09	0.08	1.50	2.00	26.8
FMEnv Limit								250

***Source**: Field Survey*

3.5.3 Ambient Noise Level

The ambient noise level recorded in the proposed project area as depicted in Table 3.3 below shows an average minimum value of 48.5 dB(A) and an average maximum value of 59.4 dB(A).

The noise levels were below the FMEnv permissible limit of 90 dBA for 8-hour exposure. Based on the noise level result, it can be inferred that the proposed project area is devoid of significant noisy activities that may be detrimental to human and environmental health. The noise sampling locations map is depicted in Fig. 3.11.

Table 3.3: Noise Level Pattern within the Proposed Project Area

Location	X	Y	Min (dBA)	Max (dBA)
A1	6.08008	7.83602	58.9	66.3
A2	6.07651	7.83074	37.1	40.7
A3	6.07958	7.82418	41.9	59.3
A4	6.08243	7.82039	58.1	64.0
A5	6.09128	7.83795	35.7	52.8
A6	6.08679	7.83381	55.7	70.2
A7	6.08664	7.82896	52.3	62.3
A8	6.08936	7.81782	38.7	72.1
A9	6.06923	7.81975	45.2	65.4
A10	6.07472	7.81468	42.8	55.4
Ave			48.5	59.4
Min			35.7	40.7
Max			58.9	72.1
Control	6.06259	7.82853	32.5	67.1

***Source**: Field Survey, SD = Standard deviation*

3.6 Soil Quality

Kabba soil is embryonic in nature with few diagnostic horizons; ground water is within 100cm of the mineral soil surface (56cm water table). The colour matrix hue is 10YR and ESP of 35% or more within 50cm mineral surface. All these characteristics classify the soil as Typic Halaquept (USDA) and Eutric Gleysol (FAO, 1974) because of >50% Base Saturation as stated by FAO/UNESCO soil classification system while at series level it was classified as Oshun series. Clayey texture in Kabba is a characteristic of wetland soil and that probably gives its characteristically high-water table at 56cm during the dry period of the year.

The soil of the proposed gully intervention area is hydromorphic in nature, which is a mixture of coarse alluvial and colluvial deposits of the river. The soil experienced 8-10 months of wetness. The soil is clayey sandy, with deeply weathered and appeared grey to reddish in colour, sticky and permeable. The predominant soil types in this area are coarse textured, ranging from loamy to sandy loam in the surface horizons and from sandy loam to coarse clay in the subsurface horizon. In view of this, four soil sampling locations inclusive of the control point were established in the Study Area (Fig. 3.11). At each of the sampling locations, both top soil (0 – 15cm) and sub soil (15 – 30 cm) were collected. Appropriate quality assurance and quality control (QA/QC) measures were implemented during the sampling activities. The QA/QC measures included regular cleaning of the soil auger after each sampling event to avoid cross-contamination. Table 3.4 presents the physico-chemical and microbial characteristics of soil samples from the study area.

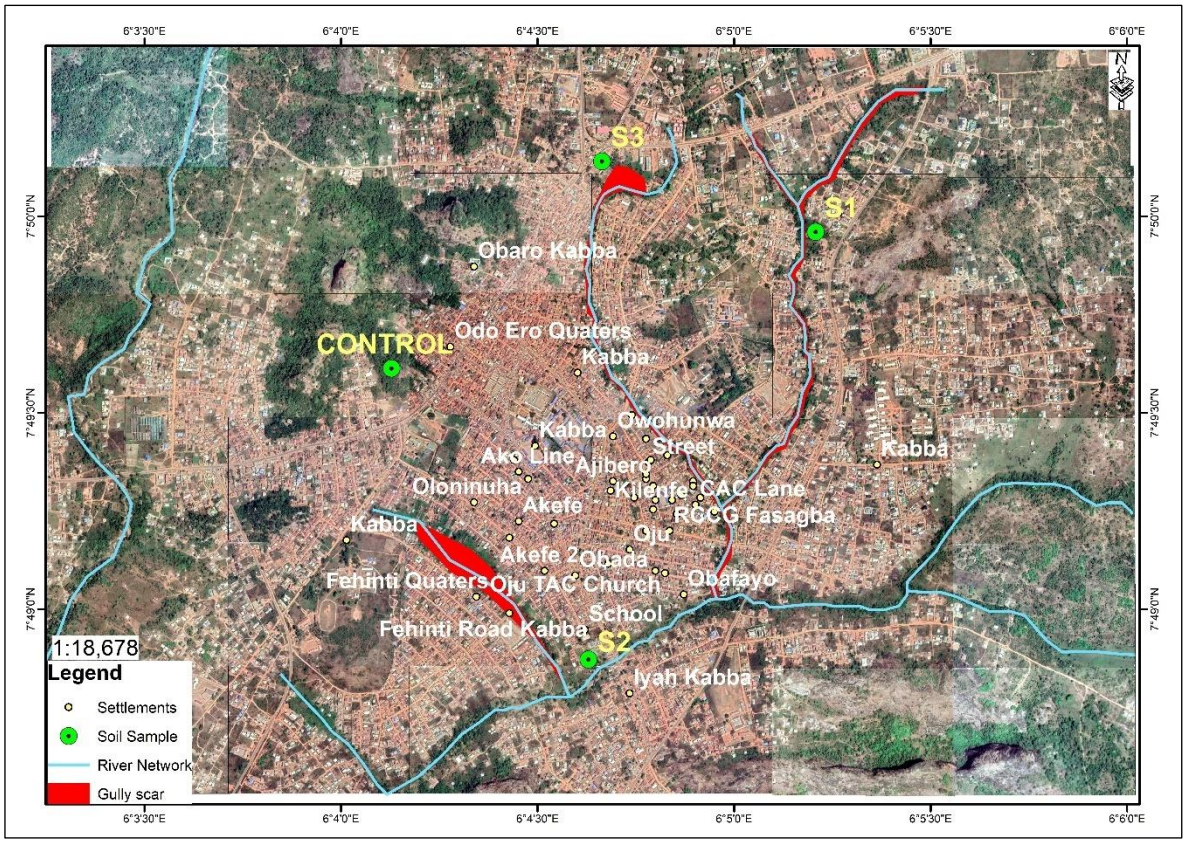


Fig 3.11: Soil Sampling Location Map

Table 3.4: Physio-Chemical and Microbial Characteristics of Soil in the Project Area

Parameter	Sample 1		Sample 2		Sample 3		Control Point		*Alloway, 1991 (limits for naturally occuring level)*
	X 6.08679	Y 7.83267	X 6.07715	Y 7.81454	X 6.07772	Y 7.83567	X 6.06880	Y 7.82689	
	Top soil	Subsoil	Top soil	Subsoil	Top soil	Subsoil	Top soil	Subsoil	
Moisture Content (%)	9.01	13.33	12.9	16.2	8.5	12.2	17.2	22.1	NS
Sand (%)	44.2	45.5	48.56	52.6	37.5	42.1	42.1	44.9	NS
Silt (%)	36.3	47.2	34.01	38.4	49.35	50.6	38.1	49.2	NS
Clay (%)	19.5	7.3	17.43	9.0	13.15	7.3	19.8	5.9	NS
pH	6.2	6.1	6.2	6.2	6.3	6.1	6.5	6.6	4.5 – 9.0
E.C (μScm^{-1})	267.8	126	133	252	125.2	189	215	222.1	NS
Ca (mg/kg)	6.18	5.21	8.16	5.12	7.23	4.12	7.2	7.9	NS
Mg (mg/kg)	1.11	2.12	1.76	1.42	0.71	0.62	2.31	2.67	NS
K (mg/kg)	5.61	4.68	7.02	7.65	6.76	6.03	9.9	3.48	NS
Na (mg/kg)	12.6	13.0	22.0	18.5	15.0	12.4	13.0	17.8	NS
SO_4^{2-} (mg/kg)	0.18	0.24	0.34	0.14	0.11	0.43	0.67	0.22	NS
PO_4^{3-} (mg/kg)	0.21	0.12	0.15	0.15	0.23	0.28	0.09	0.27	NS
NO_3- (mg/kg)	0.80	0.50	0.63	0.56	0.55	0.25	0.23	0.45	NS
Cl^- (mg/kg)	2.10	1.40	1.00	1.20	0.83	0.50	1.20	1.00	NS
TOC (mg/kg)	0.39	0.26	0.89	0.12	0.45	0.16	0.26	0.48	NS

Iron, Fe (mg/kg)	86.7	98.3	154.0	132.0	165.2	128.9	176.0	197.8	NS
Lead, Pb (mg/kg)	2.00	1.35	ND	0.94	1.75	1.22	2.33	2.00	20
Cadmium, Cd (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	0.3
Chromium, Cr (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	NS
Copper, Cu (mg/kg)	1.80	1.66	4.80	5.76	8.67	9.00	5.70	6.28	500
Vanadium, V (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	NS
Mercury, Hg (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	0.1
Arsenic, As (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	NS
Zinc, Zn (mg/kg)	4.00	4.20	3.00	6.00	7.82	6.00	10.40	9.88	50
Nickel, Ni (mg/kg)	ND	ND	ND	ND	ND	ND	ND	ND	50
TPH (mg/kg)	0.06	ND	ND	0.20	0.65	0.92	0.58	ND	50
Total heterotrophic bacterial (cfu/g)	1.0×10^4	2.0×10^4	1.0×10^4	1.0×10^4	2.5×10^4	1.5×10^4	1.6×10^4	1.0×10^4	NS
Total heterotrophic fungi (cfu/g)	1.0×10^2	1.0×10^2	2.0×10^2	2.5×10^2	1.0×10^2	1.0×10^2	2.0×10^2	1.0×10^2	NS
Hydrocarbon utilizing bacteria (cfu/g)	ND	ND	ND	ND	ND	ND	ND	ND	NS
Hydrocarbon utilizing fungi (cfu/g)	ND	ND	ND	ND	ND	ND	ND	ND	NS

***Source**: Laboratory AnalysisNS= Not Specified*

The result of the soil analysis shows that the soil is made up of varying percentage compositions of sand, silt and clay. The pH values range between 6.1 and 6.6 (slightly acidic) during the time of study. The measured pH values are within the values of 4.5 to 9.0 for optimal plant growth.

Exchangeable anions detected in the soil samples are SO_4^{2-}, PO_4^{3-}, Cl^- and NO_3^- and recorded in low concentrations. The concentration of SO_4^{2-} varies from 0.11 mg/kg to 0.67 mg/kg, PO_4^{3-} ranges from 0.09 mg/kg to 0.27 mg/kg, NO_3^- varies from 0.23 mg/kg to 0.80 mg/kg while Cl^- ranges from 0.05 mg/kg to 2.10 mg/kg. No heavy metal pollution was recorded in the soil samples. Pb, Ni, Cr, Cd, V and Hg were not detected in the soil samples while Zn and Cu were recorded in trace amounts, below the permissible limits for unpolluted soil. Iron (Fe) recorded the highest concentration with a range of 86.7 mg/kg to 197.8 mg/kg, which could be due to the geological nature of the project area typical of Precambrian basement complex.

Total hydrocarbon content (THC) was recorded in trace amount in the soil samples with a range of 0.06 mg/kg to 0.92 mg/kg, significantly below the FMEnv limit of 50 mg/kg

for mineral oil in soil. This indicates that the soil environment of the project area is not polluted with hydrocarbon.

3.7. Physico-Chemical and Microbial Analysis of the Surface and Ground Water Samples

3.7.1 Groundwater

The groundwater availability in crystalline rocks in the area is greatly dependent on the degree of weathering and fracturing of the rocks and the interconnectivity of the fractures. The aquifers found in this area are recharged directly by precipitation but can also be recharged by infiltration from tributaries of River Niger and River Benue. Aquifers found within the study area include the fractured basement aquifer and the weathered overburden aquifer. Groundwater abstraction is mainly by hand dug wells and boreholes.

Considering the minimal potential environmental footprint of the proposed project activities on groundwater resources, three (3) different boreholes within the area of influence of the project, as well as one control point, were sampled and analysed to establish the baseline groundwater conditions of the study area (Plate 3.2). The distribution of the groundwater sampling locations is shown in Fig. 3.12 while Table 3.5 presents the physico-chemical and microbial characteristics of the groundwater samples.

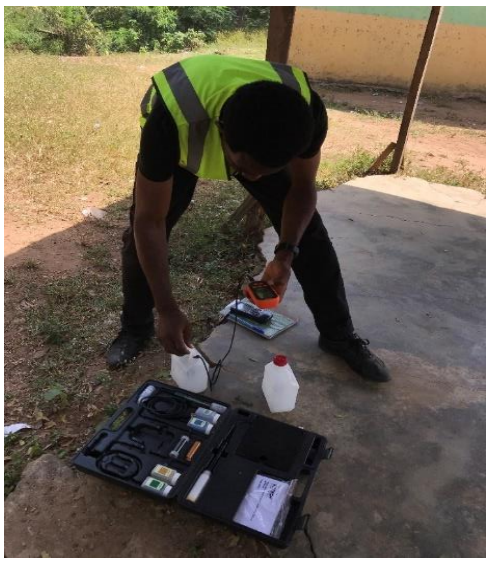


Plate 3.2: Groundwater Sample Collection and In-situ Analysis

At each sampling location, groundwater samples were collected into a 2-litre polyethylene bottle for general physico-chemical analysis (and preserved with concentrated nitric acid), while samples for hydrocarbon analysis were collected in 1-litre glass bottle and preserved with concentrated sulphuric acid. Pre-sterilized 50 ml McCartney bottles were used for samples meant for microbial analysis.

In-situ measurement of pH, electrical conductivity, Total Dissolved Solids (TDS), temperature, and Dissolved Oxygen (DO) in the groundwater samples was taken using Extech Digital DO 700 meter before the addition of preservatives.

The water samples were stored in insulating materials containing ice chests and ice chips (to maintain $4^{o}C$) and transferred to the laboratory for further analysis. The sample collection was carried out with appropriate quality assurance and quality control (QA/QC) measures in consistent with relevant local and international guidelines and standards. These measures include, amongst others:

- In-situ measurement of parameters with short holding time in the water samples immediately after collection.
- Proper calibration of all portable meters used for in situ measurements.
- Collection of separate samples for parameters requiring different treatment/preservation before analysis.
- Adequate preservation and labelling of collected samples.
- Use of only recommended sample containers to store sample media.
- Adequate labelling of chemical reagents used for sample preservation in order to avoid mix-up.
- Proper documentation of in-situ readings in field datasheets.

The results of the physico-chemical and microbial parameters analyzed in three (3) different groundwater samples and one (1) control sample collected from the project area are presented in Table 3.5. The results were compared with the FMEnv limits and the World Health Organization (WHO) standards (maximum permissible levels), in order to determine the groundwater suitability for domestic use.

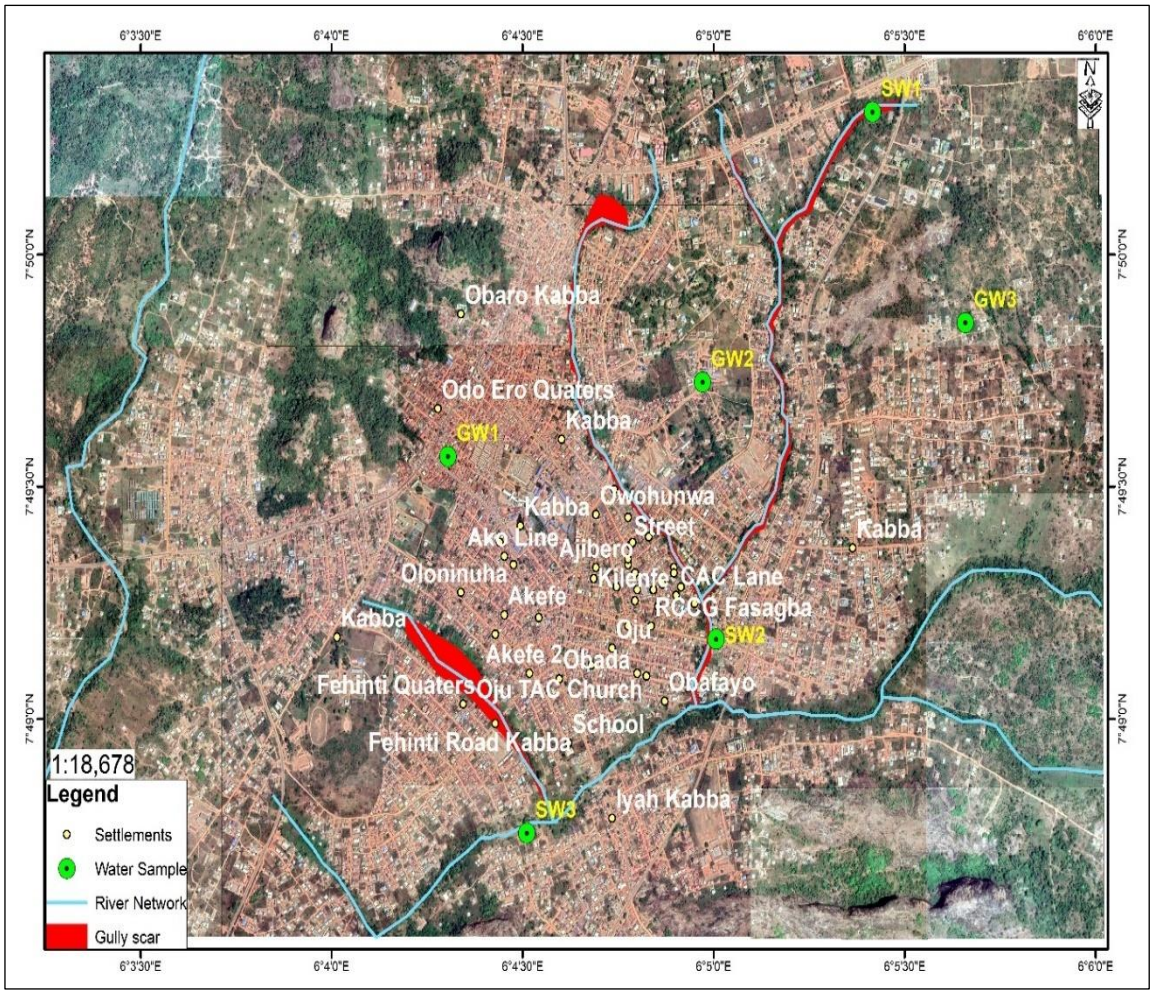


Fig 3.12: Water Sampling Location Map

The pH levels of the groundwater sample collected from across the project area ranges between 7.24 and 8.00. This value indicates pH being slightly basic and it is within the FMEnv and WHO permissible limit of 6.5-8.5 and 6.5 to 9.2 respectively. No heavy metal pollution was recorded in the groundwater samples. Vanadium (V), Arsenic (As), Lead (Pb), Chromium (Cr), and Mercury (Hg) were not detected. Also, no hydrocarbon contamination was recorded in the samples.

Table 3.5: Physico-chemical and Microbial Characteristics of Groundwater Samples from the Project Area

Parameter	Groundwater				
	GW-1	GW-2	GW-3	FMEnv Limit	WHO limit
Longitude	6.07173	6.08284	6.09431		
Latitude	7.82609	7.82875	7.83089		
Ph	7.65	8.00	7.24	6.5 - 8.5	6.5 – 9.2
Temp (^oC)	30.5	29.8	30.1	40	N/A
Electrical Cond. (µS/cm)	96.8	82.4	76.6	1000	1000
TDS (mg/L)	60.0	52.3	46.0	500	500
Sal. (ppt)	0.04	0.04	0.04	NS	N/S
DO (mg/L)	6.38	5.92	5.59	7.5	N/S
Turbidity (NTU)	1.6	2.3	3.4	1.0	5.0
COD (mg/l)	4.8	4.4	4.2	90	NS
Sodium (Na) (mg/l)	7.3	8.9	11.3	200	NS
Potassium (K+) (mg/l)	7.2	9.8	11.2	NS	NS
Calcium (Ca) (mg/l)	26.6	26.1	25.5	NS	NS
Sulphate (SO_4^{2-}) (mg/l)	6.3	7.4	9.2	500	250
Nitrate (NO_3-) (mg/l)	0.03	0.05	0.05	10	NS
Lead (Pb) (mg/l)	ND	ND	ND	0.05	NS
Iron (Fe) (mg/l)	0.26	0.18	0.09	0.3	1.0
Mercury (Hg) (mg/l)	ND	ND	ND	0.001	NS
Chromium (Cr) (mg/l)	ND	ND	ND	0.05	NS
Copper (Cu) (mg/l)	ND	ND	ND	0.01	0.01
BOD_5 @ 20 – 25^{oc} mg/l	0.6	1.0	0.5	0	NS
Phosphate (mg/l)	0.36	0.76	0.87	5.0	NS
Nickel (mg/l)	ND	0.035	0.020	0.05	NS
Zinc (mg/l)	0.364	0.351	0.432	5	5
Arsenic (mg/l)	ND	ND	ND	0.2	NS
THC (mg/L)	ND	ND	ND	0.05	0.05
Oil & Grease (mg/L)	ND	ND	ND	0.05	NS
Total coliform Count (cfu/ml)	ND	ND	ND	Nil	Nil
Total Fungal Count (spore/ml)	ND	ND	ND	Nil	Nil
Total yeast count (cfu/ml)	ND	ND	ND	Nil	Nil

***Source**: Field Survey*

3.7.2 Surface Water

Three (3) water samples were taken from the surface water body in the immediate surroundings of the project area at the upper, middle and lower sections (Fig. 3.13) and analysed. In-situ measurement was taken immediately after collection (Plate 3.3). Historical data was also used to describe the water level of the river during the rainy and dry season. The rainy season water level fluctuates between 8-10 m above the sea level as seen from the water-mark of the water in-take structure while the dry season water level ranges from 3-5 m (Table 3.6).



Plate 3.3: Surface Water Sample Collection and In-situ Analysis

Table 3.6: Chemical Analysis of Surface Water Samples from within the Project Area

S/N	Parameter	Surface water			FMEnv Limit
		SW-1 Upper	SW-2 Middle	SW-3 Downstream	FMEnv Limit
	Long	6.09026	6.08343	6.07518	
	Lat	7.83845	7.81952	7.81256	
1	Turbidity (NTU)	8.0	3.0	5.0	N/S
2	pH	7.4	7.5	7.9	6.0 – 9.0
3	Temperature (^oC)	29.5	29.5	29.4	20 – 33
4	DO (mg/l)	7.85	7.91	6.23	7.5
5	COD (mg/L)	11.8	21	10.58	NS
6	BOD (mg/l)	6.47	3.68	5.8	4.0
7	Conductivity (µs/cm)	52	48	66	N/S
8	TSS (mg/l)	0.026	0.19	0.82	N/S
9	TDS (mg/l)	26	24	33	NS
10	Sulphate (SO_42) (mg/L)	0.27	0.34	0.42	NS
11	Nitrate (NO_3-) (mg/L)	0.18	50	10	NS
12	Lead (Pb) (mg/l)	ND	ND	ND	0.0017**
13	Cd (mg/l)	0.002	<0.001	<0.001	0.0002 – 0.0018**
14	Iron (Fe) (mg/L)	1.216	1.124	2.450	NS
15	Mercury (Hg) (mg/L)	ND	ND	ND	0.001
16	Chromium (Cr) (mg/L)	0.002	<0.001	0.046	0.02 – 2.0

17	THC (mg/L)	ND	ND	ND	NS
18	Copper (Cu) (mg/l)	0.67	0.13	0.21	0.002 – 0.004**
19	Phosphate (mg/L)	2.4	2.1	3.2	NS
20	Nickel (mg/L)	1.124	1.428	1.246	0.025 – 0.150**
21	Zinc (mg/L)	0.468	0.425	0.562	0.03
22	Arsenic (mg/L)	ND	ND	ND	0.5
23	PCB (mg/l)	ND	ND	ND	NS
24	Total coliform Count (cfu/ml)	8.0	12.0	15	NS
25	Total Hydrocarbon Count (mg/l)	ND	ND	ND	NS

***Source**: Laboratory Analysis; ND=Not Detected NS=Not Specified,*

TW=Treated Water, GW =Groundwater, SW = Surface Water

WHO: World Health Organisation;

FMEnv: Federal Ministry of Environment

The pH generally ranged from 7.4 to 7.9 which indicates slightly alkalinity and fall within the WHO and FMEnv permissive limits of 6.0 to 9.0 for surface waters.The values for Total Dissolved Solid (TDS) for the upper, middle and downstream are 26 mg/l, 24 mg/l and 33 mg/l. Electrical Conductivity values are 52 μS/cm, 48 mg/l and 66 μS/cm for the upstream, midstream and downstream respectively. The temperature for the samples collected are 29.5^0 C (upstream), 29.5^0 C (midstream) and 29.4^0 C (downstream) in the proposed project area. The surface water samples in the area were analyzed for heavy metals to determine their concentration and possible contamination of the environment. The heavy metals of interest are, Copper (CU), Zinc (Zn), Iron (Fe), Cadmium (Cd), Lead (Pb), Chromium (Cr), Manganese (Mn), Vanadium (V), Arsenic (Ar), Mercury (Hg), and Nickel (Ni). No heavy metals pollution was recorded when compared with the FMEnv limit.

3.8 Biological Environment

3.8.1 Vegetation Component

The biological environment comprises flora and fauna. Table 3.7 shows the flora component within the proposed project environment. The proposed area is highly built-up with secondary vegetation. The plant species encountered in the study have both medicinal and economic values. Their common and scientific names, uses, and IUCN status were established.

The plant species which were found in the study area have medicinal, commercial and culinary importance. However, the populations and distribution pattern of the encountered species may not likely be affected by harvesting and removal due to the current project, among other similar development projects. Therefore, none of the species belong to any of the IUCN endangered categories. Plate 3.4shows some vegetation within the watershed.

Table 3.7: Flora Species in the Project Area

1	Scientific Name	Common Name	Family Name	Abundance Status	Uses	IUCN Status
1	*Achyranthes aspera*	Devil's horse whip	Amaranthaceae		Medicinal	Not endangered
2	*Afzelia africana*	African mahogany	Fabaceae	+	Medicinal / Commerce	Not endangered
3	*Albizia gummifera*	peacock flower	Fabaceae	+	Medicinal / Commerce	Not endangered
4	*Alchornea cordifolia*	Christmas bush.	Euphorbiaceae	+	Medicinal	Not endangered
5	*Allophyllus africanus*	African false currant	Sapindaceae	+	Medicinal	Not endangered
6	*Alstonia boonei*	God's tree	Apocynaceae	+	Medicinal / Commerce	Not endangered
7	*Amaranthus brasiliana*	Metal weed	Amaranthaceae	+	Medicinal	Not endangered
8	*Anacardium occidentale*	Cashew	Anacardiaceae	+	Medicinal/Food	Not endangered
9	*Annona senegalensis*	African custard-apple	Annonaceae		Medicinal / Commerce	Not endangered
10	*Anthoclesta djalolensis*	Cabbage tree	Loganiaceae		Medicinal	Not endangered
11	*Anthoclesta volgeli*	Cabbage tree	Loganiaceae	+	Medicinal	Not endangered
12	*Antiaris africana*	Bark cloth tree	Moraceae	+	Medicinal	Not endangered
13	*Arachis hypogoea*	Groundnut	Fabaceae	+	Food	Not endangered
14	*Blighia sapida*	Ackee apple	Sapindaceae	+	Medicinal / Commerce	Not endangered
15	*Bridelia ferruginea*		Phyllanthaceae	+	Medicinal	Not endangered
16	*Bridelia micrantha*		Phyllanthaceae	+	Medicinal	Not endangered
17	*Capsicum annuum*	Pepper	Solanaceae	+	Food	Not endangered
18	*Chlorophora excelsa*	Iroko	Meliaceae	+	Medicinal / Commerce	Not endangered
19	*Chromolaena odorata*	Siam weed	Asteraceae		Medicinal	Not endangered
20	*Citrullus lanatus*	Melon	Cucurbitaceae	+	Medicinal	Not endangered
21	*Citrus sinensis*	Sweet orange	Rutaceae	+	Food	Not endangered
22	*Cnestis ferruginea*	Dog breast	Connaraceae	+	Medicinal	Not endangered
23	*Colocasia esculenta*	Cocoyam		+	Food	Not endangered
24	*Colocasia sp.*	Wild cocoyam		+	Medicinal	Not endangered
25	*Combretum*	Bushwillows	Combretaceae	+	Medicinal	Not endangered

	indicum					
26	*Combretum racemosa*	Bushwillows	Combretaceae	+	Medicinal	Not endangered
27	*Crotolaria retusa*	Devil-bean	Fabaceae	+	Medicinal	Not endangered
28	*Croton lobatus*	Lobed croton	Euphorbiaceae	+	Medicinal	Not endangered
29	*Cymbopogon citratus*	Lemon grass	Poaceae		Medicinal	Not endangered
30	*Cyperus differmis.*	Sedge	Cyperaceae		Medicinal	Not endangered
31	*Daniella oliveri*	African balsam	Fabaceae	+	Medicinal	Not endangered
32	*Datura stramonium*	Jimsonweed	Solanaceae	+	Medicinal	Not endangered
33	*Dioscorea rotundata*	White	Dioscoreaceae	+	Food	Not endangered
34	*Elaeis guineensis*	Oil palm	Arecaceae	+	Food	Not endangered
35	*Eleusine indica*	Stubborn grass	Poaceae	+	Medicinal	Not endangered
36	*Ficus asperifolia*	Fig	Moraceae	+	Medicinal	Not endangered
37	*Ficus capensis*	Fig	Moraceae		Medicinal	Not endangered
38	*Ficus exasperata*	Sand paper plant	Moraceae		Medicinal	Not endangered
39	*Ficus sur*	Fig	Moraceae	+	Medicinal	Not endangered
40	*Gliricidia sepium*	Quickstick	Fabaceae	+	Medicinal	Not endangered
41	*Hollarhena floribunda*	False rubber tree	Apocynaceae	+	Medicinal	Not endangered
42	*Hoslundia opposita*	Kamyuye	Lamiaceae	+	Medicinal	Not endangered
43	*Hymenocardia acida*		Phyllanthaceae		Medicinal	Not endangered
44	*Hyptis suaveolens*	Mosquito plant)	Lamiaceae		Medicinal	Not endangered
45	*Ipomoea batatas*	Sweet potato	Convolvulaceae	+	Food	Not endangered
46	*Leucaena leucocephala*	White leadtree	Fabaceae		Medicinal	Not endangered
47	*Lonchocarpus sericeus*	Cube root	Fabaceae	+	Medicinal	Not endangered
48	*Ludwigia abyssinica*	Water weed	Onagraceae		Medicinal	Not endangered
49	*Luffa aegyptiaca*	Queen's sponge	Cucurbitaceae	+	Medicinal	Not endangered
50	*Lycopersicum esculentum*	Tomato	Solanaceae	+	Food	Not endangered
51	*Manihot esculenta*	Cassava	Euphorbiaceae	+	Food	Not endangered
52	*Milletia thoningii*	Milletia	Fabaceae	+	Medicinal	Not endangered
53	*Musa paradisiaca*	Plantain	Musaceae	+	Food	Not endangered
54	*Nauclea latifolia*	African Peach	Rutaceae	+	Medicinal	Not endangered
55	*Oryza sativa*	Rice	Poaceae	+	Food	Not endangered

56	*Panicum maximum*	Guinea grass	Poaceae	+	Medicinal	Not endangered
57	*Parkia biglobosa*	Locust bean	Fabaceae		Food	Not endangered
58	*Pennisetum purpureum*	Elephant grass	Poaceae	+	Medicinal	Not endangered
59	*Phyllanthus amarus*		Phyllanthaceae	+	Medicinal	Not endangered
60	*Piliostigma thornigii*	Monkey bread	Fabaceae	+	Medicinal	Not endangered
61	*Portulaca oleracea*	Pot herb	Portulaceae		Medicinal	Not endangered
62	*Rauvolfia vomitora*	Swizzle stick	Apocynaceae	+	Medicinal	Not endangered
63	*Ricinus communis*	Castor oil bean	Euphorbiaceae		Medicinal	Not endangered
64	*Sacciolepis africana*	Water grass	Poaceae		Medicinal	Not endangered
65	*Sida acuta*	Stubborn weed	Malvaceae		Medicinal	Not endangered
66	*Sorghum bicolor*	Guinea corn	Poaceae	+	Food	Not endangered
67	*Spondias mombin*	Hog plum	Anacardiaceae		Medicinal	Not endangered
68	*Tectona grandis*	Teak	Verbenaceae		Medicinal / Commerce	Not endangered
69	*Terminalia avicinoides*	False almond	Combretaceae	+	Medicinal / Commerce	Not endangered
70	*Trema orientalis*	Charcoal Tree	Ulmaceae	+	Medicinal	Not endangered
71	*Vitellaria paradoxa*	Sheabutter	Sapotaceae	+	Medicinal / Commerce	Not endangered
72	*Zea mays*	Maize	Poaceae	+	Food	Not endangered

***Source**: Field Survey*

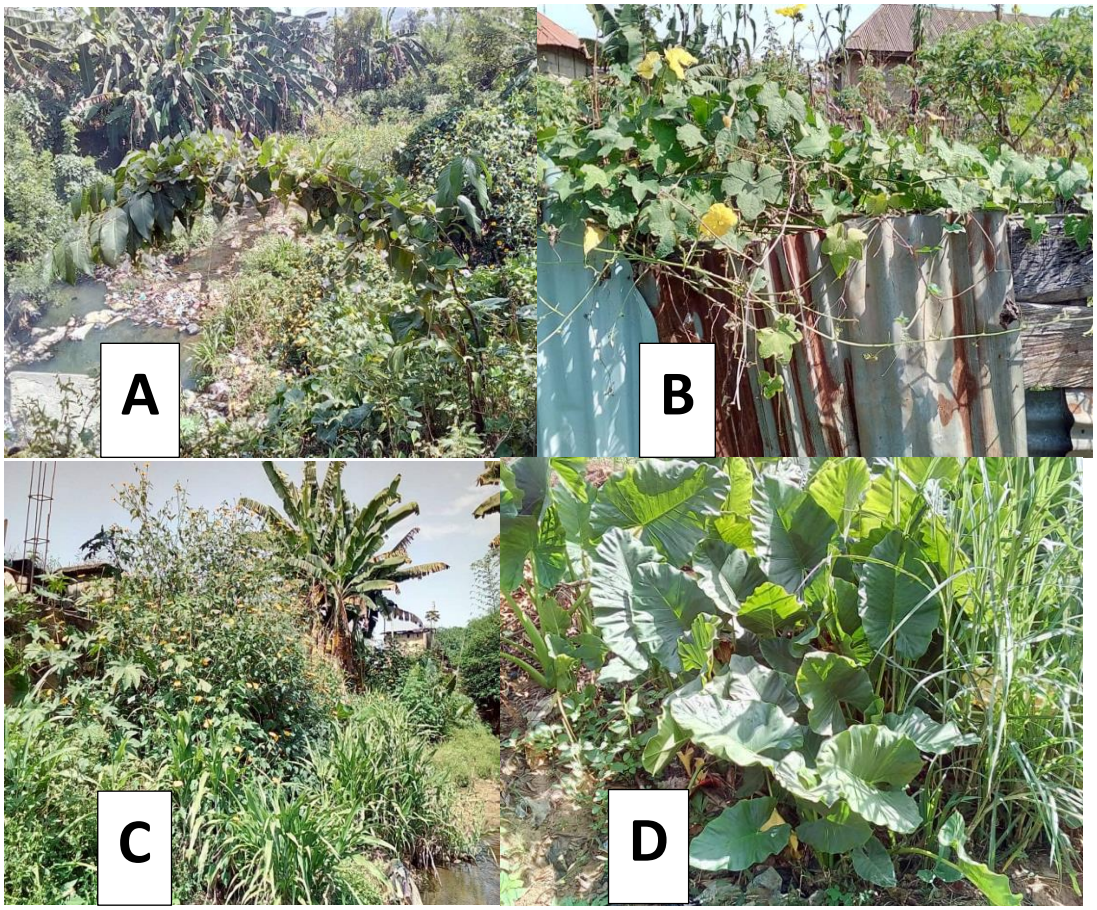


Plate 3.4: Vegetation Cover at Omigbo showing *Luffa aegyptiaca* (Queen's sponge), water course grasses, *Ricinus communis* (Castor oil plant), *Musa paradisiaca* and *Colocasia* sp.

3.8.2 Wildlife and Biodiversity (including Birdlife)

A study of the fauna was based on observation, and interviews with the community members especially the local hunters. Sound recording, sighting and track monitoring were other methods employed for identifying and tracking the birds and animals that live within and around the proposed project area. Table 3.8 presents the types of animals around the proposed project area. The wildlifes found in the state are dominated by birds, reptiles (including snakes and lizards) and mammals (including rats, rodents, squirrels, grass cutters. The bird species observed in the study area include black kites (*Muluus migrans),* African Barn Owl (*Tyto alba),* Little African Swift (*Apus affinis),* African Palm Swift (*Cypsivurus parvus*), Green fruit Pigeon (*Treron australis),* Village weaver (*Ploceus cucullatus),* Cattle egret (*Ardeola ibis), and* African green pigeon (*Treton calvus).* The fauna of the study area is not IUCN threat status classified.

Table 3.8: Fauna Species in the Project Area including Birdlife

S/N	Local Names	Species	Family	Group	Status
1.	Bush fowl	*Francolinus bicalcaratus*	Phasianidae	Aves	Not evaluated
2.	African Barn Owl	*Tyto alba*	Tytonidae	Aves	Least concern
3.	Little African Swift	*Apus affinis*	Apodidae	Aves	Least concern
4.	African Palm Swift	*Cypsivurus parvus*	Apodidae	Aves	Not evaluated
5.	Green fruit Pigeon	*Treron australis*	Columbidae	Aves	Least concern
6.	Village weaver	*Ploceus cucullatus*	Ploceidae	Aves	Least concern
7.	Cattle egret	*Ardeola ibis*	Ardeidae	Aves	Least concern
8.	Black Kite	*Muluus migrans*	Accipitridae	Aves	Least concern
9.	African green pigeon	*Treton calvus*	Columbidae	Aves	Least concern
10.	Black ant	*Lasius niger*	Formicidae	Insecta	Not evaluated
11.	Soldier ant	*Strongylognathus alboini*	Formicidae	Insecta	Least concern
12.	Termite	*Trinervitermes trinervoides*	Termitidae	Insecta	Least concern
13.	Dragon fly	*Acanthaeschna victoria*	Aeishnidae	Insecta	Least concern
14.	Giant African mantis	*Sphodromantis viridis*	Mnatidae	Insecta	Not evaluated
15.	Red patch butterfly	*Chlosyne Rosita*	Nymphalidae	Insecta	Not evaluated
16.	White patch butterfly	*Chiomara asychis*	Hesperiidae	Insecta	Not evaluated
17.	Moth	*Chrysiridia rhipheus*	Uraniidae	Insecta	Not evaluated
18.	Africa cotton stainer	*Dysdercus fasciatus*	Pyrrhocoridae	Insecta	Not evaluated
19.	Snail	*Achatina achatina*	Achatinidae	Mollusca	Not Listed
20.	Land Slug	*Limax maximus*	Limacidae	Mollusca	Not evaluated
21.	Toad	*Bufo bufo*	Bufonidae	Amphibia	Least concern
22.	Tree frog	*Litoria caerulea*	Hylidae	Amphibia	Least concern
23.	Sebe	*Naja melanoleuca*	Viperidae	Reptilia	Not evaluated
24.	Monitor lizard	*Varanus albigularis*	Varanidae	Reptilia	Not evaluated
25.	African yellow bat	*Scotophilus dinganii*	Vespertilionidae	Mammal	Least concern
26.	Striped ground squirrel	*Xerus erythropus*	Sciuridae	Mammal	Least concern
27.	Grasscutter	*Thryonomys*	Thryonomyidae	Mammal	Least concern

S/N	Local Names	Species	Family	Group	Status
		swinderrianus			
28.	African tree squirrel	*Heliosciurus gambianus*	Sciuridae	Mammal/ Rodent	Least concern
29.	African giant rat	*Crecetomys gambianus*	Nesomyidae	Mammal/ Rodent	Least concern
30.	Crested Porcupine	*Hystrix cristata*	Hystricidae	Mammal/ Rodent	Least concern
31.	African giant millipede	*Archispirostreptus gigas*	Spirostretidae	Arthropoda	Not evaluated
32.	Earthworm	*Lumbricus terrestris*	Acanthodrilidae	Annelida	Not evaluated
33.	Spider		Araneidae	Arachnida	Not evaluated

3.8.3 Aquatic Biodiversity

The description of the baseline aquatic biodiversity of the study area is provided in the following sub-sections, covering plankton, macroinvertebrates (benthos), and fisheries.

3.8.3.1 Plankton

Plankton is a term used for the diverse collection of organisms that drift in water but are unable to actively propel themselves against currents (or wind). They are usually divided into two (2) classes, namely: Phytoplankton and Zooplankton. The Phytoplanktonare free-floating organisms that undergo photosynthesis with the help of chlorophyll and thereby contribute to primary production in their endemic aquatic environment. The Zooplankton, on the other hand, are the animal component of the plankton spectrum. The diversity of phytoplankton and zooplankton recorded in the study area is further discussed below.

Phytoplankton

The distribution of phytoplankton species recorded in the project area is as follows: Diatoms (Division-Bacillariophyceae-50%), Euglenoids (Division – Euglenophyceae-28%) and Bluegreen algae (Division- Cyanophyceae-22%). The dominant phytoplankton group identified in the water body (Omigbo River) in the study area was Diatoms, followed by the Euglenoids, and the least was the Bluegreen algae. The result indicates a freshwater environment.

Zooplankton

Zooplankton depend on the phytoplankton for food. They are used by many nektons for food as well as fish. The distribution of the zooplankton group recorded in the study area is as follows: Copepoda (43%), (Cladocera (28%), and Rotifera (29%). The dominant group was Copepoda while the least group identified was Rotifera.

3.8.3.2 Macroinvertebrates (Benthos)

Among the identified benthos of the study area, the dominant groups were the Chordata (35.71%), Mollusca (28.57%), and Oligachaeta (21.43%) while the least dominant groupswere the Crustacea and Insecta (7.14%).

3.8.3.3 Fisheries

The water bodies (Omigbo and Opa Rivers) in the study area are not exclusively reserved for fishing. However, there is minor fishing game activities by young people during wet season. The fish assessment of the area revealed that Cichlidae and Clariidae were the dominant groups in terms of species richness while the less dominant family was Channidae. Most of the fish caught in the water body are usually small to juvenile. The species include *Bagrus bayad* and Tilapia (*Oreochromis niloticus).* Methods used by the inhabitants for fishing is hook and line gear. No fish trawlers are used.

3.8.4 Protected Areas

There are no protected or conservation areas in the study area that could be impacted by the project. In addition, there are no known wetlands, primary forests, and game reserves near the project area.

CHAPTER FOUR

SOCIO-ECONOMIC CHARACTERISTICS AND CONSULTATION WITH STAKEHOLDERS

4.0 Introduction

This chapter discusses themes and topics on population, land use, planned development activities, settlement and community structures, employment, distribution of income, goods, and services, recreation, health, and cultural properties as they are concerned with the project area.

4.1 Socio-Economic Characteristics

Specifically, the chapter entails a detailed discussion of the following:

- Socio-Economic Assessment: Analysis of existing livelihood opportunities, income, gender characteristics, age profile, health, transport access, existing community structures at the watershed, community, household, and individual levels etc;
- Gender-Based Violence: Analysis of the status of GBV/SEA in the project community and related issues;
- Grievance Redress Mechanism: Analysis of existing formal and informal grievance redress mechanisms in and around the intervention area;
- Public Consultation: Presentation of consultations with relevant stakeholders and affected persons; and
- Other relevant topics.

4.1.1 Data Collection Methodology

Methods employed in gathering data on the socioeconomic characteristics of the project community to ensure adequate and wide coverage are highlighted as follows:

- Reconnaissance survey;
- Preparation/design of survey material;
- Field data collection (structured questionnaire administration);
- Consultations with groups and stakeholders;
- Consultation with community health facility personnel;
- Field/direct observation; and
- Literature review (secondary data collection).
- Separate meetings withhelders, youth and women.

4.1.2 Overview of Data Collection Methodology

A reconnaissance survey of the project community was carried out prior to the field data gathering. This was done to enable the consultant to structure/design a comprehensive survey material (questionnaire). The questionnaire was structured to capture important socioeconomic variables of the project community and it was randomly administered. Furthermore, notices were given to various groups ahead of consultation with stakeholders. This was to enable the various groups such as community elders, project affected peoples (PAPs), women association, youths,

artisans, etc. prepare themselves and attend the stakeholder's meeting. In addition, various health facilities within the community were also visited and interviewed on issues relating to the health of the locals and GBV treatments.

A literature review, particularly on the history of the community, the prevalence of gender-based violence and population characteristics was also carried out. Data on the population of the study area was sourced from the National Population Commission (NPC) and the Nigeria Bureau of Statistics (NBS). Other activities engaged during the data gathering exercises are field observations (photographs and note taking), minutes of meetings held, attendances of meetings, and contacts of key persons met. These are attached as annexures. In addition to the general meeting, there were separate group meetings with women, elders and youth leaders. There are no IDPs within the area and one (1) physically challenged person attended the General Meeting and also answered the structure questionnaire. Forty-Eight per cent (48) of the respondents to the questionnaire are female.



Plate 4.1a: Men at Omigbo Site



Plate 4.1b: Women at Omigbo Site

4.2 Socio-Economic Assessment

The Socio-Economic Assessment covers population characteristics, demographics, education, employment, healthcare, housing, assets, communication, transportation, standard of living, and social services. It delves into cultural practices, environmental factors, livelihoods, and community development initiatives. The assessment highlights challenges and opportunities, considers community influence, positive and negative impacts of the project. and concludes with actionable recommendations for improvement.

4.2.1 Population Characteristics of the Project Area

The population estimate of Kabba-Bunu LGA was adopted as the closest for Kabba community. The available population data and the projected values are presented in Table 4.2. Using the 1991 and 2006 figures, the annual population growth rates were computed to arrive at 2.89% and 1.49% for Kogi State and Kabba-Bunu LGA respectively. These rates were also used to project for years 2019 and 2025, which were sufficient periods to capture the project initiation and execution phases. By 2025, the estimated population figures for Kogi State will be roughly 5.7 million while that of Kabba-Bunu LGA will be 0.191 million. As shown in the **Table 4.1.**

Table 4.1: Estimation of Population Size for Kogi State and Kabba-Bunu LGA

State/LGA	Year	Total
Kogi State	1991	2,147,756
	2006	3,314,043
	2019	4,799,647
	2025	5,694,404
Kabba-Bunu LGA	1991	NA
	2006	144,579
	2019	175,230
	2025	191,490

***Source*: National Bureau Statistics (2012)**

4.2.2 Demographic Characteristics of Sampled Population

Table 4.2 gives a description of the socioeconomic characteristics of the respondents in the study community. Demographic variables such as respondent's gender, age, marital status, religion, household size and ethnic group are described. This information would present an understanding of the profile of the respondents in the project community.

Table 4.2: Respondent's Demographic Characteristics

Indicators	Options	Respondents (%)	Findings
Gender	Male	52.0	Omigbo has a higher proportion of males (52.0%) compared to females (48.0%). This distribution could have implications for workforce participation, income distribution, and overall economic dynamics.
	Female	48.0	
Age	18-45 years	52.0	The majority of residents in the Omigbo community fall within the 18-45 age range (52.0%), indicating a significant presence of individuals in their prime working and earning years. The representation of residents aged 46-65 years (36.0%) and above 66 years (12.0%) is lower and, potentially suggests a relatively smaller proportion of younger adults in the community's workforce and economic activities.
	46-65 years	36.0	
	Above 66 years	12.0	
Marital status	Single	16.0	Most residents in Omigbo are married, accounting for 76.0% of the population, potentially contributing to a sense of stability and community cohesion. A few are single (16.0%) or separated (8.0%).
	Married	76.0	
	Divorced/separated	8.0	
Religion	Christianity	80.0	The predominant religion in the community is Christianity as indicated by 80.0% of the sampled population while Islam accounts for only 20.0%.
	Islam	20.0	
Household size	Less than 5	52.0	Household size of less than 5 members is recorded as the highest proportion (52.0%). This was followed by the household size of 11-15 members (4.0%) while households 6-10 and above 16 members account for 36.0% and 8.0% respectively. Resource allocation and community support systems should be designed to accommodate the needs of larger households.
	6-10	36.0	
	11-15	4.0	
	16 and above	8.0	
Ethnic	Yoruba	100	The dominant ethnic group in Omigbo community is Yoruba only. Provide project information in multiple languages if necessary and utilize culturally sensitive communication approaches to reach all segments of the community.
Residential Status	Permanent resident	88.0	The distribution of the residential status and duration of residence indicates most of the respondents are permanent residents in the project area. Of the sampled population 88.0% are permanent residents of the project area/community while back home(returnee) account for 12.0%.
	Back home (returnee)	12.0	
Duration in the community	3-5years	8.0	72.0% of the permanent residents have lived for more than 10 years in the area, which implies that they have stayed long enough in the project area to provide reliable information on the history of the gully and the socio-economic condition of the community while those that have lived in the community for between 6-9 years and 3-5years account for 20.0%, 8.0% respectively.
	6-9years	20.0	
	10years and above	72.0	

4.2.3 Respondents' Educational Status

The level of one's education shows one's awareness and necessary knowledge of the projects and activities that are being carried out in one's environment and also facilitates ease of communication with others. The educational status of the respondents (Fig. 4.1) shows that the highest proportion of the respondents (36.0%) has a secondary school. This is followed by 12.0% of the respondents who are university graduates, and 20.0% finished tertiary school. Those with primary school leaving certificates represent 12.0% while university postgraduates and those who had no formal education account for 16.0% and 4.0% respectively. Going by this finding, the inhabitants of the Omigbo watershed area possess the average educational training to handle the various stakeholder components of the Kogi State ACReSAl intervention and contribute meaningfully to the project and ensure sustainability.

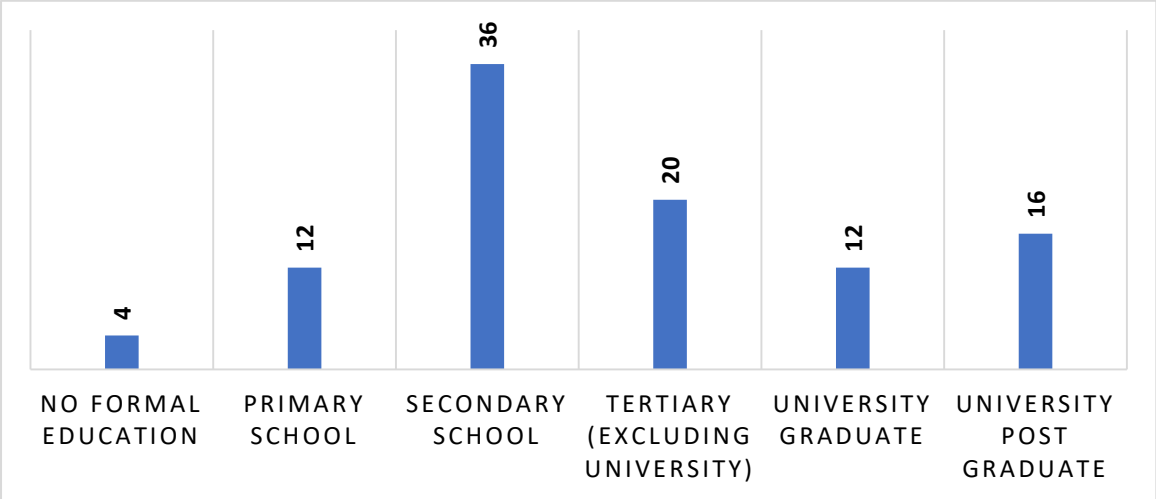


Fig. 4.1: Respondents' Educational Status

This portrays a high level of literacy in the project area. It also indicates the possible ease of communication with the project beneficiaries. Fig. 4.2 shows the distribution of the educational facilities within the project area. Specifically, situated within the project area are the Baptist Primary School and the St Monica Secondary College among others. The status of these facilities can be found in the annexure.

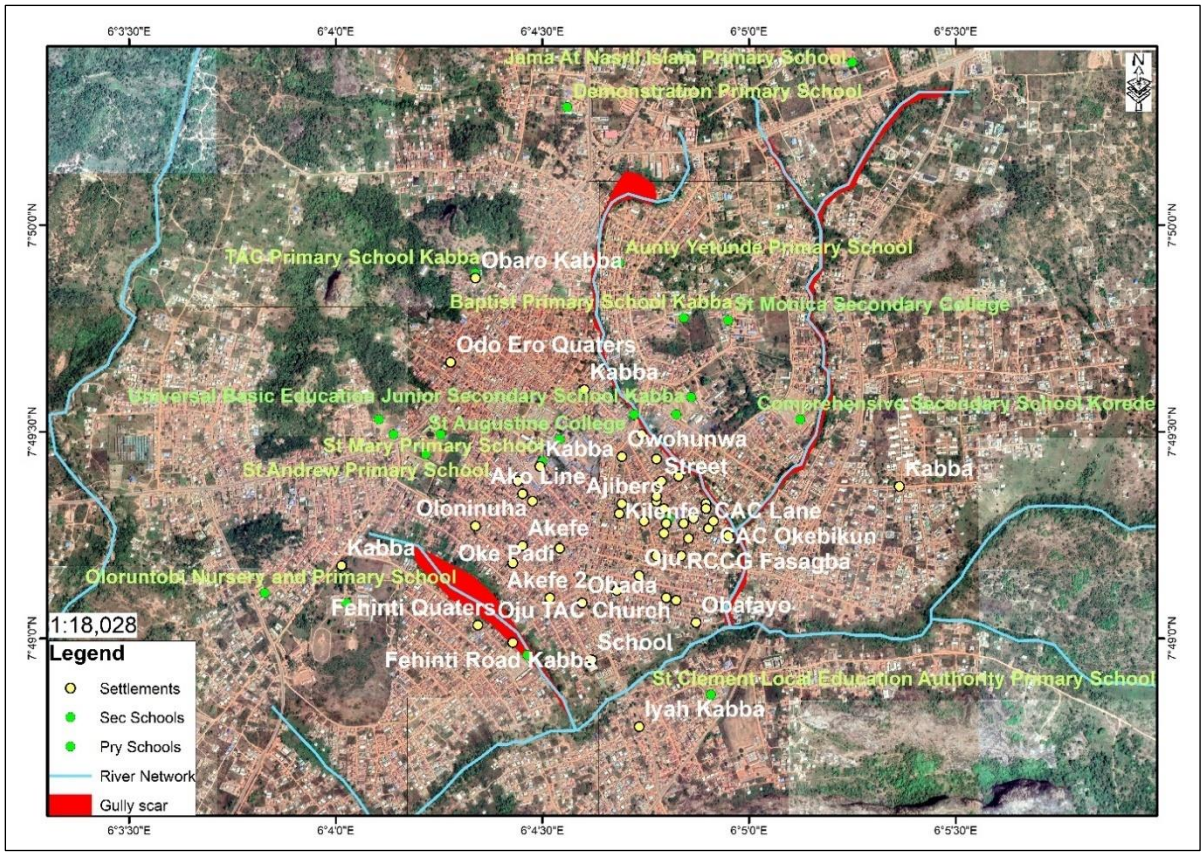


Fig. 4.2: Distribution of the Educational Facilities within the Project Area

4.2.3.1 Household Members' Educational Status

In Omigbo, most of the respondents (96.0%) of the surveyed households have at least one member attending school while 4.0% stated otherwise. The distribution of education levels indicates that respondents have education up to post-secondary level (36.0%), primary school (12.0%), junior high (24.0%) followed by senior high/technical level (28.0%). The majority of respondents (52.0%) take 15-30 minutes to reach school, 8.0% of the respondent takes less than 5minutes to reach school while significant proportions take 30-60 minutes (12.0%) and 60+ minutes (28.0%). This indicates a need to focus on improving access to higher education and skill development programs. The primary mode of transport to school is by okada (52.0%) and foot (36.0) followed by taxi (8.0%) and mini-bus (4.0%). The predominant use of foot transportation suggests potential challenges related to accessibility and transportation infrastructure in the community.

4.2.4 Respondents' Occupational Characteristics

As seen in Figure 4.3, the primary livelihood source in Omigbo community is trading/shop keeping (44.0%). (20.0%) of the respondents, however, indicated that they were farmers, daily labourer (16.0%), employed 4.0%, and about (12.0%) indicated that they artisans while retirees constitute (4.0%.). The project might consider initiatives to improve agricultural practices, provide access to modern

farming techniques, and enhance market linkages for agricultural products. Specifically, some of the PAPs can be trained on sustainable urban agriculture, horticulture and market gathering for effective utilization of the reclaimed land along Omigbo channel.

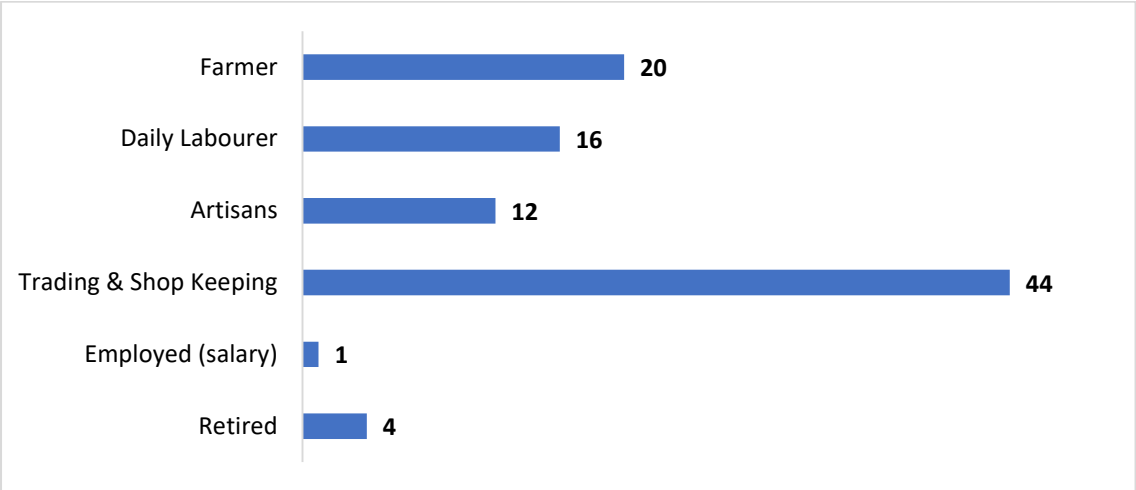


Fig. 4.3: Respondents' Livelihood Characteristics

Trading as the most prominent occupation in the project area varies from small shop in front of houses to medium scale buying and selling in the local market, (plate 4.1c).



Plate 4.1.c: Trading Stores along a Major Road in the Project Area

4.2.5 Respondents' Income Characteristics

A fair proportion of the households in the project area have their monthly earnings ranging between 10,000-20,000 naira (20.0%) and 21,000-30,000 naira (20.0%). About 12.0% earn less than 10,000 naira monthly; many of which are daily labourers,

artisans and farmers who could not estimate their monthly income because they have not been keeping records of their income and financial activities. Those earning between 31,000 - 60,000 naira and 61,000-above 100,000-naira account for 22.0 and 6% respectively of the sampled population. About 10% did not indicate their monthly income. However, it may be that they do not feel comfortable to disclose their income to a third party as that practice is not very common in Nigeria.

Other sources of income were also identified by the respondents. About 32.0% of the respondents indicated that they receive remittances from family members who live elsewhere, 68.0% claimed otherwise. As indicated, remittances received range from 10,000-20,000 naira (12.0%), 35,000 (4%) and less than 10,000 (16.0%). In addition,60% of respondent has no other income stream while 40% indicated other income streams which ranges from N10,000-N30,000 (28%), less than N5,000 (4.0%) and 8% earns above 100,000.

As seen in Figure 4.4, the distribution of total household monthly incomes in Omigbo community is diverse, with notable concentrations in the 91,000 - 100,000 range (12.0%) and lower incomes (<10,000) at 8%, indicating both economic diversity and potential disparities requiring attention for equitable development. Other income ranges are 11,000 – 20,000 (16%), 51,000 – 60,000 (8%), 21,000 – 30,000 (12.0%), 31,000 – 40,000 (24%), 41,000 – 50,000 (32%), 61,000-70,000 (4%), 71,000-80,000 (4%) while 4% of the respondents find it difficult to estimate their monthly income due to a lack of financial records. It may be that they do not feel comfortable disclosing their income to a third party as that practice is not very common in Nigeria. However, with respect to the project, the majority of the people are low income and this pose a great challenge to sustainable practices for their livelihood. It must be stated that, due to average educational level of the majority, it will be very easy to train and retrain the people in other livelihoods sources.

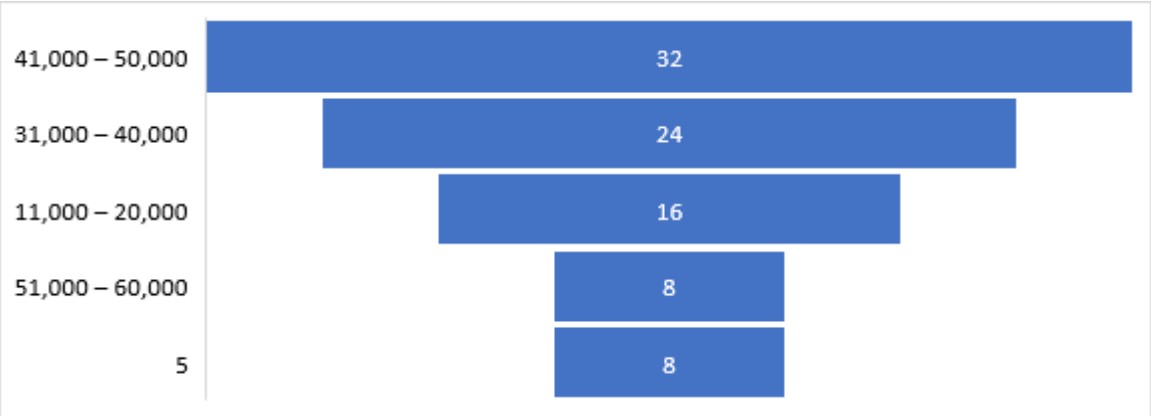


Fig. 4.4: Respondents' Total Household Income

4.2.6 Respondents' Assets

The below subsections highlight various means of living of the residents in Omigbo community.

It emphasizes on the residents' assets and household items, communication technology, comfort and convenience, transportation modes, housing characteristics, sanitation and hosing tenure.

4.2.6.1 Prevalence of Household Items among the Residents of Omigbo Community

The Omigbo community demonstrates ownership of essential electronics with 36.0% ownership of DVD players and refrigerators, as well as universal access to mosquito nets. Communication technology is well-adopted, with radio/tape recorders (52.0%), televisions (84.0%), telephone (28%), computer (8%) and mobile phones (72.0%) offering potential for information dissemination. Additionally, a focus on comfort is evident through high ownership of furniture (60.0%), beds (72.0%), fridge (44.0%), fan (44.0%), mosquito net (36.0), hunting trap (12.0%), insect screen 984.0%) and prevalent cooking facilities stove (44.0%), while varying technology ownership highlights opportunities for enhancing digital literacy and communication infrastructure to support community development.

4.2.6.2 Respondents' Prevalence of Transport Modes

As shown in Figure 4.5, the transportation landscape in Omigbo community is primarily dominated by motorcycles (68.0%), indicating their affordability and accessibility. Car ownership is low (4.0%), potentially due to economic constraints, while a diverse range of options, including bicycles (12.0%), boat (4.0%), tricycle (8.0%) and trucks (4%), demonstrates adaptability. The community's inclination towards sustainable transport and the presence of varied modes of transport highlight opportunities for improved safety, infrastructure, and environmentally friendly initiatives.

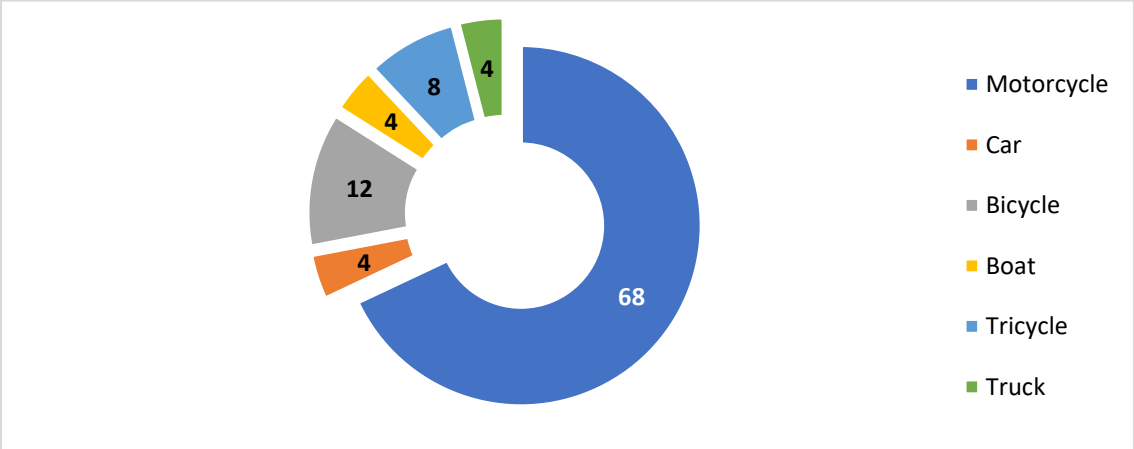


Fig. 4.5: Respondents' Prevalence Mode of Transport

4.2.6.3 Housing Characteristics

Housing types and materials used in housing construction indicate a measure of the quality/standard of living of the residents in the community. Thus, 88.0% of the respondents stated that they live in cemented block houses while 12.0% indicated plastered mud houses. The roofing material composition are majorly aluminium (68.0%) and corrugated iron sheets (32.0%) while others indicated that their floors are

made of concretes (88.0%), tiles (12.0%) Households living in 3–4-bedroom flat represent 54.2%, while those living in 1-2 rooms represent 45.8%. The most common toilet facility used by the respondents is the water closet (68.0%) pit latrine (24.0%), and toilet dwelling outside facility (10.0%). 4,0% of the respondents use pier latrine. Other structures on the plot are shops (20.0%), granary (8.0%) and animal pen (8.0%). Plate 4.2 shows the typical building types found in the project area.



Plate 4.2: Typical Building Types In The Project Area

The tenure of the housing and land is presented in Figure 4.6. As shown, 76.0% of the sampled population in Omigbo indicated they own the houses they live in, 20% live in rented apartments while 24.0% occupy rent-free. Similarly, 84.0% of the respondents claimed that they own the land they occupy while 12.0% and 4.0% of the respondents are respectively occupying a rented land and occupied rent-free land.

Challenges such as sanitation infrastructure gaps and the need for affordable housing options require targeted interventions to improve overall living standards while maintaining a balance between traditional practices and modernization.

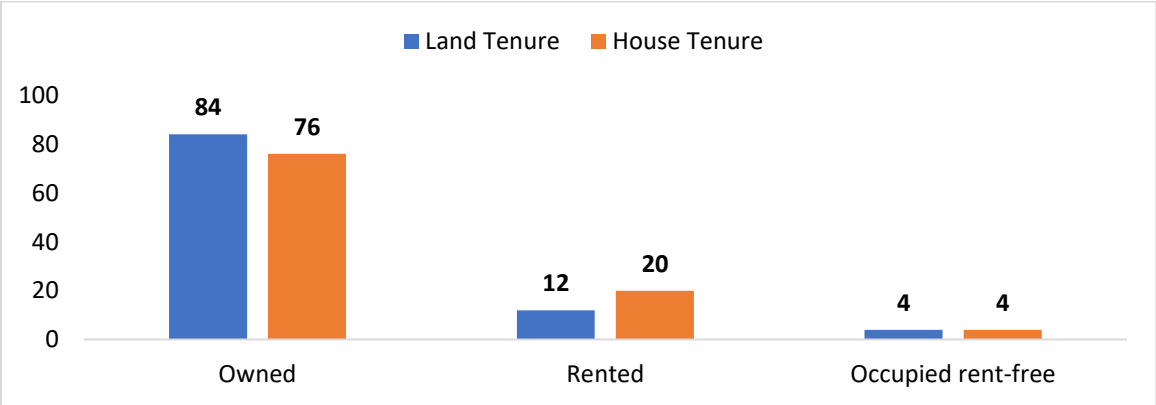


Fig. 4.6: Respondents Land and House Tenure

4.2.7 Household Solid Waste Management

As shown in Figure 4.7, 24% of the respondent claimed they deposit refuse at the backyard of their houses. Other methods such as dumping of wastes in the water body

(16.0%), dumping of waste in community refuse/garbage pit/dumpsite (28.0%) and burning after gathering of wastes together (28.0%) are also use by some respondents. while 4.0% of the remain respondent claim that they make use waste collector. The prevalence of these less environmentally friendly methods might be indicative of a lack of proper waste management infrastructure and services in the community. This has contributed significantly, to the practice of refuce dumping into the Omigbo chanell. Therefore, the community needs to invest in waste collection, segregation, and disposal facilities to provide residents with safer and more sustainable waste management options.

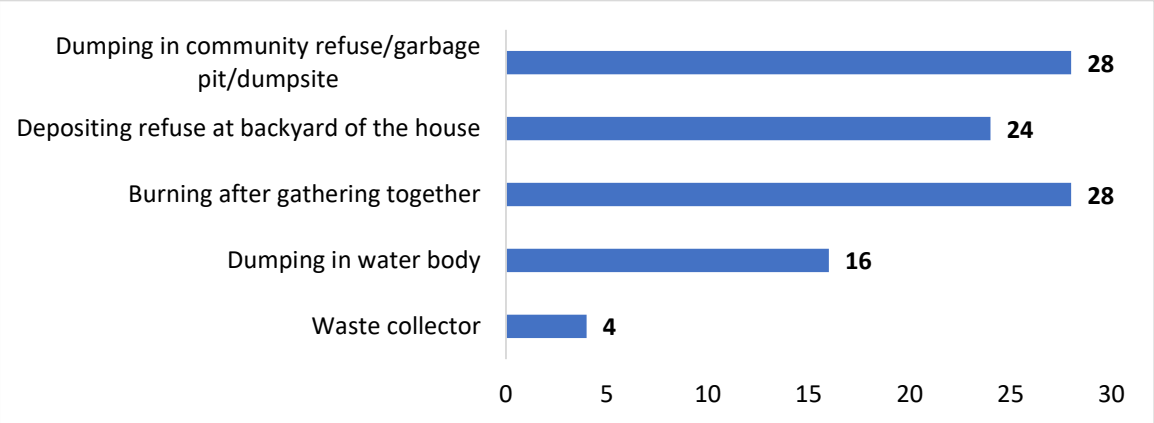


Fig. 4.7: Solid Waste Management

Some indiscriminate waste disposal sites within the project area are presented in plate 4.3



Plate 4.3: Indiscriminate Waste Disposal within the Project Area

4.2.8 Sources of Energy

Majority of the respondents in Omigbo (72.0%) indicated Power Holding Company of Nigeria (PHCN) as the major source of light for their household (plate 4.4). Generally, some households in Nigeria use more than one energy source for lighting. The households in the Project area indicated available secondary sources of lighting such as generator (28%).



Plate 4.4 Electricity Infrastructure within the Project Area

Firewood (56.0%) ranked the highest as the most used source of energy for cooking in most households in the project community. 24..0% of the respondents depend primarily on gas as their major source of energy for cooking. Other common sources of energy indicated by respondent are coal (12.0% and kerosene (8.0%). Notably, several households indicated that they combine more than one energy source for cooking.

4.2.9 Sources of Water

Figure 4.8and plate 4.5shows the sources of water supply for households in Omigbo community. Majority of the residents of Omigbo community 64% sources their drinking water from well followed by 36% from borehole/water pump. 64% indicated well while 36.0% indicated borehole as their common source of water for cooking. However, of those that source their water from bathing and washing indicated well 64.0% and borehole 36.0% respectively.

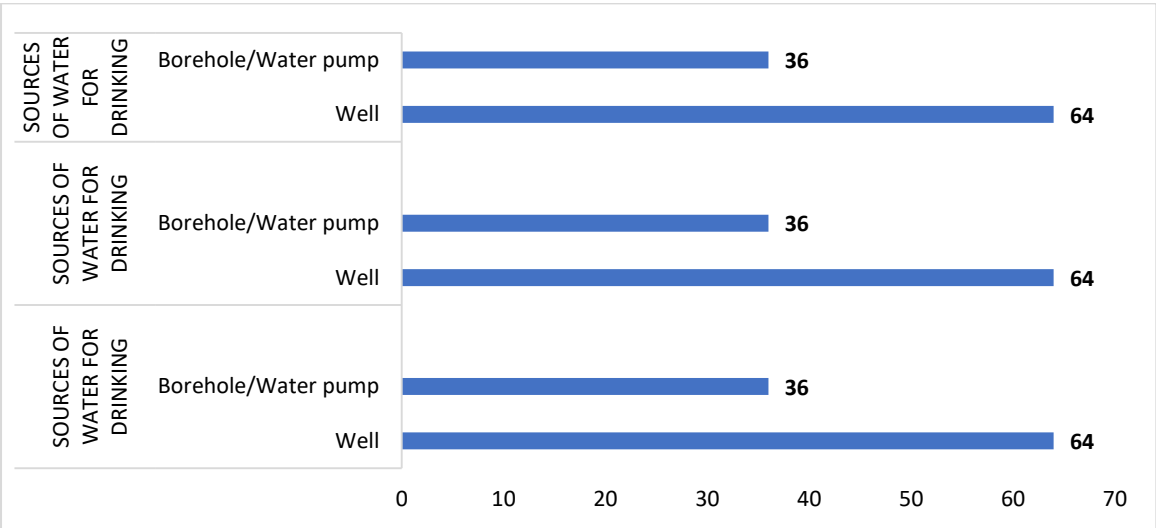


Fig. 4.8: Respondents Sources of Water for Household Uses



Plate 4.5: Some Water Infrastructure Found Within the Project Area

4.2.10 Respondents' Standard of Living and Perceived Impact of Proposed Intervention

As shown in Figure 4.9, 28% of the respondent claimed that their standard of living has remained the same over the past three years. While 28.0% indicated that the situation has worsened and 44.0% affirmed that their standard of living has got better despite the gully erosion. This could indicate economic challenges or changes in the community's overall economic conditions.

There is a perceived connection between environmental conditions and living standards. 80% of the respondents stated no connection between the state of the environment and their standard of living. 20% indicated that their standard of living got worse and was triggered by the gully erosion. They believed that the proposed intervention will create a conducive environment, 4% indicated it will prevent erosion and mosquito breeding, while others (4%) believed the proposed intervention will lead to reduction in cost of maintenance.

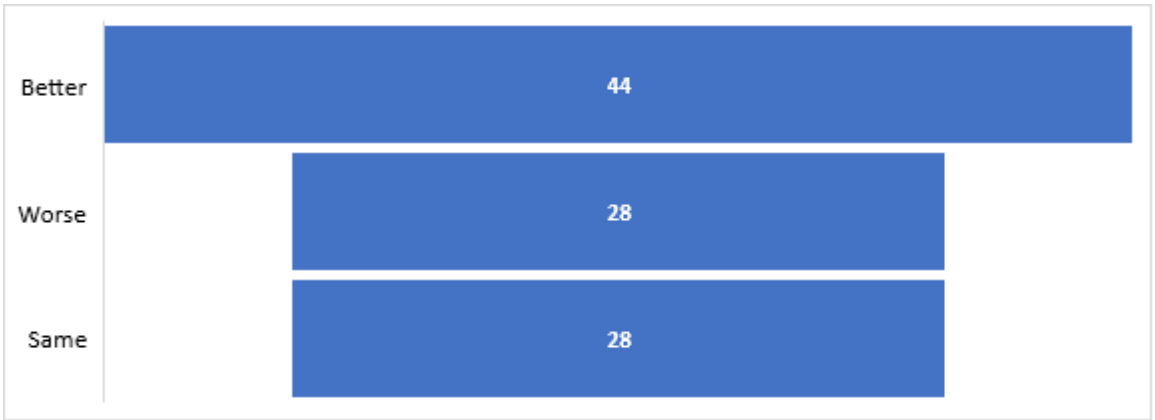


Fig. 4.9: Respondents Views on their Present Standard of Living

4.2.11 Impact of the Omigbo Gully Erosion/Flood on the Residents

As shown in Figure 4.10, all the respondents in Omigbo claimed that the gully has affected them in some way. This suggests that Gully Erosion/Flood is a significant concern in the community, potentially leading to various challenges for the residents. Most of the respondents (92.0%) claimed that they have been negatively affected by the gully/erosion and 4.0% stated the contrary. About 56% stated that the flood has caused

damage to building/property, while 16.0% stated that their farms has been affected due to the gully, another 4.0% also indicated loss of land and 8.0% economic loss due to access of livelihood each, while 12.0% indicated the flood has damage their personal belonging. Given the high percentage (56%) of reported damage to buildings and properties, the project should prioritize strengthening infrastructure resilience. This might involve engineering solutions such as reinforced foundations, flood-resistant materials, and improved drainage systems.

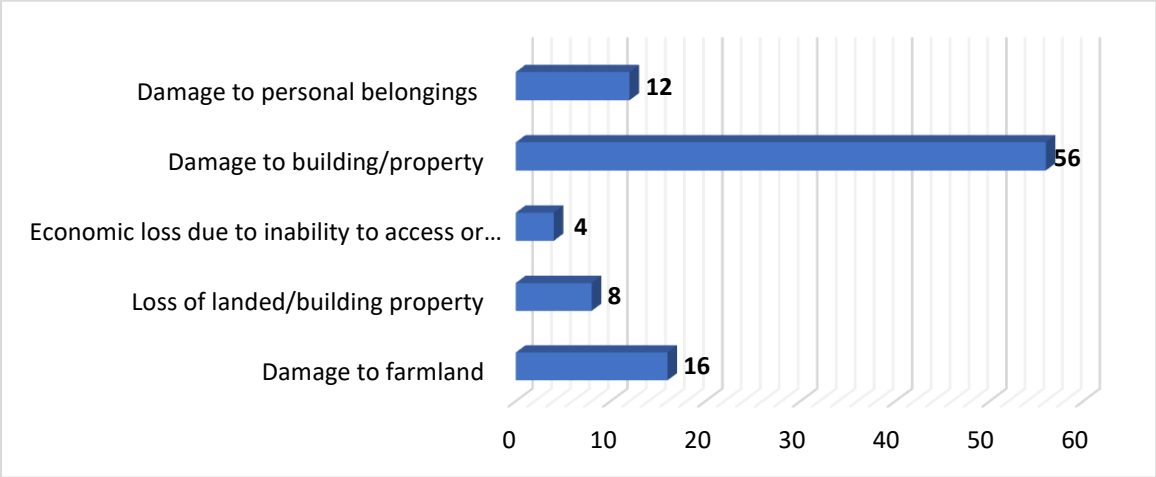


Fig. 4.10: Impact of the Gully Erosion on the Respondents

Furthermore, 84.0% of the respondents of Omigbo claimed the gully/flood incidents had prevented their children from going to school, especially during heavy rainfalls while 16.0% of the remained respondent stated contrary. Some respondents indicated that the situation happened often (66.7%), frequently (28.6%) and others stated rarely (4.8%).

4.2.12 Respondents' Health Status and Potential Impact of Proposed Intervention

The following subsection delves into the health status of the respondents and assesses the potential ramifications of the proposed intervention. It explores how the proposed measures could influence the well-being of the individuals surveyed, shedding light on the broader implications of the intervention on their health and overall quality of life.

4.2.12.1 Respondents' Underlying Ailment and Sickness and Related Concerns

Most of the respondents indicated that they suffered from malaria 72.0%. This highlights the need for better vector control and hygiene. Others ailment as indicated by the respondent include asthma (20.0%) and eye pain (8.0%). Targeted interventions and health education are vital to address these conditions and improve Omigbo health.

As seen in Figure 4.11, Of those suffering from these ailment/sicknesses, 40.0% indicated that their health issue will not be worsened by the proposed intervention while other respondents (60.0%) stated the contrary. The disparities in perceptions

point to the necessity for clear communication and interaction with the community to address concerns and offer information about the potential health effects of the intervention. As shown in Figure 4.10, concerns raised by people who fear their health would be harmed include contamination of ground water (24.0%), noise/air pollution (7.5%) and disease vectors (4.0%).

These concerns underline the importance of conducting a thorough environmental impact assessment and implementing stringent mitigation techniques to prevent contamination and pollution during the building and implementation phases.

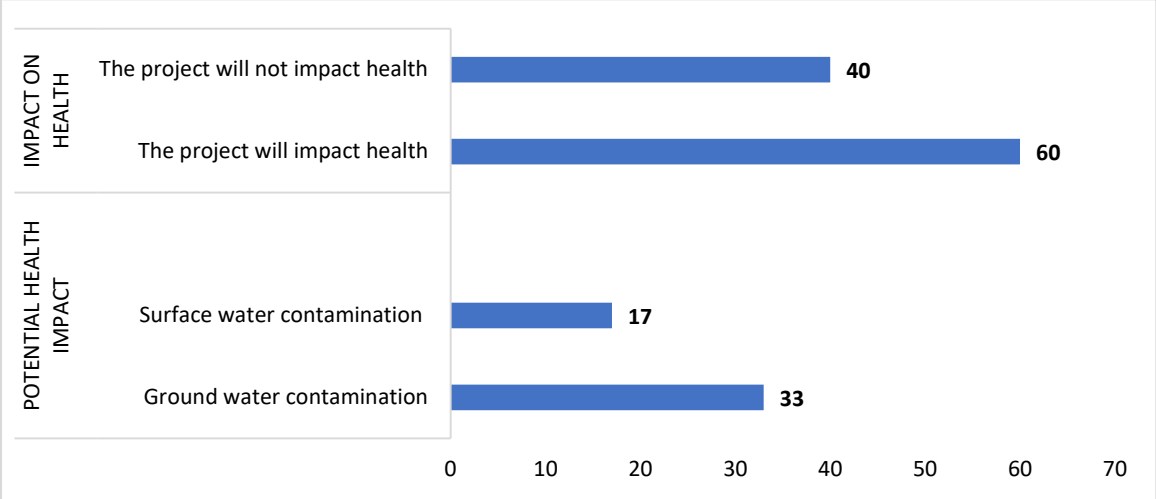


Fig. 4.11: Potential Impact of Proposes Intervention on Respondents' Health

About 92% of respondents provided suggestions on how to avert health risks during the construction and implementation of the intervention. However, few residents suggested that these impeding effects could be averted once there is proper drainage 4.0% and treatment of water (4.0%) during construction.

4.2.12.2 Effect of Gully on Respondents' Present State of Health

The result show 87.5% of respondents reported that their present state of health is affected by Gully Erosion/Flood, while 12.5% mentioned no impact. Among those affected, the reported health issues include skin diseases (8.0%), cough (4.0%), catarrh (8.0%), malaria (48.0%) and water-borne disease (32.0%). About 88% also stated that the illness become severe during flood seasons while others (12%) reported no significant change. The information highlights the need for urgent public health interventions to address the health challenges brought about by gully erosion and flooding in Omigbo community. The higher prevalence of conditions like malaria and water-borne diseases highlights the importance of sanitation and water quality improvements to prevent disease transmission during flood events.

As shown in Figure 4.12, around 84% of respondents prefer to attend a hospital or clinic when they are sick, 8% buy drugs from nearby chemists while 8% adopt the traditional methods.

This indicates a relatively high trust in formal medical institutions for addressing health concerns in Omigbo. It was also reported that 52% of respondents visited a hospital or clinic within the last six months, 40% visited in the last one year while 4% visited last five years and 4.0% had their last visit over five years ago (Fig. 4.11).

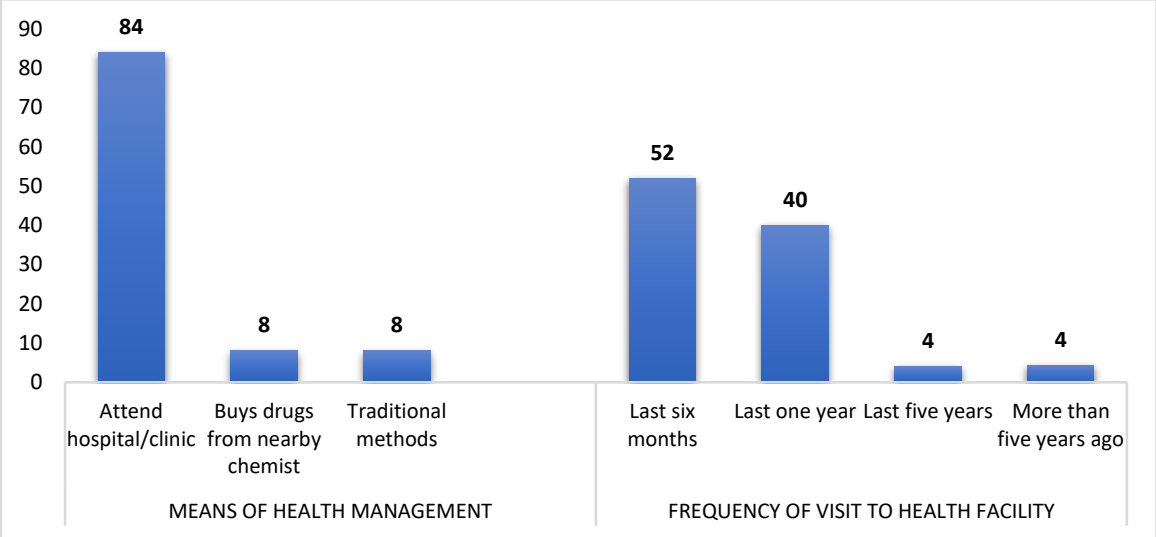


Fig. 4.12: Respondents' Health Management and Visit to Health Facility

This implies a need to focus on improving healthcare services to ensure all community members have regular access to medical care, and to address any barriers that might discourage timely healthcare-seeking behaviour. The distribution of healthcare facilities within the project area is presented in Fig. 4.13.

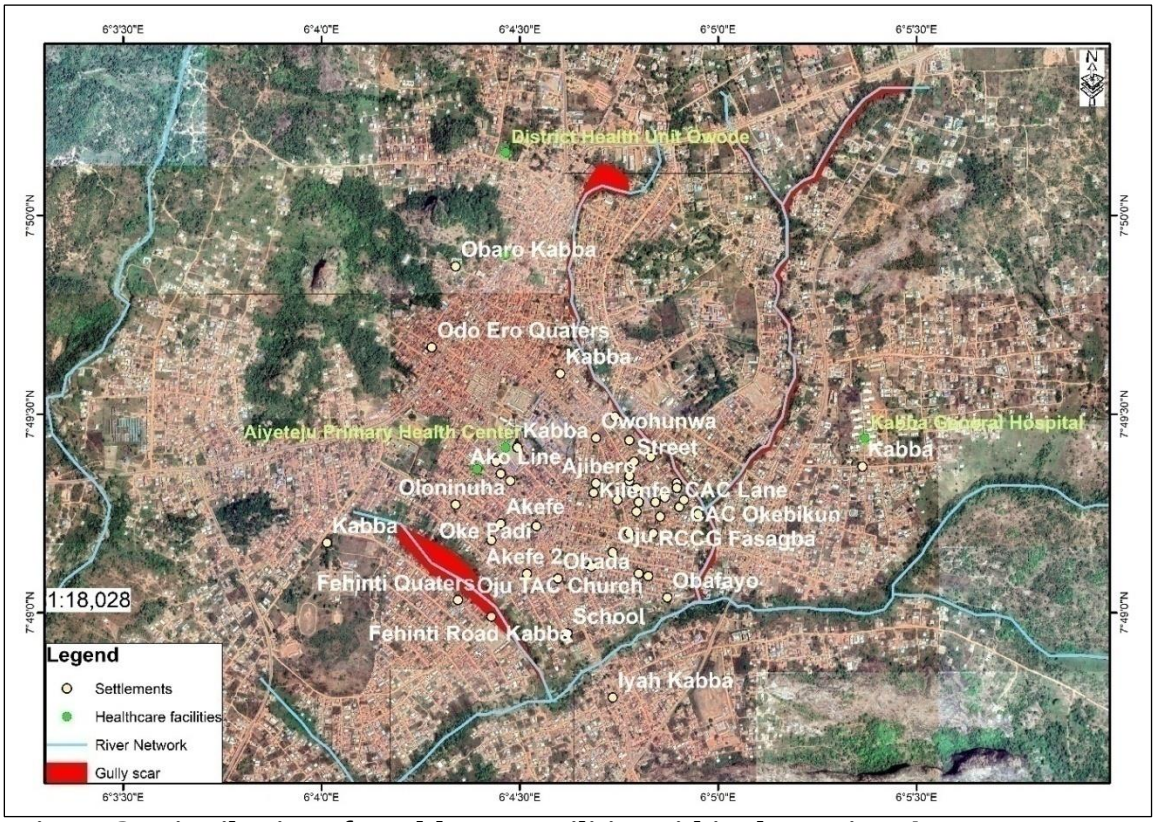


Fig. 4.13: Distribution of Healthcare Facilities within the Project Area

4.2.13 Community Environmental Concerns (CEC)

This section focuses on prevailing and projected environmental issues within the community. It covers the current environmental challenges, as well as anticipated impacts during and after project construction. Measures to alleviate these concerns and promote long-term sustainability should be considered.

4.2.13.1 Environmental Problems Which Omigbo Community Currently Experience

A significant portion of the respondents highlighted the issue of poor drainage systems (36%), bad roads (24%), bad land (16%), environmental degradation (16.0%), degraded land (4.0%) and destruction of infrastructures (4.0%) as an environmental problem in the community. Poor drainage can lead to property damage, diseases, and disruptions in daily life while the presence of bad roads can hinder transportation, accessibility, and economic activities. On the other hand, bad roads can increase travel time and maintenance costs for vehicles, impacting the overall quality of life and economic prospects for the residents. Addressing this issue is crucial to ensure the well-being and safety of the community members.

4.2.13.2 Environmental Problems Envisaged at Phases of The Intervention Project.

The environmental problems during the proposed project construction and operation envisaged by the communities (respondents) are shown in Table 4.3. Therefore, their views/fears will have to be allayed as much as possible during the phases of the intervention project.

Table 4.3: Environmental Problems Envisaged At Phases Of The Intervention Project

During Construction	Response (%)	During Operation	Response (%)
Bad road	12.0	**Soil infertility**	12.0
Poor drainage system	8.0	**Poor drainage system**	8.0
Low visibility	20.0	**Bad road**	28.0
Erosion problems	36.0	**Erosion problems**	20.0
Enviromental degradation	4.0	**Flooding**	8.0
Encroachment of land properties	12.5	**Destruction of infrastructure**	4.0
Flooding	4.0	**Encroachment of land properties**	4.0
		Low visibility	16.0

4.2.13.3 Environmental Problems Envisaged at Phases of the Intervention Project

All the respondents (100%) indicated that the project would not affect any valued resource/cultural property. The unanimous agreement among all respondents (100%) that the project will not affect any valued resource or cultural property indicates a positive outlook for the project's impact assessment. This alignment suggests a reduced likelihood of encountering opposition or conflicts related to resource or cultural preservation, potentially streamlining project implementation and community acceptance.

4.2.14 Intervention Project Activities Impact Evaluation

There is awareness about the gully erosion intervention by ACReSAL in Omigbo. The respondents (100%) are all aware of the proposed intervention and all of them

heard about it during community meetings (92%) and via media; TV, radio, newspaper and internet (8%). About 60.0% of the respondents claimed that the project will not cause restiveness in the community while 40.0% indicated the contrary. Of those that affirmed 8.0% stated that issues may arise only if local people are not employed during construction or if they lose farmlands or property during the construction process (32.0%).

The proposed intervention, however, is envisaged to have a range of positive and social impacts. As indicated by the respondents, 56% expect that the intervention will aid good roads, improve the standard of living, improve good trade and job opportunities, provide good and easy transportation, improve the standard of living, and good farmland and help protect landed property. A notable proportion (44%) of respondents anticipate indirect benefits from the project. Indirect benefits might include improvements in the local economy, social interactions, and overall quality of life for everyone. Some respondents also expressed their concerns for some animals and other habitat that may be affected during the intervention. 46% indicated that goats, chickens, ducks, dogs, pigs, and hens will be affected.

As indicated by the respondents, some of the positive impacts expected from the intervention are compensation for those whose properties will be affected (36%), employment of locals during construction (48%) and capacity building for maintenance during implementation (16%).

About 20% of respondents from the Omigbo community have expressed significant concerns about the potential negative impacts of the proposed intervention project on their livelihoods and the environment. These concerns include good drainage, good roads and job opportunities. Approximately 80% of Omigbo community residents do not foresee any negative impacts resulting from the proposed intervention project. This suggests that a significant portion of the community may be cautiously optimistic about the project's potential effects on their livelihoods and the environment. However, project planners and stakeholders need to engage with the community to ensure that their concerns are adequately addressed and that potential impacts, even if not immediately evident, are thoroughly evaluated.

4.3 Analysis of the Status of GBV/SEA in the Project Community and Related Issues

Gender-based violence, or GBV, is one of the oppressive forms of gender inequality, posing a fundamental barrier to the equal participation of women and men in social, economic, and political spheres. GBV affects both men and women, but women are much more vulnerable because violence reflects and reinforces existing interchangeably. GBV according to (Arango et al. 2014) includes among others:

- Intimate partner violence,
- Non-partner sexual assault,
- Female genital mutilation,
- Sexual exploitation and abuse,
- Child abuse,
- Child marriage

Such violence impedes gender equality and the achievement of a range of development outcomes. Gender violence precludes individuals from contributing to or benefiting from development initiatives by limiting their choices and ability to act (UN General Assembly 2006). In the project area, views from the public consultation revealed that GBV incidents are rare. This is not surprising as GBV is often denied or silenced by under-reporting, societal stigmatization of victims or by institutional weakness/failure in terms of the absence of effectual and accessible reporting mechanisms and protection services at the community level (Para-Mallam, 2018).

Odekunle et al (2019) in the study of the prevalence and pattern of gender-based violence as seen at Federal Medical Centre, Lokoja, revealed that 8.9% of patients examined during the study period, had features of GBV. GBV was found to be commonest within the age range of 20 to 29 years (38.5%) and most of them were females (95.7%). Sexual violence was the commonest type of GBV experienced by the respondents in the study population (65.2%) followed by physical violence (53.3%).

Oduenyi et al (2017) also opined Gender-based violence is an issue of concern in Kogi State but presently not being responded to adequately. Rape was reported to be the commonest form of GBV occurring in the selected communities in Kogi State followed by intimate partner violence (IPV). The existing government structure for social services through the social welfare departments is skeletal and not properly coordinated. The strong socio-cultural factors surrounding GBV also make isolated medical care inadequate therefore, there is the need to strengthen the capacity of the service providers on GBV case management and massive sensitization of all stakeholders and multi-sectoral collaboration amongst GBV actors to ensure optimal health outcome of GBV survivors. Referral services for GBV are widespread across the state and can also be found within the project area (Annex VIII). It can be concluded from the above analysis that GBV is prevalent in the project area and will probably rise due to the influx of migrants. There is therefore the need to provide measure to mitigate and manage this risk.

4.3.1 Gender-Based Violence/Sexual Exploitation and Abuse

Respondents' views (knowledge) on the prevalence of gender-based violence within the project community were thus assessed. A summary of their responses is shown in Tables (4.4 – 4.12).

4.3.1.1 Provisions Restricting Women Access to Health and Other Social Services

There are existing customs, traditions and common practices that restrict women from having access to health and social services in the community. Table 4.4 below shows that women in Omigbo by their husbands or a male figure.

Table 4.4: Provisions Restricting Women Access to Health and Other Social Services

Are there restriction which….	Omigbo	
	Yes (%)	No (%)
require the consent of a male relative/husband for a married woman's medical examination or treatment or access to contraceptives or abortion;	24.0	76.0
require parental consent in case of adolescents' access to contraceptives or abortion;	20.0	80.0
allow medical practitioners to refuse provision of a legal medical service on grounds of conscientious objection	24.0	76.0
prohibit certain medical services, or require that they be authorized by a physician, even where no medical procedure is required; in particular	36.0	64.0
are allowed to undergo IUDs (intrauterine devices) or hormonal contraceptives	36.0	64.0
are allowed emergency contraceptives, including the morning-after pill,	32.0	68.0
are allowed sterilization on request;	40.0	60.0
request on early abortion (in first trimester of pregnancy) are granted;	20.0	80.0
medically assisted or allowed on reproduction (e.g., in vitro fertilization)	36.0	64.0

4.3.1.2 Criminalization of Sexual Exploitation and Abuse

As shown in Table 4.5, certain acts such as home births by obstetricians or midwives and **t**ransmission of HIV or other venerable diseases by women are generally not criticized in the project community while child marriage, female genital mutilation, adultery, abortion, prostitution, sexual orientation and gender identities, are not encouraged in the communities.

Table 4.5: Sexual Exploitation Criminalization

Are the following are criminalized in the project area:	Omigbo	
	Yes (%)	No(%)
Transmission of HIV or other venereal diseases by women only	8.0	92.0
Female genital mutilation	16.0	84.0
Child marriage	24.0	76.0
Home births with an obstetrician or midwife	20.0	80.0
Abortion	16.0	84.0
Adultery	24.0	76.0
Prostitution	24.0	76.0
Violations of modesty or indecent assault (e.g. not following dress code)	24.0	76.0
Sexual orientation and gender identity (homosexuality, lesbianism, transgender, etc.)	32.0	68.0

4.3.1.3 Provisions in Criminal Law that Treats Women and Men Unequally

As shown in Table 4.6, certain acts such as sentencing for the same offense, especially capital punishment, stoning, lasing, imprisonment, etc. are generally not criticized in the project community.

Table 4.6: Criminal Law that Treats Women and Men Unequally

Are there any provision in criminal law that treat women and men unequally with regard to	Omigbo	
	Yes (%)	No (%)
Procedure for collecting evidence	20.0	80.0
Sentencing for the same offense, especially capital punishment, stoning, lasing, imprisonment, etc.	20.0	80.0
So called "honour crimes" (are they tolerated in order for the perpetrator to avoid prosecution or to be less severely punished if the woman is skewed?)	16.0	84.0

4.3.1.4 Respondents Views on Purpose of Criminalizing Gender-Based Violence

As shown in Table 4.7 below, most respondents across the project community indicated that sexual exploitation is criminalized to prevent unwanted pregnancies, sexually transmitted diseases (STD) and promote a healthy lifestyle for teenage girls.

Table 4.7: Are There Legal Obligations To Provide Health Education In School?

Criminalized to:	Omigbo	
	Yes (%)	No (%)
Are there legal obligations to provided health education in school?	44.0	56.0
If yes, do they cover….		
Prevention of sexually transmitted disease	32.0	68.0
prevent unwanted pregnancies	32.0	68.0
promote a healthy lifestyle, including prevention of dietary disorders of teenage girls, including anorexia and bulimia	32.0	68.0
promote psychological/psychiatric training on self-control of aggression, including sexual aggression	32.0	68.0

4.3.1.5 Respondents Views on Data Disaggregated by Age and/or Sex

As shown in Table 4.8 below, most respondents across the project community indicated that a notable portion of respondents acknowledged low incidence of data disaggregation in various form.

Table 4.8: Are There Any Statistical Data Disaggregated By Age And/Or Sex?

Are there any statistical data disaggregated by age and/sex (collected over the last 5 years) regarding	Omigbo	
	Yes (%)	No (%)
Malnutrition	24.0	76.0
Maternal mortality	16.0	84.0
Maternal morbidity including obstetrics fistula	12.0	88.0
Adolescent childbearing	16.0	84.0
Health consequences on physical, sexual and economical gender-based violence	16.0	84.0
Incidence of HIV/AIDS and sexually transmitted diseases	24.0	76.0
Drug abuse	12.0	88.0
Alcohol addiction	8.0	92.0
Legal abortions	16.0	84.0
Death resulting from legal abortions	12.0	88.0
Illegal abortions	20.0	80.0
Death resulting from illegal abortions	12.0	88.0

Use of contraceptives, including mechanical and hormonal (including emergency contraceptives)	16.0	84.0
Sterilization on request	12.0	88.0

4.3.1.6 Respondents Views on Data Disaggregated by Age and/or Sex

As shown in Table 4.9 below, most respondents across the project community indicated that a notable portion of respondents acknowledged low incidence of statistical data disaggregation in various related and unrelated cases.

Table 4.9: Are There Any Statistical Data Regarding Reported/Unreported Case?

Are there any statistical data and/or estimations regarding the numbers of reported and/or unreported cases and convictions for	**Omigbo**	
	Yes (%)	No (%)
Female genital mutilation	16.0	88.0
Illegal voluntary abortion	12.0	88.0
Forced abortions	12.0	88.0
Forced sterilizations	12.0	88.0
Malpractices in cosmetic medicine	12.0	88.0
Obstetric violence	16.0	84.0

4.3.1.7 Measures and Programmes for to Increase Women Safety in Public Spaces

Most respondents in the sampled population indicated there are no measures and programs undertaken to increase women's safety (e.g., in public urban spaces, in public transportation, etc.) in their communities. The responses are summarised in table 4.10.

Table 4.10: Measures and Programs for Women

Measure and Programs for Women in Public Spaces	**Omigbo**	
	Yes (%)	**No (%)**
Any measures and programs undertaken in order to increase women safety (e.g., in public urban spaces, in public transportation)	40.0	60.0
Are there any statistics on crimes amounting to violence against women in public spaces and/or domestic violence	28.0	72.0
Is the sex of the victim reflected in the police, prosecutors and courts records	44.0	56.0
Are there any data and/or results of research on the detrimental influence of the feelings of insecurity and unsafety on women's mental health	32.0	68.0

4.3.1.8 Measures and Programmes for Women with Special Provisions for their Children

As shown in Table 4.11, most respondents in the sampled population indicated there are no specific health and safety protective measures for women, and/or with special provisions for mothers with young children, in "closed" institutions including in their community.

Table 4.11: Measures and Programs for Women with Special Provisions for their Children

Are there specific health and safety protective measures for women, and/or with special provisions for mothers with young children, in "closed" institutions including in…	Omigbo	
	Yes (%)	No (%)
Prisons (e.g., measure like Bangkok rules)	16.0	84.0
Police detention cells	16.0	84.0
Psychiatric hospitals	12.0	88.0
Pre-deportation centres	12.0	88.0
Camps for displaced women and families (if relevant)	16.0	84.0
Nunneries	12.0	88.0
Women's shelters	20.0	80.0

4.3.1.9 Measures and Programmes for Women in Place of Medical and Legal Issues

As shown in Table 4.12, most respondents indicated there are no specific training programs in place for medical and legal professionals on the issue of gender-based discrimination in the area of health and safety while a few stated the contrary in Omigbo.

Table 4.12: Measures and Programs for Women in Place of Medical and Legal Issues

Measure and Programs for Women	Omigbo	
	Yes (%)	No (%)
Are there specific training programs for medical and legal professionals on the issue of gender-based discrimination in the area of health and safety?	48.0	52.0
Do they cover the issues connected with specific women's needs in the area of health?	20.0	80.0
Specific women's vulnerability to be victims of gender-based violence or specific crimes	20.0	80.0
The nature of gender-based violence	16.0	84.0
Its occurrences and symptoms	20.0	80.0
Methods of detection	20.0	80.0
Medical protocols	16.0	84.0
Influence of gender-based violence, in particular, sexual violence on the future behaviours of victims (post-traumatic stress symptoms, etc.)	20.0	80.0

4.3.2 Measures of Gender Equity at the Proposed Project Community

Figure 4.14 shows the ways in which gender equity is practiced in both communities. In Omigbo, it includes giving females equal opportunities and access to education and employment (60%), electing women into public offices (8%), ensuring quotas on gender in the leadership of community-based organizations (32%). These insights suggest that the community recognizes the importance of various strategies for achieving gender equity. The project should consider initiatives that align with these values and priorities, fostering women's participation in leadership, education, and

employment opportunities while also addressing underrepresentation through targeted measures.

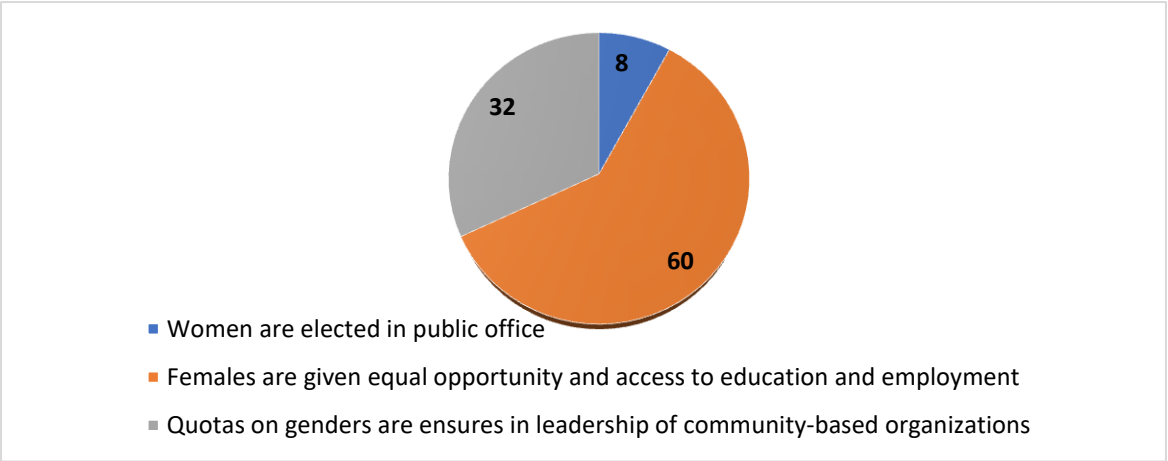


Fig. 4.14: Measures of Gender Equity at the Proposed Project Community

4.4 Social Sensitive Receptor along the RoW of Civil Activities

Table 4.13 shows the social sensitive receptor along the RoW of civil work activities. It should be noted that there is no protected or reserved forest within the Omigbo catchment. However, there are vegetation along the Omigbo channel course as shown in table 4.13. However, there is nosensitive area such as wetlands, primary forests, and game reserves within the sub-catchments of Omigbo watershed and no shrine or cultural heritage site is along the RoW.

Table 4.13: Social Sensitive Receptor along the RoW of Civil Works

S/N	Name of Road / Channel RoW	Width	Length for Rehabilitation (m)	Socially Sensitive receptor and Ecosystem Services	Side of Channel
1	Lokoja/Obajana Road Upstream	1.5	887.5	Vegetation, Khios, Mechanic and Vulgarizer joints	Right side
2	Lokoja/Obajana Road Midstream	1.1	262.5	Vegetation, Khios, Mechanic and Vulgarizer joints	Right side
3	Lokoja/Obajana Road Downstream	1.5	212.85	Vegetation, Khios, Mechanic and Vulgarizer joints	Right side
4	Waterway 1 Finger 1	2.2	519.69	Vegetation and weather regulation	Along Waterway
5	Waterway 1 Upstream	1.6	947.53	Vegetationand weather regulation	Along Waterway
6	Road 05	1.1	586.89	Residential Buildings and petty traders	Both sides
7	Waterway	1.6	158.27	Vegetationand weather regulation	Waterway
8	Waterway 1 Downstream	4.4	900	Vegetationand weather regulation	Waterway

9	Oparo Road Upstream	1.6	150.26	Residential Buildings and petty traders	Right side
10	Waterway 2 Upstream 1	1.8	135.05	Vegetationand weather regulation	Along Waterway
11	Waterway 2 Finger 1	1.3	297	Vegetationand weather regulation	Along Waterway
12	Oparo Road Midstream	1.3	350	Residential Buildings and petty traders	Right side
13	Odo -Aofin Road	1.3	419.48	Residential Buildings and petty traders	Both sides
14	Waterway 2 Midstream 1	3.4	590.43	Vegetation and structures	Along Waterway
15	Kano Road	1.1	1419	Buildings with petty traders and shops	Both sides
16	Waterway 2 Midstream 2	4.4	388.84	Vegetationand weather regulation	Along Waterway
17	Road 06 Upstream	1.3	2775.17	Mixed uses	Left side
18	Waterway	1.3	627.191	Vegetationand weather regulation	Left side

4.5 Grievance Redress Mechanisms in and Around the Intervention Area

The Grievance Redress Mechanism (GRM) is part of the broader process of stakeholder's engagement, accountability, quality and compliance assurance in the project designed to solving disputes at the earliest possible time, which is in the interest of all parties concerned.

4.5.1 Grievance Redress Mechanism (GRM) Objective

The objectives of the grievance redress mechanism are to:

- provide an effective avenue for aggrieved persons to expressing their concerns and resolving disputes that are caused by the project;
- promote a mutually constructive relationship among community members, project affected persons, government and other stakeholders;
- prevent and address community concerns,
- assist larger processes that create positive social change; and
- identify early and resolve issues that would lead to judicial proceedings.

4.5.2 GRM Structure

4.5.3 Site Level Grievance Redress Cell (GR Cell)

The site level GR Cell is the first and lowest grievance redress mechanism in the Kogi State ACReSAL GRM. The GR Cell at this level will resolve simple project-activity related issues between; members of a PAPs and community members; members of the PAPs and other members of the community; members of community and the contractor. The Site level GR Cell is made up of 7 members with at least 2 positions assigned to women. The committee amongst others must ensure that they discuss and display complaints procedures and available uptake channels in ways that are easily accessible to their members and members of the community. The uptake channels at

this level should include among others; verbal complaints to members of the Grievance Focal Points (GFPs), written complaints in complaint boxes in the community, through phone calls to the chairman and/or secretary telephone lines. All complaints are expected to be resolved and the complainant officially notified within 15 Days of receipt of the complaint by the committee. Where additional time is required, the complainant is updated of actions being taken within every 7 Days until the complaint is resolved. In all, the complaint at this level is expected to be resolved within 30 days. However, after a complaint is certified unresolvable at the GR Cell level or the issue requires arbitration, the committee secretary will refer it to next higher level GRM.

The responsibilities of GR Cell shall include the following:

- Review, consider and resolve grievances site level;
- Conduct fact-finding pertaining to grievances;
- Resolve grievances within a period of one week;
- Undertake analysis of data on grievances and use this to make informed decisions;
- Maintain confidentiality if complainants wish to remain confidential; and
- Maintain an updated GRM Complaints Log/ database/MIS.

4.5.4 Grievance Focal Points (GFPs)

Grievance Focal Points (GFPs) will be nominated by the community. These will be men and women whom the community can easily approach. Grievances can be received by GFPs in writing or by word of mouth, and recorded in the grievance register by the Secretary or the Community Liaison Officer (CLO). The GFPs for the Kogi State ACReSAL Omigbo Channelization includes

i. The Chairman,
ii. The Secretary
iii. The Women leader
iv. The Youth leader
v. Representative of the traditional institution
vi. The Community Liaison Officer (CLO) appointed by the sub-project Implementation Partners (Consultants/ Contractors/)
vii. Community Member

The GFPs committee will be identified by the relevant community in consultation with the Social Safeguard team of SPIU and CLO. The GFP would be responsible for making the community aware of the following components:

- Inform people about the GRM and how it works, and their options depending on the types of complaint;
- Types of grievances not acceptable/eligible to the GRM;
- Intake channels at the GRM, e.g., toll free number, phone numbers, postal, email and website, and information that should be included in a complaint; and
- Inform the Complainant of the investigation results and the action taken, and option of appeal if not satisfied with the outcome.

4.5.5 PIU Level GRM

A Grievance Redress Committee (GRC) has been established at Kogi State ACReSAL PIU office which shall resolve the grievances of affected persons/parties received at the PIU level. If a grievance remains unresolved at the PIU level despite making best efforts till the stipulated time of 21 days, it will either be retained for another 21 days with prior agreement of the Project Coordinator and the complainant, or sent to Project Steering Committee (PSC) for resolution, depending on the GRC's assessment on which is the best option to facilitate a resolution. The GRC will function as a dedicated body that ensures the grievance redress process is effective and efficient. The SPIU Grievance Redress Committee comprise Project Coordinator, Technical Specialist, M&E, Environmental, Social Safeguard & Resettlement and Gender Specialists of Kogi State ACReSAL. The Social Safeguards is the Focal Person/Convener. Decisions or findings taken in the GRC would be binding upon the Consultants/Contractors/Suppliers. The PIU will issue public notices to inform the public about the Grievance Redress Mechanism (GRM) sub-project area. The contractor will also display prominent signage containing the contact details of GRC in the Omigbo Channelization Site. The complainant(s) can lodge their grievances through toll free number provided by the SPIU. The Social Safeguard Specialist will be the designated focal person to receive complaint(s) in writing, through calls, fax and emails. The Social Safeguard will maintain a complaints database which will be digitized and available and will communicate with the Contractor, Site Engineers/ field(s) managers/Contractors Safeguards officer.

The responsibilities of the GRC at PIU are:

- The Social Safeguard Specialist shall be the focal person for GRC, which is responsible for logging the complaint and date of receipt onto the complaint database and informing the Contractors;
- The GRC will coordinate with local government to receive project-related complaints made directly to them;
- The GRC shall review, consider and resolve grievances related to environmental, social, gender and other issues during implementation received at the PIU level;
- The GRC is responsible for investigating the complaint to determine its validity and assess whether the source of the problem is due to project activities and identifying appropriate corrective measures. If corrective measures are necessary, GRC, will instruct the Contractors to take necessary action;
- Resolve grievances presented to the GRC within a period of two weeks;
- Inform the Complainant of the investigation results and the action taken;
- Undertake analysis of data on grievances and use this to make informed decisions;
- GRC decisions, if not acceptable to the complainant(s), can be appealed to the Project Steering Committee;
- Maintain an updated online GRM database/Complaints Logs

4.5.6 Appeals at the Project Steering Committee (PSC) Level

Appeals at the Kogi State ACReSAL Project Steering Committee (PSC) Level

The Kogi Coordination Office GRC is expected to resolve project-activity related issues such as: resettlement and compensation for damages; Gender Based Violence (GBV) or sexual exploitation; contractor impunity or highhandedness etc. This committee shall be the apex authority of the Kogi State ACReSAL GRM which will make recommendations for action to the State Project Coordinator (SPC) in the case of issues of extreme importance, or make referral to the National Coordination Office in the case of grievances that are either unresolvable at the committee level or found to be extraneous to the execution of the project. The Kogi State ACReSAL Coordination Office Grievance Redress Committee shall be established and chaired by the Honourable Commissioner, Ministry of Environment and Natural Resources. The Livelihood Safeguards Officer of the Kogi State ACReSAL shall serve as the committee secretary. The Kogi State ACReSAL Coordination Office GRC is expected to finalise mediation on grievances within 10 working days. The complainant/survivals confidentiality should also be kept in mind when reporting any incidences.

4.5.7 GRM for workers

Community Liaison Officer (CLO) will serve as Grievance Focal Point (GFP) for workers/labor complaints at site level. If the issue is successfully resolved, no further follow-up is required, and the case shall be documented and closed. In case the grievance is unresolved at the sites/contractors' level, the workers may directly approach GRC about their grievance. The prominent signage containing the contact details of GRC will be display in Yoruba, Ibira and Igala languages at the Omigbo Channelization site.

4.5.8 Grievance Redress Mechanisms for GBV and SEA/S in the Project Community and Related Issues

Gender Based Violence or GBV is any threat or harm inflicted on a person because of their gender in all forms of abuse including sexual, physical, emotional, and psychological harms. It is one of the oppressive forms of gender inequality, posing a fundamental barrier to the equal participation of women and men in social, economic, and political spheres. GBV affects both men and women, but women are much more vulnerable because violence reflects and reinforces existing interchangeably. GBV according to Arango et al. (2014) includes among others:

- Intimate partner violence (IPV);
- Non-partner sexual assault;
- Female genital mutilation;
- Sexual exploitation and abuse;
- Child abuse;
- Child marriage.

Such violence impedes gender equality and the achievement of a range of development outcomes. Gender violence precludes individuals from contributing to or benefiting from development initiatives by limiting their choices and ability to act (UN General Assembly 2006).

Oduenyi (2017) in the report of the Gender Based Violence (GBV) Rapid Assessment and Service Mapping Report for MCSP-supported Facilities in Kogi and Ebonyi States revealed that women in Kogi and Ebonyi states experience high rates of GBV, particularly rape and IPV (Intimate Partner Violence) but there is a low level of reporting of GBV cases both for healthcare and law-enforcement.

In the proposed intervention area (Kabba community), views from the public consultation revealed that GBV incidents are rare. This is not unexpected as GBV is often denied or silenced by under-reporting, societal stigmatization of victims or by institutional weakness/failure in terms of the absence of effectual and accessible reporting mechanisms and protection services at community level (Para-Mallam, 2018). This is evident at the project area community where the female respondents during the FGD stated that there is no case of rape reported. The assessment by Oduenyi (2017) corroborates the assertion that there is low level of reporting of GBV cases at the healthcare centres. The existing government structure for social services through the social welfare departments is skeletal and not properly coordinated. The strong socio-cultural factors surrounding GBV also make isolated medical care inadequate. Thus, there is the need to strengthen the capacity of the service providers on GBV case management and massive sensitization of all stakeholders and multi-sectoral collaboration amongst GBV actors to ensure optimal health outcome of GBV survivors. Referral services for GBV are wide-spread across Kogi State and can also be found within the project area (Annex VII).

It can be concluded from the above analysis that while GBV incidents may not currently be prevalent in the proposed intervention area, it will probably rise due to the influx of migrants. There is therefore the need to provide measures to mitigate and manage this risk.

4.5.9 Role of Contractor in GRM Complaints Register

The Contractor will maintain a complaint register at the campsite office to document all complaints received from the local communities. The register will also record the measures taken to mitigate these concerns. The final report regarding complaint closing will be communicated to CSC/SMPs, the relevant field(s) manager is responsible to provide the record to GRC/PIU. The PIU shall carry out the monitoring of the implementation of measures for the eradication of complaints.

4.5.10 Reporting and Monitoring

The GR Cell will enter the project affected people (PAPs) concerns/grievances at site level. The PIU gender specialist will be responsible for managing GBV and SEA/SH-related complaints at the project/PIU level. Kogi State ACReSAL PIU will develop specific procedures to ensure complainants are able to register their grievances confidentially, and in a discreet manner. GBV/SEA/SH related complaints will be

communicated to World Bank no later than 48 hours after being received by the GR Cell (site level) or by the GRC (PIU level). The GRC will record the complaint, investigation, and subsequent actions and results in the monthly Environmental Management and Monitoring reports and Monthly Progress Report by Contractors. In the construction and initial operational periods, the PIU will periodically report progress to the World Bank, including reporting complaints and their resolution. The tracking and documenting of grievance resolutions within the GRC PIU will include the following elements:

- tracking forms and procedures for gathering information from project personnel and complainant(s);
- computerized grievance database with dedicated staff to update the database routinely;
- systems with the capacity to analyze information to recognize grievance patterns, identify any systemic causes of grievances, promote transparency, publicize how complaints are being handled, and periodically evaluate the overall functioning of the mechanism;
- processes for informing stakeholders about the status of a case; and
- procedures to retrieve data for reporting purposes, including the periodic reports to the PIU and GRC, reports into the monthly ESMP Compliance monitoring report to the World Bank.

4.5.11 Existing GRMin the Project Area

It is a fact, that where human exists there cannot but be issues of disagreement. It is therefore important that measures are put in place to address any form of disagreement or grievances that may arise. Different formal and informal grievance redress mechanisms exist in Omigbo-Kabba communities in particular and Kogi State in general to resolve complaints that might emanate from the proposed intervention project. Some of the existing tools/mechanisms include the following:

- **Formal Mechanisms**

The formal system of dispute resolution in and around the project area consists of the following:

  - **Kogi State Ministry of Environment:** This is the legally authorized body exclusively responsible for the management of issues pertaining to the environment. Specifically, the agency is responsible for waste management, flood and erosion control, forest depletion and degradation and general environmental and atmospheric pollution. This ministry is made up of different departments.
  - **Kogi State Ministry of Justice:** The Kogi State Judiciary is the ministry responsible for interpreting the law and prosecuting offenders.
  - **National Environmental Standards and Regulations Enforcement Agency (NESREA):** NESREA has the responsibility for the protection and development of the environment, biodiversity conservation and sustainable development of Nigeria's natural resources in general and environmental technology, including coordination and liaison with relevant stakeholders within and outside Nigeria on

matters of enforcement of environmental standards, regulations, rules, laws, policies and guidelines. Some of the functions of the agency relating to dispute resolution are:

- coordinate and liaise with, stakeholders, within and outside Nigeria on matters of environmental standards, regulations and enforcement;
- enforce compliance with laws, guidelines, policies and standards on environmental matters;
- conduct environmental audit and establish data bank on regulatory and enforcement mechanisms of environmental standards other than in the oil and gas sector;
- ensure that environmental projects funded by donor organisations and external support agencies adhere to regulations in environmental safety and protection;
- create public awareness and provide environmental education on sustainable environmental management;
- promote private sector compliance with environmental regulations other than in the oil and gas sector.

- **Public Complaints Commission**: The commission is independent of government bureaucracy and is given extensive powers regarding disclosures and access to all government information. The commission is empowered to enforce compliance in order to obtain the necessary information that will facilitate impartial investigation in order to arrive at a fair and equitable decision. Investigation of complaints is provided at no cost to the citizen as well as non-citizen resident in the country and they are treated with the confidentiality they deserve. The commission put high priority on being accessible to the citizen and fulfil this commitment by not only having offices in thirty-six (36) state of the federation and Abuja (FCT) but also having five (5) zonal offices in each state of the federation.
- **National Human Rights Commission:** The National Human Rights Commission serves as an extra-judicial mechanism for the respect and enjoyment of human rights. It also provides avenues for public enlightenment, research, and dialogue in order to raise awareness on Human Rights issues. The focus area of the NHRC are
  - The Rights of Women and Gender Related Matters;
  - Child Rights;
  - Freedom of Expression and the Media;
  - Human Rights Defenders;
  - Labour;
  - Right to Health;
  - Refugees Internally Displaced Persons, Migrants and Asylum seekers;
  - Environment, Niger Delta and Development,
  - Food and Shelter;
  - Right to Education; and
  - Freedom of Religion or Belief and Peaceful Assembly.
- **The Nigeria Police:** The Police is an agency of the executive arm of the Federal Government of Nigeria that maintains law and order in the country. Unlike the

military, the Nigeria Police investigate and prosecute cases in the law courts. It plays a vital role in ensuring peaceful coexistence among the citizens.

- **Informal Systems**

  The informal system of dispute resolution includes the following:
  - Interpersonal and family level dispute resolution;
  - Traditional rulers and community heads; and
  - Religious leaders.

4.5.12 Evaluation of the Strengths and Weaknesses of the Existing Grievance Redress Mechanisms in the Project Area

The strength and weaknesses of the existing grievance redress institutions are outlined in table 4.14.

Table 4.14: Strengths and Weaknesses of existing Grievance Redress Mechanisms in project Area

S/N	Dispute Resolution Systems	Strengths	Weaknesses
Formal			
1	The Kogi State Ministry of Environment	The Kogi State Ministry of Environment and other parastatals under it are well positioned to receive, investigate and mediate on issues bordering on environmental management in Kogi state.	The office of Kogi State Ministry of Environment is located in the state capital. Aggrieved persons will therefore have to travel to their office at the State Secretariat Phase II Complex, Lokoja to report any misgivings. This may be counter-productive.
2	The Kogi State Ministry of Justice (Court of law)	The Kogi State Judiciary comprises the High Courts, Magistrate Courts and Customary Courts each with its own Rules. The formal law court system meets majority of the technical requirements for the resolution of potential project-related grievances.	There is constant pressure on the courts which makes formal litigation in courts unattractive, cumbersome, technical, time-consuming and expensive. Reliance on the court for the resolution of all disputes will cause long delays in the project.
3	National Environmental Standards and Regulations Enforcement Agency (NESREA)	The agency, which is the regulatory arm of the Federal Ministry of Environment, has 6 Zonal Headquarters and 22 State Offices which accepts environmental complaints from the public and investigates same. The state offices are manned by State Coordinators who report to the agencies headquarter in Abuja.	NESREA has office in Kogi State where individual, group of people or corporate organization could lodge environmental complaints. This may not be easily accessible to aggrieved project beneficiaries in Omigbo (Kaba).
4	Public Complaints Commission (PCC)	The Public Complaints Commission has offices in thirty-six (36) state of the federation and Abuja (FCT) with five (5) zonal offices in each state of the federation.	The functions, powers, and jurisdiction of the commission is unknown to a lot of people. The commission is also inadequately staffed with men and women of integrity. Funding is equally a major challenge as it hampers the operations of the Commission. Kogi state office is Opposite SSGs Office, Beside Township Stadium Complex, Lokoja, Kogi State. Area offices are in Omigbo, Adavi, Idah, Kabba, Koto

			Karfi, Ofu, Okene, Yagba-east and Yagba-west. There is also an office in Dekina LGA.
5	The Nigeria Police	The police force is an agency of the executive arm of Federal Government of Nigeria that maintains law and order in the country. It plays a vital role in ensuring peaceful coexistence among the citizens. The Nigeria Police have offices in all parts of the State. They are widespread and well structured. The organizational structure of the Police Force in Kogi is represented as shown below: • Zonal Headquarters • State Commands Headquarters • Divisional Police Headquarters • Police Station • Police Post • Village Police Post. By this structure, the Police operational crime-fighting and peace-keeping function is felt by and accessible to the populace all over the state. The project site has a police post.	The Police is mostly perceived by the public as an appendage of the government in power and very often ineffective to provide sufficient and acceptable resolutions that would be favourable to the citizen. There is also the perception that issues are often escalated by the Police as such the police is not often the best point of call for a project-based complainant.
Informal			
6	Community Associations	All executives and ex-officio of Community Association are charged with the responsibility of resolving conflicts within their group. These individuals are well-positioned to resolve disputes using the group's constitution, guiding principles and rules and regulation where they exist.	There are a lot of instances where members decide to flaunt the rules and regulation of the group without corresponding penalties. This makes the grievance redress roles of the groups ineffective.
7	Traditional rulers and community heads	There is a formidable traditional system for the resolution of conflict in omigbo-Kabba. It was noted that matters first get to the • Community chief. If it is not resolved at this level, it is referred to the • Ward head. If it is not resolved at this level, it is referred to • (Overall head of Obaro of Kabba land)	Although these institutions due have some kind of constitutional backing especially at the Kingship level, there is however, the view that they lack human and material capacity to record and maintain dispute resolution system on a continuing basis especially at the community chief level.

However, Kogi State ACReSAL has established a Grievance Redress Framework (Annex 6) following the World Bank's approaches to GRM and FPMU guidelines. The framework has five levels of addressing grievances (Level 1: Community Level of Grievance Redress; Level 2: Local Government/ Community Grievance Redress Committee (LGRC); Level 3: State Grievance Redress Committee (SGRC); Level 4: National Grievance Redress Committee (NGRC) and Level 5: the Courts). It should be noted that grievances should follow the level sequence based on the demands and outcomes of the issues at hand. However, when the parties involved in grievances

have utilized the provisions of the first four levels, they can then utilize the Law Courts (Level 5).

4.6 Public Consultation

The public consultation for the proposed intervention work in the project area entails the town hall meeting, after which the group was divided into focus group meetings with the three major demographic groups (Elders, Youth and Women). The summary of the issues raised is outlined in table 4.15. The detailed engagement record is found in annex ix.

4.6.1 Objectives of the Public Consultation

Stakeholders' engagement is essential in achieving the major objectives of any project implementation and sustainable development. Participatory approaches in project planning and implementation enhance project policy, ownership and sustainability and also empower targeted beneficiaries.

The objectives for stakeholders' engagement and sensitization include but not limited to the following;

i. To create general public awareness and understanding of the project, and ensure its acceptance;
ii. To develop and maintain avenues of communication between the project proponent, stakeholders and PAPs in order to ensure that their views and concerns are incorporated into the project design and implementation with the objectives of reducing, mitigating or offsetting negative impacts and enhancing benefits from the project;
iii. To inform and discuss about the nature and scale of possible adverse impacts of the rehabilitation work and to identify and prioritize the mitigation measures for the impacts in a more transparent and direct manner;
iv. To document the concerns raised by stakeholders and PAPs so that their views and proposals are mainstreamed to formulate mitigation and benefit enhancement measures;
v. To sensitize other MDAs, local authorities, Non-governmental Organizations (NGOs) and Community Based Organizations (CBOs) about the project and solicit their views and discuss their share of responsibility for the smooth functioning of the overall project operations; and
vi. Reducing conflict between stakeholders, project proponents PAPs.
vii. To develop stakeholder's capacity in the areas sustainable project management.

4.6.2 Identified Stakeholders

The stakeholders of the Ankpa intervention were identified during the public consultation activities. The Identified stakeholders Include:

- Project Affected Persons (PAP);
- Owners of Business and structural properties within the watershed and its immediate environment;

- Traditional Institutions of Omigbo Community, Kabba;
- Local Government Authority;
- Relevant MDAs of the State Government; and
- Religious Organisations.
- Security Agents

4.6.3 Stakeholders Engagement/Consultation

Table 4.15 shows the summary table indicating Stakeholders Engagement/Consultation. Plate 4.6 and 4.7 show group photograph after meeting with some PAPs and photograph during the town hall meeting session respectively.

Table 4.15: Summary Table Indicating Stakeholders Engagement/Consultation,

S/N		Town Hall Meeting (All)	PAP	Elders	Women
	Community Name	Omigbo (Kabba)	Omigbo (Kabba)	Omigbo (Kabba)	
	Stakeholder engaged	Residents/Busness owners in Omigbo Catchment, PAP, Traditional Institution, Religious organization and LGA representative		Elders	Women
	Date	09/08/23	09/08/23	09/08/23	09/08/23
	Location	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound
	Language	**Yoruba and English.**	**Yoruba**	**Yoruba and English.**	**Yoruba and English.**
	Information Shared	Current situation of the Omigbo Flooding.		Flood Situation and Impacts	Gender Issues and Flood impacts
	Key Stakeholder's concerns	• Immediate implementation of the project • Need to update the design • Youth employment	• Payment of compensation	• Immediate commencement and completion of the project in record time • A solid construction intervention • Poverty alleviate; • Payment of compensation • Proper relocation of affected shrines • Adherence to the cultural rites • Provision of other facilities such as clinic.	• Readiness to work in various capacities during project implementation. • Support for business • Need for formal dumpsite • No GBV/SAE issues
	Response	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns will be looked into.	The consultant and Kogi ACReSAL EO assured the PAP that their compensation will be paid.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns will be looked into.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns will be looked into.
	Action	Kogi State ACReSAL		Kogi State ACReSAL	Kogi State ACReSAL
	Time Frame	Immediate/During project implementation	Before civil work commence	Immediate/During project implementation	Immediate/During project implementation

	Date	09/08/23	09/08/23	09/08/23	09/08/23	09/08/23
	Location	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound	Chief Abejirin's Compound
	Language	**Yoruba and English.**	**Yoruba**	**Yoruba and English.**	**Yoruba and English.**	**Pidgin-English and English**
	Information Shared	Current situation of the Omigbo Flooding.		Flood Situation and Impacts	Gender Issues and Flood Impacts	Project Issues over the Lifetime
	Key Stakeholder's concerns	• Immediate implementation of the project • Need to update the design • Youth Employment	• Payment of compensation	• Immediate commencement and completion of the project in record time • A solid construction intervention • Poverty alleviated; • Payment of compensation • Proper relocation of affected shrines • Provision of other facilities such as clinics.	• Readiness to work in various capacities during project implementation. • Support for business • Need for formal dumpsite • No GBV/SAE issues	• Sexual affairs with married women by contractors and their workers is not acceptable in the community. • Youth Employment • Oppression by the foreigners.
	Response	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns would be looked into.	The consultant and Kogi ACReSAL EO assured the PAP that their compensation would be paid.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns would be looked into.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns would be looked into.	The consultant and Kogi ACReSAL EO assured the stakeholders that their concerns would be looked into.
	Action	Kogi State ACReSAL	Kogi State ACReSAL	Kogi State ACReSAL	Kogi State ACReSAL	Kogi State ACReSAL
	Time Frame	Immediate/During project implementation	Before civil work commences	Immediate/During project implementation	Immediate/During project implementation	Immediate/During project implementation

The main issues expressed by the stakeholders during the public consultation with regards to the proposed intervention in the project area include:

1. **Employment of youth in the community.** The consultant emphasized that youth, especially those within the unskilled labour group will be employed by the contractor based on the agreement ACReSAL had with them.
2. **Non-payment/Payment of inadequate compensation for Resettlement:** The consultant explained that another team of consultants would be visiting the site to prepare a Resettlement Action Plan (RAP). This entails assessing and valuing structures and all cultural activities that would be affected by the proposed intervention based on the designed engineering drawing.

3. **Fear of delay in the implementation of the proposed project.** The consultant/ ACReSAL Environmental Safeguard Officer reassured the community that the project would not be abandoned further. The project-affected persons were informed that due diligence would be done before the implementation. The ESMP is one of the reports that must be submitted before the implementation of the project.
4. **Hijack of the project by politicians:** The consultant noted that members of the site-monitoring committee would be selected democratically. No instance of hijack would occur. The major beneficiary of the project however is the community as the intervention will improve the security of lives and property and the community's economic advancement.
5. **Existence of some cultural rites in the community.** This issue was addressed by the consultant who noted that the community's fears and concerns would be documented and communicated to the contractor and other consultants. He further explained that the World Bank Safeguard Policy on Cultural Heritage addresses such issues of physical and cultural resources.



Plate 4.6: Group Photograph after Meeting with some PAPs



Plate 4.7: Photograph during the Town Hall Meeting Session (2023)

The community's expectations during the construction and operation phases are as follows:

1. New areas affected by the gully need to be captured by the engineering drawing for rehabilitation;
2. Prompt project implementation unlike the initial failed promise;
3. Payment of adequate compensation to people whose properties will be affected by the proposed intervention;
4. Adherence to the cultural rites;
5. Prioritization of the employment of the locals, especially youths, during the construction and operation phases of the project;
6. Upgrade/rehabilitation of the Primary Health Centre to better cater for the residents and construction workers.
7. Provision of healthcare centre for the elderly

4.6.4 Stakeholders Engagement Plan (SEP)

The stakeholder engagement plan allows the project manager to devise a systematic approach to ensure expectations, decisions, risk/issues and project progress information is delivered to the right person at the right time with the most efficient and effective level of information. Table 4.16 shows Omigbo River Channelization/Gully Erosion Intervention stakeholder's engagement plan.

Table 4.16: Omigbo River Channelization/Gully Erosion Intervention SEP

S/N	Stakeholder	Engagement Method	Venue	Frequency
1	Community Members of Omigbo Watershed	Town Hall Meeting	Village Square	Monthly During Pre-Construction and Construction phases
2	Project Affected Persons (PAP);	Meetings	Kogi State ACReSAL Office / Project Site	Monthly During Pre-Construction and as the need arises during construction
3	Traditional Institutions	FGD/IDI	Palace/Project Site	Monthly
4	Local Government Authority	Meeting	LGA Secretariat	Bi-Monthly / As the need arise
5	MDAs	Meeting	MDA Office / Project Site	As the need arises with particular MDA
6	Religious Organisations	FGD	Religion Centre / Project Site	Bi-Monthly / As the need arise
7	Security Agents	FGD	Police / NSCDC Office and Project Site	Monthly / As the need arise

CHAPTER FIVE
ASSESSMENT OF THE POTENTIAL IMPACTS AND ANALYSIS OF ALTERNATIVES

5.0 Introduction

The section discussed the various potential impacts (Positive and Adverse) of the proposed project. It also presents the analysis of the alternative options and chats the course to the most sustainable, viable and economically feasible option.

5.1 Impact Assessment Methodology

Quite a few methods were employed in measuring the impact of the gully erosion at the Omigbo River Channelization / Gully Erosion Intervention site. As expected for every socio-environmental assessment of this magnitude, checklists, matrix, public consultation, professional experience and field-based judgments were used. The tools birthed three phases of impact assessment which include:

a) *Impact Identification*: to itemise and enumerate the impacts connected with each phase of the project activities;
b) *Impact Prediction*: to forecast and project the nature, magnitude, extent and duration of the impacts as regards the phases of the project; and
c) *Impact Evaluation*: to appraise the significance of the impacts.

5.1.1 Impact Identification

A checklist based on exhaustive consideration of the immediate environment, normal baseline information and the essential project activities was used to develop a set of lists of the potential impacts of the project. Project impact identification involved the following:

- The source (origin) and/or the cause of the problem (project activity and or environment aspect);
- The receptor of the impact (socio-environment component i.e. existing ecological and socioeconomic condition of the project environment);
- The way and manner in which the effect is diffused from the source to the receptor (pathway and pulse); and
- The potential consequences (environmental impact).

5.1.2 Impact Prediction

Impact prediction entails a collage of processes that connect the project activities to the environment. Identified impacts were characterised based on the nature, duration, and reversibility of the possible impacts, and involved the following prediction spectral:

- *Beneficial Impacts*: these are impacts that have positive and useful effects;
- *Adverse Impacts*: these are impacts that have negative and unpleasant effects;
- *Direct Impacts*: these are first-order evidential impacts and are directly related to the proposed project and can be connected to the actions that trigger them;

- *Indirect Impacts*: these are second-order impacts that occur later in time or further away from the impact source;
- *Cumulative Impacts*: these typically occur from the incremental impacts of an action when combined with impacts from project-related events that have been commenced recently or would be activated in the near future;
- *Reversible Impacts*: these are impacts over which the components involved have the capability of recovery following the disturbances caused by the impact based on resilience traceable to it;
- *Irreversible Impacts*: these are impacts whose effects are such that the environmental components cannot be returned to its original state even after adequate mitigation measures are applied, having frail resilience capacity;
- *Residual Impacts*: these are impacts whose effects remain after mitigation measures have been applied, often requiring a review to deal with;
- *Short Term Impacts*: these are impacts whose effects remain over a short period and are confiscated after the utility of requisite alleviation measures;
- *Long-Term Impacts*: these are impacts whose effects remain over a protracted period way beyond the utility of mitigation measures.

5.1.3 Impact Evaluation

This is the third stage in the assessment procedure involves the evaluation of project-based concerns, issues and impacts. Based on its applicability to the project, the Risk Assessment Matrix (RAM) was used. The RAM approach involves an analysis of the risks of the impacts by determination of the consequence and or severity alongside the probability of occurrence. The severity of the impact was ascertained using the Consequence Severity Table while the Likelihood Ranking Table was used to estimate the probability of an impact. Table 5.1 details the RAM which was used to determine the risk level and the related significance of the impact. Tables 5.2 to 5.3 present the outcome of impact identification, characterisation and evaluation for the Omigbo River Channelization / Gully Erosion Intervention project.

Table 5.1: Probability of Occurrence, Consequence Severity, Likelihood Ranking and Risk Matrix

Probability	Attributes
Certain	Impacts that can reasonably be expected to occur during the project
Likely	Impacts that are likely to occur during the project
Possible	Impacts that might occur sometime during the project
Unlikely	Impacts that can reasonably be expected NOT to occur during the project
Rare	Impacts that are unlikely to occur except in exceptional circumstances

Severity	Attributes
Negligible	No detectable environmental and socio-economic impact
Marginal	Minimum environmental and socio-economic impact. Localized reversible habitat loss or minimal long-term effects on habitat species or media/public health and safety
Critical	Significant environmental and socio-economic harm. Significant widespread and persistent changes in species, habitat and media (e.g. widespread habitat degradation/public health and safety)
Catastrophic	Detrimental environmental and socio-economic impact. Loss of a significant portion of a

	valued species or effective ecosystem function on a landscape scale/injury and death is possible

	Severity			
Probability	Negligible	Marginal	Critical	Catastrophic
Certain				
Likely				
Possible				
Unlikely				
Rare				

Low	
Medium	
High	
Extreme	

5.2 Potential Impacts of the Proposed Project Activities

5.2.1 Potential Positive Environmental Impacts

- ***Mitigation of gully/flood activities:*** Usual environmental issues that accompany gully erosions, which includes flooding and river sedimentation, will be minimised and flood water will be channelled through the drainage channels that will be constructed. Destruction of crops cultivated along the bank/floodplain of the River will be reduced to the minimum possible extent. Consequent upon these activities, the gully erosion activities and further expansion will be controlled and the aesthetics of the project area will be restored.
- ***Restoration of degraded lands and their conversion into productive land:*** Thedegraded lands by the gully inhibiting land development will be addressed such that the land will be enhanced for agricultural activities. Also, as much as possible the productivity of the land will be enhanced to reflect the pre-gully scenario.
- ***Reducing disaster risks in the project area:*** The gully-eroded land presents a huge risk to lives and properties. All these environmental risks will be addressed by the project.
- ***Improved environment and aesthetics of the area:*** Environmental aesthetics including the landscape, scenery and the view of the town from the perspective of the gully eroded area will be improved by the project. This is because botanical cosmetic trees for land degradation control will be planted to perform the dual role of erosion control and land beautification.
- ***Afforestation:*** Afforestation reduces the impact of flooding by delaying and reducing the size of floods, dispersing the water in a more gradual manner than over bare

ground. Afforestation also provides other environmental benefits, including increasing the soil quality and organic carbon levels in the soil and avoiding erosion and desertification. Afforestation is also able to reduce air pollution via the trees' absorption and filtration of pollutants, including carbon monoxide, sulfur dioxide, and ozone, in addition to CO_2. Afforestation protects the biodiversity of plants and animals which allows the sustenance of ecosystems that provide clean air, soil fertilization, etc

- ***Water-harvesting:*** Water harvesting reduces stormwater runoff from an area. The elimination of runoff also reduces contamination of surface water with pesticides, sediment, metals, and fertilizers. By reducing stormwater runoff, water harvesting reduces a storm's peak flow volume and velocity in local creeks, streams, and rivers, thereby reducing the potential for streambank erosion. Water harvesting systems can also be employed as simple and effective methods to meet a municipality's stormwater management program requirements for individual properties. It is an excellent source of water for plants and landscape irrigation since it has no chemicals such as fluoride and chloramines (chlorine).

5.2.2 Potential Positive Social Impacts

The overarching purpose of any environmental and social oriental project is to improve both the environment and social well-being of the people. This is usually directed using the instrumentality of the socioeconomic profile of the people and their nexus with the environment. It can be expected therefore that the civil works at the Omigbo River Channelization / Gully Erosion Intervention will reduce the harrowing experiences of the people. The positive social impacts of the project are listed as follows:

- ***Safety of lives and properties:*** The civil works within the web of project-related activities will restore the eroded land and secure assets that are annually affected by flooding in the area. Also, the high-water flow off the Oparo Road, Odo-Aofin Road, Kano Road, Olle Road, Omavi Road, Ilorin-Lokoja Road and the Eluke-Kabba Road will be addressed with the construction of drainage channels to link the river. Overall, the proposed project will ensure the safety of lives and properties within the watershed.
- ***Safeguarding public infrastructures:*** Public facilities including infrastructures within the Omigbo River Channelization / Gully Erosion Intervention and those within the larger community such as electricity distribution poles, transformer, drainage of the Oparo Road, Odo-Aofin Road, Kano Road, Olle Road, Omavi Road, Ilorin-Lokoja Road and the Eluke-Kabba Road and several others are threatened by the high floodwaters which, if not controlled, could lead to damages and expand the gully if left unaddressed. With the proposed development, these public facilities will be salvaged and people will be able to use these vital infrastructures without the disruptions caused by the gully and associated localised flooding.

- ***Amplified value for structural and landed properties:*** The entire watershed will experience an increased valuation as the flooding has led to reduced interest in the initiation of civil projects in the area due to concerns about the proneness of the area to flooding. Therefore, land utilisation opportunities will increase and abandoned projects will be revived. Farmers will also be encouraged to engage in the expansion of cultivation since the rehabilitation is holistic.
- ***Employment opportunities****:* This will be a direct benefit to qualified and abled youths and professionals within the area. Construction workers, artisans, iron benders and other professionals will be sought within the community and Kogi State in general. Also, non-skilled workers including food vendors will be engaged. The project is expected to create over 100 direct and indirect jobs for new job seekers during the construction phase of the project for at least 9 months. Before full employment, some of the employed professionals will be trained concerning the civil works pattern expected. The training will enhance their future employability or as standalone employers of labour. Some women will also be employed as sanitation managers within the project area thus, gender balance will be ensured during the project.
- ***Water Supply:*** Excess water harvested can complement other sources of water supply for domestic uses.

5.3 Potential Negative Impacts of the Proposed Project Activities

These negative impacts are outlined based on their occurrence during the pre-construction, construction and operation phases to proffer suitable mitigation measures for each of the project phases as expected in the Environmental and Social Management Plan (ESMP).

5.3.1 Pre-Construction Phase: Potential Negative Social Impacts

- ***Loss of Land and Source of Livelihoods***: The proposed development will affect some activities along the gully and along the drainage channels to be constructed. The designs outlined in the engineering design require some land procurement and expropriation measures. Farmlands and some pieces of land along the channels on gully 1 finger 1 & 2 channels and gully 2 channels will be used as the construction buffer. To address this, a full or abbreviated resettlement action plan A(RAP) is required as defined by the World Bank ESS 5. This document will address issues of resettlement of land and landed properties with all the compensation and acquisition modes. Also, along the RoW, there are economic trees that will give way for the gully rehabilitation and channelization.
- ***Expectations of Improvement in Livelihood***: Usually, a project in this fold is tied with heightened expectations. Such expectations are normally tied to peoples' expectations of better infrastructure provision to communities, a possible rise in economic activities such as agriculture, aquaculture, and food vending, provision of employment opportunities offered by the project, and many more. Residents may, however, develop certain excessive expectations of these, which may not be captured as part of the project deliverables consequently leading to residents' disappointments.

- ***Proposed Project-Induced Development***: Within the entire watershed, the extent of the proposed civil works could also raise the hope of total infrastructure development such that, there may arise a perception that all projects in the area will be developed. This form of expectation could have a deleterious impact on the project and could be worsened by an ineffectual project management framework.

5.3.2 Construction Phase: Potential Negative Environmental Impacts

A series of activities during the construction phase will significantly affect the environment in more ways than one. Heavy trucks will be used to move sand and other essential construction materials on-site, heavy-duty equipment will be used and these will obstruct normal traffic, activities will be intense en route to the construction site and activities. More importantly, Gully head 1 culvert near Kabba – Obajana Road / Kabba – Ogaminan Road (Road 06) junction, the other two culverts on Ogaminan Road (Road 06), and the two culvert on Kabba – Obajana Road are hotspots. The following are the key negative environmental impacts of the project:

- ***Impacts on Air Quality***

The ambient air quality will be adversely altered during the construction phase of the project as heavy-duty vehicles and dust particles from the burrow pit where construction sand will be sourced and the main construction site will be affected. The possible negative impacts will be in the form of air quality parameters such as PM_{10} and NO_2 / NO_x and other emissions from plants and machinery. Vehicles and other emission-generating gadgets will alter the natural air quality of the proposed project area. The impact of air pollution might also affect water production activities within the abutting Omigbo River Channelization / Gully Erosion Intervention site, particularly open water operations hence air quality assessment may be significant.

With the possible length of the construction phase stated as 9 months, half of this is expected to be fully dedicated to civil works in which dust and airborne suspended fine particles will be released. Thus, this will affect some receptors which are highly sensitive to this adverse impact. Hence, before mitigation, the impact of dust on these receptors is considered will be ***major*** while the impact of potential emissions from different project-based sources will be considered ***significant***. It is therefore vital to ensure that adequate steps are taken to abate the effects of these observed imprints.

During the operation phase, however, the negative air quality impacts predicted could be associated with the following:

i. Process emissions (NO_x and CO);
ii. Cumulative process emissions (NO_x and CO); and
iii. Greenhouse Gases (GHGs).

- ***Impacts on Flora and Fauna***

Owing to the nature of the Omigbo River Channelization / Gully Erosion Intervention and the entire area within the watershed, it is inevitable that the proposed project will affect plants, animals and other biological life regardless of their size and living footprints. Micro-organisms that burrow in the soil and large animals that depend on grasses, herbs, ferns and shrubs will be displaced during land clearance. Birds and

large animals that have built their habitats on trees within the area will not be spared as they will be displaced from their natural habitat. Crawling and climbing animals will also be displaced.

During the construction phase, the ecosystem functions including the natural food chain will be severely affected.

- ***Impacts from afforestation***

  If not properly managed, afforestation can result in a reduction of local biodiversity, the modification of particular biomes, the introduction of non-native and potentially invasive species, reduced stream flow and lost revenue from agriculture. Native grasslands that are converted to forests may not contain the same habitat for local species, and ill-managed reforestation efforts may result in the production of a monoculture that lacks not only plant diversity but reduces the number of available habitat types for forest inhabitants.

- ***Impacts on Water and Water Resources***

  The Omigbo River Channelization / Gully Erosion Intervention is situated along a river course. This shows that during construction, civil works involving excavations of earth materials might release suspended particles into the river which if released in quantities beyond limits, could pose deleterious effect on the natural chemical constituents of the river. This could be further diffused from high to low concentration that affects water organisms. It could also affect aquaculture, and river bank activities. Accidental spillage of fuel, lubricants, construction materials involving wet concrete and cement and powdery substances from the construction works as well as the possibility of poor waste management could contaminate the river. Besides, there is the possibility of groundwater contamination from construction activities and the nearby freshwater would constitute a direct, secondary impact. In terms of the duration of impact, this ranges from short-term to medium and long-term if it is not properly handled and treated within the time of occurrence.

- ***Impact on Biodiversity***

  The construction phase of the project will significantly affect the natural biodiversity of not only the project site but also the lower watershed where heavy-duty vehicles will ply and other related activities will take place. Forested areas with native trees and tall grasses, which serve as the microclimatic factors will be removed and replaced with regrowth and shrubs at the bank of the river. Consequently, the natural functioning of biodiversity, including the natural habitat within the local ecosystem will be completely disrupted with some even totally removed and some partly affected. Migratory routes of birds and animals will be affected. Large animals that rely on food from the natural chain will be affected. Owing to the nature of the replenishment of biodiversity, the impact might be moderate but loss of habitat will be total. However, measures will be taken to curtail the impact to the barest minimum.

- ***Impact from Water harvesting***

Water harvesting systems require regular maintenance they may become prone to rodents, mosquitoes, algae growth, insects, and lizards. They can become breeding grounds for many animals if they are improperly maintained. Certain surfaces may seep chemicals, insects, dirt, or animal droppings that can harm plants if it is used for watering the plants. The construction of water harvesting facilities thus introduces human health risks and ecological risks. While the Human health risks include any adverse health effects in humans who may be exposed to chemicals in contaminated environmental media, now or in the future, the ecological risks include the impact on the environment from the result of exposure to one or more environmental stressors such as chemicals, land change, disease, invasive species and climate change.

- ***Soil, Land Excavation and Camp Sites Construction***

  The proposed project activities will involve land clearance, excavations, soil removals and infilling with concrete materials and cemented constructions. These will have impacts on the pristine soil characteristics such as locational soil profile, soil habitat for microorganisms, possible water table near the river, soil water and nutrients and other natural surficial soil traits in many ways. First, the topsoil removal will alter the natural drainage and surface run-off regime in situ, especially during water flow in the rainy season.

  Second, soil fertility at the point may be affected if the nature of work involves a complete removal and replacement with concrete. The soil becomes less useful for cultivation. Therefore, soil destabilisation will be unavoidable in this instance. However, if this is not properly managed, it will further potentially lead to soil erosion during heavy rainfall and sedimentation in downstream water bodies. The cumulative impacts of these will be negative, direct and indirect as some of the changes in situ will be permanent, lasting beyond the project phase. Notably, however, the scale of the impacts will be at a local level. The magnitude of the impacts is therefore considered will be ***high***.

  Considering the nature of the project site concerning the Omigbo River Channelization / Gully Erosion Intervention and the River, the sensitivity of the receptor is also considered will be ***high***. This is also dictated by the immediate use of the soil for agriculture and related activities such as fish ponds, fishing etc. Before mitigation, the significance of the impacts is therefore considered will be ***high***. A related concern to this is the location of the project depot. The working camp and administrative buildings of the project should be located with the consideration for the use transfer method after the completion of the project. To this end, plans that will consider the delicate nature of the soil should be key in site selection; such that post-project clean-up would be seamless. The significance of the impacts is accordingly considered will be ***moderate*** before mitigation.

- ***Noise***

  Noise as an environmental issue does not pose any obvious value that can be attached to the construction phase of the project. A series of activities identifiable with the project that instantaneously generate high-scale sounds could pose deleterious effects

on the environment in general including human health. The project duration, which is 9 months, with active hours of 0700–1800 Monday to Saturday with active movement of trucks and heavy-duty equipment permissible/acceptable human noise levels will be temporarily exceeded within the working zone. Therefore, noise abatement measures including adequate work scheduling must be taken into consideration. The negative noise impacts during construction are therefore considered will be of **significance** at the nearest receptors.

- ***Disruption to Communication and Transportation Routes***

  The consideration of possible disruption to communication and transportation routes is inevitable because the area is dominated by road transport, which will be kept busy and the low usage of water transport within the river. Construction activities along the Oparo Road, Odo-Aofin Road, Kano Road, Olle Road, Omavi Road, Ilorin-Lokoja Road and the Eluke-Kabba Road among others will affect normal traffic patterns. Normal road traffic may be slowed down or diverted during construction works thereby impacting travel time plans and road-based service will be altered. Hence, from the time of construction till its completion, the overall impact upon the community would be characterized by obstruction of road accessibility apart from the altered flow of road traffic flow. The impact on vehicular movement will generally be reflected in the form of an increase in trip time and other costs associated with delays. This will further result in minor inconveniences for the road users. The disruption to communication routes during construction is therefore considered to be of **significance**.

- ***Disruption to Public Utility***

  This is inevitable owing to the gravity of the work to be done and the number of public utilities such as electricity facilities that might be affected. The Omigbo River Channelization / Gully Erosion Intervention itself could be slightly disrupted. Thus, nearby electrical lines and cables would be affected as electricity supplies to customers would be affected during the construction phase of the project. The levels of the likely impacts that will arise from the damage to this and other public utilities in the project site are summarized in Table 5.2.

Table 5.2: Potential Impacts of Disruption to Public Utility

Utility	Nature of Impact	Severity
Medium Voltage Electricity Cables	Interruption of supply	Severe production loss and public inconvenience
	Personal injury	Probable death of or serious injury to the operator
	Cost of repair/delay to works	Severe
Low Voltage Electricity Cables	Interruption of Supply	Localised but severe public inconvenience
	Personal Injury	Possible serious injury to the operator
	Cost of repair/delay to works	Minor production loss. Short public inconvenience

- ***Disruption of Access to Public Facilities***

Besides the general disruption to communications, civil works at the gully-affected area might result in the temporary loss of access to other areas as work progresses past individual property entrances.

This will be most unbearable when affected residents are crossing roads and in front of public buildings (schools) and emergency service centres (hospitals and Primary health centres) as the case may be. A major example would be the public access to schools, health facilities and the church buildings which are a few metres away from the gully channels.

- ***Occupational Health and Safety***

  Civil works involving heavy-duty equipment, plant, machinery and concretise constructions are filled with occupational uncertainties in terms of injury of varying degrees. This calls for sufficient safety measures in situ. Some job specifications such as iron benders, iron welding, lifting of heavy objects, closeness of electrical materials such as heavy-duty generators, crane and others require specified safety outfits such as coveralls, safety booths, safety helmets, etc. noise from the operated vehicles and plants require specific safety from injurious exposure to such.

  To this end, safety measures must be put in place for all categories of staff, visitors and administrators including assessors from relevant agencies of government saddled with supervisory and oversight functions. Irrespective of the phase of the construction works, safety measures on the job must be fully observed to avert any loss or damages and highly intense injuries and even to avert loss of human lives.

- ***Impact on Agriculture, Settlements and Community Facilities***

  Some benefits of the proposed project are accrued to the immediate community, particularly those fending foods for in situ staff, employment of locals in different capacities and others. However, some adverse effects on the community could stem from the attitude of the employed staff. Some of these behaviours could be alcohol abuse and general engagement in unwholesome acts such as abuse of local women. The spread of diseases such as HIV/AIDS and COVID-19 is also possible. Apart from these, land clearance will affect cultivated lands, which could lead to the displacement of farmers; though the impact may not be high as the area is under temporary cultivation.

- ***Solid Waste***

  Construction waste that will be generated from excavation, earthworks and concretes will form a vital part of the solid wastes in the area. Other solid wastes that will be generated include metallic pieces, wooden planks, and stone debris. If these wastes are not properly disposed and managed, they may constitute a threat to the lives of the members of the community and the environment in general.

- ***Sanitation Issues***

  Some of the significant health concerns associated with the project's activities include a shortage of facilities like toilets, catering facilities for construction workers and

water. Measures must therefore be put in place to ensure that proper sanitary are introduced and sustained. This will be to safeguard the operational activities of the Omigbo River Channelization / Gully Erosion Intervention. In other words, sanitation must be taken very seriously.

5.3.3 Construction Phase: Potential Negative Socio-Cultural Impacts

The project, particularly within the cordoned area of the Omigbo River Channelization / Gully Erosion Intervention and generally the area, is located within a residential area with a mixture of religious and few commercial activities. The local populace consists of civil servants, a few traders and artisans. There are chances of considerable negative impacts that will be triggered by the construction works during the proposed project. These are:

1. Immigration of New Comers

Apart from the people within the community, newcomers from other parts of Kogi State and other parts of Nigeria will be employed to work in the project site. The possibility of negative social behaviours such as expansion of sex immorality, drug and alcohol abuse, insecurity, banditry, theft, STD, HIV/AIDS, spread of COVID-19 and many others cannot therefore be ruled out. There is a high tendency that some or many of these abuses will become rampant.

2. Impact on Ambient Air and Traffic

The potential air emissions from the construction machinery will be moderate and they may have significant impacts on the ambient air quality. In other words, the extent of traffic that is likely to be generated during the construction phase will be a source of concern. The movement of heavy-duty machinery, trucks, lorries and other construction works might have a harmful impact on the ambient air quality that will affect road users. The Oparo Road, Odo-Aofin Road, Kano Road, Olle Road, Omavi Road, Ilorin-Lokoja Road and the Eluke-Kabba Road as well as the connecting roads within the Kabba area will be affected at this phase of the project.

3. Loss of Livelihood by Women

Some issues raised by women who are petty traders and food vendors along Oparo Road, Odo-Aofin Road, Kano Road, Olle Road, Omavi Road, Ilorin-Lokoja Road and the Eluke-Kabba Road showed that women would be particularly adversely affected by the proposed intervention project, especially through the loss of their roadside kioks and shops. This will happen during the construction phase. In essence, women's sources of livelihoods will be adversely affected.

4. Impact on Cultural Beliefs

The influx of workers from other parts of Kogi State and Nigeria at large will require personal adjustments and adaptations to norms, values and the belief system of the residents and people of the proposed project. Traditional norms and values including festivals (e.g. the Oka festival) and various religious beliefs must be respected. Issues regarding women and children must be kept as sacrosanct as possible while forbidden acts and taboos must be avoided. To ensure this, a cooperative mechanism must be developed to ensure that these cultural values are mainstreamed into the workforce core values with the local community. If this issue is not properly coordinated and

maintained, some workers could flout these cultural beliefs. Also, the Omigbo River Channelization/Gully Erosion site project is not expected to cause any damage to historical, archaeological and cultural sites in the community. Nonetheless, *the Kogi State ACReSAL will have to consult widely to monitor the operations of the contractors throughout the works period to ensure that no archaeologically or culturally valuable areas and valuables are destroyed*.

5. Increase in Crime and Insecurity Issues

The urban character of the host community makes the flow of people easy, driven by the major road – Oparo Road, Odo-Aofin Road, Kano Road, Olle Road, Omavi Road, Ilorin-Lokoja Road and the Eluke-Kabba Road. Inflow of people who might flout some of the local security issues could build up cases of crime and security issues. Adequate sensitization and other localised measures would reduce this significantly.

5.3.4 Operations and Maintenance Phase: Potential Negative Environmental and Social Impacts

During this phase, activities will include: regular inspection, de-siltation and clearance of the drains and manholes, training of operators, maintenance of equipment used, sanitation and waste management system, maintenance of vegetation and aquaculture activities around the drainage channel, market gardening around the drainage channels area, increased vehicular traffic in the area and increase in commercial activities, emergence of unplanned land uses, increased housing and facility density, increased business attractions among several others will surface. These activities could trigger issues such as air quality diminishing, noise and vibration, water quality, traffic and transportation, occupational health and safety issues and so on.

1. Air Quality

An increase in vehicular traffic in the project area might increase the rise in dust and other air-borne particles, which might have negative impacts on the visibility and general environmental outlook of the area. Residents of the community might feel this occurrence and such disturbances might also be observed from hospital records within the area. It therefore becomes imperative to put a viable structure in place to check the air quality of the project during this phase of the project.

2. Noise and Vibration

This is a likely phenomenon. It can be related to increase in traffic and air quality issues. Since the Oparo Road, Odo-Aofin Road, Kano Road, Olle Road, Omavi Road, Ilorin-Lokoja Road and the Eluke-Kabba Road connects the project area to other parts of Kabba-Bunu LGA and by extension to other parts of Kogi and Nigeria, intensified vehicular operations will likely compound the pre-project decibels. However, this may not be beyond residential permissible threshold of 90 ḍB(A) for an 8-hour working period as regulated by the FMEnv.

3. Water Quality Issues

Runoff from the roadway, community solid wastes, agricultural wastes and lubricants oil and grease used in equipment maintenance could drive an increase in water quality issues within the site and the watershed. It is vital therefore to certify that water

quality measures such as pH level, turbidity, water colour and other physical measures are examined on a timely basis at the time of the project and monitored.

4. Traffic and Transportation

Developed road infrastructure usually attract increased utility. Thus, this is expected during the operation phase of the project. It should be noted that the attraction for increased vehicular density should not also be unexpected, thus, proper public safety measures against road vehicular accidents associated with this must be ensured and implemented during this phase of the project. Project traffic is in addition to the regular local traffic and its roadside impacts are expected. Trafic Management Plan (TMP) focusing on traffic management along the local and access roads, handling and managing traffic congestion, accidents, road safety, maintaining the access roads etc. keeping in mind the longer duration of the Project's impact on the resident was considered and presented in annex x.

Other potential adverse social impacts that could arise during and after implementation of the project include: Social exclusion from project benefits such as employment, Exploitation of vulnerable (e.g. women and children)/ Human right violations, Competition for project-generated jobs leading to conflict, Community health and safety, Negative stakeholder feedback, complaints and grievances, Site & labour induced community security issues, Limited access to information and limited communication about the project (progress, potential delays etc.), Cultural heritage impacts, Traffic Management (focusing on blockage of access, traffic diversion and/or road closure), Impacts on HSE of Community & Construction Workers (Community Health & Safety), Damage to Physical Infrastructure, Labour Influx, Gender Base Violence (GBV), Sexual Exploitation & Abuse and Child Labour. The mitigation measures for these impacts are presented in table 5.9, 5.10 and 5.11 as well as in the Environmental and Social Mitigation and Monitoring Plan tables in chapter six. However, a summary of activity specific risks and impacts is provided in table 5.2a

Table 5.2a: Summary of Activity Specific Risks and Impacts

Project Phase	Activities	Associated and Potential Impacts	Mitigation
Pre-Construction	**Land acquisition and demolition of existing buildings/hydraulic structures**	★ Reduction in access to land resources and anxiety on the part of the communities. ★ Opportunities for income generation ★ Economic activities may thrive in the affected communities. ★ Grievance /conflict due to resettlement and compensation issues ★ Work related accidents leading to injury /death of workers. ★ Accidents and injuries to scavengers or community members during demolition and removal of structures	★ Stakeholder Engagement Plan. ★ RAP/GRM ★ Occupational Health and Safety Management Plan. ★ Demolition Management Plan ★ Community Health and Safety
	Mobilization of equipment and personnel	★ Increase traffic and delays. ★ Noise from heavy duty vehicles all through the working hours from morning to early evening except break hour ★ Gas emission from vehicles and machines	★ Traffic and Vehicle Management Plan. ★ Noise and Vibration Control Management Plan. ★ Air Quality and Dust Control Management Plan
	Site clearing and preparation	★ Loss of species diversity and abundance ★ Potential increase in erosion of area(s) cleared. ★ Increased generation of solid and liquid waste ★ Noise from heavy duty vehicles during working hours of the day from morning to early evening except break hour ★ Dust generation and emissions from vehicles and machines	★ Vegetation Clearing and Biomass Management Plan. ★ Waste and Chemical Management Plan. ★ Air Quality and Dust Control Management Plan ★ Noise and Vibration Control Management Plan
	Recruitment of local labour	★ Employment opportunities for the local populace ★ Increase in economic activities. ★ Increase in the price of commodities (High demand for food, fuel etc.) ★ Influx of people in search of jobs, which may lead to population / demographic change. ★ Influx of people searching for jobs may lead to increase in crime. ★ Increase in the spread of communicable and sexually transmitted diseases (e.g., HIV, Hepatitis) ★ Cultural conflict between migrants and local people. ★ Increase demand for housing	★ Occupational/Public Health and Safety Management Plan. ★ Labour Management Plan. ★ GRM and Stakeholder Engagement Plan
Construction	**Excavation for drainage/gully route**	★ Change to local topography of the area. ★ Work related accidents leading to injury /death of workers. ★ Soil and surface water pollution because of accidental spill of fuel and lubricant ★ Noise and ground vibration from	★ Occupational Health and Safety ★ Storage of fuel and hazardous material management plan. ★ Control of Noise and

Project Phase	Activities	Associated and Potential Impacts	Mitigation
		heavy equipment through the working hours of the day from morning to early evening except break hour ★ Respiratory effects on the health of the workers because of dust	Vibration Management Plan ★ Waste Management Plan.
	Blasting of rocks for drainage/gully route	★ Flying rock fragments causing injuries to workers, residents and passersby ★ Vibration causing cracks on nearby structures and possible collapse ★ Noise from blasting causing injuries to the ear drums during blasting operations ★ Respiratory effects on the health of the workers and residents because of dust	★ Occupational Health and Safety ★ Control of Noise and Vibration Management Plan ★ Air Quality and Dust Control Management Plan. ★ Rock Blasting Management Plan
	Construction of drain canal	★ Creation of deviation/diversion routes that will likely take up land and cause traffic delay. ★ Hinder access to homestead during drainage construction due to depth of ditches created along the gully route. ★ Noise pollution from equipment and workers may create nuisance in the communities from morning till early evening during working hours except break hour ★ Concerns over oil/fuel spills from fuel dump areas and workshop at the project sites. ★ Generation of waste from camp sites and sites where works are undertaken. ★ Work related accidents leading to injury /death of workers.	★ Traffic and Vehicle Management Plan. ★ Control of Noise and Vibration Management Plan. ★ Storage of fuel and hazardous material management plan. ★ Waste Management Plan. ★ Occupational Health and Safety
	Backfilling	★ Noise and vibrations from heavy machineries through morning till closing in the evening except break hour ★ Alteration of soil profile / gully bathymetry ★ Fugitive emission of hazardous dusts with potential impact on human health and the ecosystems ★ Work related accidents leading to injury /death of workers.	★ Control of Noise and Vibration Management Plan. ★ Air Quality and Dust Control Management Plan. ★ Occupational Health and Safety
Operation	**Flow of storm water**	★ Possibility of flooding from blocked drain channel or poorly constructed drain.	★ Flash flood Emergency Preparedness Plan. ★
	De-silting	★ Exposure of workers, motorist, and nearby community residents to odour ★ Waste nuisance within the community work area and material transport route ★ Traffic obstruction around the desilting work area	★ Waste Management Plan ★ Traffic and Vehicle Management Plan ★ Occupational Health and Safety (OHS). ★ Community Health and Safety (CHS)

Project Phase	Activities	Associated and Potential Impacts	Mitigation
		★ Work related accidents leading to injury /death of workers.	
Demobilization	**Dismantling and Removal of Equipment and vehicles**	★ Noise and vibration ★ Traffic congestions	★ Control of Noise and Vibration Management Plan.
	Land Restoration	★ Restoration of aesthetic value to the environment. ★ Leisure and social activities may resume in the affected communities	★ Bioremediation and establishment of green area on 5m buffer of both sides of the rehabilitated channel.

Table 5.3: Characterisation and Evaluation of Potential Impacts Pre-Construction Phase

S/N	Project Activities	Potential Environmental and Social Impact	Impact Qualification										Risk		Impact Category
			Direct	Indirect	Reversible	Irreversible	Cumulative	Long term	Short term	Beneficial	Adverse	Residual	Probability	Severity	
1	Land acquisition for the intervention project	Conflict from the members of the community to vacate areas allocated for the project especially the drainage channel sites.	X			X	X	X			X		Possible	Catastrophic	Extreme
2	Public Awareness	Pessimistic Community perception can disrupt the proposed project activities	X		X				X		X		Possible	Marginal	Medium
3	Labour influx	• Threat to community culture due to labour influx; • Conflict arising from the poor employment/engagement of local labour for site clearing and other pre construction activities.	X		X				X		X		Possible	Critical	High
4	Mobilisation	• Noise and vibration from the use of motorized vehicles and equipment; • Ambient air pollution from release of dusts and gaseous emissions; • Soil contamination from accidental leakage/spillage of fuel, oil and lubricants.	X		X				X		X		Possible	Marginal	Medium
5	Site clearing	• Loss of soil quality from de-vegetation and erosion; • Impact on water quality; • Generation of vegetal wastes and other cleared materials; • Impact on flora and fauna and wildlife; • Risk of diseases arising from indiscriminate waste disposal;	X		X				X		X		Possible	Marginal	Medium

		• Impact on site of cultural heritage; • Impact on intangible cultural heritage; • Exposure of workers to occupational hazards.													
6	Installation of the contractor's base camp	• Security issues that may lead to stealing of contractor equipment mobilised to site; • Impact on site of cultural heritage; • Impact on intangible cultural heritage; • Exposure of workers to occupational hazards.	X		X				X		X		Possible	Marginal	Medium
7	Installation of the Staging area	• Security issues that may lead to stealing of contractor equipment mobilised to site; • Impact on site of cultural heritage; • Impact on intangible cultural heritage; • Exposure of workers to occupational hazards.	X		X				X		X		Possible	Marginal	Medium
8	Material sourcing	Conflict arising from the sourcing of material	X		X				X		X		Possible	Marginal	Medium

Table 5.4: Characterisation and Evaluation of Potential Impacts Environmental Impacts in the Construction Phase

S/N	Project Activities	Potential Environmental and Social Impact	Impact Qualification										Risk		Impact Category
			Direct	Indirect	Reversible	Irreversible	Cumulative	Long term	Short term	Beneficial	Adverse	Residual	Probability	Severity	
1	• Demolition and site clearance • Removing refuse dumps • Desilting and clearing pond • Desilting underground sewers • Earthworks for road reconstruction • Construction of open channel drains • Construction of roads and pavement • Construction of water harvesting channels and storage • Desilting existing drains, etc • Bioremediation works	Channel Bank Failure	X		X				X		X		Possible	Marginal	Medium
2		Rock material might cave in during channel and baffled chute construction.	X		X				X		X		Possible	Marginal	Medium
3		Mudflow	X		X				X		X		Possible	Marginal	Medium
4		Soil impacts on activities such as excavating, grading, levelling, compacting etc.	X		X				X		X		Possible	Marginal	Medium
5		In situ waste management	X		X				X		X		Possible	Negligible	Low
6		Channelization of flood waters	X		X				X		X		Possible	Marginal	Medium
7		Topographic alterations and other civil works for remediation purposes	X		X				X		X		Likely	Marginal	Medium
8		Air Quality Issues (Dust)	X		X				X		X		Possible	Marginal	Medium
9		Water Quality Concerns	X		X				X		X		Possible	Marginal	Medium
10		Air Quality (Noise)	X		X				X		X		Possible	Marginal	Medium
11		Increased Siltation and runoff	X		X				X		X		Possible	Marginal	Medium
12		Noise and vibration from the use of motorized vehicles and equipment	X		X				X		X		Possible	Marginal	High
13		Loss of soil quality from de-vegetation and erosion	X		X				X		X		Possible	Marginal	High
14		Generation of spoils and other construction wastes	X		X				X		X		Possible	Marginal	High

Table 5.5: Characterisation and Evaluation of Potential Impacts for the Biological Impacts in the Construction Phase

S/N	Project Activities	Potential Environmental and Social Impact	Impact Qualification										Risk		Impact Category
			Direct	Indirect	Reversible	Irreversible	Cumulative	Long term	Short term	Beneficial	Adverse	Residual	Probability	Severity	
1	Clearing of Forest	Impact on flora and fauna	X		X				X		X		Certain	Marginal	Medium
2	Afforestation	Impact on Wildlife	X		X				X		X		Possible	Marginal	Medium

Table 5.6: Characterisation and Evaluation of Potential Impacts for the Socio-Economic Impacts during Construction Phase

S/N	Project Activities	Potential Environmental and Social Impact	Impact Qualification										Risk		Impact Category
			Direct	Indirect	Reversible	Irreversible	Cumulative	Long term	Short term	Beneficial	Adverse	Residual	Probability	Severity	
1	• Demolition and site clearance • Removing refuse dumps • Desilting and clearing pond • Desilting underground sewers • Earthworks for road reconstruction • Construction of open channel drains • Construction of roads and pavement	Traffic and transportation Impact	X		X				X		X		Certain	Marginal	Medium
2		Accidents and Road Crashes	X		X				X		X		Possible	Critical	High
3		Employment Opportunities	X		X				X		X		Possible	Marginal	Medium
4		Human displacement	X		X				X		X		Possible	Critical	Extreme
5		Aesthetics	X		X				X		X		Possible	Negligible	Low
6		Shrines and Cultural sites	X		X				X		X		Possible	Marginal	Medium
7		Damage to and disruption of services of existing public utility cables and pipes	X		X				X		X		Possible	Marginal	Medium
8		Interference from local community causing disruptions to work	X		X				X		X		Possible	Marginal	Medium
9		Risk of flooding	X		X				X		X		Possible	Critical	High
10		Impact on accessibility to public	X		X				X		X		Possible	Critical	High

	• Construction of afforestation channels and storages • Afforestation • Bioremediation works	establishment												
11		Potential increase in GBV cases	X		X				X		X		Possible	Critical	High

Table 5.7: Characterisation and Evaluation of Potential Impacts for the Public Health Impacts during the Construction Phase

S/N	Project Activities	Potential Environmental and Social Impact	Impact Qualification										Risk		Impact Category
			Direct	Indirect	Reversible	Irreversible	Cumulative	Long term	Short term	Beneficial	Adverse	Residual	Probability	Severity	
1	• Demolition and site clearance • Removing refuse dumps • Desilting and clearing pond • Desilting underground sewers • Earthworks for road reconstruction • Construction of open channel drains • Construction of roads and pavement • Desilting existing drains, etc • Bioremediation works	HIV/AIDS and STDs	X		X				X		X		Possible	Critical	High
2		COVID-19	X		X				X		X		Possible	Critical	High
3		Water-borne diseases	X		X				X		X		Possible	Marginal	Medium
4		Malaria Issues	X		X				X		X		Likely	Critical	High
5		Domestic Water Usage	X		X				X		X		Likely	Critical	High
6		Increase mosquito vector breeding sites	X		X				X		X		Likely	Critical	High
7		COVID 19	X		X				X		X		Likely	Critical	High

Table 5.8: Characterisation and Evaluation of Potential Impacts for Operation Phase

S/N	Project Activities	Potential Environmental and Social Impact	Impact Qualification										Risk	Impact Category
			Direct	Indirect	Reversible	Irreversible	Cumulative	Long term	Short term	Beneficial	Adverse	Residual	Probability	Severity	
1	General maintenance operations • Regular inspection • Desilting and clearance of drains, manholes, • Desilting drainage channels, • Repair of damaged engineering structure, • Cleaning of drainage channel to prevent mosquitoes, • Training of operators, • Maintenance of equipment used, • Sanitation and waste management system	Generation of waste, spill of oil from equipment, loss of vegetation.	X		X				X	X			Possible	Marginal	Medium
2		Poor visibility, Increase air pollution level / dust	X		X				X		X		Possible	Marginal	Medium
3		Noise and vibration from machinery	X		X				X		X		Possible	Marginal	Medium
4		Spill from equipment could pollute surface and ground water	X		X				X		X		Possible	Marginal	Medium
5		Obstruction to free flow of traffic during maintenance.	X		X				X		X		Possible	Marginal	Medium
6		Health and safety Issues	X		X				X		X		Possible	Marginal	Medium
7		Increase soil erosion, create gully and cause land degradation.	X		X				X		X		Possible	Marginal	Medium

5.4 Mitigation Measures for the Potential Impact

5.4.1 Mitigation Measures for Impact/Risk Evaluation (Pre-Construction)

Table 5.9 shows mitigation measures for impact/risk evaluation (Pre-Construction)

Table 5.9: Mitigation measures for impact/risk evaluation (Pre-Construction)

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
Land acquisition for the intervention project Public Awareness	Conflict from the members of the community to vacate areas allocated for the project especially the drainage channel sites.	Pre-Construction	Substantial	Prob: 3, Impact: 4 Risk: High	• Legal check on land including traditional ownership • Negotiate with the rightful owner and avoid land speculators • Acquire proper documents from both the government and land owners
Public Awareness	Pessimistic Community perception can disrupt the proposed project activities	Pre-Construction / Construction phases	Moderate	Prob: 3, Impact: 2 Risk: Medium	• Invest in public awareness • Understand the people's perception and respond to their issues positively •
Labour influx	Risk to community health from HIV/AIDS/ 19 or ther transmitted infections as a result of the presence of migrant construction labour.	Pre-Construction and Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Contact numbers (hotlines) of the nearest health facility will be pasted at vantage points in the communities, where the sub projects will be implemented • Workers will not be allowed to receive visitors in project/camp sites without the express permission of site supervisor.
Mobilisation	Noise and vibration from the use of motorized vehicles and equipment;	Pre-Construction	Substantial	Prob: 4, Impact: 3 Risk: Medium	• Maintain equipment and machineries adequately to reduce their noise levels • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation • Avoid unnecessary idling of internal combustion engines
	Ambient air pollution from release of dusts and gaseous emissions;	Pre-Construction	Low	Prob: 2, Impact: 2 Risk: Low	• Suppress dust emissions by appropriate methods such as spraying water on soil • Ensure vehicles are in good working condition. • Ensure exhaust fumes from vehicles conform to applicable National standards and specifications
	Soil contamination from accidental leakage/spillage of fuel, oil and lubricants.	Pre-Construction	Negligible	Prob: 2, Impact: 2 Risk: Low Prob: 3, Impact: 3 Risk: Medium	• Ensure fuel storage tanks are leak-proof, • check daily & installed in a bunded area • Establish the procedures for storage & handling of hazardous materials. • Implement emergency response plan as part of OHS Plan to deal with spillage

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
Site clearing	Loss of soil quality from de-vegetation and erosion	Pre-Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Vegetation along drainage lines and gullies will be protected where practicable to provide natural attenuation of flows. • Area to be cleared will be kept to the minimum necessary to prevent disturbance of soils outside the boundary • No species of global conservation significance occurs at the protect sites and so it is not expected that such species will be affected • Workers would be advised that in the unlikely event animals are encountered, they are not to be killed; but instead caught and released into a similar environment. • Contractor to be aware of known cultural heritage sites • Flagging or physical barriers to be put in place if required. • Take precautions when excavating. • If any object or site discovered cease works and follow the • Chance-Find Procedure (CFP)
	Impact on water quality	Pre-Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	
	Generation of vegetal wastes and other cleared materials	Pre-Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	
	Impact on flora and fauna and wildlife	Pre-Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	
	Risk of diseases arising from indiscriminate waste disposal	Pre-Construction	Substantial	Prob: 2, Impact: 2 Risk: Low	
	Exposure of workers to occupational hazards.	Pre-Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	
	Security issues that may lead to stealing of contractor equipment mobilized to site	Pre-Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	
Installation of the contractor's base camp Installation of the Staging area	Impact on site of cultural heritage;	Pre-Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Adequate security to be provided • Contractors to work with local security structure in addition to formal structre
	Impact on intangible cultural heritage	Pre-Construction	Low	Prob: 3, Impact: 3 Risk: Medium	• Contractor to be aware of known cultural heritage sites
	Exposure of workers to occupational hazards.	Pre-Construction Construction	Negligible	Prob: 3, Impact: 3 Risk: Medium	• Contractor to be aware of known cultural heritage sites • Flagging or physical barriers to be put in place if required. • Take precautions when excavating. • If any object or site discovered cease works and follow the Chance-Find Procedure (CFP)
	Noise and vibration from the movement of motorized vehicles and equipment	Pre-Construction	Negligible	Prob: 4, Impact: 3 Risk: Medium	• Labour Management Plans shall be prepared by Project Contractor(s) based on the Project Labour Management Procedures for approval by the Bank/PMU to guide labour relations • Contractors and Sub-contractors will be required to hire labour through a structured HR process and not 'at the gate' • All workers will be given contracts specifying the type of work they are to undertake and their

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
					remuneration package as well as their conditions of service • All contracts will be vetted by the Ministry of Labour and Social Security before they are signed by workers • Contractors shall be required to consider alternative work schedules or shifts to accommodate the hiring of more female workers.
Material sourcing					• Maintain equipment and machineries adequately to reduce their noise levels • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation • Avoid unnecessary idling of internal combustion engines

5.4.2 Mitigation Measures for Impact/Risk Evaluation (Construction)

Table 5.10 Mitigation Measures for Impact/Risk Evaluation (Construction)

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
Air Quality	Potential for fugitive emission or particulate matter (dust) from earthworks, stockpile materials, heavy vehicles during construction /operation phase.	Construction Operation Decommissioning	Substantial Low Moderate	Prob: 4, Impact: 3 Risk: Medium	• Dust minimization measures shall be implemented including watering of the construction areas, including the road surfaces under construction. • Soil stockpiles and stores of friable material will be covered to reduce the potential for fugitive emissions of dust where possible. • Vehicles carrying friable materials will be enclosed or sheeted. • Loading, unloading and handling of dusty materials will only be carried out in designated areas. • Regular damping of unpaved roads or exposed soils/ground to control dust/particulate matter and keep it down. • Limit active construction activities to not more than a total of 500 meters at a time on a 2.0 km road length section to minimize dust • Workers would be provided with dust protection PPE
	Potential for road traffic exhaust emission (NOx, PM etc.) including dust from vehicular movement during construction / operation phase.	Construction Operation	Moderate Low	Prob: 3, Impact: 3 Risk: Medium	• Ensure vehicles/machines are switched off when not in use. • Ensure only vehicles required to undertake works are operated on-site. • Ensure all construction vehicles, plant and machinery are well maintained and in full operating condition. • Effective preventative maintenance established to ensure all construction equipment and electricity generators are maintained in good working order and do not adversely impact air quality due to inadequate maintenance or damage. • Concrete batching, crushing and screening plants will be fitted with dust extraction and / or suppression systems where necessary.

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
Noise and vibration	Potential for increased noise generation from construction machinery, earth moving equipment as a result of construction activities	Construction	Substantial	Prob: 4, Impact: 3 Risk: Medium	• Install noise reduction devices such as silencers and mufflers as appropriate to mobile plant and equipment. • Limit the active construction site to not more than 500 meters per 2.0 km lengths • Limit work to daylight hours. Schedule noisy construction activities during specific times in the day especially near the sensitive receptors
	Vehicle movement both during construction, operation and decommissioning could cause increase noise	Construction Operation	Moderate Low		• Advance notice will be given to communities if short-term noisy construction activities are to take place, which could cause these levels to be exceeded.
	Potential for project activities to cause vibration	Construction	Moderate		• Near places of worship, construction producing nuisance level noise be minimised or rescheduled so as not to occur on locally recognised religious day. • Work areas will be organised and operated strive to restrict noise levels to not exceed World Bank thresholds at the nearest sensitive receptor during normal activities. • If existing noise levels exceed these threshold values, the Project will not cause more than a 3dB increase in measured ambient levels during normal activities
Soils/Erosion	Potential impact on soils physical, chemical and biological properties from clearing, excavation during construction.	Construction Operation Decommissioning	Low	Prob: 3, Impact: 3 Risk: Medium	• Vegetation along drainage lines and gullies will be protected where practicable to provide natural attenuation of flows. • Where possible, drainage outlets will discharge into vegetated areas and not to exposed soil. • Slope stability measures will be incorporated such as benching and installation of erosion protection features such as silt barriers and sedimentation ponds. • Area to be cleared will be kept to the minimum necessary to prevent disturbance of soils outside the boundary
	Soil erosion from vegetation removal, soil exposure, excavations during construction and road rehabilitation.	Construction	Low		
	Potential for contamination from stockpile areas, wastes storage areas, fueling of vehicles	Construction Operation	Moderate		
Surface Water	Potential for water pollution from soil erosion during construction and extreme rainfall event	Construction	Substantial	Prob: 3, Impact: 2 Risk: Medium	• Refuelling, maintenance and wash-down of construction vehicles and equipment will only occur in designated areas and away from surface water bodies, and provided with secondary impermeable containment measures. • The construction contractor will be contractually required to take all reasonable precautions to prevent and clean up all spills / leaks, and take necessary measures to prevent materials from falling into the river or pollute soils or groundwater. • The Environmental and Social Management Plans including spills and waste management measures will be implemented. • For work to be undertakenclose to surface water bodies measures will be taken to ensure that pollution of water resources does not occur
	Construction (eg. Spillage of oil, fuel and chemicals) activities may discharge contaminants into the water body	Construction Operation	Low	Prob: 3, impact: 2 Risk: Medium	
	Potential for wastewater discharges into water body during construction and operation	Construction Operation	Moderate	Prob: 3, Impact: 2 Risk: Medium	• Set-up temporary disposal mechanism within the construction area and properly dispose solid waste generated

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
Visual Aesthetics	Landscape impacts from site preparation and construction activities including vegetation removal and soil removal	Construction	Low	Prob: 2, Impact: 2 Risk: Low	• Construction material to be stacked in designated area and cordoned off.
	Reduced aesthetic quality impact resulting from presence of equipment, vehicles and machinery and poor waste management practices	Construction	Low		
Wastes	Potential impact on existing waste management due to increase generation of waste streams	Construction	Low	Prob: 3, Impact: 3 Risk: Medium	• Waste bins will be provided at all construction sites for the disposal of the various types of wastes generated by the project. These bins will be clearly marked to facilitate segregation of waste, for collection, transportation and disposal. • Separation of domestic and hazardous waste at the source shall be strictly enforced. • Where possible, wastes will be re-usedor recycled. This is a requirements for waste oils, other hydrocarbons and tires and other hazardous and non-hazardous wastes • Burning of waste will not be permitted • All personnel will be trained in the appropriate management of waste according to the WMP.
	Potential impact on environmental media (soil, water, air) and the community from waste transportation and disposal of spoils and contaminated materials.	Construction	Low		• Proper storage, transport and disposal of hazardous wastes (oily wastes, used batteries, fuel drums) in the designated areas by the national/local authorities in accordance with National Environmental Law.
	Disposal of spoils in unsuitable areas such as hilly terrain could result in environmental impacts including erosion, water pollution, obstruction of drainage patterns, etc. spoils disposal will be particularly pertinent for the urban upgrading project and the landfill construction project.		Low		• In as far as practicable, spoils will be backfilled into the borrow pits as part of the rehabilitation of these borrow pits, which is a condition of the contractor contracts. • Side tipping of spoils in any hilly locations will be strictly prohibited. • Roads will be designed to achieve a balance between the amount of spoil produced from cuttings and that required for fill to minimise the need for disposal of surplus.
Vegetation	Potential impact on sensitive vegetation and increase in invasive species during construction and site clearing activities.	Construction	Low	Prob: 2, Impact: 2 Risk: Low	• Vegetation along drainage lines and gullies will be protected where practicable to provide natural attenuation of flows. • Area to be cleared will be kept to the minimum necessary to prevent disturbance of soils outside the boundary
	Impact on sensitive vegetation – crops, trees during site clearing activities.	Construction	Negligible		
Natural Habitat	Impact natural habitat during site clearing activities.	Construction	Negligible	Prob: 2, Impact: 2 Risk: Low	• Contractor to only use public non-productive land for laydown/equipment storage. • Ensure that stockpile is secured and stored in a safe place. • Vegetate stockpiles if storage required for long periods
Flood and landslide	Floods/landslide over slopes in the form of overland flow	Construction	Substantial	Prob: 4, Impact: 3 Risk: Medium	• Prefer given not to work during rainy seasons Provide alternative drainage for rainwater if earthworks fill established drainage lines Best construction practices to be employed

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
					• Flood/landslide emergency to be employed by contractors.
GHG	Emissions from construction activities like fuel combustion, power generators, concrete batching plant, operational vehicles could cause adverse impacts on air quality affecting the health and welfare of people, crops and sensitive natural fauna and flora	Construction Operation	Moderate Low	Prob: 3, Impact: 3 Risk: Medium	• Use of ozone depleting substances such as chlorofluorocarbons (CFCs), halons, carbon tetrachloride, trichloroethane and halogenated hydrobromofluorocarbons (HBFCs) will not be permitted.
Wildlife	Potential impact on wildlife as a result of loss of habitat during site clearing and construction activities including noise from vibration equipment	Construction	Negligible	Prob: 2, Impact: 2 Risk: Low	• No species of global conservation significance occurs at the protect sites and so it is not expected that such species will be affected • Workers would be advised that in the unlikely event animals are encountered, they are not to be killed; but instead caught and released into a similar environment.
	Potential impact on endangered and threatened species around the hilltop areas due to habitat loss during construction	Construction	Negligible (no endangered and threatened species		
Aquatic life	Potential impact on aquatic life (fish spawning ground), from oil spillage and discharge of wastewater or other contaminants during construction.	Construction	Low	Prob: 2, Impact: 2 Risk: Medium	• The construction contractor will implement waste management and environmental health and safety plans to limit water pollution. • No species of global conservation significance occurs at the project sites and so it is expected that such species will not be affected. Aquatic bird species only occur a considerable distance away from the project sites.
Socioeconomic					
Job creation, flood control	Potential positive impact of the Project includes creation of employment, flood and improved access to basic services.	Construction Operation	Substantial		• No mitigation required
	Increase in individual and household wellbeing due to increased income from direct and indirect employment	Construction Operation	Substantial		
Infrastructure service	Potential positive impact from improved access to healthcare facilities and health care	Construction	High	Prob: 3, Impact: 3 Risk: Medium	• Flag persons are to be provided where the plant cross/meet the community road. • The contractor's Community Liaison Officer collaborates with communities to identify sensitive areas and inform communities before movement. • Request for road closure must be approved by the relevant authority
	Potential strain on existing infrastructure and waste services due to increased population and increased vehicle from contractor presence in the community		Low		
Economics, Livelihood	Disruption of livelihood activities resulting from land acquisition for Project	Construction Operation	High	Prob: 3, Impact: 3 Risk: Medium	• Stakeholders Engagement Plan developed and implemented • Develop and implement Resettlement Action Plan (RAP), • Ensure commensurate compensation • Develop livelihood restoration plan
	Temporary disruption of livelihood activities due to blockades, diversions, traffic etc., during construction	Construction	Moderate		
	Potential economic loss due to damage to assets (e.g animals) from Project related	Construction Operation	Moderate Low		

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
	activities				
Community health and safety	Risks of accident and injury during Project related activities	Construction Operation	Moderate Low	Prob: 3, Impact: 2 Risk: Medium	• Adequate signage and warnings including "highly-flammable", "no smoking" • Ensure that construction workers and host community are • adequately informed, and aware • Equipping workers with PPEs, • Conduct training of workers conducting engines and vehicles
	Potential increase in disease (malaria, communicable diseases, HIV) due to migration of workforce to the community	Construction	Moderate		
	Potential mental issues caused by disruption of traditional support and community cohesion resulting from possible resettlement and compensation	Construction Operation	Substantial		
Community and social cohesion	Potential conflict and tension between communities, local leaders and Project proponent due to unmet expectations around Project benefits and employment	Construction Operation	Substantial	Prob: 3, Impact: 3 Risk: Medium	• Stakeholders Engagement Plan developed and implemented
Land use and Resettlement	Potential physical and economic displacement during land acquisition	Construction Operation	High	Prob: 3, Impact: 3 Risk: Medium	• Stakeholders Engagement Plan developed and implemented • Develop and implement Resettlement Action Plan (RAP), • Ensure commensurate compensation
	Potential increase in land disputes during resettlement and compensation	Construction Operation	High		
	Changes in land use (fishing, livestock rearing) resulting from land acquisition, resettlement, and compensation process	Pre-construction Operation Construction	High		
Labour and working condition	Potential injury or loss of life due to inadequate occupational health and safety standards.	Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Labour Management Plans shall be prepared by Project Contractor(s) based on the Project Labour Management Procedures for approval by the Bank/PMU to guide labour relations • Contractors and Sub-contractors will be required to hire labour through a structured HR process and not 'at the gate' • All workers will be given contracts specifying the type of work they are to undertake and their remuneration package as well as their conditions of service • All contracts will be vetted by the Ministry of Labour and Social Security before they are signed by workers • Contractors shall be required to consider alternative work schedules or shifts to accommodate the hiring of more female workers.
	Potential impact on wellbeing of workers due to discrimination, infringement on labour and employment rights (excessive working hours, forced labour)	Construction Operation	Low		
Labour influx	Risk to community health from HIV/AIDS/ or other transmitted infections as a result of the presence of migrant construction labour.	Construction	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Contact numbers (hotlines) of the nearest health facility will be pasted at vantage points in the communities, where the sub projects will be implemented • Workers will not be allowed to receive visitors in project/camp sites without the express permission of site supervisor.
	Risk of gender-based violence from migrant labour, which often remains away from home on the site.				• Certain employment opportunities on site should be preserved for vulnerable persons such as Persons Living with Disability and women e.g. wardens – A grievance mechanism system will be made available to all workers to report any issues associated with OHS and / or

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
					labour and working conditions – All workers will sign a Code of Conduct (CoC) prior to start work • Contractual clauses will be inserted in Contract Documentsprohibiting the Contractors/Consultants and their employees from Forced Labour, Child Labour, that also makes reporting all Child Labour cases to law enforcement agencies, the Grievance Redress Committee and Project Consultant mandatory
GBV/SEA/SH	Unwanted aggressive advances, SEA/SH against women and children.	Construction	Substancial	Prob: 3, Impact: 2 Risk: Medium	• Clearly define the GBV requirements and expectations in the bid documents for a GBV action plan, Code of conduct for workers and adequate costing for implementing the GBV plan. • The contractor ESMP and should among others, set out the mechanism for receiving, reviewing and addressing GBV complaints in a confidential manner, workers SEA/SH code of conduct and the accountable framework, mapping of GBV response actors within the project areas and working with them to provide quality survivor centered services including case management, referral services and linkage to others services not provided by them, etc. • The supervising consultants' team should include a GBV specialist to supervise implementation of the contractor GBV plan. • Contractual Clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discriminationand GBV will be inserted in the Contractors and Consultants Contracts as well as those of PMU staff; • Contractual Clauses with a commitment to cooperate with law enforcement agencies investigating cases of GBV will be inserted into the Contract Documents of the Contractors, Sub Contractors and Supervising Consultant; • Workers of Project Consultants, Contractors and Sub Contractors will be made to sign Code of Conduct with acceptable behaviour and sanction against GBV; • Sensitization workshops/training on GBV/SEA/SH shall be undertaken for all employees of the Contractor/Supervising Consultant and Sub-Contractors; • Contractors shall provide contact numbers of the nearest law enforcement Agency Office, the Grievance Redress Committee Members and GBV/SEA Service Providers/FSU to workers and paste same at vantage points within the project zones/sites/communities; • Prohibition posters on sexual exploitationand harassment will be posted in and around the sites as well as in the project communities. • A helpline will be provided and disseminated in all the project communities and facilities by the ACC/EOC to deal with GBV/ SEA/H complaints
Cultural	Sites or items of heritage significance	Construction	Moderate	Prob: 2, Impact: 2	• Contractor to be aware of known cultural heritage sites

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
heritage	could be found in the course of construction work.			Risk: Low	• Flagging or physical barriers to be put in place if required. • Take precautions when excavating. • If any object or site discovered cease works and follow the • Chance-Find Procedure (CFP)
Traffic	The increased vehicular movement and speed may result in road safety issues like traffic accidents.	Construction	Substancial	Prob: 3, Impact: 3 Risk: Medium	• Community consultations and meetings on the ongoing works and related hazards will be held. • Active sites will be sealed off from the public using reflective tapes and cones; where necessary road diversions will be created. • Safety initiatives will be developed and implemented, including: – Ensuring that only qualified (licenced) drivers operate machinery; – Implementing speed limits and traffic control measures in appropriate locations; – Implementing safety signage; – Installing speed control devices on trucks • Movement of large construction machinery will be guided by a flagwoman/flagman.

5.4.3 Mitigation Measures for Impact/Risk Evaluation (Operation)

Table 5.11 shows mitigation measures for impact/risk evaluation (Operation). The activities here will be monitored by the Ministry of Environment. The Ministry has the mandate and capacity interm of human and material resources to carry out such monitoring.

Table 5.11 Mitigation Measures For Impact/Risk Evaluation (Operation).

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
Regular inspection	Generation of waste, spill of oil from equipment, loss of vegetation.	Operation	Low	Prob: 3, Impact: 3 Risk: Medium	• Ensure fuel storage tanks are leak-proof, • check daily & installed in a bunded area • Establish the procedures for storage & handling of hazardous materials. • Implement emergency response plan as part of OHS Plan to deal with spillage
Desilting and clearance of drains, manholes	Poor visibility, Increase air pollution level / dust	Operation	Moderate	Prob: 3, Impact: 2 Risk: Medium	• Flagging or physical barriers to be put in place if required. • Take precautions when excavating. • Maintain equipment and machineries adequately to reduce their noise levels • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation • Avoid unnecessary idling of internal combustion engines
Desilting drainage channels	Noise and vibration from machinery	Operation	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Flagging or physical barriers to be put in place if required. • Take precautions when excavating. • Maintain equipment and machineries adequately to reduce their noise levels • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation • Avoid unnecessary idling of internal combustion engines
	Obstruction to free flow of traffic during maintenance	Operation	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Flag persons are to be provided where the activities cross/meet the community road. • The contractor's Community Liaison Officer collaborates with communities to identify sensitive areas and inform communities before movement. • Request for road closure must be approved by the relevant authority • Proper signage during activities • Active sites will be sealed off from the public using reflective tapes and cones; where necessary road diversions will be created. • Ensuring that only qualified (licenced) drivers operate machinery • Implementing speed limits and traffic control measures in appropriate locations; • Installing speed control devices on trucks • Movement of large construction machinery will be guided by a flagwoman/flagman

Media	Potential Impact	Project Development Phase	Significance	Probability of Impact and Impact	Possible Mitigation Measures
Repair of damaged engineering structure	Noise and vibration from the use of motorized vehicles and equipment;	Operation	Moderate	Prob: 4, Impact: 3 Risk: Medium	• Maintain equipment and machineries adequately to reduce their noise levels • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation • Avoid unnecessary idling of internal combustion engines
Cleaning of drainage channel to prevent mosquitoes	Spill from equipment could pollute surface and ground water	Operation	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Vegetation along drainage lines and gullies will be protected where practicable to provide natural attenuation of flows. • Area to be cleared will be limited to the drainage channel • Workers would be advised that in the unlikely event animals are encountered, they are not to be killed; but instead caught and released into a similar environment. • Flagging or physical barriers to be put in place if required. • Take precautions when excavating.
Training of operators	Health and safety Issues	Operation	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Provision of PPE for workers • Maintain equipment and machineries adequately to reduce their noise levels • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation • Avoid unnecessary idling of internal combustion engines
Maintenance of equipment used	Health and safety Issues	Operation	Negligible	Prob: 4, Impact: 3 Risk: Medium	• Provision of PPE for workers • Maintain equipment and machineries adequately to reduce their noise levels • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation • Avoid unnecessary idling of internal combustion engines
Sanitation and waste management system	Increase soil erosion, create gully and cause land degradation.	Operation	Moderate	Prob: 3, Impact: 3 Risk: Medium	• Vegetation along drainage lines and reclaimed land will be protected where practicable to provide natural attenuation of flows. • Where possible, drainage outlets will discharge into vegetated areas and not to exposed soil. • Slope stability measures should be protected and not temper with • Area to be cleared will be kept to the minimum necessary to prevent disturbance of soils outside the boundary • All waste and obstruction to free flow of water will be removed

5.5 Analysis of Alternatives

Every project requiring an environmental study in the fold of ESMP must be guided by scientifically crafted project alternatives. Thus, Project Alternatives here refer to a comparison of possible actions and modes taken and changes to be considered regarding the implementation of the proposed project at the Omigbo River Channelization/Gully Erosion site. Weighing the strengths of these alternatives to select the most appropriate, in terms of addressing the key issues, also becomes a vital step in the ESMP. The choice will be centred on the fundamentals of achieving the threshold of the set criteria concerning all the considered environmental and social variables that are vital to the project (i.e. Applicable or Relevant and Appropriate Requirements (ARAR)).

5.5.1 Delayed-Action and Right-Away Action Alternatives

Delayed-Action: The delayed-action alternative advocates a deferred option which will result into further damages and degradation of the watershed and increase the cost of rehabilitation in the long run. The consequence of this alternative is that inflation will increase the project costing and the integration of other economic factors may further cause huge changes in the accrued cost of materials, thereby increasing the financial burden of the entire project. Apart from high project cost, there are no definite advantage identifiable with this alternative in the short-term. This is to the extent that any incurred damages may eliminate the gains from long-standing effects. This alternative is therefore, undesirable and not recommended for the project.

Right-Away Action: As the term suggests, it means get-go and get it done! It suggests that an immediate action would be taken to address the damages posed by the current status of the gully. This action also suggests prompt and speedy attention to address the issues and to consolidate on the accrued benefits from both the short-term and long-term effectiveness. The influence of inflation and other economic forces will have minimal or little influence on the cost of materials. Accordingly, it will make the anticipated financial burden of the rehabilitation a convincing assessment. This alternative, together with other alternatives, is recommended.

5.5.2 Use of Civil Works, Bioengineering and Technological Options

Civil Works: This entails constructions and all civil and engineering works as well as the enhancements associated with the project. Civil works are expected to be intense, spanning the broad spectrum of the affected and high-risk areas which demands such level of activities.

Bio-engineering: This action involves stable seeding and planting of vegetation as part of the gully stabilization measures following construction of the civil engineering measures. The procedure of combining natural vegetation with civil works birth the tag the name bioengineering. The approach involves the use of vegetation, which will stem runoff velocities, holdsthe soil together, provides habitat for wildlife and is visually pleasing. This approach is also less costly. However, it is imperative to select the

appropriate species that are preferably indigenous, and at the least non-invasive so as to integrate vegetal symbiosis as constituent of the project.

Technological Options: For the anticipated rehabilitation of the gully induced damage at the gully site, all elements of the watershed, particularly the environmental and social components, will be considered. These will be captured as the relevant components of the natural and human environment at the risk of destruction including the soil, public infrastructure, social and community infrastructures and facilities will be secured in the affected communities of concern.With regards to topography alteration and slope instability, the technological option will ensure that construction works will be done according to local relief and hydrology and height of bank stabilisation is done to the local relief. Excavation / scooping will be top down and no down or base cutting with huge rock hanging will be allowed.

However, the procedure for the restoration works and associated enhancements of the gully site will involve intensive civil works across the broad spectrum of the affected and high-risk areas. Consequently, construction works (civil works option), synchronised with bioengineering and technological methods will be adopted in restoring and enhancing the affected areas as presented in the ACReSAL, as described in Table 5.9 below. The adverse impacts of these activities will be highly reduced in such a way that the benefits will offset the demerits.

The merits of the Civil Works, synchronized with bioengineering approach in the right-away alternative outweigh the No-Action alternative and it is, therefore, recommended. The three alternatives and technological options as enunciated are summarised in Table 5.12. As shown in the table, Civil Work synchronised with bioengineering technology in the right-away action alternative will provide the solution that the ACReSAL sought while the No-Action alternative will undoubtedly aggravate the problem being experienced in the area.

- Old drainage systems should be maintained and new ones prioritized;
- Ensure that engineering designs are designed with respect to local topography;

Excavation / scooping should be top down and no down or base cutting with huge rock hanging

- Height of bank stabilisation to the local relief;
- Depth and area extent of excavation;
- Number and area extent of cut and fill;

Terraced areas (extent).

Table 5.12: Appraisal of the 'No Action' Alternative and Use of Civil Works

Criteria	Delayed Action	Right Away Action	Biological works alone	Civil works alone	The Civil works & Bioengineering (Biological & the construction of Hard Structures)
General Safeguard of Environment and Human Health (General protection mechanisms)	This will not benefit the concerned stakeholders and community residents. The damage might potentially become catastrophic and the level of human and material losses may be well beyond repair with economic loss of materials worth millions of naira. The delay action may lead to restiveness in the area. Also delays in the mobilization of the contractor or by other administrative bureaucratic processes.	This will be the right step to safeguard the environment and human well-being from further degradation	The remediation of the biological life form will involveafforestation. It will lead to the improvement of life, properties and infrastructures will be secured, lives saved, resources recovered, transportation facilities enhanced and general restoration of livelihood. It will benefit the Project Affected People and the residents.	The implementation of this proposed project will lead to the improvement of life. Infrastructures will be secured, lives saved, resources recovered, transportation facilities enhanced and general restoration of livelihood. It will benefit the Project Affected People and the residents.	The rehabilitation of degraded environment, watershed management, landscape investment, and special ecosystems management. coupled with remediation of the biological life form will result into better and an improved life. Public Infrastructures will be secured, lives saved, resources recovered, transportation facilities enhanced and general restoration of livelihood. It will benefit the Project Affected People and the residents.
Short-Term Usefulness	Delayed action will contribute nothing to short – term usefulness.	This will be an immediate derivable benefit and a sustained long-term benefit will be achieved.	The timeline for the biological works is long term. Nevertheless, the benefits derivable can only be optimized if combined with civil work. Even under a Delayed-Action alternative the combination of the two will provide useful results.	The timeline for the civil work is long term. Nevertheless, the benefits derivable are still better than a No-Action and Delayed-Action alternatives. With biological works alone, the short-term civil work will not provide long-term effectiveness value that biological alternative adds to the final solution.	The timeline for the civil and biological works are long term. Nevertheless, the benefits derivable are still better than biological or civil work alone.
Long-Term Effectiveness and Permanence	Already incurred damages may obliterate the gains from long-term	This alternative perfectly meets both the long-term and short-term effectiveness and	The biological works alone will provide long-term effectiveness for the watershed but may not be	Civil works alone will provide a long-term use for the watershed but may not be sustainable without the	The combination of the Civil and Biological works will provide long-term effectiveness for the watershed

	effectiveness and the cost of intervention may increase due to inflation.	permanence criteria.	sustainable without the civil works.	biological works because of the unforeseen long-term effect of water erosion.	

CHAPTER SIX
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

6.0 Introduction/Objectives

This chapter addresses the fundamentals of the environmental and social management plan in line with the identified adverse impacts, with a view to building the framework for suitable mitigation measures. Institutional responsibilities and accountabilities that will ensure all the provisions are implemented under strict supervision are outlined in this chapter. The respective cost analysis is detailed and tied to each mitigation measure. Each of these are carefully segmented and discussed as follows:

- Description of proposed mitigation measures;
- Institutional responsibilities and accountabilities;
- Capacity building plan;
- Public consultation plan;
- Description of grievance redress mechanism;
- Monitoring and evaluation plan, including suitable indicators for the proposed project;
- Plans for some specific issues including Environmental and social safeguard training.
- Specific ways that GBV risks are to be addressed in the project by identifying mitigation measures, including development of a GBV Action plan with accountability and response from work;
- Costs of implementing the ESMP.

6.1 Description of the Proposed Mitigation Measures

6.1.1 Pre-Construction Phase Measures

At the pre-construction phase, the mitigation measures are proffered to resolve the adverse effects of the project prior to the commencement of civil works. Notably, this phase covers the preliminary works that pre-dates the construction and developmental works in the area. In effect, there are two critical issues that might be of cogent significance: land acquisition and community perception of the project. Each of these is discussed as follows:

i. Land acquisition

This is an essential component of the project involving lands along the catchment configuration and the drainage channels (if needed). This will address the legally binding right-of-way for civil works activities such as the large drains along the catchment configuration. Thus, comprehensive land acquisition details are already being handled by the RAP report. Table 6.1 provides further details on this activity.

ii. Community perception of the project

A project of this nature is anticipated to gather various views in terms optimism of execution, pessimism and scepticism. However, the impact of the gully erosion on the Omigbo River Channelization / Gully Erosion Intervention could stimulate a sense of strict optimism. This plausible flip-flop perception could present an unfortunate backlash against community support towards the project. Measures to address adverse community perception on the proposed project are enlisted in Table 6.1 below.

6.1.2 Construction Phase Mitigation Measures

The expected activities at the various layers of the watershed:

- *Upper watershed*: Excavation, channelization, concretisation, and filling;
- *Middle watershed*: Channelization, concretisation, filling, lining, gabion drop structures and re-vegetation;
- *Lower watershed*: Concretisation, lining, Tree planting, Rain harvesting, afforestation, Nurseries and re-vegetation

6.1.3 Operation Phase Mitigation Measures

The expected activities during the operation phase include:

- Maintenance and repairs;
- Scheduled and unscheduled reliability tests for the renovated gully area, constructed drainage channels, maintenance and replacement of degraded/wearing/faulty/damaged sections and components;
- Maintenance of cracks and potholes;
- Drainage cleaning (where and when necessary);
- Vegetation, cleaning and control through weeding of the shoulders;
- Borrow pit reclamation.

6.1.4 Monitoring of Mitigation Measures during Project Implementation

- ***Pre-Construction Phase***

  The pre-construction phase of the project is the project initiation stage with series of ground works and documentation that will set the project's construction phase in tune. It guarantees the efficient running of the project with pre-project works. Table 6.1 provides the detail of monitoring activities for this phase of the project.

- **Construction Phase**

  The high intense activities within the construction set the tone for the nature of impacts and the associated mitigation measures. As earlier mentioned, there are series of environmental and social impacts associated with the proposed project; thus, the possible mitigation measures have been outlined. The missing maze is the monitoring which is required to track the progress of the mitigation measures. The details of these with

respect the project implementation was stated in Table 6.2 for the construction phase of the project as well as the connected impacts.

- **Operation and Maintenance Phase**

  Monitoring measures are essential at the operation and maintenance phases because these are key pivots that keep the project intact. Specific environmental and social monitoring details are stated in Table 6.3. Also, the respective monitoring measures are attached to the explicit environmental and social issues identified with its associated mitigation measures.

6.1.5 Environmental and Social Mitigation and Monitoring Plan during the Pre-Construction Phase

Table 6.1 shows the ESMP for Environmental, Socio-Economic, Public Health and Covid-19 Impacts Mitigation and Monitoring Plan during the Pre-Construction Phase. The Mitigation / Enhancement Measures and Mitigation responsibility (Implementation) are identified. The Monitoring indicators, Method of measurement, Frequency of measuring, Monitoring responsibility and the Cost of monitoring are properly documented.

Table 6.1: Environmental and Social Mitigation and Monitoring Plan during the Pre-Construction Phase

S/N	Activity	Potential Impacts	Mitigation/ Enhancement Measures	Mitigation Responsibility (Implementation)	Cost of Mitigation	Indicators/ Parameters	Measurement Method	Sampling Location	Frequency of Monitoring	Monitoring Responsibility (Supervision)	Cost	
											Implementation	Monitoring
											USD$	USD$
Environmental Impacts												
A1	Land Acquisition	Conflict from the members of the community to vacate areas allocated for the project especially the drainage channel sites.	• Legal check on land including traditional ownership • Negotiate with the rightful owner and avoid land speculators Acquire proper documents from both the government and land owners •	• Kogi ACReSAL SPMU;		Number of people checked on land and number of traditional ownership negotiated with •	•	Construction Site and the surrounding area	Base on need	N/A		
A1	• Mobilisation • Site clearing • Material sourcing • Staging area • Worker's camp • Burrow pit site location	Noise and vibration from the use of heavy-duty trucks vehicles and equipment	• Keep equipment and machinery amply to reduce noise levels; • Fix machineries and heavy-duty equipment with exhaust mufflers/ silencers to minimize noise generation; • Keep internal combustion engines low.	Contractor		• Noise Levels (Not to exceed 90dB(A); • Records of Equipment Maintenance.	• In-situ measurement; • Complaint Register.	Construction Site and the surrounding area	Daily	Environmental Safeguards Officer (ESO), Kogi ACReSAL - SPMU Kogi State Ministry of Environment (KSME)	890	750
A2		Ambient air pollution from release of dusts	• Suppress dust emissions by appropriate	Contractor		• Suspended Particulates (SPM), SO_2,	• In-Situ Measurement	Construction Site and the	Daily	ESO-Kogi ACReSAL SPMU	890	750

		and gaseous emissions	methods such as spraying water on soil; • Ensure vehicles are in good working condition; • Ensure exhaust fumes from vehicles conform to applicable National standards and specifications.			NOx, CO, THC; • Vehicle Exhaust Measurements; • Records of maintenance for all machineries and equipment;		surrounding area		KSME		
A3		Soil contamination from accidental leakage/spillage of fuel, oil and lubricants	• Ensure fuel storage tanks are leak-proof; • checked daily & installed in a bonded area; • Establish procedures for storage & handling of hazardous materials; • Implement emergency response plan as part of OHS Plan to deal with spillage.	Contractor		• Soil quality parameters (especially hydrocarbon contaminants); • Compliance with fuel storage procedures.	• In situ/ and Laboratory analysis; • Visual observation.	Project site	Monthly	ESO-Kogi ACReSAL SPMU KSME	900	800
A4		Loss of soil quality from de-vegetation and erosion	• Avoid removal of vegetation and trees to the extent possible; • Protect all vegetation not required to be removed against damage;	Contractor		• % of Vegetal Loss; • Revegetated areas.	• Visual estimate	Construction Site and surrounding area	During site clearing and construction	ESO-Kogi ACReSAL SPMU KSME	890	750

			• Re-vegetate exposed soil quickly.									
A5		Impact on fish habitat and water quality • Reduced primary productivity in fisheries, • Potential impact on fish spawning and bank-nesting • degradation of spawning habitat • Habitat loss, fragmentation and degradation leading to potential loss of specie • restriction of fish movement and reduced reproductive success	• Washing of Project plant and vehicles in watercourses will not be undertaken; • Avoid direct impacts (i.e. habitat disturbance in the channel) or increases in suspended sediments in the water in the rivers especially in the spawning season; • Daily visual monitoring of turbidity will be undertaken at gully erosion while works are being undertaken at that river; • Only essential construction vehicles (as approved by the Company) will be allowed to enter rivers or streams and only with prior examination of the vehicles for fuel/lubricant leaks;	Contractor		• Records of fish catch; • Visual monitoring; • Probe monitoring.	• Complaint Register	Construction Site and surrounding area	During site clearing and construction	ESO-Kogi ACReSAL SPMU KSME	980	800

			• The gully erosion contractor will prepare a plan to respond to an outbreak of pollution, including clean up and remediation for outbreak and liaison with downstream users.									
A6		Generation of vegetal wastes and other cleared materials	• Comply with the Waste Management Plan; • Promote waste avoidance; reduction; reuse and recycling as applicable; • Ensure proper handling, and disposal of wastes (especially contaminated soil, concrete, oils, grease, lubricants, metals, etc.).	Contractor		• Contractors Compliance to WMP; • On-site Waste management techniques.	• Visual observation; • Waste Tracking Report.	Construction Site and surrounding area	Weekly	ESO-Kogi ACReSAL SPMU KSME	900	800
											5450	4650
Biological Impact												
A7	• Mobilisation • Site clearing • Material sourcing • Staging area • Worker's	Impact on flora and fauna	• Planting of trees and re-vegetation of affected area.	Contractor		• Area cleared outside the gully remediation corridor; • Extent of area cleared	• Visual observation	Construction Site and surrounding area	Weekly	Kogi State ACReSAL -SPMU; Federal ACReSAL and Other relevant	2,200	1,500

	camp • Burrow pit site location					for installation; • Number of trees planted and area extent of lawns developed.				Ministries		
A8		Impact on Wildlife	• Avoid protected area in project implementation	Contractor		• Number and extent of protected/conserved area developed; • Number of trees planted.	• Visual observation	Construction Site and surrounding area	Weekly	Kogi State ACReSAL-SPMU; Federal ACReSAL and Other relevant Ministries	2,200	1,500
	Total										4,400	3,000
Socio-Economic Impacts												
A9	• Sensitisation • Mobilisation • Site clearing • Material sourcing • Staging area • Worker's camp	Loss of building, farmland as well as land-based livelihood including economic trees and crops	• Implementation of measures outlined in the RAP which will outline the mitigation measures and compensation where eligible.	• Kogi ACReSAL SPMU; • Kogi State Town Planning & Land Development.	As documented in the RAP report	• RAP Prepared; • Implementations of the requirements of the resettlement instrument.	• Assessment by the Kogi ACReSAL SPMU to determine if the objectives of the resettlement instrument have been achieved.	Impacted communities	All issues should be settled before the start of civil works	FPMU Kogi ACReSAL SPMU; Kogi State Town Planning & Land Development	As documented in the RAP report	
A10		Grievances and conflict arising potentially from members of the community asked to vacate areas allocated for the project	• Continuous community engagement/consultation; • Establishment of grievance redress mechanism (GRM) to receive and address concerns.	• Social Safeguard Officers (SSO) – Kogi ACReSAL SPMU, GRCs		• Regular consultations with stakeholders and members of the communities; • Implementation of GRM.	• Evidence of consultation, e.g., minute of meetings pictures; • Number of complaints received and resolved.	Impacted communities	Throughout project implementations	FPMU Kogi ACReSAL SPMU;	**2,200**	**1,500**
A11		Security issues that may lead	• Engage competent	Contractor		• Regular meetings	• Log book	Community/project	Monthly	Supervision	**2,200**	**1,500**

		to stealing of contractor equipment mobilised to site	security personnel; • Provide adequate training of security personnel; • Disclose site security arrangements to the Police and host communities.			with community heads		site		Consultant Kogi ACReSAL SPMU;		
A12		• Threat to community culture due to labour influx • Impact on site of cultural heritage • Impact on intangible cultural heritage (Oka festivals)	• Involve local community and opinion leaders in the project planning process; • Develop an induction program including a code of conduct for all workers; • Provide cultural sensitization training to improve awareness of and sensitivity of workers to local cultures, traditions and lifestyles. (Implement the PCRMP); • Minimize the disruption as a result of the relocation and removal of sacred sites; • Where possible,	Contractor Kogi ACReSAL SPMU	As documented in the RAP report	• Implementations of the requirements of the code of conducts and the cultural sensitization programs; • Regular meetings with community heads; • RAP Prepared.	• Log book; • Assessment by the Kogi ACReSAL SPMU to determine if the objectives of the resettlement instrument have been achieved.	Community/project site	Monthly All issues regarding cultural heritage should be settled before the start of civil works	Kogi ACReSAL SPMU; Supervision Consultant	2,300 As documented in the RAP report	1,750 As documented in the RAP report

			design or re-design Project components to avoid or minimize impacts to known physical cultural heritage resources based on input from cultural heritage specialists; • Avoidance of shrines determined to be very important to the local community; • If shrines considered important to the local community cannot be avoided, consultation with the local community will occur to offer compensation for the loss of the cultural resource or to inquire about the possibility of relocating the resource; • Sensitise all workers on the restriction during the series of festivals (Oka festival); • Educational, awareness-									

			raising and information programmes, aimed at the general public, in particular construction workers from other communities; • Identify and define the various elements of this intangible cultural heritage including festivals with the participation of communities and relevant non-governmental organisations; • Consultation with chief priest and community elders on the required compensation; • Adopt a general policy of respect aimed at promoting the function of these intangible cultural heritages and at integrating the safeguarding of such heritage into project planning programmes;									

			• The impact on cultural areas will be further examined through the RAP study.									
A13		Exposure of workers to occupational hazards	• Implement site specific OHS Plan: • Ensure that staging areas for contractor equipment are adequately delineated and cordoned off with reflective tapes and barriers; • Any uncovered work pits should have appropriate signage and protection around them; • Workers should get a daily induction/toolbox before going on the site and a refresher of what happened on site a day before; • Adequate safety signage on construction sites should be installed to alert community/drivers/pedestrians; • Lighting and/or reflective tapes and signage	Contractor		• Contractors Compliance to Occupation safety and Health (OSH)/Health Safety and Environment (HSE) Plan; • Compliance to use of PPEs; • HSE Statistics (FAC, LTI, etc.); • No of workers trained.	• Routine Inspection; • HSE Reports.	Construction Site/ Campsite/ Staging areas/ borrow pit areas	Weekly	ESO-Kogi ACReSAL SPMU KSME Supervision Consultant	1200	1000

			integrated in all worksites for safety at night; • Appropriate security measures in place to prevent harassment or kidnapping (see OHS plan).									
A14		Conflict arising from the poor employment/engagement of local labour for site clearing	Employment of local labour should be maximized by ensuring the submission of statement of intent to employ local labour as a condition in the procurement document for the contractor.	Contractor		• No. of local labour used	• Log book	Construction Site	Weekly during Pre-Construction	Kogi ACReSAL SPMU	1200	1000
											9,100	6,750
Public Health Impacts												
A15	• Mobilisation • Site clearing • Material sourcing • Staging area • Worker's camp • Burrow pit site location	Risk of diseases arising from indiscriminate waste disposal Risk of contracting COVID 19	• Develop a site specific HSE plan; • Comply with the waste management plan; • Comply with ACReSAL COVID 19 guidelines and NCDC PROTOCOL.	Contractor		• Workers Using PPE; • HSE Statistics (FAC, LTI, etc.).	• Routine Inspection; • HSE Reports.	Project site	Daily during Pre-Construction	ESO-Kogi ACReSAL SPMU and SSO KSME	1200	1000
	Total										1200	1000
Total												15400

6.1.6 Environmental, Socio-Economic and Public Health Impacts Mitigation and Monitoring Plan during the Construction Phase

Table 6.2 shows the ESMP for Environmental, Ecological, Socio-Economic and Public Health Impacts Mitigation and Monitoring Plan during the Construction Phase. The Mitigation / Enhancement Measures and Mitigation responsibility (Implementation) where identified. The Monitoring indicators, Method of measurement, Frequency of measuring, Monitoring responsibility and the Cost of monitoring are properly documented.

Table 6.2: Environmental and Social Mitigation and Monitoring Plan during the Construction Phase

S/N	Activity	Potential Impacts	Mitigation/ Enhancement Measures	Responsibility (Implementation)	Cost of Mitigation		Indicators/ Parameters	Method of Measurement	Sampling Location	Frequency of Monitoring	Responsibility (Supervision)	Cost (USD$)	
												Implementation	Monitoring
					(USD$)	NGN						(USD$)	(USD$)
Environmental Impacts													
B1	• Earthworks including excavation and grading • Provision of lateritic sub-base and base course (150mm) • Side Drains • Culvert works • Utilization of borrow pits for gully reclamation • Rain harvesting, • Afforestation, • camp sites decommission and sites restoration • burrow pits restoration • tree planting and revegetatio	Noise and vibration from the use of motorized vehicles and equipment	See A1	See A1			See A1	See A1	See A1	See A1	See A1	890	750
B2		Drainage Channel Failure	• Heavy duty machinery and filling material should be about 30m away from the channel; • Vibration induced machines should be avoided; • Lower the overhand before using excavator with a boom of at least 25 meters.	Contractor			• Distance of heavy-duty machines from the channel during civil works; • Overhead position of excavator with boom of at least 25 meters; • Vibration level of machinery during civil works.	• Visual observation	Construction Site	Every day, during the construction phase	ESO-Kogi ACReSAL SPMU Engineer – Kogi ACReSAL SPMU State Ministry of Works	890	750
B3		Ambient air pollution from release of dusts and gaseous emissions during construction	See A2	See A2			• Suspended Particulates Matter (SPM), SO_2, NOx, CO, THC; • Vehicle Exhaust	See A2	See A2	See A2	See A2	950	800

	n river banks					Measurements; • Records of maintenance for all machineries and equipment.						
B4		Increased Siltation and runoff/flooding	• De-silting of drainage channel; • Enlighten the populace on proper disposal of domestic waste; • Enhance proper handling and disposal of wastes (especially contaminated soil or water, concrete, demolition materials, oils, grease, lubricants, metals, etc.); • Construct temporary drainage channels with sedimentation traps and/or screens; • Install sediment silt fences or	Contractor		Surface Water Quality (pH, TDS, TSS, BOD, COD, Turbidity)	In-Situ Measurements	Discharge point, midstream and downstream	During construction	ESO-Kogi ACReSAL SPMU, Engineer, KSME	890	750

			other similar devices at strategic locations to prevent run-offs of sediment/silt into River.									
B5		Topographic alterations and slope instability arising from excavation to construct drainages	• Construction works should be done according to local relief and hydrology; • Old drainage systems should be maintained and new ones prioritized; • Ensure that engineering designs are designed with respect to local topography; • Excavation / scooping should be top down and no down or base cutting with huge	Contractor		• Height of bank stabilisation to the local relief; • Depth and area extent of excavation; • Number and area extent of cut and fill; • Terraced areas (extent).	Routine Inspection	Construction Site	During construction	ESO-Kogi ACReSAL SPMU Engineer – Kogi ACReSAL SPMU State Ministry of Works	890	750

			rock hanging.									
B6		Loss of soil quality from de-vegetation and erosion	See A4	See A4		See A4	See A4	See A4	See A4	See A4	750	600
B7		Generation of spoils and other construction wastes	See A6	See A6		See A6	See A6	See A6	See A6	See A6	850	700
	Total										6110	5100
Biological Impacts												
B8	• Earthworks including excavation and grading • Afforestatio,	Impact on flora and fauna	See A7	See A7		See A7	See A7	See A7	See A7	See A7	1,150	900
B9		Impact on Wildlife	See A8	See A8		See A8	See A8	See A8	See A8	See A8	980	800
											2,130	1,700
Socio-Economic Impacts												
B10	• Earthworks including excavation and grading • Side Drains • Culvert works • Utilization of borrow pits • Rain harvesting, • Afforestatio n,	• Risk of diseases arising from indiscriminate waste disposal	See A15	See A15		See A15	See A15	See A15	See A15	See A15	1900	1200
B11		• GBV/SEA risks; • Intimate Partner Violence (IPV); • Public harassment; • Harmful widowhood practices and women and child trafficking.	• Commitment / policy to cooperate with law enforcement agencies investigating perpetrators of gender-based violence; • Ensure a copy of the code of conduct is	Contractor, ESO-Kogi ACReSAL SPMU, SSO, GRC, Procurement Kogi ACReSAL SPMU	Part of construction cost	• No of workers sensitized; • Code of conduct developed for workers • Code of conduct signed by Contractor and workers • Level of awareness	Routine Inspection	Priority Site	During Constructio n	Supervision Consultant Kogi ACReSAL SPMU ESO-Kogi ACReSAL SPMU Police	2,000	1,400

			presented to all workers and signed by each worker; • Ensure workers are trained on the content of the code of conduct in English and local language; • Provide cultural sensitisation training to improve awareness of and sensitivity of workers to local cultures, traditions and lifestyles; • Prohibit child and forced labour; • Establish and implement the GBV-GRM; • Engage competent security personnel; • Developing a clear ACReSAL specific internal "Reporting and Response Protocol" to			of workers to local cultures • Awareness of grievance • Procedures. • No of local workers • Presence of security personnel						

			guide relevant stakeholders in case of GBV/SEA incidents; • Strengthening operational processes of ACReSAL states project area on GBV/SEA; • Identifying development partners and cultivating pragmatic partnership on GBV/SEA prevention measures and referral services; • Providing financial support implementation of the GBV/SEA actions described herein, including training and awareness building for various stakeholders; • Establishment of inter-ministerial committee to advance									

			GBV/SEA actions described above.									
B12		Conflict arising from the poor employment/ engagement of local labour for construction activities	See A15	See A15		See A15	See A15	See A15	See A15	Supervision Consultant See A15	2,000	1,000
B13		Traffic congestion and increased risk of road traffic accidents and injury	Implement site specific Transport Management Plan (TMP) and OHS Plan	Contractor in conjunction with FRSC		• Contractors Compliance; • Workers Using Personal Protective Equipment-Health Safety and Environment (PPE-HSE) Statistics/ Incident/accident report	• Routine Inspection	Priority Site	During Construction	ESO-Kogi ACReSAL SPMU Federal Road Safety Commission	950	800
B14		Damage to shrines and cultural sites	See B12	See B12		• See B12	• See B12	Project site and its surrounding	During Construction	Supervision Consultant, ESO-Kogi ACReSAL SPMU, SSO, Kogi State Ministry of Culture and Tourism	1700	1,000
B15		Damage to and disruption of services of existing public utility cables and pipes	• Employ utility survey maps to identify existing underground facilities	Contractor		• Notify Utility Service Providers	• Notification Register • Visual Observation	Construction area	During excavation	ESO-Kogi ACReSAL SPMU Engineer, Kogi ACReSAL SPMU	780	600

			before excavation works to prevent / minimize damages and disruption of services; • Shut down service if necessary, should be as temporal as possible; • Any disruption will be discussed with utility operators and the community beforehand.							PC, Kogi ACReSAL SPMU		
B16		Interference from local community causing disruptions to work	• Engage members of communities in stakeholder consultation throughout the Lifecyle of the project; • Involve local community and opinion leaders in planning process; • To minimize the number of foreign workers being	SSO and ESO-Kogi ACReSAL SPMU Contractor		• Regular meetings with community heads	• Log book	Community/project site	Monthly	Kogi ACReSAL SPMU	800	600

			brought to the site, the contractor will be required to hire skilled/unskilled labour from local people if they wish to be hired.									
B17		Impacts on water supply /water quality	• A12	A12		• A12	• A12	A12	A12	A12	870	700
B18		Risk of flooding	• Desilting of drainage channels; • Enlighten the populace on proper disposal of domestic waste; • Enhance proper handling and disposal of wastes (especially contaminated soil or water, concrete, demolition materials, oils, grease, lubricants, metals, etc.).	Contractor		• Record keeping	• Log book	Construction Site	During Construction	Supervision Consultant, ESO-Kogi ACReSAL SPMU, SSO, Kogi State Ministry of Culture and Tourism	1500	900
B19		Impact on accessibility to public establishment (Primary and secondary	• Provide alternative route/access to public and private establishmen			• Record keeping	• Log book	Construction Site	During Construction	Supervision Consultant, ESO-Kogi ACReSAL SPMU, SSO, Kogi	1500	700

		schools, health centres)	ts; • The Contractor should liaise with the Kogi State Ministry of transport and where possible the federal government agencies such as the Federal Road Safety Commission (FRSC) throughout the construction phase to ensure traffic during the construction period. The design of traffic management system should involve all the modes of road transport particularly motorcycles.							State Ministry of Health		
B20		Impact on water production and supply activities	• Suppress dust emissions by appropriate methods such as spraying			• Record keeping	• Log book	Construction Site	During Construction	Supervision Consultant, ESO-Kogi ACReSAL SPMU, SSO, Kogi State	970	850

			water on soil; • Ensure vehicles are in good working condition; • Fit machineries and heavy-duty equipment with exhaust mufflers/silencers to minimize noise generation; • Avoid unnecessary idling of internal combustion engines.							Ministry of Culture and Tourism		
	Total										14970	9750
Public Health Impacts												
B21	• Earthworks including excavation and grading • Side Drains • Culvert works • Utilization of borrow pits • Rain harvesting, • Afforestation,	Risks of diseases such as HIV/AIDS, STDs	• Develop a site specific HSE plan; • HIV/AIDS and STD awareness programme should be prioritized; • Other activities should include treating any sexually transmitted	Contractor		• Contractors Compliance; • Wor;kers Using PPE • HSE Statistics (First Aid Case (FAC), Loss Time Injury (LTI), etc).	• Routine Inspection; • HSE Reports; • Record of awareness and theme carried out.	Construction Site	During Construction	Site Engineer/ Kogi State ACReSAL; KSMEPP; Kogi State Ministry of Health	950	800

			diseases, distributing condoms, and providing counselling, screening, and support services for employees; • Medical examinations on general health issues should be performed on new employees and repeated regularly throughout the term of employment; • Workers should be prohibited from patronising prostitutes and the use of alcohol and drugs.									
B22		Community health & safety risks	Implement a site specific HSE plan	Contractor		• Contractors Compliance; • Workers Using PPE • HSE Statistics (FAC, LTI, etc).	• Routine Inspection; • HSE Reports.	Construction Site	During Construction	Supervision Consultant Kogi ACReSAL SPMU; KSME	870	750
B23		Safety risks associated with falls in poorly	• Develop and Implement a borrow	Contractor		• Contractors Compliance to borrow pit management	• Routine Inspection • HSE Reports	Borrow pit Site	During Construction	ESO-Kogi ACReSAL SPMU	820	700

		managed borrow pits	pit management and reclamation plan; • Adequate PPEs must be provided and used by workers; • All borrow pits must be reclaimed; • Any uncovered work pits should have appropriate signage and protection around them.			plan; • Workers Using PPE; • Report of unreclaim borrow pits from completion audit re.				KSME		
B24		The potential risk of drowning	• Adequate PPEs (life jackets, buoyancy aid and surf helmets) must be provided and used by worker;s • All river should have appropriate signage and protection around them;	Contractor		• Workers Using PPE	• Routine Inspection • HSE Reports	Rehabilitated gully site	During Construction	Supervision Consultant ESO-Kogi ACReSAL SPMU KSME	850	700

			• Design and erect fences or barrier gate around the walking paths; • Install warning signs and install lighting system around the project sites; • Develop a site specific HSE drowning plan.									
B25		Uncontrolled sale of food and other items to workers on the site	• The HSE officer will ensure that only approved vendors are allowed to sell food; • Access to the site should be restricted to avoid sale of contraband on site; • Implement a site specific HSE plan (section 12-Welfare) .	Contractor		• HSE Statistics (FAC, LTI, etc)	• Routine Inspection • HSE Reports	Construction Site	During Construction	Kogi ACReSAL SPMU; KSME;Ministry of Health	900	750
B26		Water-borne diseases	• Good sanitation including hygienic	Contractor		• HSE Statistics (FAC, LTI, etc)	• Routine Inspection • HSE Reports	Construction Site	During Construction	Kogi ACReSAL SPMU; KSME;	1000	850

			water supply and proper waste disposal at its operation and residential accommodations during the phase of the project.							Ministry of Health		
B27		Increased mosquito vector breeding sites	• Government programmes to improve existing medical and health services in the local communities should be supported as much as possible. This should include Mosquito control programmes such as the distribution of insecticide treated nets to affected community members.	Contractor		• HSE Statistics (FAC, LTI, etc)	• Routine Inspection • HSE Reports	Construction Site	During Construction	Kogi ACReSAL SPMU; KSME; Ministry of Health	970	750
	Total										6300	5500
Total											29510	22050

6.1.7 Environmental, Socio-Economic, Public Health Impacts Mitigation and Monitoring Plan during the Post-Construction/Operation Phase

Table 6.3 shows the ESMP for Environmental, Socio-Economic, Public Health and Covid-19 Impacts Mitigation and Monitoring Plan during the Post-Construction Phase. The Mitigation / Enhancement Measures and Mitigation responsibility (Implementation) are identified. The Monitoring indicators, Method of measurement, Frequency of measuring, Monitoring responsibility and the Cost of monitoring are properly documented.

Table 6.3: Environmental and Social Mitigation and Monitoring Plan during the Post–Construction/Operation Phase

S/N	Activity	Potential Impacts	Mitigation/ Enhancement Measures	Responsibility (Implementation)	Cost of Mitigation	Indicators/ Parameters	Method of Measurement	Sampling Location	Frequency of Monitoring	Responsibility (Supervision)	Cost	
											Implementation	**Monitoring**
											(USD$)	**(USD$)**
Environmental Impacts												
C1	• Maintenance and Repairs; • Planned and unplanned integrity checks for rehabilitated gully area and maintenance and replacement of wearing/faulty/damaged components; • Repairs of cracks and potholes; • Cleaning of drains where and when necessary; • Cleaning and vegetation control along the shoulders; • Borrow pit reclamation.	Increased air pollution level / dust due to increased vehicular traffic after the rehabilitated gully area	See A2	See A2		See A2	See A2	See A2	See A2	See A2	850	700
C2		Soil contamination from accidental leakage/spillage of fuel, oil and lubricants during rehabilitated gully area maintenance	See A3	See A3		See A3	See A3	See A3	See A3	See A3	890	750
C3		Contamination of surface water as a result of waste dumping in and around the river during maintenance	• Implement the Waste Management Plan (WMP); • Promote waste avoidance; reduction; reuse and recycling as applicable.	Contractor		Surface Water Quality (pH, TDS, TSS, BOD, COD, Turbidity, THC, Heavy Metals)	• In-Situ / Laboratory Measurements	Discharge point, midstream & downstream	Monthly	Kogi ACReSAL SPMU;	850	700
	Total										2590	2150
Socio-Economic Impacts												
C4	• Maintenance and Repairs; • scheduled and unscheduled integrity checks for bridges and culverts; • maintenance and replacement of	Exacerbation of the risk of transmission of HIV/AIDS and other STIs due to potential labour influx	• Conduct sensitization and awareness campaigns; • Supply health check equipment; • Ensure compliance to workers' Code of conduct as stated.	Contractor HSE officer		• Number of health campaigns and toolbox meetings • Number of health checks	Routine inspection	Project area	Daily	Supervision Consultant, Ministry of Health, Kogi ACReSAL SPMU;	870	700

C5	wearing/faulty/damaged components; • repairs of cracks and potholes; • Cleaning of drains where and when necessary; • Cleaning and vegetation control along the shoulders; • Borrow pit reclamation. • Maintenance of the rain-harvesting channels and storage tanks • Maintenance of the reforested area	Risks of occupational and social accidents and injuries in using the rehabilitated gully area	• Implement the site specific HSE plan; • Build concrete or steel barriers to protect pedestrians.	Contractor		HSE Statistics (FAC, LTI, etc.)	Routine Inspection	Road and drainage	Monthly	Supervision Consultant Ministry of Work, Kogi ACReSAL SPMU	950	800
C6		Safety risks from abandoned borrow pits after construction	See B17	See B17		See B17	See B17	See B17	See B17	See B17	1000	850
C7		Traffic congestion and increased risk of road traffic accidents and injuries due to increase in traffic after gully area rehabilitation	Ensure free flow of traffic and traffic officials are strategically positioned at specific junctions to provide safety guidelines and ensure free flow of traffic within the project area.	Contractor		See B13	See B13	See B13	See B13	See B13	950	800
C8		Rehabilitated gully area damage from use	Develop plan for regular maintenance of rehabilitated gully area	Contractor		Log book	Visual inspection	Project area	Daily	Kogi ACReSAL SPMU;	1100	900
C9		Sand Mining in rehabilitated channel	• Ensure sand mining is not done in the rehabilitated channel	Contractor		Visual sighting during the implementation	1. Number of truck load of sand evacuated from the channel.	Project area	Weekly	Kogi State NEWMA; KSME	1000	850
C10		• Contamination of surface water as a result of waste dumping in and around the stream/river; • Waste dumping impact on the life span of the rehabilitated area by blocking access to waterflow.	• Implement the Waste Management Plan (WMP) • Promote waste avoidance, reduction; reuse and recycling as applicable; • Ensure proper handling, and disposal of the various types of solid municipal and household wastes; • Fence off river/stream banks around bridge.	Contractor		Contractors Compliance to WMP Waste Handling and Disposal	Visual Observation Waste Tracking Report	Project area	Weekly	Kogi ACReSAL SPMU	1100	900
	Total										6970	5800

Public Health Impacts												
C11		Community Health and Safety	• Ensure water pollution free environment; • Use of PPEs; • Health and Safety talk.	Contractor		• No. of complaints about pollution due to operations; • Number of workers with PPEs; • Number of FRSC and police present in the area; • Number of safety talk and awareness conducted.	In situ	Project site and its surrounding	Quarterly, throughout the operation phase of the project	Kogi State Relevant Ministries: Environment, Transport, Works and Infrastructure	890	750
											1740	1450
Total											11300	9400

6.2 Occupational Health and Safety/Community Health and Safety Management Plan

6.2.1 Occupational Health and Safety

Health and safety concerns are very vital during construction and operation phases. For this project, the key reference document is the World Bank Group Environmental, Health, and Safety (EHS) Guidelines (April 2007) and the essential industry safety guidelines that are extended to project community's safety. This is available online at www.ifc.org/ehsguidelines. The project in addition will comply with the National and State's safety regulations and requirements. A comprehensive worker intensive and site specific OHS plan is expected to be provided as part of the Contractor's ESMP (CESMP). As expected of the ESMP, health and safety measures incorporate all aspects of the project construction and operation including ancillary activities. The plan will address issues such as:

- The proper provision and use of personnel protective equipment (PPE) such as safety boots, respirators, eye protection, hearing protection, gloves, and hardhats;
- Analysis of risks associated with job activities in order to develop standard requirements for PPE on a job-specific and station-specific basis;
- Provision of training on the proper use of PPE and penalties for the improper use of PPE;
- Training on the proper and safe use of all equipment in workshops, garages, the plantation, nurseries, and mills;
- Physical barriers so that unauthorized personnel are not admitted to areas where dangerous equipment is in use;
- Training related to job-specific risks and activities, including:
- Electrical installations (e.g. electric shock on direct contact with conductors and indirect contact with masses powered up, burns, fire and explosion);
- Mechanical equipment (e.g. tool blasting or matter risk, crushing of fingers, wounds, equipment shock);
- Lifting devices (e.g. crushing risk, injury caused by appurtenances, falling, collision); machinery and vehicles (e.g. risk of accident on contact with other materials, collision with or knocking down of persons, obstacle shock, fall by the operator, collision with a vehicle or machine);
- Hand tools, electric or other welding equipment (e.g. risk of injury, electrocution, poisoning, dazzle);
- Workshops and garages (e.g. risk of mechanical injury, shock and collision with machines);
- Sterilizers and boilers (e.g. risk of burns due to heat and steam from furnace, explosion risk); and
- Power plant, processing lines and workshops (e.g. noise-related risks, electrocution risk) provision of properly trained and equipped first aid personnel including a well-stocked pharmacy, a treatment room with beds, and an ambulance for any worksite injuries.

6.2.2 Community Health and Safety Management Plan

Issues and potential impacts regarding community health are addressed by the Community Health and Safety Plan. This is because human populations within the residential Kabba community as well as those traversing the community to other parts of Kogi State are related to the health and safety issues requiring mitigation. Thus, the respective mitigation measures include:

- Construction activities can draw significant numbers of unmarried (single) men and others attracted by the opportunity to provide goods and services to construction workers and project beneficiaries with disposable income. Some of these activities such as alcohol, drugs, and sex trade can lead to increased crime and diseases, including HIV/AIDS, thus the project contractor is expected to recruit most of the construction workers from the immediate area to minimize the number of single men migrating for work;
- The project contractor shall ensure that adequate training and enforcement of code of conduct to curtail workers' participation in sensitive activities such as sex trade, drugs and alcoholism;
- The project contractor is expected to conduct sensitization across the frontiers of Kabba community with the clans and villages therein regarding the potential impact of the project and the workers' code of conduct;
- The project contractor will conduct community training and awareness programmes to ensure that the local population understands the risks of participating in risky economic activities for short-term economic gain; and
- The project contractor will work closely with the Kogi State Ministry of Health promote sensitization campaigns to help the local population avoid risky activities; and to monitor the incidence of diseases and other health measures that has indicated a need for further intervention to protect community health and safety as these are connected to the proposed intervention project in Kabba community.

6.3 Institutional Arrangements, Responsibilities and Accountabilities

In implementing the details of the ESMP, specific roles and responsibilities of the project executor and respective institutional engagements are vital to the efficient execution of the stated environmental and social safeguard measures. These roles and responsibilities are outlined below with their monitoring and reporting cadres to provide adequate checks and balances and to ensure that cases of duty overlap (if any) are addressed forthwith.

MDAs and SPMU

the Kogi State ACReSAL will undertake the overall management of the Project Contractor and ensure compliance with recommended impact mitigation measures and the requirements of the ESMP, Liaise with FMEnv and the World Bank to coordinate the preparation and implementation of the ESMP, Enforce the integration of the recommended environmental and social impact mitigation measures and requirement for the implementation of the ESMP in the tender documents and contract award documents, Supervise and monitor the

implementation of the mitigation measures in the ESMP and take adequate steps, Compilation and submission of periodic ESMP reports to the World Bank. The other MDAs will perform supervisory roles as they relate to specific MDA.

***The* Construction supervision consultant**

The Supervision Consultant will,

- Coordinate the implementation of the requirements of the EMP during the phases of the project;
- Coordinate the environmental monitoring activities at the field level;
- Communicate the results of monitoring and auditing inspections to appropriate offices through submission of reports, summaries of reports, and periodic formal and informal reports as appropriate;
- Communicate with the HSE Manager regarding emerging environmental and social matters and concerns;
- Conduct independent monitoring and auditing to ensure compliance with the requirements of this EMP and Contractor's HSE plan and other site-specific plans;
- Review EMP compliance monitoring reports and conduct site visits/inspections;
- Collaborate with the EIA Consultant regarding environmental and social concerns and conducting stakeholders' consultation;
- Advise the Contractor field personnel concerning environmental and social issues and the implementation of the environmental and social regulatory requirements; and
- Compile a comprehensive report on the implementation of this EMP for submission

Construction Contractor

The construction contractor will be responsible for

- day-to-day onsite implementation of the ESMP and coordination of all environmental and safety-related activities of the Company, the Contractor shall appoint:
    - An Environmental Officer;
    - Site Engineer and
    - An Independent Consultant
- The Environmental Officer or Representative of the Contractor shall be responsible for performing the following: Development of a sound Environmental Management Plan for the proposed flood/gully erosion rehabilitation project;
- Ensure that all construction site staff including all subcontractors comply with the requirements of the ESMP;
- Supervise the implementation of all the mitigation measures and preparation of the required monitoring reports;
- Perform regular inspection of the Ibore gully erosion site to ensure adherence to all relevant environmental management actions specified by the ESMP;
- Preparation of work plans for environmental management in line with the ESMP;

- Provide inputs into the regular environmental report to be compiled by the Environmental Safeguard Officer (ESO);
- Maintain adequate records of environmental and safety incidence as well as corrective and preventive actions taken;
- Ensure that any changes made during the construction process that may have a significant environmental and social impact are communicated to the ESO on time and managed accordingly;
- Ensure ESO is adequately informed about the Contractor's monitoring results

Community Based Organizations / CSOs

- Assisting in their own respective ways to ensure effective response actions. Conducting scientific researches alongside government groups to evolve and devise sustainable environmental strategies and rehabilitation techniques;
- Organize, coordinate and ensuring safe use of volunteers in a response action, and actually identifying where these volunteers can best render services effectively and
- Providing wide support assistance helpful in management planning, institutional / governance issues and other livelihood related matter, project impacts and mitigation measures, and awareness campaign

6.3.1 Pre-Construction Phase

6.3.1.1 Key Agencies

The main governmental and non-governmental agencies charged with major roles in the implementation of the ESMP during the pre-construction phase are:

- The Consultants;
- The Federal ACReSAL-PMU;
- The Kogi ACReSAL-SPMU;
- Kogi State Ministries, Departments and Agencies (Health, Environment, Information, Land, Finance, Town Planning, and Agriculture);
- Community-Based Organisations; and
- The Omigbo River Channelization/Gully Erosion Site Committee

6.3.1.2 Role of the Involved Agencies

The significant duty for ESMP monitoring remains with The Kogi ACReSAL-SPMU and the Ministry of Environment while the implementation of and reporting on the ESMP progress rests with the project Contractor. At the initial stage, groundworks and preparatory meetings and consultations were conducted with the Omigbo River Channelization/Gully Erosion Site Monitoring Committee, Community Based Organizations (CBOs), Management of the Omigbo River Channelization / Gully Erosion Intervention as well as with some members of the communities who will be directly or indirectly affected by the project activities. The contractor will liaise with the Kogi State ACReSAL-SPMU on issues raised to reach equilibrium before the response and execution of rectification proposals. This will boost the project's capacity to meet the World Bank standards on environmental and social safeguard issues. Efforts will also be put in place to

ensure that the observed concerns are communicated to the concerned Kogi State Ministries Departments and Agencies (MDA) for prompt action.

6.3.1.3 Project Reporting and Follow-Up

The Omigbo River Channelization/Gully Erosion Site Monitoring Committee via the Secretary will forward the details of the meetings held to the Kogi State ACReSAL-SPMU. This is to enhance reporting, feedback and follow-up processes for the issues raised and to drive a swift response implementation. All issues raised shall be forwarded together with the contributions of the Kogi State ACReSAL, which is expected to have reviewed the comments within the scope of the project and their suitability to World Bank standards. Also, the Contractor must ensure that the observations, comments and notes are implemented rigorously as approved and the feedback conveyed to the Kogi State ACReSAL-SPMU. This process should continue through a chain of reporting-feedback, follow-up-and-response mechanisms until the pre-construction phase is completed.

6.3.2 Construction Phase

6.3.2.1 Major Actors / Key Agencies During Construction Phase

Given that the construction phase of the project is filled with intensive civil activities, various players in different categories are involved. For the proper implementation of the provisions of the ESMP, the key players will include:

- The Supervision Consulting Firm;
- The Contractor;
- Kogi State ACReSAL-SPMU;
- The Federal ACReSAL-PMU;
- Kogi State Ministries, Departments and Agencies (Works, Health, Environment, Agriculture and Forestry);
- Federal Ministry of Environment and Agency (FMEnv), NESREA; and
- World Bank (will guide support and Omigbo River Channelization / Gully Erosion Intervention tasks).

In addition to these key agencies, the Kogi State Government through the vital MDAs will perform general oversight functions in certifying that all the provisions of the ESMP are executed.

6.3.2.2 Role of Concerned Agencies

It has been affirmed that the key responsibility for monitoring and reporting of the ESMP implementation rests with the site Supervision Consultant Firm and the Contractors. The Environmental and Social Specialists (ESS) of the Supervision Consultant and the Contractor will be responsible for periodic and systematic supervision and reporting on the ESMP execution. The supervision consultant firm and contractors will each have to engage a team of socio-environmental experts in different fields (water, soil, social consultant, land and natural resources, etc.) to be headed by their ESS officer. These teams will ensure that sufficient capacity information delivery on ESMP implementation is fully delivered.

The implementation of the ESMP will be managed by the Kogi State ACReSAL-SPMU through the Environment Officer (EO) who will be primarily responsible for the daily inspection and monitoring of the ESMP implementation. The Kogi State Ministries of Works, Health, Environment, Agriculture and Forestry have responsibilities to monitor the ESMP implementation using the fundamentals of their respective internal mechanisms and regulations and policies as established by legal machinery guiding their procedures. However, these MDAs may embark on on-site visits vis-à-vis the representatives of the Federal ACReSAL-PMU. Also, the reports of these activities will be forwarded to the World Bank with full details and findings concerning the project.

The Federal Ministry of Environment (FMEnv) and NESREA will also send their corresponding EOs and officials observing the ESMP project under the Federal ACReSAL-approved projects to monitor the level of execution of the provisions of the ESMP and the degree of compliance. At the local level, the Kogi State Ministry of Environment will also visit the project site regularly to observe and monitor the level of compliance with the provisions of the ESMP.

6.3.2.3 Reporting and Follow-Up

A follow-up process is a continuous chain of reporting of the project activities about the ESMP implementation. The Environmental and Social Specialists (ESS) of the Supervision Consultant/ Monitoring Firm must arrange, document and register incidents on a weekly and monthly basis. The reports must however be submitted to the Kogi State ACReSAL Project Coordinator (PC) for comments, observations, and recommendations (where necessary). Subsequently, the Kogi State ACReSAL-SPMU should send feedback to the contractor through the supervision consultant firm or directly if urgent. The Kogi State ACReSAL-SPMU Environmental Officer's; duty should include checking and reporting on the implementation of the follow-up action showing the inevitability of the office to the ESMP implementation and monitoring. The Contractor and the Supervision Consultant should submit monthly reports on the implementation of the ESMP to the Kogi State ACReSAL-SPMU. The EO who will advise the project management unit should inspect and affirm its authenticity. Any incongruity on environmental issues will require the project coordinator to convene a Project Environmental Management (PEM) meeting to settle them.

6.3.3 Operational and Maintenance Phase

The Kogi State ACReSAL and the Federal ACReSAL as the managing entity of the proposed project to rehabilitate the Omigbo River Channelization/Gully Erosion site have the responsibility to consider the stated monitoring measures. Also, they must inform other government agencies, especially the state Ministry of Environment for proper action where necessary during the operation and maintenance phases. The roles of the Kogi State ACReSAL and the Federal ACReSAL will come to an end at the project closure date. The relevant agencies will then continue to ensure ESMP compliance.

6.3.3.1 Key Agencies

At the maintenance operational phase, the main governmental institutions which the Kogi State ACReSAL will cooperate with include:

- The Kogi State Ministry of Environment;
- The Kogi State Ministry of Health;
- The Kogi State Ministry of Forestry;
- The Kogi State Ministry of Transport;
- The Kogi State Ministry of Works; and
- The Nigerian Police.

In addition to these, the local government administrative council (Kabba-Bunu LGA) will have roles in the general oversight functions of the ESMP implementation and in ESMP up-dating.

6.3.3.2 Major Actors / Key Agencies During Operational and Maintenance Phase

The duties of the institutions that have roles to perform in the process of the operation of the Omigbo River Channelization/Gully Erosion monitoring are stated as follows:

- The Monitoring and Supervision Unit of the Kogi State Ministry of Environment as well as that of Health should conduct continuous visits to the site to check and confirm that the gully site is well managed and maintained. Monitoring activities should be conducted within the legal and administrative capacities of the concerned Ministries via their corresponding departments and agencies;
- The Kogi State Department of Forestry should conduct constant inspections on compliance with afforestation and biodiversity plans. This should be in line with international standards;
- The Ministry of Transport should check the nature of vehicular traffic and road transportation patterns in the area focussing on safety and vehicular controls;
- The Ministry of Works should conduct normal checks on the nature of infrastructure provided within the duration of the project;
- The Nigerian Police should ensure that crime and criminal activities are reduced to the lowest rate to avoid attachment of crime to the project activities.

6.3.3.3 Institutional and Implementation Actions for the ESMP at the Local Level

At the local level, the ACReSAL ESMF vests the overall implementation of the ESMP on the Site Monitoring Committee. The Omigbo River Channelization/Gully Erosion Site Monitoring Committee has already been constituted by the Kogi State ACReSAL. Thus, the committee forms a critical mass source of information, community liaison and local engagements during the field activities for the preparation of the ESMP. The committee comprises several

sub-committees including the women, youth, elders and environmental sub-committees.

Significantly, considering the importance of the Site Monitoring Committee members, it is essential to design and execute a suitable capacity building for them on environmental and social issues concerning the implementation of the ESMP. Consequently, capacity strengthening and sensitization of the Omigbo River Channelization/Gully Erosion Site Monitoring Committee and the Environmental sub-committee members are proposed, owing to their importance in the implementation of the ESMP. The content of the training should include but not restricted to:

(i) The role of the community during the pre-construction, construction and post-construction phases of the project;
(ii) Sustainable practices to ensure gully stabilization;
(iii) Local level of ESMP Implementation; and
(iv) Socio-economic issues including GBV/SEA, Labour Influx, Child Labour and Abuse etc.

6.4 Contractor's Plans

Annex III and XI show detailed Environmental Code of Practices and the Contractor's Environmental and Social Management Plan (C-ESMP) for construction contracts/civil works. Other plans prepared in the annex are; the Grievance Redress Framework for Kogi State ACReSAL (Annex V) and Traffic Management Plan (TMP) Risk on Traffic and Pedestrian Safety due to Construction Traffic (Annex X), Occupational Health and Safety Plan (Annex XII), Management of possible impacts on culture and privacy of local communities (Annex XIII), Waste Management Plan (Annex XIV), Storm-water Pollution Prevention and Control Plan (Annex XV), Erosion and Sediment Control Plan

(Annex XVI) and Hazardous Material and Hazardous Waste Plan (Annex XVII). Other plans are presented in the body of the report as appropriate.

6.5 Labour Influx, Child Labour and Gender-Based Violence (GBV)

6.5.1 Labour Influx

The project may face the problem of an influx of non-local labour and working conditions issues. This may be because skilled labourers might not be available as required within the community of the project site. The project will take concrete measures to mitigate potential labour influx-related risks such as workers' sexual relations with minors and any consequential pregnancies, the presence of sex workers in the community, the spread of HIV/AID, sexual harassment of female employees, child labour and abuse, inadequate resettlement and fear of retaliation, failure to ensure community participation, poor labour practice, and lack of road safety. These risks, if and when they occur at all, require careful consideration to improve social and environmental sustainability, resilience and social cohesion. Hence, the project will include mitigation measures such as: (a) evaluating living conditions of workers' camps and ensuring suitable living conditions; (b)

establishing and enforcing a mandatory Code of Conduct for the company, managers and workers, and an Action Plan for execution; (c) ensuring suitable location for these camps; (d) taking countermeasures - indicated in the Social Management Plan - to reduce the impact of the labour influx on the public services; and, (e) devising and implementing a strategy for maximizing employment opportunities for local population, and proper gender balancing.

The following guidelines dictate the principles that are vital to the proper assessment and management of the risks of adverse impacts on the Omigbo River Channelization/Gully Erosion area that may result from temporary ACReSAL-induced labour influx:

- The Contractor and Consultants will have to hire, to the maximum extent, skilled and unskilled workers from Kabba and other communities within the project area. The SPMU will adopt and or implement all possible measures to avoid if not restrict labour influx into the project area;
- The SPMU will evaluate and manage labour influx risk based on appropriate instruments such as those based on risks identified in the ESMP and the World Bank's sector-specific experience in Nigeria;
- Depending on the risk factors and their levels, appropriate mitigation instruments need to be developed by the contractor including contractor ESMP, Site-specific Labour Influx Management Plan and/or a Workers' Camp Management Plan[2];
- Risk factors to the SPMU that should be considered, include:
    - Weak institutional capacity of the implementing agency;
    - Principal presence of contractors without strong worker management and health and safety policies;
    - Anticipated high volumes of labour influx;
    - Pre-existing social conflicts or tensions;
    - Weak local law enforcement;
    - Prevalence of gender-based violence and social norms towards it in the community (acceptance of gender-based violence);
    - Prevalence of transactional sex;
    - Local prevalence of child and forced labour;
    - Existing conflict situation between communities;
    - Absorption capacity of workers to the community (See http://pubdocs.worldbank.org/en/497851495202591233/Managing-Risk-of-Adverse-impact-from-project-labour-influx.pdf)

- The SPMU will be required to incorporate social and environmental mitigation measures into the civil works contract and responsibilities for managing these adverse impacts. This will be a binding contractual obligation on the SPMU, the

[2] A Labor Influx Management Plan addresses specific activities that will be undertaken to minimize the impact on the local community, including elements such as worker codes of conduct, training programs on HIV/AIDS, etc. A Workers' Camp Management Plan addresses specific aspects of the establishment and operation of workers' camps.

contractor and consultants with appropriate mechanisms for addressing non-compliance.

- The Supervising Consultant shall be responsible for monitoring the contractor's performance and adherence to the labour influx guidelines and that of its Sexual Exploitation and Abuse (SEA) obligations. This will be done by putting a protocol in place for immediate, timely, mandatory and confidential reporting in case of incidents to the project community.
- This will allow the SPMU to enforce the implementation of mitigation measures, which are required to ensure the consultant's compliance with Bank policy and standard requirements. While the Bank reviews and clears project-level safeguard instruments such as the ESIA/ESMP, it is the SPMU's responsibility to (i) ensure the safeguard instruments are reflected in the contractor's ESMP (CESMP), and (ii) ensure the project is implemented following the CESMP, safeguard instruments and other relevant contractual provisions.

6.5.2 Child Labour

The project may also face the problem of child labour and abuse, especially from contractors. This may increase the rate of school children's dropouts. The child labour problem specifically relates to either underage workers (below the age of 18 years) who should be in schools acquiring knowledge and skills or in the form of forced labour. The project will establish and enforce a mandatory Code of Conduct for the company, managers and workers, and an Action Plan which will prevent child and forced labour at all the phases of the project. The Supervision Consultant shall be responsible for monitoring the contractor's performance and adherence to child labour obligations.

The Kogi State SPMU through the Social Livelihood Officer shall ensure total compliance with the ACReSAL child labour policy and ensure the involvement of underage workers by individuals and organizations (contractors and consultants) in the execution of the proposed project should be eliminated.

6.5.3 Gender Based Violence (GBV)

Nigeria has either ratified or made a commitment to the core international human rights treaties and as such has become a party to major regional human rights instruments which obliged States (countries) to respect, protect and fulfil the human rights of all persons within the territory and subject to the jurisdiction of the State without discrimination. Rape may violate several human rights obligations enshrined in the instruments ratified by Nigeria and is also a form of gender-based violence and a brutal manifestation of violence against women. As a State party to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (the "Maputo Protocol"), Nigeria has made legally binding commitments to exercise due diligence to combat gender-based violence and discrimination.

6.6.4 GBV Risk Management Mechanisms

A GBV workshop to sensitize the SPMU, contractors and consultants' staff on the key principle and specific requirements to address GBV/SEA have been included in the bidding documents ('pre-qualification and 'employers' requirements'). Also, the SPMU has a qualified GBV/SEA specialist to manage any GBV/SEA case that might arise in connection with project activities. Hence, specific measures to reduce and mitigate the risk of GBV/SEA in the project will include:

i) GBV/SEA assessment of the project;
ii) mandatory contractors' code of conduct on sexual harassment;
iii) appointment of NGO to monitor GBV/SEA in ACReSAL-AF;
iv) community and workers' sensitization on GBV/SEA;
v) provision of referral units for survivors of GBV/SEA;
vi) provisions in contracts for dedicated payments to contractors for GBV/SEA prevention activities against evidence of completion; and
vii) contractor and SPMU requirement to ensure a minimum target of female employment with incremental rewards for the obtainment of this target.

The following **ACTIONS** are recommended for immediate implementation:

- Inclusion in the focal NGO's ToR services for managing social risks associated with GBV/SEA in the project;
- Building and improving SPMUs, Kabba community and other relevant stakeholders' capacities to address risks of GBV/SEA by developing and providing guidance, training, awareness, and dissemination of relevant GBV/SEA materials to communities;
- Strict adherence to the "*Reporting and Response Protocol*" provided in this ESMP to guide relevant stakeholders in case of GBV/SEA incidents;
- Identifying development partners and cultivating pragmatic partnerships on GBV/SEA prevention measures and referral services; and
- Strengthening consultations and operationalising GBV/SEA-specific grievance redress mechanisms,

Overall, GBV risks in the project target areas might include Intimate Partner Violence (IPV), public harassment including; verbal insults, physical abuse, rape, harmful widowhood practices and women and child trafficking. Furthermore, all risks related to labour influx will have to be mitigated by the participation of project beneficiaries/communities, and the involvement of project contractors and contractors' workers and consultant employees, in identifying mitigation and implementing measures. Analysis of the status of GBV/SEA in the project community has been discussed under socio-economics.

6.5.5 Stakeholder/Citizen Engagement

This is vital to attaining the foremost objectives of any project implementation plus sustainable development. Participatory approaches in project planning and implementation enhance project strategy, ownership and sustainability and also authorize concerned beneficiaries.

The objectives for stakeholders' engagement and sensitisation include but are not limited to the following measures:

i. Create general public awareness and understanding of the project, and ensure its acceptance;
ii. Develop and maintain avenues of communication between the project proponent, stakeholders and PAPs to ensure that their views and concerns are incorporated into the project design and implementation with the objectives of reducing, mitigating or offsetting negative impacts and enhancing benefits from the project;
iii. Inform and discuss the nature and scale of possible adverse impacts of the rehabilitation work and to identify and prioritize the mitigation measures for the impacts more transparently and directly;
iv. Document the concerns raised by stakeholders and PAPs so that their views and proposals are mainstreamed to formulate mitigation and benefit enhancement measures;
v. Sensitise other MDAs, local authorities, Non-governmental Organizations (NGOs) and Community-Based Organizations (CBOs) about the project and solicit their views and discuss their share of responsibility for the smooth functioning of the overall project operations; and
vi. Reduce conflict between stakeholders, project proponents PAPs; and
vii. Develop stakeholders' capacity in the areas of sustainable project management.

These suggest a process to spell out the role of stakeholders in the project planning, implementation and monitoring. The involvement of stakeholders in monitoring service delivery, revenues, budget execution, procurement, contract awards, and reform policies can increase the level of transparency, improve the efficiency of service delivery or budget execution, and reduce opportunities for corruption. Some mechanisms for stakeholder-led monitoring include public expenditure tracking surveys, social audits, or stakeholder report cards.

Additional entry points for stakeholders' engagements in monitoring include collaboration with local CBOs/NGOs, communities, local academia, or think tanks in gathering results data and conducting joint evaluations of project results after project completion (including in the preparation of project Implementation Completion Reports). Capacity building will also be an integral part of the stakeholder's engagements.

6.5.6 Envisaged Benefits

The envisaged benefits of Stakeholder engagement and sensitisation exercises include:

- Provision of opportunities to foresee and/or resolve potential obstacles, constraints and conflicts;
- Means to identify and address potential negative social and environmental impacts as envisaged by stakeholders;
- Opportunities to generate social learning and innovations based on local field experiences;

- Means of ensuring that project benefits are distributed equitably, and;
- Strengthened working relations between stakeholders; Federal and State Governments, etc., and the World Bank.

6.6 Fundamentals of Stakeholder Engagement Approach

- **Consultations**

  Meaningful consultations can contribute enormously to advancing the design, implementation, and sustainability of development interventions. The objectives of consultations include obtaining input for better decision-making about the design and execution schedules of a development programme/project, contributing to improve the results and sustainability, to adapting local and internal mechanisms to improve project plans. In this context, consultations can potentially give voice to the needs of different population groups, including the vulnerable and marginalised groups; improve risk management by identifying opportunities and risks from and to a project; and increase transparency, public understanding, and stakeholder involvement in development decision-making.

  Consultations with key stakeholders, including the project-affected persons and the civil society, are obligatory in development projects providing the expected project best practices.

  Consultation methods include town hall meetings, public hearings, professional meetings, focus group discussions, household surveys and interviews, electronic consultations, and advisory/expert groups. In addition, consultations can include informal structures at the local level, such as village councils, and youth and women's groups. Good practice approaches to consultation, including closing the feedback cycle, have to be applied more analytically.

- **Collaboration**

  Collaboration with stakeholders in the decision-making processes and events can make decisions more responsive to stakeholders' needs and improve the sustainability of program and project outcomes through increased ownership by stakeholders. Collaboration devices include stakeholder/user membership in decision-making bodies, integrity pacts, participatory planning and budgeting, and stakeholders' juries.

- **Collecting, Recording, and Reporting on Inputs from Stakeholders**

  Stakeholders' feedback can be collected regularly on the various scopes of public services provided such as effectiveness, inclusiveness, quality, delivery time, transaction costs, and targeting, as well as on resource operation or engagement processes. Tools can include satisfaction surveys, focus group discussions, hotlines, community scorecards, stakeholder report cards, or SMS/online feedback.

  However, the Kogi State ACReSAL has been implementing its Citizen/Stakeholders Engagement Plan since the inception of the Project. Major

milestones in the Omigbo River Channelization/Gully Erosion intervention include:

- identification of Project stakeholders;
- summary of past consultation efforts from baseline study and GIS mapping;
- establishment of site committee;
- Stakeholders' engagements during ESMP data collection.

Other planned consultation efforts to prepare for construction activities include:

- stakeholder engagement during consultancy services;
- Stakeholder engagement during construction;
- Stakeholder engagement during operations;
- resources for stakeholder engagement;
- monitoring and reporting on stakeholder engagement; and
- formation of the site monitoring committees for Omigbo River Channelization / Gully Erosion Intervention Gully Erosion Site.

6.7 Training Programmes

The Kogi State ACReSAL is expected to develop, implement, and track training programmes at the SPMU and community levels. Table 6.4 explains the institutional capacity strengthening plan including the subjects, resource personnel and period of the capacity needs at the SPMU and community levels.

Table 6.4: Institutional Capacity Strengthening Plan

S/N	Capacity Needs	Participants	Subject	Resource Person	Duration	Cost (US $)
1	Personnel requires appreciation of WB's, Federal/State environmental policies and standards, as well as, an application of these policies and standards in implementing the World Bank support for Omigbo River Channelization/Gully Erosion intervention.	**SPMU Training** PC, Environmental Safeguards Specialist, Project Engineer, Social Safeguards Specialist, Livelihood Officer and other associated support staff from the Ministry. The estimated number of participants is Ten (10) persons	In-depth consideration of the mitigation measures proffered by the ESMP. Satellite Image interpretation of the Omigbo River Channelization / Gully Erosion Intervention watershed imagery for critical assessment of changes overtime	Environmental Science Specialist (ESMP, Remote Sensing & GIS)	2 days seminar	2,500
2	Training on GBV/SEA, Labour Influx Issues and other Social Safeguards and Livelihood Issues as it affects Omigbo River Channelization/Gully Erosion intervention.	**Community** Omigbo River Channelization/Gully Erosion site monitoring committee members and PAPs. The estimated number of participants is Twenty-Five (25) persons.	GBV/SEA, Labour Influx and Social Livelihoods	GBV/SEA specialist, Social Livelihood Specialist. Environmental specialist	1-day workshop	2,500
3	Training on Catchment Management Structures,	**Community** Omigbo River Channelization/Gully Erosion site	Water-harvesting, Afforestation and restoration of special ecosystems	Environmental Science Specialist (botanist and	2 days seminar	2,000

	establishment of plant nurseries, planting operation and forest management in a dryland	monitoring committee members and PAPs. The estimated number of participants is Twenty-Five (25) persons.		hydrologist)		
4	ACReSAL institutional arrangements as it affects Omigbo River Channelization/Gully Erosion intervention site	**Community** Omigbo River Channelization/Gully Erosion site monitoring committee members and PAPs, Contractors and their staff. The estimated number of participants is Fifty (50) persons.	General environmental awareness; seminars that will include ecological and social science principles, as it affects the Omigbo River Channelization/Gully Erosion site. Understanding Environmental Checklist for monitoring contractor's compliance with the mitigation measures proffered in the ESMP.	Environmental science specialist	1-day worksh op	3,000
Sub Total (Monitoring)						**10,000**
5	Training of contractors on the implementation of the ESMP	Contractors Engineers, Project Manager, Safeguards officers, Health and Safety and other Staff	ESMP Implementation	Environmental Science Specialist	1 day	2,500
Sub Total (Implementation)						**2,500**
Total for Capacity Building						**12,500**

6.8 Implementation Schedule

The implementation schedule is a periodic and time-based outline of the progress of the project, indicating milestones to be achieved by the project. It is task-based concerning all the mitigation measures stipulated in the ESMP. For each of the stated mitigation measures the respective monitoring tasks are expected to be suitably appended with specific time. For the Omigbo River Channelization / Gully Erosion Intervention, Table 6.5 provides a snapshot of the designed implementation schedule which is related to the respective phases of the project as well as the period expected for the completion of tasks.

Table 6.5: ESMP Implementation Schedule

S/N	Mitigation measures for:	Mitigation Timeline (Monthly)								
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th
1.	**Pre-construction phase** i. Land Acquisition									
	ii. Community sensitivity of the project									
2.	**Construction phase** 1. Environmental impacts									
	2. Biological impacts									
	3. Socioeconomic impacts including Labour Influx, Child Labour etc									
	4. Public health including GBV/SEA									
3.	**Operation and maintenance phase** Air quality, noise and vibration, water quality, traffic & transportation, and health and safety									

6.9 ESMP Costing and Cost Analysis

The total sum of the stated mitigation measures in Tables 6.1, 6.2 and 6.3 covering the pre-construction, construction and operation phases of the project is presented in Table 6.6. The cost of mitigation, monitoring and capacity building are also included to arrive at the total cost estimate for ESMP implementation and monitoring.

Table 6.6: Cost Estimate of ESMP Implementation and Monitoring

S/N	ESMP Activities (Monitoring)	Cost Estimate ($) Implementation	Cost Estimate (₦) Monitoring
1	***Pre-construction Phase***	20150	***15,400***
2	***Construction Phase***		
	Environmental Impacts	6110	5100
	Biological Impacts	2130	1700
	Socioeconomic Impacts	14970	9750
	Public Health Impacts	6300	5500
	Sub-Total	29510	22050
3	***Operation Phase***	11300	9400
	Total for Construction Impact Mitigation Implementation and Monitoring	60960	46850
4	***Institutional Capacity Reinforcement Programme***		
	Kogi State ACReSAL including the Officers of the relevant MDAs, (Monitoring). Contractor Statff (Implementation)	2,500	4,500
	Community representative capacity building		5,500
5	**Total for Institutional Capacity**	2,500	10,000
Total for Mitigation Implementation and Monitoring		63460	56850
	10% Contingency	6346	5685
Grand Total		69,806	62,535

6.10 ESMP Disclosures

After a review and clearance by the World Bank, the ESMP will be disclosed at the FMEnv, SME and the host LGA offices as well as at the World Bank website. The purpose will be to inform stakeholders about the project activities, impacts, anticipated and proposed environmental management actions as well as to obtain the certificate of conformity from the Federal Ministry of Environment.

6.11 Environmental and Social Management Obligations of the Contractor

The Contractor shall meet the specific E&S obligations provided in this ESMP, which shall be incorporated into the contract specifications for the project. The Contractor shall develop a fieldwork guideline explaining how the recommended mitigation measures in this ESMP will be implemented during the project. The Contractor shall be provided with a copy of this ESMP to guide the preparation of the Contractor's Environmental and Social Management Plan (C-ESMP) for the safe implementation of the project.

6.12 Contractor's Environment and Social Management Plan (C-ESMP)

The contractor shall within six (6) weeks of signing the Contract, prepare a work plan to ensure the adequate management of the E&S aspects of the works, including implementation of the specific requirements of the E&S safeguards. The Contractor's E&S document shall describe:

i) the procedures and methods for complying with the environmental and social conditions specified in the ESMP,

ii) the mitigation measures to be implemented against adverse impacts,
iii) the likely impacts, monitoring activities and reporting; and
iv) the internal organizational, management and reporting mechanisms put in place for the E&S management.

Thus, before the commencement of construction, the Contractor is required to submit a site-specific Contractor's Environmental and Social Management Plan (C-ESMP) for the work, which will be reviewed and approved by the Environment Safeguard Officer (ESO). The EMSP as a minimum shall have a campsite plan that includes the following:

a) Workers' accommodation where applicable.
b) Fuel containment area and refuelling locations.
c) Equipment maintenance area.
d) Material storage area.
e) Demolition and Removal of Structure Management Plan
f) Waste Management Plan.
g) Noise and Dust Control Plan.
h) Chemical/Fuel Spill Response Plan.
i) Gender based Violence (GBV), Sexual Exploitation and Abuse (SEA) Plan etc.
j) Stakeholder Engagement Plan
k) Occupational/Community Health Safety Management Plan
l) Traffic Control and Transport Management Plan
m) Emergency Preparedness and Response Plan
n) Flood Risk Management Pan
o) Flash Flood Emergency Response Preparedness
p) Rock Blasting Management Plan
q) Labour and Working Conditions (includes Workers Code of Conduct on Labour and working conditions and Occupational Health, Safety and Security Management Plans)
r) Channel /gully Crossing Plan
s) Biodiversity Management Plan
t) Hazardous Materials Management Plan
u) Reinstatement Management Plan
v) Security Management Plan
w) Project Corridor (set back) Management Plan

6.13 Contractor's HSE Officer

The Health, Safety and Environment (HSE) officer of the Contractor(s) shall be responsible for the overall on-site implementation of this ESMP alongside other environmental and social requirements prepared for the Project for the duration of the contract. The HSE officer must be well equipped and grounded with the requisite experience to handle such a high-risk project, in this regard he/she must have the minimum basic HSE training. The Contractor(s) HSE officer shall:

- Make sure that all personnel are informed of the requirements of this ESMP, and the associated responsibilities and implications.

- ❖ Produce, provide, and present on request relevant records required to demonstrate compliance with requirements of this ESMP for inspection by relevant officers.
- ❖ Consult with the Client's HSE Officer regarding interpretation of the ESMP and any other aspects of the contract that may impact significantly on the environment.
- ❖ Ensure that all personnel demonstrate respect and care for the environment in which they are operating.
- ❖ Act as point of contact for residents and community members.

It is the responsibility of the construction Contractor(s) to ensure compliance with every provision in the engineering design of the intervention work. Therefore, the Kogi State ACReSAL SPMU shall not be liable for any property damaged by the Contractor in the process of executing the gully rehabilitation activities. In the event of such damage occurring, the Contractor shall be liable for the cost of such damage (if the affected asset is not part of the RAP).

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATIONS

7.1 Summary

Omigbo river channelization/gully erosion intervention site is located in Kabba town in Kabba Bunu LGA of Kogi State. It is located between latitude 07^0 50.010 and 07^0 49.147 and longitude 06^0 04.697 and 06^0 05.032. Omigbo River is a natural river flowing almost through the entire length of Kabba town. It is about 5km long and during the rainy season, it overflows its bound and causes flooding resulting in the displacements of households living along the river and causing gully erosion due to poor drainage system. The gully is about 10-15m wide and is as deep as 20-25 feet (ft). The flood is more aggressive during the rainy season with water level rising between 8-10m above the stream bed. The air quality result shows that the concentrations of gaseous parameters measured within and around the project area are relatively low and fall within the Federal Ministry of Environment (FMEnv) limits. The measured NO_2 values ranged from below the detection limit of 0.01 ppm to 0.02 ppm and fell below the FMEnv maximum permissible limit of 0.06 ppm for NO_2 in ambient air. NO was not detected in any of the sampling locations. SO_2 ranged from below the detection limit of 0.01 ppm to 0.04 ppm and fell within the FMEnv limit of 0.1 ppm. The measured CO values were also below the FMEnv maximum permissible limit of 10 ppm. Its concentration ranged from below the detection limit of 0.1 ppm to 2.0 ppm. Similarly, TVOC was recorded in low concentration, below the FMEnv limit of 0.16 ppm.

The Particulate Matter (PM) constituent within the immediate surroundings of the Omigbo River Channelization/Gully Erosion site shows that the average values of $PM_{0.5}$ range between 0.01 and 0.06 µg/m^3 $PM_{1.0}$ varies between 0.01 and 0.20 µg/m^3, $PM_{2.5}$ lies within 0.05 and 1.10 µg/m^3 while $PM_{5.0}$ and PM_{10} exhibit a range between 1.00 and 4.50 µg/m^3 and 1.00 and 6.00 µg/m^3 respectively. The TPM across the location ranges between 8.89 and 34.5 µg/m^3. The measured TMP values fall below the FMEnv limit of 250µg/m^3 for suspended particulate matter. The ambient noise level shows an average minimum value of 48.5 dB(A) and an average maximum value of 59.4 dB(A). Kabba soil is embryonic in nature with few diagnostic horizons; groundwater is within 100cm of the mineral soil surface (56cm water table). The colour matrix hue is 10YR and ESP of 35% or more within 50cm mineral surface. The pH values of soil ranged between 6.1 and 6.6 (slightly acidic) during the time of study.

The pH levels of the groundwater sample collected from across the project area range between 7.24 and 8.00. This value indicates pH being slightly basic and it is within the FMEnv and WHO permissible limit of 6.5-8.5 and 6.5 to 9.2 respectively. No heavy metal pollution was recorded in the groundwater samples.

Vanadium (V), Arsenic (As), Lead (Pb), Chromium (Cr), and Mercury (Hg) were not detected. Also, no hydrocarbon contamination was recorded in the samples.
The pH generally ranged from 7.4 to 7.9 which indicates slight alkalinity and falls within the WHO and FMEnv permissive limits of 6.0 to 9.0 for surface waters. The values for Total Dissolved Solid (TDS) for the upper, middle and downstream are 26 mg/l, 24 mg/l and 33 mg/l. Electrical Conductivity values are 48 µS/cm, 52 mg/l and 66 µS/cm for the upstream, midstream and downstream respectively. The temperature for the samples collected are 29.5^0 C (upstream), 29.5^0 C (midstream) and 29.4^0 C (downstream) in the proposed project area.

The estimated population for Kabba-Bunu LGA in 2019 and 2025 is 175,230 and 191,490 people respectively. Major ethnic groups in the area are the Igala (82.5%), the Ebira (2.5%), and the Okun (15%). An average household size of 6-10 recorded the highest percentage (69.4%) in the area while an average household size of <5 and 11-15 account for 11.1% respectively. A fair proportion of the households in the project area have their monthly earnings ranging between 10,000-20,000 naira (10.0%) and 21,000-30,000 naira (7.5%). About 7.5% earn less than 10,000 naira monthly; many of whom are daily labourers, artisans and farmers who could not estimate their monthly income because they have not been keeping records of their income and financial activities. Depositing refuse in the backyard of their houses (50.0%) is the most common method of solid waste disposal in the project area. Other methods such as dumping of waste in the water body (12.5%), dumping waste in community refuse/garbage pits/dumpsites (17.5%) and burning after the gathering of wastes (15.0%) are also employed by some respondents.

7.2 Conclusion

This document has provided a suitable set of measures and mitigation action-driven plans to enhance the execution of a series of civil works at the Omigbo River Channelization/Gully Erosion Rehabilitation Site. The document is prepared to provide steps to keep to global best practices and curtail environmental and social impacts to the barest minimum. The Environmental and Social Management Plan (ESMP) employs a series of methods to evaluate the vital biophysical and social baseline data and information of the proposed project site, identified the vulnerable environmental parameters for ambient air, water, soil and noise which may be positively and or negatively impacted upon at the different identified phases of the project development. It also presented the crucial mitigation measures for such identified impacts. Since the development objectives of the Kogi ACReSAL project are to rehabilitate the gully-induced destruction and to curtail lingering gully vulnerability around the Omigbo River Channelization / Gully Erosion Intervention environment, this ESMP has also adequately provided the guidelines for achieving these objectives without compromising the all dimensions of human and environmental values within the entire watershed of the project area.

7.3 Recommendations

The following recommendations are presented for the consideration of the Kogi State ACReSAL SPMU. The recommendations are suggested to ensure the improvement of decisions and fill of gaps identified by the ESMP study.

- Implementation of the RAP before the commencement of the project;
- Capacity building of the project site committee members, PAP and other stakeholders to ensure effective and efficient contribution;
- Complete compliance with the mitigation measures in the ESMP at all the stages of project implementation by all actors in project delivery; and
- Adequate awareness creation in the area of water harvesting; this will reduce surface run-off, especially during the rainy season thereby preventing flooding and subsequent erosion.

CHAPTER EIGHT

DECOMMISSIONING/ABANDONMENT

This section provides additional specific guidance on the prevention and control of community health and safety impacts that may occur during project development and at the end of the project life cycle. Many of the provisions here are adopted from the General EHS Guidelines of the World Bank.

Noise and Vibration

During decommissioning activities, noise and vibration may be caused by the earth moving and excavation equipment, the transportation of equipment, materials and people. It is recommended that noise reduction and control strategies be considered in areas close to community areas. These strategies include:

- Planning activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance;
- Using noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for combustion engines; and,
- Avoiding or minimizing project transportation through community areas.

Soil Erosion

Soil erosion may be caused by exposure of soil surfaces to rain and wind during site clearing, earth moving, and excavation activities. The mobilization and transport of soil particles may, in turn, result in the sedimentation of surface drainage networks, which may result in impacts on the quality of natural water systems and ultimately the biological systems that use these waters. Recommended soil erosion and water system management approaches include reducing or preventing erosion by:

- Scheduling to avoid heavy rainfall periods (i.e., during the dry season) to the extent practical
- Contouring and minimizing the length and steepness of slopes
- Mulching to stabilize exposed areas
- Re-vegetating areas promptly
- Designing channels and ditches for post-construction flows;
- Lining steep channels and slopes (e.g. use jute matting).

Air Quality

Decommissioning activities may generate the emission of fugitive dust caused by a combination of on-site excavation and movement of earth materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind.

A secondary source of emissions may include exhaust from diesel engines of earth-moving equipment, as well as from open burning of solid waste on-site. Techniques to consider for the reduction and control of air emissions from construction and decommissioning sites include:

- Minimizing dust from material handling sources, such as conveyors and bins, by using covers and/or control equipment (water suppression, bag house, or cyclone);
- Minimizing dust from open area sources, including storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content;
- Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements;
- Selectively removing potential hazardous air pollutants, such as asbestos, from existing infrastructure before demolition;
- Managing emissions from mobile sources;
- Avoiding open burning of solids.

Solid Waste

Non-hazardous solid waste generated at construction and decommissioning sites includes excess fill materials from grading and excavation activities, scrap wood and metals, and small concrete spills. Other non-hazardous solid wastes include office, kitchen, and dormitory wastes when these types of operations are part of construction project activities. Hazardous solid waste includes contaminated soils, which could potentially be encountered on-site due to previous land use activities, or small amounts of machinery maintenance materials, such as oily rags, used oil filters and used oil, as well as spill cleanup materials from oil and fuel spills. Techniques for preventing and controlling nonhazardous and hazardous construction site solid waste include those already discussed in Section 1.6 of the EHS guidelines.

Hazardous Materials

Decommissioning activities may pose the potential for the release of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. These materials may also be encountered during decommissioning activities in building components or industrial process equipment. Techniques for prevention, minimization, and control of these impacts include:

- Providing adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids;
- Using impervious surfaces for refuelling areas and other fluid transfer areas;
- Training workers on the correct transfer and handling of fuels and chemicals and the response to spills;

- Providing portable spill containment and cleanup equipment on site and training in the equipment deployment;
- Assessing the contents of hazardous materials and petroleum-based products in building systems (e.g. PCB containing electrical equipment, asbestos-containing building materials) and process equipment and removing them prior to initiation of decommissioning activities.

Wastewater Discharges

Decommissioning activities may include the generation of sanitary wastewater discharges in varying quantities depending on the number of workers involved. Adequate portable or permanent sanitation facilities serving all workers should be provided at all construction sites. Sanitary wastewater in construction and other sites should be managed as prescribed in Section 1.3 of the EHS guidelines.

Contaminated Land

Land contamination may be encountered in sites under construction or decommissioning due to known or unknown historical releases of harmful materials or oil, or due to the presence of abandoned infrastructure formerly used to store or handle these materials, including underground storage tanks. Actions necessary to manage the risk from contaminated land will depend on factors such as the level and location of contamination, the type and risks of the contaminated media, and the intended land use. However, a basic management strategy should include:

- Managing contaminated media to protect the safety and health of occupants of the site, the surrounding community, and the environment post-construction or post-decommissioning;
- Understanding the historical use of the land with regard to the potential presence of hazardous materials or oil prior to initiation of construction or decommissioning activities;
- Preparing plans and procedures to respond to the discovery of contaminated media to minimize or reduce the risk to health, safety, and the environment consistent with the approach for Contaminated Land in Section 1.6
- Preparation of a management plan to manage obsolete, abandoned, hazardous materials or oil consistent with the approach to hazardous waste management described in Section 1.6 of the EHS guidelines.

Slips and Falls

Slips and falls on the same elevation associated with poor housekeeping, such as excessive waste debris, loose construction materials, liquid spills, and uncontrolled use of electrical cords and ropes on the ground, are also among the most frequent cause of lost time

accidents at construction and decommissioning sites. Recommended methods for the prevention of slips and falls from, or on, the same elevation include:

- Implementing good house-keeping practices, such as the sorting and placing loose construction materials or demolition debris in established areas away from foot paths;
- Cleaning up excessive waste debris and liquid spills regularly;
- Locating electrical cords and ropes in common areas and marked corridors;
- Use of slip retardant footwear.

Struck By Objects

Construction and demolition activities may pose significant hazards related to the potential fall of materials or tools, as well as ejection of solid particles from abrasive or other types of power tools which can result in injury to the head, eyes, and extremities. Techniques for the prevention and control of these hazards include:

- Using a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels;
- Conducting sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable;
- Maintaining clear traffic ways to avoid driving of heavy equipment over loose scrap;
- Use of temporary fall protection measures in scaffolds and out edges of elevated work surfaces, such as hand rails and toe boards to prevent materials from being dislodged;
- Evacuating work areas during blasting operations, and using blast mats or other means of deflection to minimize fly rock or ejection of demolition debris if work is conducted in proximity to people or structures;
- Wearing appropriate PPE, such as safety glasses with side shields, face shields, hard hats, and safety shoes

Moving Machinery

Vehicle traffic and use of lifting equipment in the movement of machinery and materials on a construction site may pose temporary hazards, such as physical contact, spills, dust, emissions, and noise. Heavy equipment operators have limited fields of view close to their equipment and may not see pedestrians close to the vehicle. Center-articulated vehicles create a significant impact or crush hazard zone on the outboard side of a turn while moving. Techniques for the prevention and control of these impacts include:

- Planning and segregating the location of vehicle traffic, machine operation, and walking areas, and controlling vehicle traffic through the use of one-way traffic routes, establishment of speed limits, and on-site trained flag-people wearing high-visibility vests or outer clothing covering to direct traffic;

- Ensuring the visibility of personnel through their use of high visibility vests when working in or walking through heavy equipment operating areas, and training of workers to verify eye contact with equipment operators before approaching the operating vehicle;
- Ensuring moving equipment is outfitted with audible back-up alarms;
- Using inspected and well-maintained lifting devices that are appropriate for the load, such as cranes, and securing loads when lifting them to higher job-site elevations.

Dust

- Dust suppression techniques should be implemented, such as applying water or non-toxic chemicals to minimize dust from vehicle movements;
- PPE, such as dusk masks, should be used where dust levels are excessive

Other Site Hazards

Construction and decommissioning sites may pose a risk of exposure to dust, chemicals, hazardous or flammable materials, and wastes in a combination of liquid, solid, or gaseous forms, which should be prevented through the implementation of projectspecific plans and other applicable management practices, including:

- Use of specially trained personnel to identify and remove waste materials from tanks, vessels, processing equipment or contaminated land as a first step in decommissioning activities to allow for safe excavation, construction, dismantling or demolition;
- Use of specially trained personnel to identify and selectively remove potentially hazardous materials in building elements prior to dismantling or demolition including, for example, insulation or structural elements containing asbestos and Polychlorinated Biphenyls (PCBs), electrical components containing mercury;
- Use of waste-specific PPE based on the results of an occupational health and safety assessment, including respirators, clothing/protective suits, gloves and eye protection.

General Site Hazards

Projects should implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning. Risks may arise from inadvertent or intentional trespassing, including potential contact with hazardous materials, contaminated soils and other environmental media, buildings that are vacant or under construction, or excavations and structures which may pose falling and entrapment hazards. Risk management strategies may include:

- Restricting access to the site, through a combination of institutional and administrative controls, with a focus on high-risk structures or areas depending on

site-specific situations, including fencing, signage, and communication of risks to the local community;

- Removing hazardous conditions on construction sites that cannot be controlled effectively with site access restrictions, such as covering openings to small confined spaces, ensuring means of escape for larger openings such as trenches or excavations, or locked storage of hazardous materials

Traffic Safety

Construction activities may result in a significant increase in the movement of heavy vehicles for the transport of construction materials and equipment increasing the risk of traffic-related accidents and injuries to workers and local communities. The incidence of road accidents involving project vehicles during construction should be minimized through a combination of education and awareness-raising, and the adoption of procedures prescribed for Traffic Safety.

Campsite Decommissioning:

The design and facilities shall take due recognition of the need to decommission the campsite and the ancillary facilities at the end of the operational life by preparing a Decommissioning and Abandonment Plan at least three months before decommissioning. The abandonment plan shall take due note of the current national and international legislative requirements. The following shall be considered at the end of the construction activities:

- The decommissioning activities shall be in agreement with the owner of the site to ensure the site decommissioning process is in line with the future use by the owner
- Relocating all un-used Tools and equipment to their contractor Outside the central store
- Any equipment that has gone into waste shall be treated as waste and disposed of in appropriate ways for example re-use, recycle, reduce or sold to recycling plants
- Demolish any additional structures that were constructed/installed by the contractor. The site shall be levelled
- Dispose of all the generated waste by the waste management plan and waste management regulations
- Clean up the site and hand over the site to the Client and demobilize/withdraw all personnel that had been posted to the site including the security personnel. Handover acknowledgement shall be written/ documented
- A team shall be set up to study and plan the decommissioning/abandonment programme in a manner that meets standard requirement
- An Environmental Evaluation Report (EER) to determine if the activities carried out at the site have caused any detrimental effects and if any to discuss mitigations and restoration measures.
- In-depth Environmental Studies for the actual removal of equipment (demolition) will be carried out.

Site demobilization or decommissioning summary

Environmental Management Impacts Requiring Mitigation	Sources of Impacts	Mitigation Measures	Monitoring Actions and Methods	Responsibility for Implementation	Resources required for the Implementation
Site clean up	Temporary structures, equipment, materials, waste and facilities used for construction activities.	Clear and clean the construction site to the satisfaction of the Site Engineer	Inspection of the site by the Site Engineer	**Contractor**	Post Construction site reexamine.
Monitoring of constructed facilities	Ineffectiveness of constructed facilities.	Monitoring of: •The safety and functionality of equipment and components. •Functionality of the structures and all facilities.	Inspection of the various components.	Site Engineer	Periodical monitoring.

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ANNEXURES

ANNEX I: ESMP QUESTIONNAIRE

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) QUESTIONNAIRE

KOGI STATE ACReSAL OMIGBO RIVER CHANNELIZATION / GULLY EROSION INTERVENTION PROJECT

Dear Respondent,
Thank you for taking the time to complete the following survey. The purpose of this survey is to gain valuable insight into proposed ACReSAL intervention at Omigbo River Channelization/Gully Erosion Site in Kogi State. This provides you the opportunity to contribute to the environmental and social components of the project implementation.

NOTE:
Please read each question carefully. Your answers are completely confidential and will be included only in summaries where individual answers cannot be identified. Unless otherwise instructed, please tick appropriate answer category that best describes your opinion. It will take approximately 20 minutes to complete this questionnaire.

SECTION A: Household Data

1. Gender of Respondent: (a) Male (b) Female
2. Age: (a) Below 18 yrs (b) 18-45 yrs (c) 46-65 yrs
   (d) Above 66 yrs
3. Marital Status: (a) Single (b) Married (d) Divorced/Separated (e) Widowed
4. Occupation: (a) Famer (b) Daily Labourer (c) Trading & Shop Keeping
   (d) Artisans (e) Employed (salary) (f) Retired (g) Civil Servant
   (h) Unemployed (i) Others specify……
5. Residential Status: (a) Permanent Resident (b) Back Home (Returnee)
   (c) Non-Resident, Visiting
6. Ethnic Group: (a) Igala (b) Ebira (c) Fulani (d) Okun
7. Religion: (a) Christianity (b) Islam (c) Traditional
8. Relationship to Household Head (HH): (a) Self (b) Spouse (c) Child
   (d) Parent (e) Other, specify…...
9. Size of the HH……
10. How long have you been living in this area? (a) 0-2 yrs (b) 3-5 yrs
    (c) 6-9 yrs (d) 10 yrs and Above
11. If non-resident, please state your actual location: ……. (Location/LGA/State)

12. Education: (a) NO formal education (b) Primar*y School

(c) Secondary School (d) Tertiary (Excluding University)

(e) University Graduate (f) University Post Graduate

13. Are you in any way affected by the Omigbo River Channelization/Gully Erosion

(a) YES (b) NO

14. If question 13 is YES, how (a) Damage to farmland

(b) Damage to building/property (c) loss of landed / Building property

(d) Damage to household utensils/personal belonging

(e) economic loss due to inability to access or operate means of livelihoods

(f) Damage to Public Infrastructures (f) others specify……

15. Does Omigbo River Channelization/Gully Erosion prevent children from going to school?

(a) YES (b) NO

16. If question 15 is yes, how regular is the occurrence? (a) Often (b) frequently (c) rarely

SECTION B: Health Status

1. Is your present state of health affected in any way by Omigbo River Channelization/Gully Erosion?

(a) YES (b) NO

2. If yes, in what way? (a) Skin diseases (b) Cough (c) Catarrh

(d) Malaria (e) Water-borne diseases (f) Other, Specify……

3. Does the prevalence/occurrence of the disease(s) become severe during erosion periods (a) YES (b) NO

4. How do you manage your health conditions when sick? (a) Attend hospital/clinic

(b) Buys drugs from nearby chemist (c) Traditional medicine

(d) None (e) Others Specify…….

5. If you do attend a hospital/clinic, when last did you visit one? (a) last six months

(b) last one year (c) last five years (d) more than five years ago (e) Never visited one.

6. Please tick one or more of the under-mentioned ailments/sicknesses, you suffer from most accordingly.

Ailment		**Ailment**	
Whooping Cough		Rheumatism	
Tuberculosis		Rashes	
Asthma		Eczema	
Dysentery		Ringworm	

Diarrhoea		Eye pains	
Cholera		Cataract	
Pile		Glaucoma	
Hypertension		Typhoid fever	
Congestive health problem		Malaria	
Pneumonia		Sickle cell anaemia	
Sexually transmitted diseases		Epilepsy	

7. Do you think your health condition will be affected by the proposed intervention at the Omigbo River Channelization/Gully Erosion site? (a) YES (b) NO

8. If yes, how? (a) Contamination of groundwater (b) Contamination of surface water (c) Provide a breading site for disease vectors (d) Noise/air pollution (e) Others, specify……

9. Please suggest how this can be averted during construction and implementation ……
….

SECTION C: Standard of Living / Socio-Economic Activities

1. Assets

1.1 What sort of housing does your household live in?					
a. Construction material - Walls		Plastered mud	c. Number of rooms		1-2
		Cement blocks			3-4
		Other (specify)			Other
b. Construction material - roofing		Corrugated	d. Other structures on plot		Animal Pen
		Aluminium / Roofing tiles			Granary
		Asbestos			Shops
		Tile			Kiosks
		Other (specify)			Other
e. Construction material - floor		Earthen			
		Concretes			
		Tiles			
		Other (specify)			
f. Toilet Facility		Pit latrine			
		Water closet			
		Toilet facility outside dwelling			
		Pier latrine			
		Other (specify)			
		None			
g. Tenure of housing		Owned			
		Rented			
		Occupied rent free			
		Other			
h. Tenure of land		Owned			
		Rented			
		Occupied rent free			
		Lease hold			
		Others specify			

2. Indicate household refuse disposal for solid waste? (Multiple options)

(a) Depositing refuse at backyard of the house (b) Dumping in water body

(c) Dumping in community refuse/garbage pit/dumpsite

(d) Burning after gathering together (e) Waste collector (f) Other specify……

2.0 Household Services

2.1 Rank in order of availability and usability the source(s) of lighting for the household? (please use 1, 2,...in hierarchical order with 1 indicating the most available and used source)

(a) PHCN	(b) Generator	(c) Lantern	(d) Candle	(e) Palm Oil Lamp	(f) Torchlight Battery	(g) Wood	(h) Kerosene	(i) Gas

2.2 Using the method in 2.1, indicate major source of energy for cooking?

(a) Fire Wood	(b) Coal	(c) Kerosene	(d) Electricity	(e) Animal dropping	(f) Gas	(g) Crop Residue/saw dust	Others

3.0 **Sources of Water**

	for drinking	for	for bathing and
a. Well			
b. Borehole/Water pump			
c. Community tap			
d. Piped water outside dwelling			
e. River			
f. Rain harvesting			
g. Water vendor			
h. Tanked water			
i. Other (specify)			

4.0 Income

State your main income per month	₦

4.1 **Remittances**

1. Does anyone in the family who lives elsewhere send money to you?	1	YES	2	NO
2. If yes, how much (per month)	₦			

5. In your opinion, how has the standard of living of your household changed over the previous three years?

(a) Same (b) Better (c) Worse

6. Is the option in 5 propelled by the Gully Erosion problem (a) YES (b) NO

7. If 6 is YES, do you think the proposed intervention will improve the situation?

(a) YES (b) NO

8. If 7 is YES specify how the project will improve the situation

……

SECTION D: Gender-Based Violence/Sexual Exploitation and Abuse

1. Are there any provisions which restrict women's access to health and other social services? In particular, which:
   (Please specify in the space provided for this purpose "yes" or "no")
   ( ) require the consent of a male relative/husband for a married woman's medical examination or treatment or access to contraceptives or abortion,
   ( ) require parental consent in case of adolescents' access to contraceptives or abortion;
   ( ) allow medical practitioners to refuse provision of a legal medical service on grounds of conscientious objection
   ( ) prohibit certain medical services, or require that they be authorized by a physician, even where no medical procedure is required; in particular:
   ( ) IUDs (intrauterine devices) or hormonal contraceptives
   ( ) Emergency contraceptives, including the morning-after pill,
   ( ) Sterilization on request;
   ( ) Early abortion (in first trimester of pregnancy) at the pregnant woman's request
   ( ) Medically assisted reproduction (e.g., in vitro fertilization)
2. Are the following acts criminalized?
   (Please specify in the space provided for this purpose "yes" or "no")
   ( ) transmission of HIV or other venereal diseases by women only
   ( ) female genital mutilation
   ( ) child marriage
   ( ) home births with an obstetrician or midwife
   ( ) abortion
3. Are the following acts criminalized?
   (Please specify in the space provided for this purpose "yes" or "no")
   ( ) adultery
   ( ) prostitution
   (If yes, who is criminally responsible – please circle the appropriate answer: the sex worker, the procurer and/or the customer)
   ( ) sexual orientation and gender identity (homosexuality, lesbianism, transgender, etc.)
   ( ) violations of modesty or indecent assault (e.g. not following dress code)
4. If yes, does it cover: *(Please specify in the space provided for this purpose "yes" or "no")*
   ( ) prevention of sexually transmitted diseases
   ( ) prevention of unwanted pregnancies
   ( ) promotion of a healthy lifestyle, including prevention of dietary disorders of teenage girls, including anorexia and bulimia
   ( ) psychological/psychiatric training on self-control of aggression, including sexual aggression
5. Are there any measures and programs undertaken in order to increase women's safety e.g. in public urban spaces, in public transportation, etc.?
   YES ( ) NO ( )

6. Are there specific training programs for medical and legal professionals on the issue of gender-based discrimination in the area of health and safety?
   YES ( ) NO ( )

7. Do they cover: *(Please specify in the space provided for this purpose "yes" or "no")*
   ( ) the issues connected with specific women's needs in area of health
   ( ) specific women's vulnerability to be victims of gender-based violence or specific crimes
   ( ) the nature of gender-based violence,
   ( ) its occurrences and symptoms
   ( ) methods of detection
   ( ) medical protocols
   ( ) influence of gender-based violence, in particular of sexual violence on the future behaviours of victims (post-traumatic stress symptoms etc.)
8. How do you ensure gender equity in the community?

   (a) Women are elected in public office (b) Females are given equal opportunity and access to education and employment (c) Quotas on genders are ensured in leadership of community-based organizations (d) Others specify……

SECTION E: Resources/ Cultural Property

1. Please indicate the environmental problems which your settlement/community experiences and whose cause can be linked to Omigbo River Channelization/Gully Erosion?

   (a) Soil infertility (b) Poor drainage system (c) Bad road

   (d) Bad lands (e) environmental degradation (f) Degraded land

   (i) Destruction of infrastructures (j) Others (specify) ……...

2. Please indicate the environmental problems which your settlement/community would likely experience and whose cause can be linked to the proposed intervention project during construction? (a) Soil infertility (b) Poor drainage system (c) Bad road (d) Low visibility (e) Erosion Problems (f) Flooding

   (g) Environmental degradation (g) Destruction of infrastructures

   (h) encroachment of land properties

   (i) Pollution (air, surface water, ground water, noise) (j) Others (specify) ……

3. Please indicate the environmental problems which your settlement/community would likely experience and whose cause can be linked to the proposed intervention project during operation? (a) Soil infertility (b) Poor drainage system (c) Bad road (d) Low visibility (e) Erosion Problems (f) Flooding

   (g) Environmental degradation (h) Destruction of infrastructures

   (i) encroachment of land properties (j) Pollution (air, surface water, ground water, noise) (k) Others (specify) ……..

4. Do you think the proposed intervention project will affect any valued resource/cultural/archaeological property in your area? (a) YES (b) NO

5. If yes mention the name(s) of the valued resource/cultural/archaeological property ……

6. How will valued resource/cultural/archaeological property be affected?

   (a) Displacement of such valued cultural properties

   (b) Vandalisation of sacred items/locations

   (c) Possible theft of sacred/archaeological items (d) Others, specify: ……

SECTION F: Intervention Project Activities Impact Evaluation

1. Are you aware of the proposed intervention by ACReSAL (a) YES (b) NO
2. If yes, from which source (a) Community meetings (b) Media (TV, Radio, Newspaper, Internet) (c) Others specify…….
3. Do you think the project can cause restiveness in your community?(a) YES (b) NO
4. If 3 is yes how will the proposed intervention result in restiveness?
   (a) Disrespect of norms and culture by contractors

   (b) loss of farmland / Property

   (c) Possible theft of sacred/archaeological items

   (d) local people not employed during construction

   (e) Others, specify: ……

5. How will the proposed intervention project impact on your livelihood and environment?

Positive impacts	Negative impacts
(a)	
(b)	
(c)	
(d)	
(e)	
(f)	

6. Can you name some of the animals and other habitat at the gully erosion site that may be affected by the proposed intervention project?
   ……

7. What do you expect from the activities of ACReSAL intervention? (a) employment of Locals during construction (b) compensation for those whose properties will be affected (c) capacity building for maintenance during implementation (d) community input into final engineering design (e) Others please specify……..

8. Are there any other issue(s) of concerned as regards the intervention project in your area, please state clearly?
   ……...……

ANNEX II PHOTOS

Public Consultations











MEN AT OMIGBO SITE





WOMEN AT OMIGBO SITE

Environmental Data Assessment







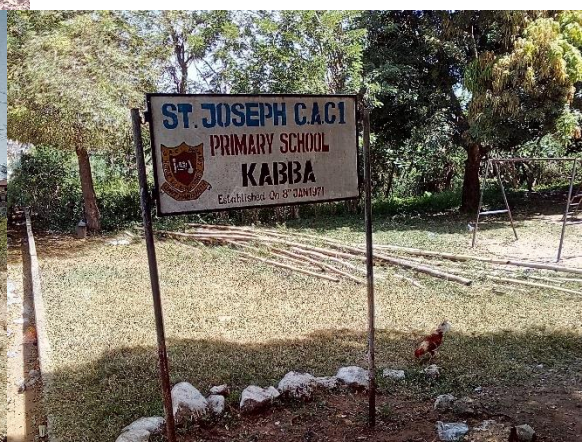
Environmental Degradation











ANNEX III: GENERAL ENVIRONMENTAL MANAGEMENT CONDITIONS FOR CONSTRUCTION CONTRACTS/CIVIL WORKS

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

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

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

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

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

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

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

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

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

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

i) Ensure that garbage, sanitation and drinking water facilities are provided in construction workers' scamps.

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

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

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

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

5. Besides the regular inspection of the sites by the Supervising Engineer for adherence to the contract conditions and specifications, the Owner may appoint an Inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. State environmental authorities may carry out similar inspection duties. In all cases, as directed by the SE, the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.

6. All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous chemicals shall be bonded in order to contain spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed-off at designated disposal sites in line with applicable government waste management regulations.

7. All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.

8. Used oil from maintenance shall be collected and disposed-off appropriately at designated sites or be reused or sold for re-use locally.

9. Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

10. Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a daily basis.

11. If disposal sites for clean spoil are necessary, they shall be located in areas, approved by the SE, of low land use value and where they will not result in material being easily washed into drainage channels. Whenever possible, spoil materials should be placed in low-lying areas and should be compacted and planted with species indigenous to the locality.

12. The Contractor shall obtain appropriate licenses/permits from the relevant authorities to operate quarries or borrow areas.

13. The location of quarries and borrow areas shall be subject to approval by the relevant local and national authorities, including traditional authorities if the land on which the quarry or borrow areas fall in traditional land.

14. New extraction sites:

a) Shall not be located in the vicinity of settlement areas, cultural sites, wetlands or any other valued ecosystem component, or on high or steep ground or in areas of high scenic value, and shall not be located less than 1km from such areas;

b) Shall not be located adjacent to stream channels wherever possible to avoid siltation of river channels;

c) Where they are located near water sources, borrow pits and perimeter drains shall surround quarry sites;

d) Shall not be located in archaeological areas. Excavations in the vicinity of such areas shall proceed with great care and shall be done in the presence of government authorities having a mandate for their protection;

e) Shall not be located in forest reserves. However, where there are no other alternatives, permission shall be obtained from the appropriate authorities and an environmental impact study shall be conducted;

f) Shall be easily rehabilitated. Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height, are preferred;

g) Shall have clearly demarcated and marked boundaries to minimize vegetation clearing.

15. Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

16. Stockpile areas shall be located in areas where trees can act as buffers to prevent dust pollution. Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exits from workings.

17. The Contractor shall deposit any excess material in accordance with the principles of these general conditions, and any applicable ESMP, in areas approved by local authorities and/or the SE.

18. Areas for depositing hazardous materials such as contaminated liquid and solid materials shall be approved by the SE and appropriate local and/or national authorities before the commencement of work. Use of existing, approved sites shall be preferred over the establishment of new sites.

19. To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.

20. Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.

21. Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.

22. Re-vegetate stockpiles to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil microbes.

23. Locate stockpiles where they will not be disturbed by future construction activities.

24. To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.

25. Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.

26. Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.

27. Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term land use, and allow natural regeneration of vegetation.

28. Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.

29. Minimize erosion by wind and water both during and after the process of reinstatement.

30. Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

31. Re-vegetate with plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local research institutions, forest department and the local people. Water Resources Management

32. The Contractor shall at all costs avoid conflicting with water demands of local communities.

33. Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.

34. Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.

35. Temporary damming of streams and rivers shall be done in such a way avoids disrupting water supplies to communities downstream, and maintains the ecological balance of the river system.

36. No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.

37. Wash water from washing out of equipment shall not be discharged into water courses or road drains.

38. Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

39. Location of access roads/detours shall be done in consultation with the local community especially in important or sensitive environments. Access roads shall not traverse wetland areas.

40. Upon the completion of civil works, all access roads shall be ripped and rehabilitated.

41. Access roads shall be sprinkled with water at least five times a day in settled areas, and three times in unsettled areas, to suppress dust emissions.

42. Blasting activities shall not take place less than 2km from settlement areas, cultural sites, or wetlands without the permission of the SE.

43. Blasting activities shall be done during working hours, and local communities shall be consulted on the proposed blasting times.

44. Noise levels reaching the communities from blasting activities shall not exceed 90 decibels.

45. Unusable materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures will be disposed of in a manner approved by the SE. The Contractor has to agree with the SE which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.

46. As far as possible, abandoned pipelines shall remain in place. Where for any reason no alternative alignment for the new pipeline is possible, the old pipes shall be safely removed and stored at a safe place to be agreed upon with the SE and the local authorities concerned.

47. AC-pipes as well as broken parts thereof have to be treated as hazardous material and disposed of as specified above.

48. Unsuitable and demolished elements shall be dismantled to a size fitting on ordinary trucks for transport.

49. In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of AIDS.

50. Adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points.

51. Construction vehicles shall not exceed maximum speed limit of 40km per hour.

52. Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

53. In cases where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the SE. This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation.

54. Within 6 weeks of signing the Contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works.

The Contractor's EHS-MP will serve two main purposes:

- For the Contractor, for internal purposes, to ensure that all measures are in place for adequate HSE management, and as an operational manual for his staff.
- For the Client, supported where necessary by a SE, to ensure that the Contractor is fully prepared for the adequate management of the HSE aspects of the project, and as a basis for monitoring of the Contractor's HSE performance.

55. The Contractor's EHS-MP shall provide at least:

- A description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an EMP;
- A description of specific mitigation measures that will be implemented in order to minimize the adverse impacts;
- A description of all planned monitoring activities (e.g. sediment discharges from borrow areas) and the reporting thereof; and

- The internal organizational, management and reporting mechanisms put in place for such.

56. The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts, and has defined appropriate measures to counteract any potential impacts.

57. The Contractor shall prepare bi-weekly progress reports to the SE on compliance with these general conditions, the project EMP if any, and his own EHS-MP. An example format for a Contractor HSE report is given below. It is expected that the Contractor's reports will include information on:

- HSE management actions/measures taken, including approvals sought from local or national authorities;
- Problems encountered in relation to HSE aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Lack of compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to HSE aspects; and
- Observations, concerns raised and/or decisions taken with regard to HSE management during site meetings.

58. It is advisable that reporting of significant HSE incidents be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, it is advisable that the Contractor keeps his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as copies of incident reports, as appendices to the bi-weekly reports. Example formats for an incident notification and detailed report are given below. Details of HSE performance will be reported to the Client through the SE's reports to the Client

59. The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project EMP, and his own EHSMP, and are able to fulfil their expected roles and functions. Specific training should be provided to those employees that have particular responsibilities associated with the implementation of the EHS-MP.

General topics should be:

- Occupational Health and Safety Basics;
- Occupational Health and Safety in water supply pipeline installation;
- Safety Practices in Borehole installation and Aquifer Abstraction;
- Electrical Safety Basics;
- Hazard Identification and Control;
- Hazard Communication Program;
- Accident Investigation;
- Asbestos Management;
- Safe work Procedures;
- Fall Protection;

- Noise Management Program;
- Workers Respiratory Program;
- Work place Violence Management;
- Fire Safety;
- Emergency Management; and
- Social and cultural awareness.

60. It is expected that compliance with these conditions is already part of the standard good workmanship and state of the art as generally required under this Contract. The item "Compliance with Environmental Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable HSE impact.

ANNEX IV: EXAMPLE FORMAT: HSE REPORT

Contract:
Period of reporting:
HSE management actions/measures:
Summarize HSE management actions/measures taken during period of reporting, including planning and management activities (e.g. risk and impact assessments), HSE training, specific design and work measures taken, etc.
HSE incidents:
Report on any problems encountered in relation to HSE aspects, including its consequences (delays, costs) and corrective measures taken. Include relevant incident reports.
HSE compliance:
Report on compliance with Contract HSE conditions, including any cases of non-compliance.
Changes:
Report on any changes of assumptions, conditions, measures, designs and actual works in relation to HSE aspects.
Concerns and observations:
Report on any observations, concerns raised and/or decisions taken with regard to HSE management during site meetings and visits.

Signature (Name, Title Date):
Contractor's Representative
Example Format: HSE Incident Notification
Provide within 24 hrs to the Supervising Engineer
Originators Reference No:
Date of Incident: Time:
Location of incident:
Name of Person(s) involved: Employing Company:
Type of Incident:
Description of Incident:
Where, when, what, how, who, operation in progress at the time (only factual)
Immediate Action:
Immediate remedial action and actions taken to prevent reoccurrence or escalation
Signature (Name, Title, Date):
Contractor's Representative

ANNEX V

GRIEVANCE REDRESS FRAMEWORK FOR KOGI STATE ACReSAL

a. FIRST Level of Grievance Redress in Kogi ACReSAL
Community Level of Grievance Redress in Kogi ACReSAL

Members

i. One Representative of the Eze (Community head);
ii. One Representative of the Women group;
iii. One Representative of the Focal NGO;
iv. One Representative of Community Association (CA);
v. Four Representative from Site Committee (SC);
vi. Secretary Site Committee as Secretary;
vii. Chairman Site Committee as Coordinator.

b. Second Level of Grievance Redress in Kogi ACReSAL
Local Government/ Community Grievance Redress Committee (LGRC)

Members

viii. One Representative of the Cas;
ix. One Representative of the Host Communities King;
x. One Representative of the LGA (Technical Officer);
xi. One Representative of the Ministry of Lands (ACReSAL Technical Committee Member from Lands);
xii. Assist. Social Livelihood Officer (Kogi ACReSAL) as Secretary;
xiii. Environmental Safeguard Officer (Kogi ACReSAL);
xiv. Social Livelihood Officer (Kogi ACReSAL);
xv. Focal NGO as Coordinator.

c. Third Level of Grievance Redress in Kogi ACReSAL
State Grievance Redress Committee (SGRC)

Members

i. One Representative of the Ecology Department (Ministry of Environment and Sustainability);
ii. One Representative of the Ministry of Lands;
iii. One Representative of the Ministry of Justice;
iv. The Project Accountant (Kogi ACReSAL);
v. Focal NGO;
vi. Social Livelihood Officer (Kogi ACReSAL) as Secretary;
vii. Project Coordinator (Kogi ACReSAL) as Coordinator.

d. Fourth Level of Grievance Redress in Kogi ACReSAL
National Grievance Redress Committee (NGRC)

Members

i. The Permanent Secretary Ministry of Environment;
ii. Focal NGO;
iii. Social Livelihood Officer (Kogi ACReSAL);
iv. Social Livelihood Specialist (Federal ACReSAL);
v. Two Representative of Project Affected Persons (PAPs);
vi. Social Livelihood Officer as Secretary;
vii. Project Coordinator (Kogi ACReSAL);
viii. Umbrella NGO as Coordinator.

e. Fifth Level of Grievance Redress in Kogi ACReSAL
The Courts

NOTE: All grievances will first of all be addressed at the First Level. It will only move on to the Second Level if the first level agreement was not accepted by the party involved and then to third then to the fourth under similar situations.

If a party is not satisfied with the outcomes of Levels I, 2, 3 & 4, then He/she can take the case to the Law Courts (the Fifth Level).

ANNEX VI: MEETING ATTENDANCE

KOGI STATE AGRO-CLIMATIC RESILIENCE IN SEMI-ARID LANDSCAPES PROJECT (KG-ACReSAL)

UPDATE OF THEESMP STUDY FOROMIGBO CHANNELIZATION SITE UNDER KOGI STATE ACReSAL

STAKEHOLDERS'S ATTENDANCE SHEET

S/N	Name	E-mail	Phone No	Position	Sign.
1	Folorunsho Elizabeth		08062965875		
2	Rufus Gubai Rachael		07066184702		
3	Aupe John		08148357943		
4	Olagunloluwa Titilayo R		08133661501		
5	Omole modupe		09017767040		
6	Adeola Bose		09034325268		
7	Joseph Hannah		08140360184		
8	Oforumado Rachael		08119805949		
9	Fatimoh Aruna		08106167065		
10	Mary michael		08136764445		
11	Esther Olayinka		07059896767		
12	Olorunshaye Idowu		08144249592		
13	Aderibigbe funke		09131192486		
14	Omolayo Abejide		08106611725		
15	Ogunmakinwa Bolaji		08137086171		
16	Grace David Aina		08104225458		
17	Osatuyi Monday		09053818614		
18	Abiola folashade		09160711975		
19	Bosede Thomas		07139723623		
20	Bamikole Bosede		09166119933		
21	Ibidun		08032674555		
22	Ojo Esther		08139778056		
23	Mercy Mark		08133515248		
24	Gabriel victoria		07063523619		
25	Yaru matthew		09068377791		
26	Aledare Esther		08103497117		
27	Rufus Adeola		09068972574		
28	Ojo matthew		09068374791		
29	Olubiyo Helen		08135737445		
30	David femi		09024145780		
31	Adeola folashade		08165167453		
32	Oluwalose-ji Raphael		08115320450		

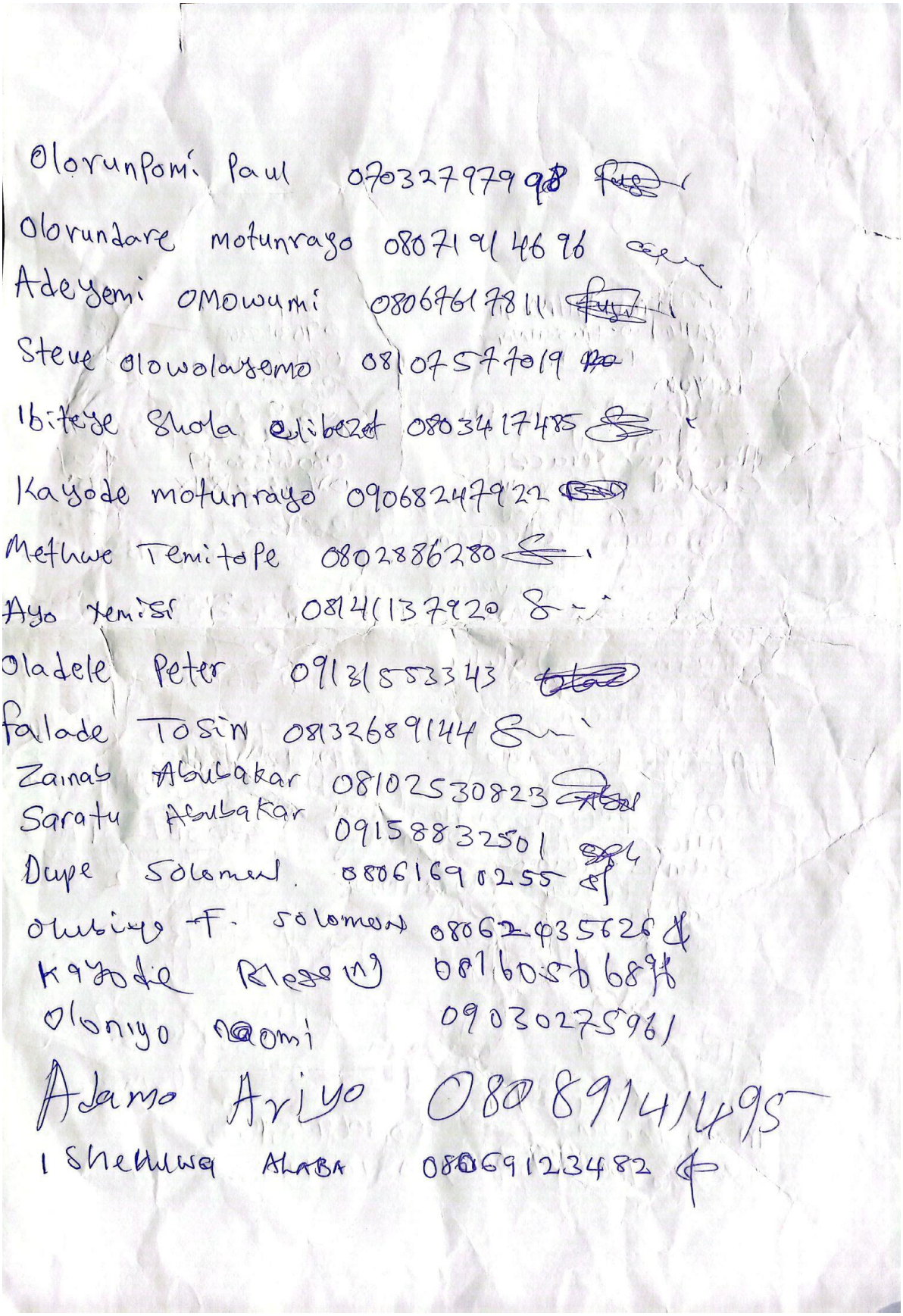
33 Roseline Abejide 08075880906
34 Dupe paul 09036481785
35 Michael Bukola 08108487166 m.s
36 Bello Elizabeth Anla 09047812960
37 Ezekel Bonibayede 09033546073
38 Danel mary 09156269322
39 olonyo Temitope 09063785919
40 Bukola stephen 07065971962
41 Emmanuel oyomi 0963891[illegible]13
42 michael oluwapemi 07044229490
43 Raphael oloruntoba 08129568109
44 Imikaye modupe. 08138025716
45 Mary motojeki 08130822864 m.m
46 oladele Vicent 09117039590
47 FOLORUNSHO JOSEPH
48 ESTHER OLORUNFEMI
49 MAYOWA OLORUNFEMI
50 ABIGAIL JETHROW

KOGI STATE AGRO-CLIMATIC RESILIENCE IN SEMI-ARID LANDSCAPES PROJECT (KG-ACReSAL)

UPDATE OF THEESMP STUDY FOROMIGBO CHANNELIZATION SITE UNDER KOGI STATE ACReSAL

STAKEHOLDERS'S ATTENDANCE SHEET

S/N	Name	E-mail	Phone No	Position	Sign.
1	MR AJIBADE Augustine		08035671690	Chairman	
2	Pastor Solomon Ibor Oloyo		08065424228	Member	
3	Chief Abolusoro Joseph		08060342854	Member	
4	MR Paul Ayo		08075477774	Sec	
5	Otedeke Sunday		08060420002	member	
6	Pastor Paul Olarewaju		08034187	Exchange	
7	Pastor OSHE		07068742107	member	
8	OBASAJU Adebayo Joseph		08034493135	ASST Secty	
9	Adetunwise Emmanuel		08067505726	member	
10	Abraham Adeloju		08065325066	member	
11	Otedeke Christiana		07066961290	Member	
12	Pastor Iyke ~~Joseph~~ UMENSOFOR		08039736884		
13	Miracle O. Umensofor		08103062578	member	
14	Comfort Mathew		08049976958	Member	
15	Gabriel O. Bello		08063109887	Member	
16	Olaniyan Tunwayo		08060639145	member	
17	Idris Felix		08060153736	member	
18	Peter Ovi		08057232855	member	
19	Ayobami Emmanuel		07038244800		
20	Olarewaju L.M.		07032039746		
21	Toyin Anthony		08036429956		
22	Felicia Joseph		08065447597		
23	Joseph Kola		07032765197		
24	Funsho Veronica Dada		08037460777		
25	Amupitan Yemi Alice		08104384674		
26	Alegbam Esther		08132206621		
27	Peluwi Clement		08052783711		
28	Esther Ibietan		07067398194		
29	Latifat Jamiu		07030587735		
30	Anah Yoko		08062913899		
31	Ruth Olorunfemi		07032222587		
32	Funsho Christianah		08000274879		
33	Emmanuel Sunday		07030855071		
34	Ayeji Dare		08032266501		
35	Samuel Mary		07052683848		
36	Amputal Abel		08037557033		
37	Abolusoro Omoloka		07030604529		
38	Adeyemi John		08162608367		
39	Olufemi Felix B.		08164012903		
40	Abu Jumai		08143850586		



Olorunpomi Paul 07032797998
Olorundare motunrayo 08071914696
Adeyemi OMowumi 08067617811
Steve olowolayemo 08107577019
Ibiteye Shola Olibeat 08034117485
Kayode motunrayo 09068247922
Methwe Temitope 08028866280
Ayo Yemisi 08141137920
Oladele Peter 09138553343
Falade Tosin 08132689144
Zainab Abubakar 08102530823
Saratu Abubakar 09158832501
Dupe Solomon 08061690255
Olubiyi F. Solomon 08062035626
Kayode Rasaq 08160576895
Oloniyo Raomi 09030275961
Adamo Ariyo 08089141495
I Shekwo Abba 08069123482

KOGI STATE AGRO-CLIMATIC RESILIENCE IN SEMI-ARID LANDSCAPES PROJECT (KG-ACReSAL)

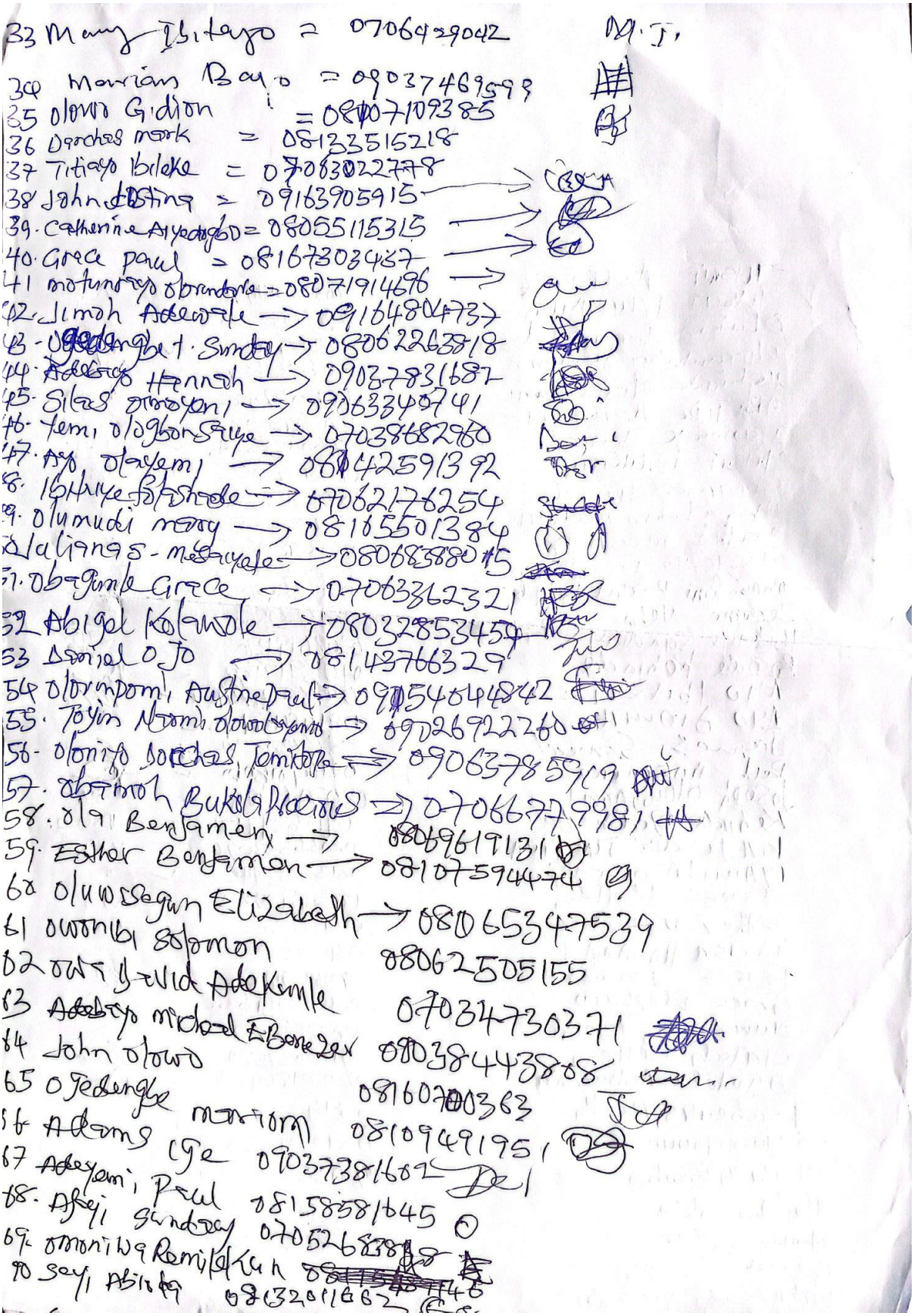
UPDATE OF THEESMP STUDY FOROMIGBO CHANNELIZATION SITE UNDER KOGI STATE ACReSAL

STAKEHOLDERS'S ATTENDANCE SHEET

S/N	Name	E-mail	Phone No	Position	Sign.
1	IBRAHIM KHADIJAH		08145815288		
2	IBRAHIM O. HUSSEINAT		07031538S		
3	Paul Roseline		08164018060		
4	KHADIJAH		08060		
5	JAMES A. Oluchan		08060680		
6	Tolu J. T		08038227288		
7	Abegunrin Grace		08062580089		
8	Comfort Olorunsanu		08133531878		
9	Nasiru Jeen Mosood	09154044712			
10	Abiodun Oluchan	070	36833894		
11	Joseph Tunde oluchan		08066725735		
12	Iyabo marvelous oluchan				
13	Tomosoni Mary		0703563788		
14	Taiye Jimoh	070 32763703			
15	Mary John		08136714430		
16	Janet Gbadebo		08076245092		
17	Elizabeth Anne Bello		09047819G		
18	Abiodun Blessing		09037 05 5		
19	Abigail O. oye	080612	67		
20	Kayode Benson	09063	10		
21	Ojo peter Shadrach		08032841		
22	Alice Ngeyi Ogunlaye		08037223178		
23	John J. Alaba		09163905915		
24	Mojisola Olorunfemi		08060778230		
25	Juliana Oye		08166716878		
26	Oluwo Godson		08107109385		
27	Job Oluwo		08149587941		
28	Oluwo Victor		07084253		
29	Iyabo Owoshuyi		09164804737		
30	Ilugbemi Elizabeth		08136325588		
31	Ibitoye Shade	08134	22		
32	Abubakar Bilal		08058067031218		

Mary Jerome 08064355153

Adejoke Isaac Testimony 08104120586

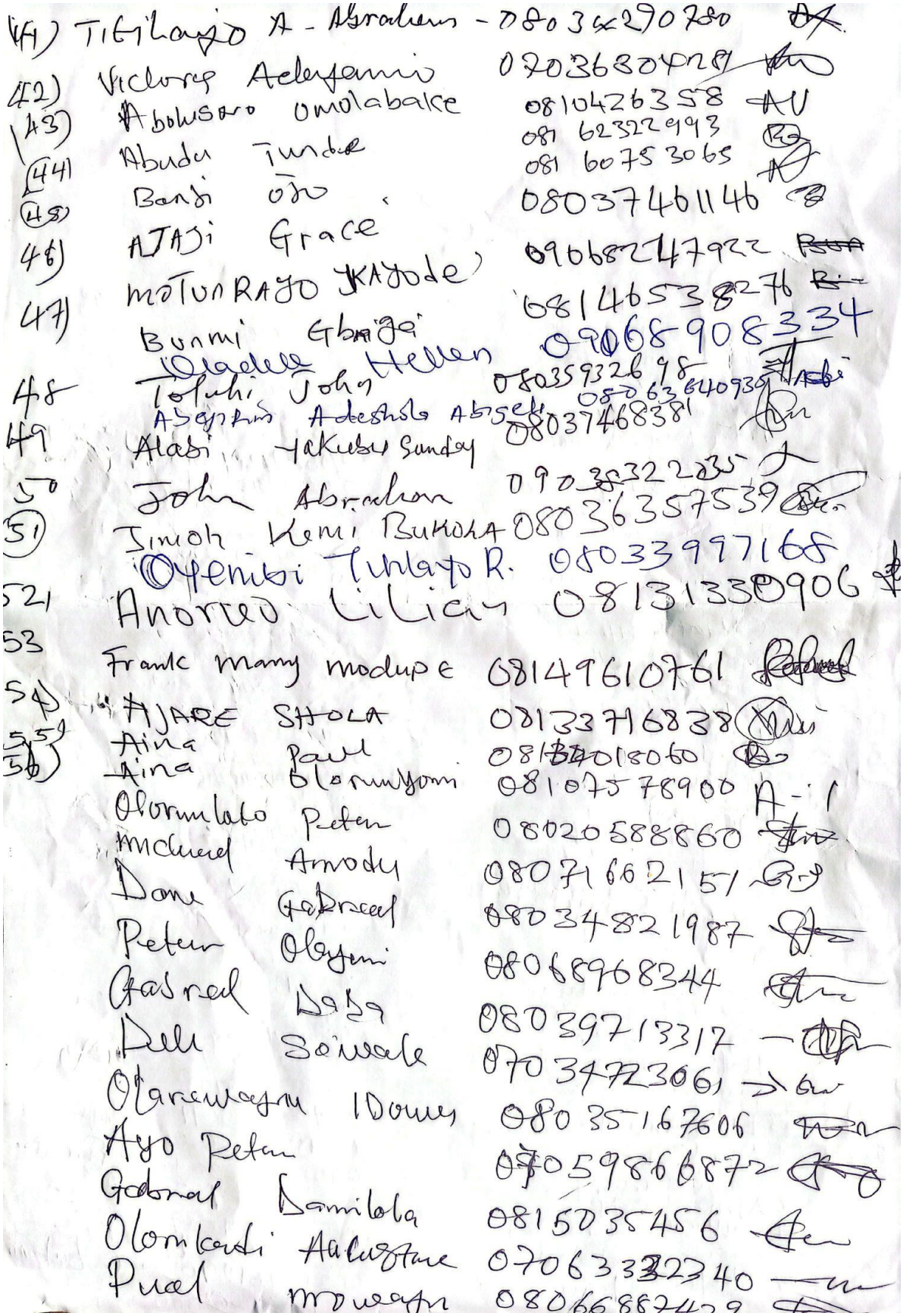

33 Mary Ibitayo = 07064290422
34 Mariam Bayo = 09037469598
35 Olowo Gidion = 08107109385
36 Oyeches mark = 08133515218
37 Titiayo bileke = 07063022778
38 John Ebiring = 09163905915
39. Catherine Aiyedogbon = 08055115315
40. Grace paul = 08167303457
41 motunrayo oborunleke = 08071914696
42. Jimoh Adewale → 09164804737
43 - Ogedengbe t. Sunday → 08062263818
44. Adeoye Hannah → 09037831687
45. Silas Omoyoni → 09063340741
46. Yemi Ogbonsaye → 07038682980
47. Ayo Olayemi → 08142591392
48. Ibitoye Ebenezer → 07062176254
49. Olumudi mary → 08185501384
50. Aliyu s. Musa → 08068588015
51. Obagunle Grace → 07063862321
52 Abigal Kolawole → 08032853459
53 Daniel Ojo → 08143766329
54 Olorunpomi Austine Paul → 09154048442
55. Toyin Naomi Oluwayomi → 09026922260
56. Oloniyo Oyeches Tomiwa → 09063785919
57. Oluwatoyin Bukola Precious → 07066777981
58. Ola Benjamen → 08069619131
59. Esther Benjamen → 08107594474
60 Oluwasegun Elizabeth → 08065347539
61 Owonibi Solomon 08062505155
62 Owoyele David Adekunle 07034730371
63 Adeoye michael Ebenezer 08038443808
64 John Olowo 08160700363
65 Ogedengbe mariam 08109491951
66 Adams Oge 09037381602
67 Adeyemi Paul 08158581645
68. Akeji Sunday 07052688888
69 Omoniwa Remilekun 08115481746
70 Seyi Abiola 08132011662

KOGI STATE AGRO-CLIMATIC RESILIENCE IN SEMI-ARID LANDSCAPES PROJECT (KG-ACReSAL)

UPDATE OF THEESMP STUDY FOROMIGBO CHANNELIZATION SITE UNDER KOGI STATE ACReSAL

STAKEHOLDERS'S ATTENDANCE SHEET

S/N	Name	E-mail	Phone No	Position	Sign.
1	YUSUF AMBROSE		07030564449	MEMBER	
2	YUSUF IMUKAILA		08066539262	✓	
3	OLufemi Emmanuel		08035920620	✓	
4	Oloruntoba Jerom		08065616879	✓	
5	Kehinde Olorunyomi		08131072082	✓	
6	ABEJIDE ABIODUN		07031920032	✓	
7	IBinaiye Janet		08066103524	✓	
8	Yusuf Bilikisu		08061673852	✓	
9	Gonimo Jimoh		08069685181	✓	
10	Abraham Adelolu		08068325006	✓	
11	David Monday		08109806360	✓	
12	Arolcoyo Fimilayo		08065766287	✓	
13	Olorun fimi Patrick Kolapo		08060688058	✓	
14	Jerome Ndbi		08136325683	—	
15	Ibiniye Sunday		08023577836	—	
16	Bode Kehinde		07039177393	—	
17	Ayo Ibitoye		08867578741	✓	
18	Ayo Jimoh		08149150142	✓	
19	James Samuel		08161300731	✓	
20	Paul Adeshina		08164018010	✓	
21	Joseph Olorunnoni		08077163483	✓	
22	Kehinde Ojedapo		07063971710	—	
23	KAJO d'JUSTINA		08066553076	✓	
24	IYAMOLA Owoseyi		08137557942	✓	
25	Olayemi Hellen		08065643980		
26	Esther Kehinde		08064123128		
27	Idris HASSAN T		08164123128		
28	LATEEF Akorede		07034517006		
29	Grace Elegbede		08102578163		
30	Oluwatosin Ajayi		07025529737		
31	Elojah Hellen		09160037584		
32	Ayodele Anthonia		08050480486		
	Zacchaeus Reuth		08143285067		
	Segun Gomin G		08100133777		
	Ngozi Azomba		08036525052		
	Ibilola Oke		07150815828		
	Okeke Esther		07134730792		
	Bose Joseph		09037895099		
	Otori Kasi Augustine		08163333340		


41) TIGILAYO A - Abraham - 08034290780
42) Victory Adeyemi 07036804281
43) Abolsoro Omolabake 08104263558
44) Abudu Iyabo 081 62322993
45) Bandi Ojo 081 60753065
46) AJAJi Grace 08037461146
47) MOTUNRAYO (KAYODE) 09068247922
Bunmi Gbadeja 08146538276
Olaolu Helen 09068908334
Tofuhi John 08035932698
Ayanfunmi Adeshola Abisola 08063640939
48 Alasi Yakubu Sunday 08037468381
49 John Abraham 09035322837
50 Imoh Kemi Bukola 08036357539
51) Oyenibi Tunlayo R. 08033997165
52) Anorue Lilian 08131330906
53 Frank many modupe 08149610761
54) AJARE SHOLA 08133716838
55) Aina Paul 08140180160
56) Aina Blessyom 08107578900
Olorunlobo Peter 08020588860
Michael Amody 08071662151
Dare Gabriel 08034821987
Peter Olayemi 08068968344
Gabriel Dada 08039713317
Dele Soiwale 07034723061
Olaniwaju Idowu 08035167606
Ayo Peter 07059866872
Gabriel Damilola 08150354560
Olomkadi Augustine 07063322340
Paul Mowoyin 08066882479

KOGI STATE AGRO-CLIMATIC RESILIENCE IN SEMI-ARID LANDSCAPES PROJECT (KG-ACReSAL)

UPDATE OF THEESMP STUDY FOROMIGBO CHANNELIZATION SITE UNDER KOGI STATE ACReSAL

STAKEHOLDERS'S ATTENDANCE SHEET

S/N	Name	E-mail	Phone No	Position	Sign.
1	Samuel 14960		08138815711		
2	Mary Jeromy		08064351S		M. J
3	Akerele. O. Victoria		07031025942		
4	ebelaJ. A4469		08100131481		
5	Chief Funsho Olorunbon		08038654809	Head	
6	Baneka Sunday Ekidow		08035907560	"	
7	Obasa Janet		08063069590		
8	Odunayo Amboose		08162664497		
9	Bola Amboose		07025929473		
10	Abigeal Folakes		09164192426		AF
11	Regina Badogun		08064405134		R B
12	Oluetan seyi		08137785289		
13	Olorunmaiye Bose		07064662914		
14	Oluetan Iyabo		09138596468		
15	John Segun Samuel		08135417728		
16	Grace Elegboro		08037461146		
17	Samuel mary		07052683848		
18	Ologunlowa Praise		08063107328		
19	Ologunlowa Samuel		07088545914		
20	Ige olarewaju		07014634088		
21	Benjamen oladeleolanide		07033432931		
22	Tolorunshogbon Afodele m		07061947167		
23	Ogedegbe Jeromy		08038524055		
24	Benjamin folake		07068128609		B. J.
25	Opeyemi Benjamin		08061443899		
26	Ogedegbe Idowu Sunday		08062263318		
27	Wumi Rehinde mary		09037323674		W. M.
28	Oluetan ojo		08032294034		O. I
29	Gomino Sunday		09137550095		
30	Abiodun olarewaju		08156174419		
31	Oluetan Joseph Tunde		08066775935		
32	Oluetan Abiodun		07036883894		A. B
33	Sadiq Tayudeen		09043178888		ST
34	Bilkisu Rabiu		09030002437		BR
35	Bashir Rafat Olutayo		08035248313		BR
36	Olusa Hellen		09069248292		CH
37	Sadiq Blessing		09054927727		
38	OLORUNMAGBA SAMUEL		09032022483		
39	SAMUEL RUTH		09033899242		
	Olorunmaiye Joseph		09012273410		
(41)	Ajayi Tinuke TINA		08131329935		

ANNEX VII: GBV REFERRAL CENTRES

GENDER-BASED VIOLENCE (GBV) SERVICES

REFERRAL DIRECTORY for KOGI STATE, NIGERIA

	Name & Address of Organization	Coverage Area	Contact Information
A	**HEALTH – Closest referral hospital**		
B	**PSYCHOSOCIAL COUNSELING**		
	Renaissance Lifeline Foundation (RELIEF) Off Estate Road, Nagazi, Adavi LGA	• Ajaokuta • OkeneOkehi	Innocent Ibrahim Anomi 080-3627-8188
	Foundation for Enhancement and Promotion of Family Life (FEPFL) No.10b NIWA Headquarters Road, Adankolo, Lokoja	• Lokoja • Okene • Adavi • Ofu • Olamaboro • Dekina	John Amabi 080-6565-9796
C	**SHELTER/SAFE HOUSE**		
	Dual Care and HIV Prevention Initiative (DCI) No. 7 Salihu Ibrahim Road, Along Kogi State Government House Lokoja	• Okene • Okehi/Adavi	Roseline Alabi: 080-3619-2684 Jimoh Okene: 070-3139-8833 Adamu Moses: 080-3605-0229 Aloko Titus: 080-6417-3987
	Diocesan Action Committee on AIDS (DACA) Opposite First Bank of Nigeria Plc, Anyigba	• Olomaboro • Dekina	Samuel Audu 081-0013-4898; 080-5124-1996
D	**SOCIAL RE-INTEGRATION & ECONOMIC EMPOWERMENT**		
	Teen Education Development and Information Initiative (TEDIIN) Obason Plaza, Opposite Idrinana Hotel, Lokogoma, Lokoja	• Ijumu, Yagba West • Kabba Bunu • Okene • Okehi • Adavi • Ajaokuta • Dekina	Titus A Alonge 081-3827-9795
	Lift Up Care Foundation (LUCAF) GP 705, Olobayo Estate Behind Division 'C' Police Station Ganaja Village, Lokoja	• Lokoja • Ankpa • Okene	Idris Ozovehe Muraina: 070-6379-7550 Adegbe Ugbede (Lokoja) 070-3243-7609 Adamu Memunat (Ankpa): 070-3116-1493 Okeji Fatayat (Okene): 080-6617-7778
E	**COMMUNITY MOBILIZATION & ADVOCACY, EDUCATION & IEC SENSITIZATION**		
	Global Hope for Women and Children (GLOHWOC) Kabba Road, Kabba	• Okene • Kabba	Barr. Christie Abayomi 080-3215-3120
	El-Sophi Community and Child Care Initiative (ELSOPHI) Anyigba, Dekina LGA	• Dekina	Japhet Omaye 080-6218-1034
	Achievers Initiative Nigeria Plot 127 - 128 Lokogoma Layout, Off Ganaja Rd, Lokoja	• Basa • Lokoja	Mr Nathaniel Abaniwo: 080-3658-1956 achivers.ng@yahoo.com
	Kindling Hope Across Nations Initiative (KHAN) No 8 Okondo Shopping Plaza, Beside Conoil, Kabba Junction, Okene	• Okene • Kabba-Bunu	Mr Vincent 080-6010-0324
	Youth & Women's Health Empowerment Project (YAHWEP) No. 33, Okene-Kabba road, Opposite Airtel Office, Ganaja Junction, Lokoja	• Adavi • Yagba West • Isanlu • Omala Kogi	N/A
	Better Health Communication Development (BHECOD) No 7, Pastor Ayaba, Ganaja Road, Lokoja	• Basa • Lokoja	Segun Ojo 080-2292-7935
F	**LEGAL ASSISTANCE**		
	Justice Development & Peace Commission (JDPC) Catholic Cathedral Church, Opposite National Open University Lokoja	• Okene • Kabba • Bunu • Koton Karfe • Mopa • Yagba East & West • Adavi •Ajaokuta • Okehi	Simon Enejor 080-3627-0402
	Participation Initiative for Behavioral Change in Development (PIBCID) Opp Kafas Multipurpose Hall, Phase 2, Lokogoma, Lokoja	• Adavi • Igala-Mela	Gift Omoniwa: 080-3634-6070 pap8kogi13@yahoo.com
	FIDA Lokoja, Obason Plaza,Opp. Idrinana Hotel, Phase 2, Lokoja	• Lokoja	Barr. Christie Adejumo: 080-3679-2295
	Justice Centre for Women & Children	• Lokoja	Barr. Janet Makun: 080-3377-7446
G	**LAW ENFORCEMENT**		
	Kogi Area Command, Nigerian Police Force	• Lokoja	SPO Comfort Otuku: 070-3577-5208
	Nigerian Security & Civil Defense Corps (NSCDC)	• Lokoja	Mrs. Eucharia Okereke: 081-6336-4644
H	**ALL CATEGORIES**		
	Kogi NGO Network (KONGONET)	• Lokoja	Mr. Victor Adejoh: 080-6496-3303
	Initiative for Grassroots Advancement (INGRA) Along Dunamis Road, After Federal University Lokoja	• Lokoja	Hamza Aliyu: 080-3317-7259 ingralokoja@yahoo.com
	Development and Female Gender Initiative (DEGENDER) No 40, Ganaja Ajaokuta Road, Opp Saharr Plaza, Lokoja	• Lokoja	Comrade Rajan Sulaiman: 080-3601-3322 globaltour2006@yahoo.com
	Community Life Advancement Project (CLAP) Opposite Federal University Lokoja	• Kabba • Okene • Lokoja • Ankpa	Rallat Isiyaka: 080-3313-9486 isiyakaliyat@gmail.com
	Power Relief Organization, Iyala Road, Anyigba	• Ankpa • Ofu • Olomaboro, • Ibaji	Bishop Igomu 080-6661-1397
	Diocesan Action Committee on Aids (DACA) Opposite First Bank of Nigeria Plc, Anyigba	• Olomaboro • Dekina	Samuel Audu 081-0013-4898; 080-5124-1996

• **DAYS OF OPERATION**: Monday – Saturday (Organizations can be reached directly on Sundays • **HOURS OF OPERATION**: 8:00AM - 4:00PM • **SERVICE FEES**: Nil

The compilation and printing of this directory was made possible with support from USAID FROM THE AMERICAN PEOPLE Maternal and Child Survival Program

ANNEX VIII LANDMARK

S/N	Name	Latitude	Longitude
1	CAC Lane	7.82107	6.08165
2	Daddy Shows House	7.82223	6.07964
3	Street	7.82288	6.07969
4	Playing Ground	7.82301	6.07982
5	Esirister Church of Christ	7.82086	6.07991
6	Owohunwa	7.82398	6.07815
7	Emmanuel Primary School	7.82193	6.07994
8	Deeper Life Church	7.82129	6.07997
9	Oju Tower Ministry Church	7.81825	6.08001
10	Kilenfe	7.82166	6.07811
11	Oju TAC Church	7.81817	6.08045
12	Obadofin	7.81862	6.07796
13	Ago Alahji Shuaibu	7.82318	6.08047
14	RCCG Fasagba	7.82005	6.08063
15	Emmanuel Anglican Church	7.82127	6.08073
16	Basic Nursery and Primary School	7.82068	6.08086
17	Mummy Adeoti Lane	7.82146	6.08110
18	Obafayo	7.81733	6.08119
19	CAC Wosem	7.82212	6.08156
20	School	7.81584	6.07703
21	Funsho Street	7.82193	6.08163
22	Ajibero	7.82212	6.07816
23	Obada	7.81815	6.07660
24	CAC Agbala Wura	7.82076	6.08252
25	Oloninuha	7.82120	6.07235
26	Akefe 2 Church	7.81965	6.07376
27	Olorunnado	7.82305	6.07402
28	Ako Line	7.82247	6.07423
29	Akefe Settlement	7.82216	6.07456
30	Akefe	7.82038	6.07418
31	CAC Okebikun	7.82135	6.08187
32	Akefe 2	7.81830	6.07526
33	Oke Padi	7.82035	6.07568

S/N	Name	Latitude	Longitude
34	Oju	7.81916	6.07894
35	Reedemed Church	7.82487	6.07902
36	Alausa Day Care	7.82136	6.07909
37	Willys House	7.82388	6.07956
38	Gbadebo	7.82004	6.07960
39	Alhaji House	7.82237	6.07962
40	Odo Ero Quarters	7.82778	6.07134
41	Fehinti Quarters	7.81718	6.07237
42	Fehinti Road Kabba	7.81648	6.07377
43	Obaro Kabba	7.83123	6.07233
44	Iyah Kabba	7.81314	6.07893

Schools

S/N	Name	Latitude	Longitude	Category	Management	Ward name
1	Immanuel Primary School	7.82151	6.08012	Primary	Public	Aiyeteju/Kajola
2	Home Economic Centre Primary School Kabba	7.82487	6.06899	Primary	Public	Aiyewa
3	St Andrew Primary School	7.82409	6.07028	Primary	Public	Aiyewa
4	St Mary Primary School	7.82379	6.07502	Primary	Public	Aiyewa
5	Methodist Local Education Authority School	7.82546	6.06844	Primary	Public	Aiyewa
6	Kajola Primary School	7.82567	6.08036	Primary	Public	Asuta
7	Baptist Primary School Kabba	7.82964	6.08069	Primary	Public	Asuta
8	Aunty Yetunde Primary School	7.83179	6.07814	Primary	Private	Asuta
9	Ayobami Nursery and Primary School	7.82575	6.07873	Primary	Private	Bolorunduro/ Odoakete
10	Oloruntobi Nursery and Primary School	7.81846	6.06378	Primary	Private	Odolu
11	St Joseph Home Economic Centre Kabba	7.81596	6.07441	Primary	Public	Odolu
12	Demonstration Primary School	7.83808	6.07602	Primary	Public	Okekoko
13	TAC Primary School Kabba	7.83137	6.07231	Primary	Public	Okekoko
14	St Clement Local Education Authority Primary School	7.81441	6.08183	Primary	Public	Out/Egunbe
15	Jama At Nasril Islam Primary School	7.83992	6.08749	Primary	Public	Out/Egunbe
16	St Augustine College	7.82472	6.07565	Secondary	Senior	Aiyewa

17	St Andrew Universal Basic Education Junior Secondary School	7.82488	6.07091	Secondary	Junior	Aiyewa
18	Comprehensive Secondary School Korede	7.82550	6.08536	Secondary	Standard	Asuta
19	St Monica Secondary College	7.82945	6.08249	Secondary	Standard	Asuta
20	Universal Basic Education Junior Secondary School Kabba	7.82639	6.08096	Secondary	Junior	Asuta
21	St Barnabas Secondary School Kabba	7.81810	6.06708	Secondary	Aggregate	Odolu

Health Facility

S/N	Name	Latitude	Longitude	Category	Ownership	Ward name
1	St Mary Primary Health Centre	7.82274	6.07324	Primary Health Centre	Public	Aiyeteju / Kajola
2	Aiyeteju Primary Health Centre	7.82364	6.07436	Primary Health Centre	State Primary HealthCare Development Agency	Aiyewa
3	Kabba General Hospital	7.82396	6.08946	General Hospital	State Ministry of Health	Asuta
4	District Health Unit, Owode	7.83598	6.07438	Primary Health Clinic	State Primary HealthCare Development Agency	Okekoko
5	Kabba Family Support Programme Clinic	7.83174	6.07442	Primary Health Clinic	State Primary HealthCare Development Agency	Okekoko

ANNEX IX: STAKEHOLDERS CONSULTATION

Issues Raised at the Town Hall Meeting

Date of Consultation: 0908/2023 Time: 5:30 pm Venue: Chief Abejirin's Compound, Kabba	
Stakeholders in Attendance	• **Elders, Women and Youth, other members of the communities, Kogi State ACReSAL Environmental Safeguard Officer and the ESMP Consultancy team**
Language	**Yoruba and English**
Items	**Stakeholders' comments and views**
Opening Remark	• The meeting was called to order with an opening remark given by the ACReSAL Environmental Safeguard Officer (Mr. Samson Benu). • He requested for an opening prayer which was said by one of the stakeholders Pastor Paul Olarenwaju • Mr. Samson welcomed and appreciated the untiring efforts of the community members and leaders each time the team visited the community and stated that the agenda of the ESMP from ACReSAL was to update and determine the current baseline studies of the environment and to assess the environmental and social impact of the project on the community. • He stated that the gully erosion project which will be carried out by ACReSAL (Agro Climatic Resilience in Semi-arid Landscapes) had started with the NEWMAP (Nigeria Erosion and Watershed Management Project) long ago and that the consultant who came to Kabba sometime back for environmental and social management plan is here with his team to update the information that was elicited before. • Mr. Samson explained to the stakeholders that members would be categorized into demographic groups during the breakout session in order to capture necessary information from each category. • Subsequently, he introduced the ESMP consultancy team and team lead (TL), whilst informing the stakeholders about their functions and sought for their cooperation in ensuring the success of the assessment. • The consultant explained that the design for the project as proposed before is still the same. • He also assured them that those who would come for compensation, for residents whose buildings or farmlands shall be affected, would actually come within the shortest possible time. • Moreover, he asked them: o if they would still like the project to be implemented; o about things that have changed regarding their environment as were surveyed in the previous environmental impact assessment; and • about what needs they would like to be integrated into the forthcoming project, based on the realities on the ground now.
Stakeholders' response	• The stakeholders said that gully hazard in their environment still persist and they would like the project to be carried out. • In addition, as a reminder of what had been promised initially, they will want their youths to be involved in the construction and general activities. • They also said there are new places around Omigbo river that have been affected by erosion which they want to be captured. • Similarly, they mentioned that Kano Road has been repaired but they want the bridge to be expanded. • The aged men and women complained that they are not given a small stipend anytime they are gathered together, and they asked to build a room or clinic, especially for those who suffer from high blood pressure and diabetes, where they can go and be attended to.

Summary of Issues Raised at FGD with Elders

Date of Consultation	**09/08/23** **Time: 5.40 pm**
Language	**Yoruba and English.**
Items	**Stakeholders' comments and views**
• **History of the gully erosion/flood**	• Chief Emmanuel Ogedengbe responded that the erosion started about twenty years ago. • He mentioned that once it rained, his house gets flooded and he had to relocate his family. • Chief Abejirin also responded that he had been living in the community since 1963. As at that period, the flow of the water was lentic and students could easily jump over. Subsequently, the issue got worsened about 30 years ago, the water gained momentum, eroded the land and the economic crops planted along the path. • He recalled that although the government intervened at some point, the issue remained unresolved. According to him, the gully would have cared in but beneath the ground lied some impermeable concrete of about 30 ft. which was not allowing the water to percolate. Thus, instead of the gully to cave in, the width of the gully became widened and started to encroach people's lands and properties.
• **What is the major Occupation of people in the community?**	• A member responded that there are traders, farmers, artisans, civil servants, and architects in the community.
• **What are the expectations of Elders during project implementation?**	• Quick completion of the project in due time to reduce damages • A solid construction intervention • Involvement of the youths and some of the men in the project-to-project jobs and alleviate poverty; • Payment of compensation to those whose properties will be destroyed; • Relocation of affected shrines in consultation with the operators of those shrines
• **Cultural/festivals activities that is unique to the communities of the project.**	• Oka festival takes place yearly in a day or two days within June where women and non-natives or even adult male that are not initiated must not be seen.
• **How is conflict resolved in the community?**	• Matters were resolved by the baba ladugbo (Community Chief) then to the Ololus (the council of chiefs), the Oba (Obaro) before escalating to the Police
• **Impact of the gully erosion/flood on the elders**	• The impact was worse during rainy season. About 4 years ago, it swept away and killed a boy • Some of the elders who were directly affected mentioned that the gully had destroyed their buildings, personal properties, farmlands and church. • Paul Ayo responded that his house was close to the water bank, then it was small until erosion started sweeping away his compound and crops. • Another elder also mentioned that he cannot access his house. In 2005, the width was just like a gutter where he placed a slab for people to pass through but for the past 2-3years now, he has been displaced. • A member mentioned that since he moved to the community in 2005, he has had to construct some embankments that failed until he consulted an architect whom took the soil sample and advised on the best method about six years ago. This method in a way has protected his properties till date.

Issues Raised at FGDs with Women

Date of Consultation: 09/08/2023	**Time: 5.40 pm**
Name of Stakeholders	**Women**
Language	**Yoruba and English**
Items	**Stakeholders' comments and views**
• **Is there any existence of women associations in the community?**	• The women responded that there were women associations in the community.
• **What is the major occupation of women in the community?**	• Women in the community were involved in trading and farming.
• **Are women afforded equality with men in leadership positions in the community? (Gender equity and equality)**	• Women were afforded equality with men in leadership positions in the community.
• **What are the expectations of women during project implementation?**	• The women expressed their readiness to work in various capacities during project implementation. • Specifically, they were ready to work as site laborers, food vendor, etc. • They expect funds for business and employment opportunities for the youths. • Also, there was the need for a dumpsite in the community. • Mrs. Janet A Eluetan mentioned that the youths should be employed during the construction
• **Are there cultural rites in the community which restricts women's access to economic and health services?**	• The women reported that there was the Oka festival usually in June where women must not participate in. It is communicated before the date.
• **In the event of criminal offences, are women and men treated equally?**	• In such event, women and men were punished equally. The mode of reporting was from the council of Chiefs to the Oba before they were reported at the Police station.
• **What are the channels, measures and programmes undertaken in order to increase women's safety by registering complaints?**	• Channel of reporting is from the council of Chiefs to the Oba before reporting to the Police station.
• **Is Female Genital Mutilation (FGM) practised within the community?**	• The women reported that FGM was not practiced in the community
• **Is early child marriage practised?**	• The women responded that early child marriage was not practised in the community.
• **Issues of Domestic Violence within the community?**	• According to a member, it was normal for couples to have misunderstanding in their relationships which sometimes led to some confrontations; misunderstandings however did not lead to any bodily harm or death. It was usually resolved within them amicably.
• **Issues of Rape or kidnapping of girls in the community?**	• The women expressed that there are no reported cases of rape or kidnap in the community.
• **Any restrictions for the female child in the community?**	• There were no other restrictions for females in the community asides the restrictions of the Oka festival on females.

Annex X: Issues Raised at FGD with Youth

Date of Consultation: 09/08/2023	Time: 5.40 pm
Language	**Pidgin-English and English. Translation to Yoruba**
Items	**Stakeholders' comments and views**
• Impact of the gully erosion	• The youths mentioned that the gully had destroyed buildings, personal properties, economic crops in the community. • It had led to loss of lives and displacement of persons. • It affected youth productivity and business especially during the rainy season
• Awareness of the proposed intervention	• The youth emphatically indicated that they were aware of the proposed project. • They also expressed that they were really expectant of its implementation as that would bring significant development into their community.
• Expectations of the youth during project implementation?	• The youth responded that they were grateful to ACReSAL for coming to their aid and saw this project as their own project • They would really like to be gainfully employed during the construction.
• Potential causes of restiveness in the community	• Sexual affairs with married women were totally frowned at in the community. Thus, the contractors having sexual affairs with married women would cause youth restiveness. • The youths should be informed by the contractors before talking to any woman in order to ascertain if she's single or not, otherwise, it would result to conflict. • Failure to employ many youths could also lead to conflict • There was also the issue of oppression by the foreigners

Annex XI
Traffic Management Plan (TMP) Risk on traffic and pedestrian safety due to construction traffic

COMPONENT **(Impact Description)**	CONSIDERATION	**Mitigation Measures**	**Implementation Plan**	**Responsibility**
Site Access and Parking Plan	Lot assignment	Investigate all construction areas and construction access routes for potential community interaction (with a particular attention to schools, children parks, etc.) with Project construction phase traffic. Based on results, develop and implement site specific measures (i.e. improve signage, visibility) and driver/operator trainings prior to initiation of any construction work	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan Community Health and Safety Plan Community Relations Management Plan Occupational Health and Safety Management Plan	Contractors
	Vehicle access and circulation • Parking area ingress • Pick-ups and drop-offs • Parking area egress	Implement access restriction at construction areas and access routes, by specifying restricted zones, (i.e. dangerous routes), fencing, barriers, etc. Install signs, signals, markings and other appropriate traffic regulation devices, including reflective and flashing signage for nighttime traffic safety, at all required sites.	Traffic (Transportation) Management Plan	Contractors
	Parking area design and operation	Install signs, signals, markings and other	Traffic (Transportation)	Contractors

	• Process component • Park component	appropriate traffic regulation devices, including reflective and flashing signage for nighttime traffic safety, at all required sites.	Management Plan	
	Parking occupancy monitoring	Provide appropriate information and labeling of occupancy of parking lots	Traffic (Transportation) Management Plan	Contractors
	Parking regulations	Ensure parking is well regulated around the project site and that drivers make use of appropriate paring spaces.	Traffic (Transportation) Management Plan	Contractors
	Traveler information	Get adequate information of routes of travelers especially the commercial drivers along the project site;	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan	Contractors / PIU
Traffic Flow Plan	Route planning • Corridor traffic flow route • Local traffic flow route	Where passage through existing settlements is unavoidable, take all necessary measures (i.e. speed limits, traffic signs, driver trainings) to prevent safety risks on local communities, engage with community representatives to plan the traffic by taking the daily life of the communities into account	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan Community Health and Safety Plan	Contractors
	Alternate routes	Avoid passage of construction traffic through the settlements, whenever alternative roads are present. Prioritize selection of material borrow sites and quarries in the areas that does not interact with public	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan Community Health and Safety Plan	Contractors / PIU
	Emergency access routes	Use only licensed firms for explosives delivery to ensure safety along the existing roads to be used for transport of explosives	Traffic (Transportation) Management Plan	Contractors / PIU
	Background traffic accommodation	None for the Omigbo intervention		
	Transit accommodation	None for the Omigbo intervention		
En-route Traveler Information Plan	Static signing	Provide information and awareness raising activities with stakeholders, communities including women, children and also disabled	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan	Contractors / PIU

	Changeable message signs	Provide information and awareness raising activities with stakeholders, communities including women, children and also disabled	Traffic (Transportation) Management Plan	Contractors / PIU
	Highway advisory radio	Provide information and awareness raising activities with stakeholders, communities including women, children and also disabled	Traffic (Transportation) Management Plan	Contractors / PIU
	Media	Provide information and awareness raising activities with stakeholders, communities including women, children and also disabled	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan Community Health and Safety Plan Community Relations Management Plan Occupational Health and Safety Management Plan	Contractors / PIU
	Other technology applications	Provide driving skills improvement trainings in consideration of the requirements of specific vehicles, machinery,	Traffic (Transportation) Management Plan	Contractors
Traffic Incident Management and Safety Plan	Crash prevention • Signing • Public information safety campaign	Conduct periodic medical checks for drivers/operators; Conduct periodic vehicle maintenance; Initiate construction only after relevant permits are obtained and all required measures such as signage, barriers, fencing, lighting, safety campaign etc. are taken.	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan Community Health and Safety Plan Community Relations Management Plan Occupational Health and Safety Management Plan	Contractors / PIU
	Service patrols	Allow only drivers/operators with valid licenses specific to each construction phase vehicle to drive/operate vehicles	Traffic (Transportation) Management Plan	Contractors
	Traffic incident quick clearance initiatives	Allow only drivers/operators with valid licenses specific to each construction phase vehicle to drive/operate vehicles.	Traffic (Transportation) Management Plan	Contractors

Pedestrian Access Plan	Pedestrian control • Pedestrian routing • Pedestrian crossing	Implement access restriction at construction areas and access routes, by specifying restricted zones, (i.e. dangerous routes), fencing, barriers, etc; Install signs, signals, markings and other appropriate traffic regulation devices, including reflective and flashing signage for nighttime traffic safety, at all required sites.	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan Community Health and Safety Plan Community Relations Management Plan Occupational Health and Safety Management Plan	Contractors
	Disabled accessibility	Implement access restriction at construction areas and access routes, by specifying restricted zones, (i.e. dangerous routes), fencing, barriers, etc. Install signs, signals, markings and other appropriate traffic regulation devices, including reflective and flashing signage for nighttime traffic safety, at all required sites; Provide access route for the disable through temporary and permanent structures following approved design.	Traffic (Transportation) Management Plan Stakeholder Engagement Plan Emergency Preparedness and Response Plan Community Health and Safety Plan Community Relations Management Plan Occupational Health and Safety Management Plan	Contractors / PIU
	Shuttle bus service • Service design • Station design • Management • Cost	Provide and or regulate shuttle bus services for workers.	Traffic (Transportation) Management Plan	Contractors / PIU
Traffic Control Plan	Freeway traffic control • Traveler information • Interchange operations	Install signs, signals, markings and other appropriate traffic regulation devices	Traffic (Transportation) Management Plan and Safety Management Plan	Contractors
	Street traffic control • Alternative lane operations • Route marker signing • Monitoring	Install signs, signals, markings and other appropriate traffic regulation devices; Provide alternative route and properly label and give directions.	Traffic (Transportation) Management Plan Stakeholder Engagement Plan and Safety Management Plan	Contractors / PIU
	Intersection traffic control • Turning movement lane balance • Traffic signal operations	Install signs, signals, markings and other appropriate traffic regulation devices; Provide alternative route and properly label and give directions. Ensure there is an	Traffic (Transportation) Management Plan Stakeholder Engagement Plan and Safety Management Plan	Contractors / PIU

		operator (Manual or Digital to operationalize traffic signal.		
Traffic Surveillance Plan	Closed-circuit television systems	Implement speed limits at all construction sites and monitor using technology	Traffic (Transportation) Management Plan	Contractors / PIU
	Feld observation	Implement speed limits at all construction sites and ensure compliance through monitoring	Traffic (Transportation) Management Plan	Contractors / PIU
	Aerial observation	Implement speed limits at all construction sites and ensure compliance	Traffic (Transportation) Management Plan	Contractors / PIU
	Media reports	Provide adequate media reports to sensitize the people.	Traffic (Transportation) Management Plan Stakeholder Engagement Plan	Contractors / PIU

Annex XII: Contractors's ESMP

Topic / Potential Impact	**Mitigation, Management and Enhancement Measures**	**Means of Verification**	**Responsibility**	**Monitoring Procedure**
Occupational Health and Safety				
Occupational Health and Safety	Provide H&S Training to the construction workforce (including sub-contractors, temporary workers and drivers)	Training performed and recorded	Contractor / SCO	Check Training Records
	Ensure site premises are provided with appropriate fencing (where applicable) and lighting. Use hazard notices/signs/barriers to prevent access to dangerous areas.	H & S planning of construction site done, items installed	Contractor	Random Site Inspection
	Ensure speed limits on site and on transporting routes	Speed signs installed	Contractor	Random Site Inspection
	Ensure the use of personal protective equipment (PPE) for workers	PPE used on-site by workers	Contractor	Random Site Inspection
	Maintain high standard in housekeeping on site	Good housekeeping on-site	Contractor	Random Site Inspection
	Ensure provision of Health and Safety (H&S) facilities at the project site, including shaded welfare areas, bathrooms and potable water	H & S Facilities provided at site	Contractor	Random Site Inspection
	Ensure that the workers camp and construction areas are open only to formal employees	Access controlled	Contractor	Random Site Inspection
Fire Prevention	Provide necessary fire prevention equipment on site in line with applicable regulations	Fire prevention equipment in place	Contractor	Regular Site Inspection

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Labour Rights	Ensure that workers have access to and are aware about the grievance mechanism	Grievance mechanism in place and grievance recorded	SCO/Contractor	Review of grievance register
	Ensure minimum legal labour standards as per ILO regulations (child/forced labour, no discrimination, working hours, minimum wages) are met	Grievance mechanism records Training recorded	Contractor	Inspection reports (also from labour authorities), review of grievance register and training record
	Provide hygienic, adequate facilities for workers, ensuring toilets and changing rooms are separated to male and female employees	Appropriate facilities in place	Contractor	Random site inspection
	Ensure the workforce has access to primary healthcare on site, providing prescriptions	Healthcare available on site	Contractor	Random site inspection
	Provide housing conditions in accordance with all applicable health and safety regulations and norms by ensuring the provision of adequate space, supply of water, adequate sewage and garbage disposal system, appropriate protection against heat, cold, damp, noise, fire and disease-carrying animals, adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting, and in some cases basic medical services	Appropriate housing conditions for workers	Contractor	Random site inspection Worker interviews
Ambient Air				
Dust emissions (especially in dry conditions)	Ensure watering of transportation roads during dry and windy conditions. Generally, keep roads in good condition	Watering conducted, roads in good conditions	Contractor	Random site inspection, inspection of roads
	Cover truck loads with canvas to avoid dust blow	Trucks covered	Contractor	Random site inspection
	Ensure optimal traffic routes. Enforce vehicle speed limits on unpaved roads	Speed limit signs Driver training records	Contractor	Random site inspection
	Ensure appropriate stockpile management (friable materials) to minimize dust blow. Minimize drop heights for material transfer activities such as unloading of friable materials	No extensive dust blow	Contractor	Random site inspection
Emissions from equipment and	Use equipment and vehicles in appropriate technical conditions. Provide emissions control equipment where applicable (e.g.	Technical specification sheet	Contractor	Each time new equipment/vehicle is used at the site

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
vehicles	filters)			Random site inspection
	Use low sulphur content fuels, in line with legal provisions in force as well as local availability	Technical specification sheet	Contractor	Random site inspection
	Ensure optimal traffic routes to minimize lengths of travel while avoiding settlements if possible	Optimal routes chosen	Contractor	Random site inspection
	Ensure vehicles and equipment are switched off when not in use	Engines switched off	Contractor	Random site inspection
Noise and Vibrations				
Noise and vibration impact at the construction sites and from construction traffic	Limit the hours of operations for specific pieces of equipment or operations, especially mobile sources operating through community areas or close to residential houses (typically between 10pm and 7am). Avoid vehicle movements at night	No work conducted between 10pm and 7am / grievance mechanism	Contractor	Random site inspection, Review of filed grievances, review of timesheets of workers
	Use of state-of-the-art technology and limit the number of machines operated simultaneously	Grievance Mechanism	Contractor	Spot checks, review of filed grievances
	Ensure the use of modern and well-maintained equipment (e.g. use of silencers)	Technical specification sheet	Contractor	Random site inspection
	Set traffic speed limits. Verify drivers' behaviour with respect to driving speed and safety	Speed limit signs Driver training Records as part of induction training	Contractor	Random site inspection, review of training records
	Plan vehicle routes to avoid settlements where possible	Safest routes selected, Grievance Mechanism	Contractor	Review of traffic routes, review of filed grievances
	Use protective hearing equipment for workers conducting noisy activities	Protective hearing equipment used	Contractor	Random site inspection
Traffic and Transport				
Disruption, noise and increased air pollution	Schedule traffic activities to avoid peak hours on local roads if feasible	Peak hours on local roads avoided, Grievance Mechanism	Contractor	Review of filed grievances
	Ensure safe driving by project personnel (e.g. through training/induction)	Driver training Records as part of induction training	Contractor	Review of training records
	Organize carpools/buses for worker transportation where possible to avoid additional traffic pressure	Carpools/buses used	Contractor	None
	Prevent storage of construction materials, equipment and	Dedicated storage areas in	Contractor	Random site inspection

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
	machineries on traffic lanes	place		
Soil and Groundwater				
Environmental contamination / spills	Collect and segregate wastes and ensure safe storage and in line with legal requirements	Waste collection areas existent, waste inventories	Contractor	Random site inspection, review of waste inventories
	Ensure disposal through waste contractors licensed for treatment / removal/recycling of each of the waste types	Disposal through licensed contractors	Contractor	Random site inspection, Inspect offsite waste disposal facilities if feasible
	Ensure appropriate containment and disposal of construction wastewater, including sanitary water	Water disposal compliant with legal requirements	Contractor	Random site inspection
	Ensure appropriate and safe storage of contaminants such as fuels, construction materials and wastes. Provide absorbent and intervention materials in sufficient quantities and at relevant locations for intervention in case of leakages/spills	Safe storage of hazardous materials, spill remediation equipment in place	Contractor	Random site inspection
	Implement appropriate secondary containment and spill controls for maintenance or refuelling works	Containment and spill controls in place	Contractor	Random site inspection
	Ensure immediate cleaning of any spills and remediation of contaminated areas after construction	Workers trained	Contractor /SCO	Random site inspection One-time inspection after construction
Best practice soil handling	Ensure appropriate storing of topsoil removed. After construction topsoil will be used as backfill for restoration of the area	Topsoil stored and re-used	Contractor	Random site inspection
	Limit stockpile height to 2m maximum to avoid soil compensation	Stockpile height	Contractor	Random site inspection
	Reinstatement of construction working area to the best possible after construction activities are completed.	Reinstatement completed	Contractor /SCO	One-time inspection after construction
	If construction takes place on inclined surfaces/slopes, ensure preventive erosion control measures are applied (e.g. plan to retain trees and other vegetation, use of natural contours for roads and drainage networks, excavated drainage channels)	Preventive erosion control measures in place	Contractor	Random site inspection

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Water and Hydrology				
Surface Water Quality	Prioritise the use of rainwater/stormwater over surface water/groundwater abstraction by using harvesting equipment and systems on site	Water harvesting conducted	Contractor	Random site inspection
	Restrict excavation activities during periods of intense rainfall. Use temporary bunding to reduce the risk of sediment, oil or chemical spills to the receiving waters	No excavation during intense rainfall	Contractor	Random site inspection
	Carry out excavation works in cut off ditches to prevent water from entering excavations	No water entering excavations	Contractor	Random site inspection
	Reuse wastewater wherever feasible	Wastewater reused	Contractor	Random site inspection
Flora and Fauna				
Areas of high ecological value	Assess the occurrence of protected areas and/or natural/critical habitats at and around the construction site. Avoid these areas where possible through traffic management and site setup	Areas of ecological value avoided	Contractor /SCO	Random site inspection
Site clearance – vegetation removal and habitat disturbance	Limit vegetation clearing to areas within the site boundary where it is absolutely necessary	Vegetation clearing minimal	Contractor	Random site inspection
	Avoid clearing mature trees	No mature trees cleared	Contractor	Random site inspection
	Avoid off-road vehicle traffic. Use existing roads	No off-road traffic	Contractor	Random site inspection
	Ensure revegetation of cleared areas where possible after construction using native species	Revegetation completed	Contractor /SCO	One-time inspection after construction
Light	Shield lighting downwards towards the site to avoid side-spill. Avoid tall masts where possible	Light nuisance minimised	Contractor	Random site inspection
Pesticide use and management	If pesticides are to be used for agriculture program, only those that are low in human toxicity, that are known to be effective against the target species, and that have minimal effects on non-target species and the environment shall be used.	Pesticide specification sheet	Contractor	Random site inspection
Socio-Economic				

Topic / Potential Impact	**Mitigation, Management and Enhancement Measures**	**Means of Verification**	**Responsibility**	**Monitoring Procedure**
Stakeholder Engagement and Grievance Mechanism	Engage / communicate with communities and plan sufficient time for participation. Ensure regular consultations with the local authorities and communities regarding the management of construction. See also planning state (Chapter 6)	Minutes of Meetings Grievance Mechanisms	SCO / Contractor	Review of grievance register
	Initiate an efficient Grievance Mechanism to allow potentially affected individuals to voice their concerns on the project. See also planning stage (Chapter 6)	Grievance Mechanisms in place, grievances recorded	SCO / Contractor	Review of grievance register
Local Employment & Procurement	Ensure local communities are preferred for the supply of goods and services to the project and project personnel, where appropriate	Local Procurement and Employment Records	Contractor	Review procurement and employment rules and records
Land Acquisition and Compensation, Physical Displacement / Economic Displacement	Avoid land take and hereby avoid physical relocation of both, formal and informal land-owners / land users Engage with the local community and potential affected households to understand the land ownership and land use Should land acquisition and displacement be inevitable, prepare a Management Plan for Land Acquisition and Compensation including provisions for resettlement	Grievance Mechanisms recorded Management Plan for Land Acquisition and Compensation if needed		
Impacts on Livelihoods / Economic Displacement	Engage with the local community and potential affected households to understand their needs and identify the risk of damage to their livelihood basis through the project (e.g. take of pasture land, lack of access to water) Should land acquisition and displacement be inevitable, prepare a Management Plan for Land Acquisition and Compensation including provisions for livelihood support for the affected parties	Minutes of Meetings Grievance Mechanisms recorded Management Plan for Land Acquisition and Compensation if needed	Contractor / SCO	Review of grievance register and meeting minutes

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Community Health and Safety	Ensure all contractors implement codes of conduct concerning employment and workforce behaviour (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general)	Workers Code of Conduct Grievance Mechanism recorded	Contractor / SCO	Workers interviews, review of grievance register
	Target signage and outreach activities to improve public awareness of traffic changes and potential hazards for high-risk sections of public roads, including near the site and laydown areas	Warning signs Minutes of Meetings	Contractor	Inspection if traffic routes, review of grievance register
	In case of security personnel at the size, ensure proper training and in the use of force and appropriate conduct toward workers and affected communities	Training Records	Contractor	Review of training records and grievance register
Communicable Diseases	Report any occurrence of any communicable diseases amongst the workforce (STD, HIV/AIDS, TB, Malaria and Hepatitis B and C) and set up diseases prevention programme if needed	Communicable Diseases Register	Contractor	Review of diseases register and disease prevention programme if available
Cultural Heritage				
Damage of Cultural Heritage	Ensure all chance finds of cultural heritage (e.g. graves, old ceramic, old building fragments) are reported immediately to the relevant authority. If possible, avoid excavation in the ultimate neighbourhood of a chance find, fence the chance find and await instructions from the competent authority.	Training records, records about chance fiends	Contractor / SCO	Random site inspection

Annex *XIII OCCUPATIONAL HEALTH AND SAFETY (OHS) PLAN*

1.0 INTRODUCTION

Every project poses its HSE risks. This plan was necessitated to meet up with OHS standards and to achieve the objectives set for the proposed project. The project team shall undertake to ensure high performance standards and conformity with contract requirements by managing the works in a systematic and thorough manner.

2.0 PROJECT DESCRIPTION

2.1 Purpose

The purpose of this document is to describe the Project Occupational Health and Safety (OHS) plan for the proposed infrastructure rehabilitation and construction and the specific management controls, risk control systems and workplace precautions required to ensure compliance with Occupational Health and Safety Laws and Standards.

2.2 HSE Objectives

The Objectives for this plan are to:

- Adopt a positive Health & Safety Culture.
- Adopt the principles of prevention to avoid risk.
- Complete the project without incident (Zero fatalities, Zero Lost Time Injury (LTI) or occupational illness).

2.3 Scope of Work

The Project Occupational Health and Safety (OHS) plan covers the scope of works defined in the contract. This includes Preconstruction, Construction, Operation & Maintenance and Decommissioning phases.

2.4 Policy Statement

In addition to the existing HSE policy, other policies shall be developed which includes:

- Substance Abuse Policy – Prohibiting the consumption or possession of narcotics, drugs, alcohol and other banned substances
- Emergency Response Policy – Stating commitment to ensure adequate resources and arrangement are in place in the case an emergency.
- Community Affairs Policy – Stating commitment to foster healthy relationships with communities through observance of the highest standard of conduct.
- Road Safety Policy–Stating commitment to complying with Road Traffic regulations and continuously improving its road safety performance by implementing a Road Safety Management Plan (RSMP)

3.0 KEY RESPONSIBILITIES

Involvement of all in implementing, maintaining and continually improving OHS processes is the key to successful completion and achievement of quality objectives set by the management. All project personnel shall therefore be required

to be familiar with the content of this OHS plan and shall participate in implementing, maintaining and improving the management system. It is the responsibility of the project manager and all key personnel to ensure that the requirements for quality are fulfilled for works under their responsibility. All new staff and staff who are given new responsibilities are to be inducted into the requirements set out in this plan in general and into their function and responsibilities in particular.

3.1 Project Manager Responsibilities

- Set good example in HSE issues.
- Ensure the availability of resources essential to establish, implement, maintain and improve the OHS Management System.
- Define, document and communicate roles, allocate responsibilities and accountabilities, delegating authorities, to facilitate effective OHS management.
- Ensure that all of the activities undertaken in the Project conform to Nigerian legislation, client requirements or international standards when applicable.
- Review objectives achievements throughout the year.

3.2 Project Supervisors Responsibilities

- Enforcing all phases of the established HSE plan.
- Set good example in HSE issues.
- Preparing Job Hazard Analysis when required.
- Ensuring the safety of all workers associated with the site.
- Conducting HSE inspections.
- Ensuring workers are competent for their allocated tasks.
- Attending and participating in HSE meetings.
- Participating in accident investigations.

3.3 HSE Manager/Supervisor Responsibilities

- Prepare relevant OHS documentation and procedures.
- Monitor the efficient implementation of OHS requirements.
- Participate and organize the OHS risk assessments.
- Advise management of compliance and of conditions requiring attention.
- Conduct regular HSE inspections.
- Make thorough analysis of statistical data and inspections; delineates problem areas; and makes recommendation for solutions.
- Take part in the review of all OHS incidents and assist in investigating incident.
- Monitor the efficient implementation of the Project's OHS requirements.
- Organize the Project's OHS risk assessment exercises.
- Check on the use of all types of personal protective equipment specifies the use of appropriate PPE for the various work activities. Evaluates their effectiveness and suggests improvements where indicated.

3.4 HSE Advisor Responsibilities

- Check on the use of all types of personal protective equipment specifies the use of appropriate PPE for the various work activities. Evaluates their effectiveness and suggests improvements.

- Conduct independent inspections to observe conformance with established OHS Plan and determines the effectiveness of individual elements of the plan (pre-task briefing, weekly toolbox talk, etc)
- Establish contact with Subcontractors with the objective of maintaining good relations and coordination of accident prevention activities and compliance with the established OHS plan.
- Correct unsafe acts and unsafe conditions.
- Deliver HSE induction/orientation course to all employees, including subcontractors.
- Deliver HSE awareness course and toolbox talk.
- Advise employees on OHS matters.

3.5 All employees Responsibilities

- Take all reasonable and practical steps to care for their own health and safety and avoid affecting the health and safety of co-workers and the general public.
- Follow all instructions and use the equipment properly
- Not interfere with any safety arrangements.
- Report any circumstances which may not comply with the project's OHS management system.

4.0 Competency

All personnel required to operate or work with any equipment or machine must be competent, be tested for each equipment that he/she shall be operating. All personnel who as part of their profession require licensing or certification must obtain the necessary certification before he/she shall be allowed to work on the site.

5.0 Fitness

All personnel working on site shall be required to be certified medically fit to do so by an approved medical facility or Medical Doctor (pre-employment medical examination).

6.0 HSE Training

6.1 Induction/Orientation

Every new or rehired employee and Subcontractors employees must undergo mandatory OHS orientation / induction. The purpose of the Induction is to educate workers and make them aware of the major potential hazards he or she shall come into contact with while working on the site; also, it is one more opportunity to stress the importance of HSE being the first priority in the operations. The content of the HSE orientation / induction shall cover the following subjects:

- Site safety rules.
- Personnel protective equipment requirements (PPE).
- Environmental sensitivity and protection.
- Preparation and planning of the job (Daily Pre-task talk).
- Emergency plan and muster points.

6.2 Project Specific HSE Training

In addition to the HSE orientation /induction, there shall be specific site HSE trainings which shall cover the following topics:

- Manual handling.
- Electrical Safety
- Emergency Prevention, Preparedness and Response
- Work at height training
- First Aid training (for site First Aiders)
- Lifting and Rigging
- Safe Driving techniques (for drivers)

7.0 Hazard identification & HSE risk assessment

7.1 Project HSE Risk Assessment

The project HSE risk assessment shall be developed and recorded. The Project's HSE risk assessment shall be conducted by a team consisting of HSE Manager/ Supervisor and technical managers/supervisors. It must be approved by the Project manager.

7.2 Fire Risk Assessment

A fire risk assessment shall be developed and recorded. A fire safety plan shall be in place in the site.

7.3 Job Hazard Analysis

Job hazard analysis is required when the hazards and risks associated with a specific task is to be identified so as to implement control measures. The HSE department together with the technical managers/supervisors shall develop a job hazard analysis when applicable.

8.0 EMERGENCY PREPAREDNESS AND RESPONSE

Emergency procedures and evacuation plan shall be developed by the HSE Department and displayed on the notice board. These procedures shall be communicated to all staff. Also, each section/department shall have at least a trained first aider at all times.

9.0 HSE IMPLEMENTATION AND PERFORMANCE MONITORING

9.1 HSE Meetings

HSE management meetings shall be held once a month. The meeting is to help identify safety problems, develop solutions, review incident reports, provide training and evaluate the effectiveness of our safety program. Some of the meetings shall be:

- Project/Site Management HSE Meeting for management and supervision (Monthly).
- Tool box talk meetings for all workforce (Weekly).
- Pre-task briefing for all workforces (Daily).
- Special situation meeting (As required).

9.2 HSE Reporting

All incidents and illnesses must be reported to site supervisor after which investigation shall commence and recorded so that appropriate corrective actions shall be implemented to prevent any re-occurrence and report findings shall be

forwarded to management for review. Reporting requirements shall include notification of incident, investigation report, and monthly report. Notification of Incident form shall be developed which shall be filled and submitted to HSE department for investigation.

9.3 HSE Inspection and Audits

For continual improvement of HSE management system, HSE inspection and audit shall be conducted. An inspection checklist shall be developed. This is to ensure that the HSE management system is being adhered to. The inspection shall be conducted by the HSE department together with site management.

9.4 Corrective and Preventive Actions and Non-Conformities

During the cause of inspections, concerns raised shall be addressed and closed out. It is expected that in a period of two weeks, a close out inspection shall take place to verify that the corrective actions have been closed.

10.0 Project HSE Rules

The project HSE rules shall be developed and supervision shall develop specific rules and procedures when necessary. The following site rules shall be implemented at all times. The Site Manager shall draw these rules to the attention of their own workmen or staff. All sub-contractors must ensure that these rules are drawn to the attention of their workmen and staff. The Principal Contractor may implement additional site rules during the contract programme. Any such additional rules shall be notified to all personnel engaged on the project prior to their implementation. The HSE rules shall include but not limited to:

1. Personal Protective Equipment must be worn at all times.
2. All instructions issued by the Site Manager regarding the storage, handling or cleaning of materials, plant and equipment must be followed.
3. All vehicles must be parked in the designated areas.
4. Any workman suffering from a medical condition that might affect his work and/or that could require specific medical treatment must inform the supervisor before commencing work.
5. All site tools shall either be battery operated or 110 volts.
6. No one shall be permitted on site if it is believed that they are under the influence of alcohol or drugs.
7. Vehicles must not reverse without a banksman in attendance.
8. All visitors to site must undergo a site-specific induction and operative Identity badges must be worn at all times.
9. All excavations must be secured.
10. Smoking and eating shall only be permitted in the designated area. This area shall be identified during induction.
11. All food and drink vendors on site shall be registered.
12. The variant of food and drink to be sold in the sites must be approved by the HSE officer
13. No hot works operations are permitted without a hot work permit in place.
14. There shall be no radios or other music playing devices on site.
15. Good housekeeping practices to be adopted.
16. Compliance with all Ethical Power Permit to Work systems
17. The site keyed access procedure must be strictly adhered to.

18. All Contractors must comply with Site Health & Safety Guidelines / Site Safety Method Statement
19. No untrained worker shall be permitted to operate heavy machineries.

11.0 SAFE WORK PRACTICES

Implementing safe work practices is one of the keys to achieving our HSE objectives and some of these safe work practices include:

11.1 Personal Protective Equipment (PPE)

The basic PPE required for the project shall be Safety Glasses, Safety Boots, Hand Gloves, Hard Hat and Coverall. Any other PPE shall be used as applicable. Management is responsible for the provision of PPE and usage shall be enforced at all time. PPE shall be provided in circumstances where exposure to hazards cannot be avoided by other means or to supplement existing control measures identified by a risk assessment.

An assessment shall be made to ensure that the PPE is suitable for purpose and is appropriate to the risk involved. Information, instruction & training shall be given to all employees on safe use, maintenance and storage of PPE. Employees shall, in accordance with instructions given, make full use of all PPE provided and maintain it in a serviceable condition and report its loss or defect immediately to the maintenance department where it shall be replaced. PPE shall be replaced when it is no longer serviceable and returned on a new for old basis. Employees shall sign to state that they have received PPE when issued.

12.0 WELFARE FACILITIES

The provision of welfare facilities on the site shall be communicated to all operatives at site induction. A cleaning regime shall be implemented and maintained for the duration of the construction phase to ensure the site welfare facilities remain in a clean and tidy condition.

- If mains drinking water becomes unavailable during the construction phase bottled water shall be brought to site for all operatives for the necessary period.
- All food and drink vendors on site shall be registered.
- The HSE officer will ensure that only approved vendors are allowed to sell food.
- The variant of food and drink to be sold on the sites must be approved by the HSE officer
- Access to the site should be restricted to avoid sale of contraband on site
- Smoking and eating shall only be permitted in the designated area. This area shall be identified during induction.

13.0 SIGNAGE

Adequate provision for warning and directional signs shall be made.

14.0 PROJECT HSE PROCEDURES

OHS procedures shall be developed. Project activities shall generally be controlled in accordance with OHS Procedures. These procedures shall include:

- Lifting and Rigging Procedure
- HSE Reporting Procedure
- Working at Height Procedure.
- Emergency Procedure

ANNEX XIV

Protection of Cultural Property

1. Cultural property includes monuments, structures, works of art, or sites of significance points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards and graves.

2. The initial phase of the proposed emergency reconstruction operations pose limited risks of damaging cultural property since projects will largely consist of small investments in community infrastructure, reconstruction of existing structures, and minor public works.

Nevertheless, the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed and included in standard bidding documents.

Chance Find Procedures

3. Chance find procedures will be used as follows:

(a) Stop the construction activities in the area of the chance find;

(b) Delineate the discovered site or area;

(c) Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Ministry in charge of Department of Archaeology and Museums take over;

(d) Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Ministry of Culture immediately (within 24 hours or less);

(e) Responsible local authorities and the Ministry in charge of Department of Archaeology and Museums would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Department of Archaeology and Museums (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;

(f) Decisions on how to handle the finding shall be taken by the responsible authorities and the Ministry in charge of Department of Archaeology and Museums. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

(g) Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Ministry in charge of Department of Archaeology and Museums; and

(h) Construction work could resume only after permission is given from the responsible local authorities and the Ministry in charge of Department of Archaeology and Museums concerning safeguard of the heritage

4. These procedures must be referred to as standard provisions in construction contracts, when applicable, and as proposed. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed.

5. Relevant findings will be recorded in World Bank Project Supervision Reports (PSRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

ANNEX XV

WASTE MANAGEMENT PLAN

Since the project will generate significant volume of wastes of various types, the contractor will therefore implement its waste management plan. The following objectives form the basis for the waste management plan of the Campsite:

- Progressive reduction of wastes with the target to minimize overall emissions/discharges, which have adverse impact on the environment,
- Establishment, Implementation and maintenance of waste segregation aimed at enhancing recycling,
- Ensure effective waste handling and disposal processes, which shall be monitored by relevant waste disposal authorities.

Waste Handling Guidelines

For proper handling and disposal, wastes shall be well defined at source and the definition transmitted along with the wastes to the final disposal points. ETL shall define and document all wastes generated in the course of work in a monthly waste stream report, which shall be used to track/monitor wastes generated from the project. The major categories of wastes envisaged from the water scheme Project are outlined as follows:

Solid wastes:

These include felled vegetation/trunks, woods from crates, metals, papers, printer cartridges and other office equipment scraped which are due to be removed during site clean-up, domestic waste (waste generated from camp kitchens, packing materials, boxes and plastics).

Liquid wastes:

These include non-hazardous operational waste generated from work construction sites e.g. sanitary water, paints etc. Gaseous wastes: These include combustion products from construction engines, welding gas, natural gas leaks etc.

Hazardous waste:

any gaseous, liquid or solid, which due to quantity, physical, chemical or infectious characteristics have the potential to harm human health, environment when improperly handled, stored, disposed, transported or treated e.g. acids, lead phenols, etc. Waste Minimization / Reduction

Waste minimization implies reduction to the greatest extent possible of the volume or toxicity of waste materials. The four principles of waste minimization (reduce, reuse, recycle and recover) shall be adopted as applicable.

Excavated Earth Material Waste During Channelization: All earth material that will be scooped-out from channelization activities will be use for backfilling. There will be know solid waste of earth material as everything will be used for backfilling.

Waste Segregation:

Waste segregation and characterization shall be carried out on wastes that are similar and shall be combined to simplify storage, treatment, recycling and effective implementation of appropriate waste disposal methods. Wastes shall be segregated at source into clearly designated bins at strategic locations. Particular attention shall be given to the work area where a variety of wastes shall be generated. The site HSE Representative shall be responsible for maintenance of the waste segregation scheme at the site.

Waste Disposal

All debris, spoilt materials, and other wastes shall be cleared regularly from the site and disposed at approved dump sites operated by designated waste disposal authorities (Kabba / Bunu Local Government Landfill). Instructions on material safety handling sheet shall be strictly adhered to and shall form the basis for the disposal of wastes related to such products. Wastes in transits shall be accompanied and tracked by waste disposal notes. The note shall contain such information as date of dispatch, description of wastes, waste quantity, container type, designated disposal site and method, consignee name, means of transport and confirmation of actual disposal time and date. Special attention will be accorded to hazardous wastes removed from the sites and also drums of waste oil that might contain dangerous substances; these are to be transported to a site designated by the District Environmental Officer for safe storage and subsequent testing prior to disposal. Waste management audit of facilities shall be carried out in consultation with the key stakeholders, and findings shall be properly documented and followed up. Accommodation, catering services areas and work site shall maintain acceptable standard of hygiene and good house-keeping

The contractor will be committed to effectively managing all their activities' environmental impacts through compliance with legislation and appropriate arrangements to protect the environment will be put in place at all workplaces, including:

- Approved storage and use of raw materials and substances.
- Waste Management Plan - Waste minimization (promoting reduce, reuse, recycling, recovery including energy recovery and safe disposal).
- Identifying waste disposal routes under the Duty of Care.
- Monitoring and review of environmental performance

ANNEX XVI

Storm-water Pollution Prevention and Control Plan

Storm-water that has accumulated in excavated areas, chlorinated rinse water, and chlorinated water used to sterilize/flush pipelines shall not be directly discharged or otherwise allowed to enter the storm waterways, or drainage ditches without following due diligence.

The contractor will devise means of minimizing all potential for spills specifically, do not allow liquids, including (but not limited to) gasoline, diesel fuel and lubricating oil to enter the storm sewer systems, waterways, drainage ditches, or the ground and use due caution when operating oilbearing equipment near aquatic resources by using absorbent materials to prevent leaks or spills from entering waterways and maintain a 25-ft minimum buffer zone from streams, be aware of storm drain inlets, and cover or contain debris stored outside. Excess concrete will be safely transported to the batching plant and flushing empty concrete trucks or dumping excess concrete is prohibited. Solidified cement waste from truck chute cleaning is solid waste and shall be cleaned up and transported to the landfill.

ANNEX XVII

Erosion and Sediment Control Plan

All erosion and sediment control measures shall be maintained throughout the course of the project and removed at the completion of the project, and appropriate measures shall be taken to return the area to its previous state. Maintenance shall include but not be limited to reuse of accumulated sediment for backfill after solidification, repairs, and/or replacement of storm-damaged or otherwise deteriorated structures. All excavated soil and spoil materials will be managed in a manner protective of the environment and use due caution during excavation or any other soil management in the vicinity of sanitary or storm systems, waterways, or drainage ditches.

Annex XVIII

Hazardous Material and Hazardous Waste Plan

All hazardous wastes produced by the Project shall be packaged, transported, and disposed of with care by a registered waste disposal company under direct supervision of HSE representative. Such loads shall be manifested and a copy of the manifest sent to the Project Manager. All hazardous materials will be properly labeled and stored until removed from the Project site and all accidental releases of a hazardous material or hazardous waste will be reported promptly to the Project Manager. All spills, regardless of the volume, will be reported and recorded, however, the Sub-contractors responsible for the spill will be obligated for all costs incurred as a result of the cleanup effort. Sub-Contractors shall inspect their hazardous material and waste storage areas at least weekly to ensure they are properly maintained. All inspections are to be documented, with records retained in the project files. The Contractor shall randomly audit the labelling and storage

of hazardous material and waste and the disposal of hazardous waste to verify that all Sub-contractors, at any tier, are fulfilling their roles as responsible parties.

Annex XIX: BLAST MANAGEMENT PLAN

1.0 INTRODUCTION

1.1 SCOPE

The rehabilitation works at Omigbo community requires the preparation, approval and implementation of an Environmental Management Strategy (EMS) and subordinate Environmental Management Plans (EMP). One of these EMPs is the Blast Management Plan (BMP). This BMP addresses environmental protection connditions that relate to OMIGBO PROJECT AREA's blasting activities. Whilst this plan specifically addresses issues related to the management of blasting on site, it should be read in conjunction with other EMP's.

This BMP has been prepared in consultation with Environmental Protection Authority (EPA) and Department of Planning, Industry and Environment – Resources Regulator to the satisfaction.

1.2 OBJECTIVES

The primary objective of the BMP is to enable the effective management of blasting activities to minimise the impact of blasting operations on off-site receptors. The BMP will achieve this objective through the implementation of the following strategies:

- Complying with consent and licence conditions through the utilisation of best practice methodologies;
- Defining blast design criteria;
- Monitoring meteorological conditions prior to blasting;
- Maintaining a blast monitoring system;
- Implementing measures to protect buildings and infrastructure;
- Maintaining a resident notification procedure to advise of future blasting events;
- Maintaining a blast environmental checklist for the retention of blast design records and environmental conditions;
- Recording blast related complaints and responding to complaints in a timely fashion; and
- Interpreting and reporting the results of blast monitoring.

2.0 STATUTORY REQUIREMENTS

The relevant approval and licence conditions are shown in **Table 1** along with information on where they are addressed in this plan.

Table 1: Statutory Requiremes

Condition
Time of blasting Blasting operations on the premises must only take place between 9:00am and 5.00pm Monday to Friday inclusive, unless permission is granted where special circumstances related to the safety of the Omigbo project area requires a blast to be initiated outside these hours.
Overpressure The overpressure level from blasting operations on the premises must not: (i) Exceed 115dB (Linear Peak) for more than 5% of the total number of blasts over a period of 12 months when measured at any residence on privately owned land or noise sensitive locations (such as a school or hospital); and (ii) Exceed 120dB (Linear Peak) at any time, when measured at any residence on privately owned land or noise
Ground vibration (ppv) Ground vibration peak particle velocity from the blasting operations at the premises must not: (i) Exceed 5mm/s for more than 5% of the total number of blasts over a period of 12 months when measured at any residence on privately owned land or noise sensitive locations (such as a school or hospital); and (ii) Exceed 10mm/s at any time, when measured at any residence on privately owned land or noise sensitive location (such as a school or hospital) The overpressure and ground vibration limits above do not apply if the Applicant has a written agreement with the relevant owner(s) of these residences to generate higher blast levels, and Council has been advised in writing of the terms of the agreement. The blasting limits above do not apply to residences owned by the Applicant.

The Applicant must investigate any blast ground vibration/air overpressure concerns associated with residential buildings which occur as a result of blasting at the mine in relation to the standards in the consent. Should such an investigation be necessary the Applicant shall advise Council the result of such investigation and any proposed preventive/remedial measures.
The Applicant must prepare and implement an updated Blast Management Plan, in consultation with EPA and DRE, to the
(i) demonstration of consistency in compliance with blasting criteria;
(ii) compliance blasting criteria;
(iii) mitigation measures, such as, adverse weather conditions;
(iv) monitoring methods and program in accordance with blast monitoring and inspection conditions;
(v) measures to be undertaken to demonstrate that the development is achieving best practice applicable to the development in minimising air blast overpressure, ground vibration levels, fumes and odours from blasting activities;
(vi) measures to protect underground utilities (e.g.: rising mains, subsurface telecommunication and electric
(vii) measures to protect surface infrastructure where relevant, such as dams, rail infrastructure and power poles;
(viii) measures to consider the blasting activities from other neighbouring mines. This shall include details of the proposed measures to ensure that cumulative blast related impacts are managed, such as through consultation with the other mines to co-ordinate blasting activities
(ix) procedures for the investigation of blast related complaints from the development, in consultation with other
(x) procedures for the notification of occupiers of buildings and residences prior to detonation of each blast;
(xi) measures to ensure no damage by fly rock to people, property, livestock and power lines;
(xii) location of blast monitors to assess blasting within the development; and
(xiii) when blasting is no longer required for this development, the management plan will need to be revised to suspend requirements of Blast Monitoring (Cond. 34) and Blast Management Plan requirements listed in this consent. The Applicant must implement the approved Blast Management Plan.

Condition
The Applicant must, as a minimum, advise occupiers of buildings and residences, unless otherwise requested by the occupier, in the North Muswellbrook, Sandy Creek Road and other areas to the satisfaction of Council of future blasting events through a community information telephone hotline and the advertisement and promotion of the hotline. The hotline shall be at no cost to the caller.
The Applicant must respond to complaints regarding blasting in accordance with its Environmental Management Strategy.
The Applicant must monitor ground vibration and air blast overpressure of all blasts at locations in accordance with the Blast Management Plan;
Ground vibration or airblast overpressure is to be monitored at the relevant noise sensitive sites (e.g. Residences on privately owned land, hospitals, schools etc.), selected in consultation with the EPA.
The Applicant must document the date, wind speed and direction, weather conditions, atmospheric conditions including cloud cover, location of blast and the quantity of explosive used for each blast.
The airblast overpressure level from blasting operations in or on the premises must not exceed 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period at either monitoring point 3, 4, 5 or 6 in Condition P1.2.

Condition
The airblast overpressure level from blasting operations in or on the premises must not exceed 120 dB (Lin Peak) at any time at either monitoring point 3, 4, 5 or 6 in Condition P1.2.
The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed 5mm/s for more than 5% of the total number of blasts carried out on the premises during each reporting period at either monitoring point 3, 4, 5 or 6 in Condition P1.2.
The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed 10mm/s at any time at either monitoring point 3, 4, 5 or 6 in Condition P1.2.
Offensive blast fume must not be emitted from the premises. Definition: Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances 1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or
The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
All records required to be kept by this licence must be: (a) in a legible form, or in a form that can readily be reduced to a legible form; (b) kept for at least 4 years after the monitoring or event to which they relate took place; and
The following records must be kept in respect of any samples required to be collected for the purposes of this licence: (a) the date(s) on which the sample was taken; (b) the time(s) at which the sample was collected; (c) the point at which the sample was taken; and

<table>
<tr><th>Condition</th></tr>
<tr><td>To determine compliance with condition(s) L3.1 and L3.2:

a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring points

3, 4, 5 and 6 for the parameters specified in column 1 of the table below; and

b) The licensee must use the units of measure, sampling method, and sample at the frequency specified opposite in the other columns.
<table>
<tr><th>Parameter</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Airblast Overpressure</td><td>Decibels (Linear Peak)</td><td>All blasts</td><td>Australian Standard AS 2187.2-2006</td></tr>
<tr><td>Ground Vibration Peak Particle Velocity</td><td>millimetres/second</td><td>All blasts</td><td>Australian Standard AS 2187.2-2006</td></tr>
</table>
</td></tr>
<tr><td>"The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: (a) a Statement of Compliance; and
(b) a Monitoring and Complaints Summary.
A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA."</td></tr>
<tr><td>The licensee must report any exceedance of the licence blasting limits to the regional office of the EPA as soon as
practicable after the exceedance becomes known to the licensee or to one of the licensee's employees or agents.</td></tr>
<tr><td>The results of the blast monitoring required by condition M7.1 must be submitted to the EPA at the end of each reporting period.</td></tr>
<tr><td>The lease holder must ensure that the ground vibration peak particle velocity generated by any blasting within the lease
area does not exceed 10mm/s and does not exceed 5mm/s in more than 5% of the total number of blasts over a 12 month period at any dwelling or occupied premises unless determined otherwise by the EPA.</td></tr>
<tr><td>The lease holder must ensure that the blast overpressure noise level generated by any blast within the lease area does not
exceed 120dB(L) and does not exceed 115dB(L) in more than 5% of the total number of blasts over a 12 month period at any dwelling or occupied premises unless determined otherwise by the EPA.</td></tr>
</table>

Condition
The lease holder must ensure that the ground vibration peak particle velocity generated by any blasting within the lease area does not exceed 10mm/s and does not exceed 5mm/s in more than 5% of the total number of blasts over a 12 month period at any dwelling or occupied premises as the case may be unless determined otherwise by the EPA.
The lease holder must ensure that the blast overpressure noise level generated by any blast within the lease area does not exceed 120dB(linear) and does not exceed 115dB(linear) in more than 5% of the total number of blasts over a period of 12 months, at any dwelling or occupied premises, as the case may be, unless determined otherwise by the EPA.

3.0 BLASTING CRITERIA

The blasting criteria that apply to OMIGBO PROJECT AREA are shown in **Table 2**.

Table 2: Blast Criteria

Vibration (mm/s)	Allowable Exceedance
5	5% of total number of blasts over a 12 month period
10	0%
Overpressure (dB(L))	**Allowable Exceedance**
115	5% of total number of blasts over a 12 month period
120	0%

4.0 MANAGEMENT SAFEGUARDS AND AMELIORATIVE ACTIONS

4.1 MEASURES TO PROTECT PUBLIC INFRASTRUCTURE

To protect public surface infrastructure and underground facilities, the Mine Engineer responsible for blast design will:

- Identify all public surface infrastructure and underground facilities within 500 metres of potential blast zones;
- Contain the Maximum Instantaneous Charge (MIC) to a level so that damage will not occur to the public surface infrastructure and underground facilities; and
- Periodically monitor public infrastructure to verify that no damage is occurring.

4.3 BEST PRACTICE DRILL AND BLAST

The intent of best practice goals in drill and blast activities is to comply with the fragmentation requirements for each blast. The use of best practice techniques will reduce air blast overpressure, ground vibration, fumes and odours from blasting activities.

Best practice in drill and blast activities at OMIGBO PROJECT AREA include:

- A high degree of accuracy in the placement of drill holes so that design spacing and burden is achieved using Automatic Positioning System (APS) or other survey control;
- Management of surface and groundwater in the drill holes (to reduce fume and odour issues);
- Blast design and delays are designed to avoid wavefront reinforcement;
- Regular inspections of ground and hole conditions to identify any geological abnormalities that may create a path for the uncontrolled release of gaseous products from explosive material;
- Loading of the explosive material so that holes are not loaded in excess of the design;
- Proper placement of decking charges if required;
- Effective placement of good quality stemming to design column height for containment of explosive product;
- Reduce the sleep time of the blast pattern to minimise the potential for deterioration of the explosive material;
- Take into account any adverse meteorological conditions at the time of the blast and defer or modify the blast to accommodate those conditions;
- Video recording of blasts to identify any causal factors contributing to any aberration from the predicted outcomes; and
- Vibration and overpressure monitoring for all blasting activities on site.

4.4 DESIGN OF BLASTS

Every blast pattern is designed so far as reasonably practicable that OMIGBO PROJECT AREA aims not to exceed the criteria in **Table 2**.

4.5 FIRING TIME OF BLASTS

All routine blasts are to occur between the hours of 9:00am to 5:00pm Monday to Friday. No blasts are planned to occur outside of these hours unless the General Manager or Mining Engineering Manager determines that safety-related issues dictate an emergency blast.

An emergency blast outside of the approved hours shall not to be initiated until OMIGBO PROJECT AREA have utilised their best endeavours to gain specific approvals. If approval can't be gained despite the contractor's best endeavours the General Manager or Engineering Manager can approve for the blast to go ahead.

4.6 PRE-BLAST NOTIFICATIONS

OMIGBO PROJECT AREA operates a toll-free telephone Blast Information Service Line which contains recorded information that provides residents with proposed blasting times for that particular day.

A nominated employee will update the message on the Blasting Information Service Line prior to 9am on the day of each blast (Monday-Friday). If the blast time is changed by more than 2 hours, the message shall be updated as soon as practicable after the decision to vary the blast time is made. The message shall include the following information for the blast planned for that day:

- Date;
- Approximate time range (maximum 2 hour window);
- Location; and
- Predicted vibration levels

A misfire that requires a second initiation is considered to be the same blast as originally advertised.

4.7 SAFETY ZONE OF EXCLUSION

Prior to the initiation of a blast, the Blast Controller shall:

- Confirm that sentries are safely positioned at all points of access to the blast;
- Confirm that the public are excluded from an area within the blast exclusion zone of the planned blast.

4.8 PRE--BLAST ENVIRONMENTAL CHECKLIST

THE CONTRACTOR utilises a daily weather forecasting system to assist with identifying the weather conditions at the time of blasting. This involves a summary daily email to personnel on site and access to a webpage for further detail. Prior to granting approval for the initiation of a blast, the Blast Controller shall complete the pre-blast section of the Blasting Environmental Checklist. This checklist includes the recording of date, wind speed and direction, stability class, cloud cover, location of the blast and the MIC of the blast.

Unfavourable meteorological conditions can increase the impact of overpressure and dust. The meteorological conditions for the contractor are monitored at the on-site weather station as shown in **Figure 1**.

If the weather conditions are potentially adverse a review of the weather conditions, and the location and type of blast will be undertaken by relevant personnel to assess the risk of this blast. If the General Manager or Mining Engineering Manager determines that the risk is low they can approve for the blast to proceed.

4.9 BLAST MONITORING

All blasts are monitored by blast monitoring equipment which is established at the sites shown in **Table 3** and **Figure 1**.

When construction cease the requirement for ongoing blast monitoring will be reviewed in consultation with the EPA before the changes are implemented.

Blast monitoring instrumentation is installed and maintained in accordance with relevant standards or as otherwise prescribed by the EPA. Monitoring units are calibrated annually in accordance with the relevant standards.

Blasts are recorded on a suitable video recording device with a target capture rate >95%.

4.10 FUME MANAGEMENT

Blasts at OMIGBO PROJECT AREA are designed to minimise the risk of fume generation from blasting activities. All blasting activities at OMIGBO PROJECT AREA will be rated with a fume category rating scale, using the rating system – Prevention and Management of Blast Generated NOx Gases in Surface Blasting. The rating is given to the greatest extent of the post blast fume.

If a blast has a fume rating of 3 and the fume is leaving site or a rating of 4 or greater, MOE will be notified.

4.11 POST-BLAST REVIEW

The Mine Engineer shall undertake a Post-Blast Review and take the following actions:

- If the ground vibration recorded at any monitoring site exceeds 5mm/s or the overpressure exceeds 115 B(L), the blast shall be investigated, and the reasons recorded for the variation on the Blast File. A copy shall be provided to the General Manager and Environmental Superintendent. Corrective action will be taken to prevent a recurrence;
- If the ground vibration recorded at any monitoring site exceeds 10mm/s or the overpressure exceeds 120dB(L), the Mine Engineer shall promptly contact the Environmental Superintendent who, after satisfying themselves with the veracity of the monitoring records, and following discussions with the General Manager, shall contact MSC and the EPA and advise them of a potential exceedance. A full investigation that establishes the causes of the exceedance shall be performed by the Mine Engineer and following endorsement by the General Manager and Environmental Superintendent, shall be forwarded by the Environmental Superintendent to MSC and the EPA within 7 days. Corrective action will be taken to prevent a recurrence;
- If any flyrock lands outside of the Mine Lease or the Exclusion Zone, the Mine Engineer shall investigate the cause of the incident and report to the General Manager and the Mining Engineering Manager. The Mines Inspector and the Industry Safety and Health Representative will be notified as well; and
- If any complaints are received in respect to vibration, noise, dust or fumes associated with the blast, the Mine Engineer and Environmental Superintendent are to manage the complaint in accordance with the requirements in **Section 5.0**.

5.0 COMPLAINT MANAGEMENT

Blasting related complaints by the community can be directed to the 24 hour toll free telephone Environmental Contact Line 1800 600 205. More details on the complaints management at OMIGBO PROJECT AREA are found in the Environmental Management Strategy.

5.1 PROPERTY INSPECTIONS

If a private landholder has concerns that buildings and/or structures on their land have been damaged as a result of blasting activities at OMIGBO PROJECT AREA, a review of the damage will be undertaken by the contractor. If required, a qualified and experienced independent expert may be engaged to undertake this review.

If the review confirms the landholder's claim, and both parties agree with these findings, the contractor will repair the damages. However if the landholder or the contractor disagree with the findings of the report, either party may refer the matter to MSC for resolution.

6.0 RECORDS

The Mine Engineer shall maintain a Blast File for each individual blast for a minimum of four years. A misfire is considered part of the original blast. The Blast File shall contain the following information:

- The drill hole layout plan;
- Drill records;
- Shot firer's dip sheets;
- Stemming records;
- Tie up/surface initiation plan;
- Charge sheets including MIC;
- Quantities and types of explosives;
- Video of blast;
- Actual fume rating;
- Results from all blast monitors; and
- Blasting Environmental Checklist.

If any of the blast monitors recorded a ground vibration level of greater than 5mm/s or an overpressure greater than 115dB(L), the Blast File shall also contain:

- Blast monitor waveforms; and
- Any subsequent investigations and/or reports associated with the blast.

7.0 EXCEEDANCE REPORTING

In the event that an initial investigation concludes that an exceedance of the criteria in

Within 7 days of the incident, the contractor will submit a written report to MSC and the EPA that:

a) Describes the date, time, and nature of the exceedance;
b) Identifies the cause (or likely cause) of the exceedance;
c) Describes what action has been taken to date; and
d) Describes the proposed measures to address the exceedance.

8.0 EXTERNAL REPORTING

The performance of OMIGBO PROJECT AREA's BMP will be reported through a number of external reporting requirements, which include;

- Annual Environmental Management Report (AEMR);
- EPL Annual Licence Return;
- Regular updates of monitoring results on the OMIGBO PROJECT AREA website; and
- CCC Meetings.

8.1 ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

The AEMR will include a summary of:

- Blast monitoring results and comparison to the criteria, monitoring results from previous years and predictions in any Environmental Assessment (if applicable);
- Summary of blast related complaints and management measures undertaken;
- Identification of any trends in the monitoring results;
- Measures undertaken during the period to monitor compliance;
- Identification of any non-compliance and management measures undertaken; and
- Review of the performance of management measures and the monitoring program.

8.2 EPL ANNUAL RETURN

The Annual Return will include the following;

- The date and time of each blast;
- The blast monitoring results at each blast monitoring station; and
- An explanation for any exceedances or missing blast monitoring results.

9.0 REVIEW OF MANAGEMENT PLAN

The Blast Management Plan will be reviewed;

- Within 3 months of changes to Development Consent or licence conditions relating to blast management;
- Following reportable incidents at OMIGBO PROJECT AREA relating to blasting;
- Following an independent environmental audit which recommends changes to the Blast Management Plan;
- If there is a relevant change in technology or legislation;
- At the completion of mining activities; and
- Every three years, or as directed by regulatory body, in accordance with Condition of the Development Consent Conditions.

10.0 RESPONSIBILITIES

Table 4 outlines the responsibilities relating to the BMP.

Table 4: Management Plan Responsibilities

Position	Task	Timing
General Manager	Provide adequate resources to implement the requirements of the BMP	Annual review
	Undertake best endeavours to gain authorisation from MSC to blast outside of approved hours	Prior to blasting outside of approved hours
Mining Engineer	Undertake blast notifications as required	Prior to each blast
	Design blasts to comply with vibration and overpressure limits	For each blast
	Maintenance of blast record system	For each blast
	Notify surrounding mines of blasting activities to minimise cumulative impacts	Prior to each blast
	Undertake post blast reviews	For each blast
	Confirm that blast monitors are working prior to blasting	Prior to each blast
Blast Controller	Confirm safety exclusion zone is in place with placement of blast sentry guards	Prior to each blast
OCE	Confirm the exclusion zone has been cleared	Prior to each blast
Environmental Superintendent	Notify regulatory authorities of any exceedance of the blast criteria	Following any exceedance of blasting limits
	Coordinate response to all blasting related complaints	Following a blast related complaint
	Coordinate reviews of the BMP	As outlined in BMP
	Coordinate annual calibration of blast monitoring equipment	Annually
	Coordinate reporting as required in BMP	As required (minimum monthly)

ANNEX XX: Traffic Management Plan

The objective of this TMP is to provide safe passage for community members, pedestrians, motorcyclist, cyclists and vehicular traffic in the project areas during the construction.

The Contractor should designate a TMP Supervisor who will oversee traffic management along major roads within the project corridors.

The following are the minimum requirements for traffic management on the project:

- **Design and layout of Road Systems**

The contractor in conjunction with the community, SPMU and FRSC must: -

a) Plan traffic routes to give the safest route between places within the project route

b) Make traffic routes wide enough for safe movement of the largest vehicle using them.

c) Ensure all drops and falls are adequately protected.

d) Avoid traffic routes passing close to vulnerable areas such as fuel tanks.

e) Ensure there are designated safe areas for loading, unloading and plant maintenance.

f) Avoid sharp corners or blind bends, if these cannot be avoided install mirrors.

g) Road crossings and junctions, should be clearly signed and marked.

h) Make entrances and gates wide enough.

i) Set speed limits and clearly mark on traffic routes; (5mph).

j) Give prominent warning of limited headroom and overhead cables.

- Liaisons with Government Traffic Agencies

The TMP will ensure liaisons with the FRSC at the State level. In situations where heavy traffic impacts are envisaged, the Contractor will liaise with the FRSC to ensure traffic coordination and mitigate adverse traffic impacts.

- **Pedestrians**

a) Provide separate routes for pedestrians and where needed provide suitable barriers.

b) If traffic routes are used by both pedestrians and vehicles they should be wide enough.

c) Provide suitable well marked crossing points.

S/N	Aspects	Descriptions	Responsible Party
1	Traffic/Safety Signage	• Safety signage should be put at strategic locations to warn road users of the ongoing construction activities. • Signages should also be located along borrow pits, engineering yards and workers' camp.	Contractor
2	Movement of Vehicles and Equipment	• Mobilization of equipment and materials should be done at off-peak period (10am – 4pm), mainly on weekends, holidays • Enforce speed limit. • Ensure vehicles and equipment are parked at Camp site and designated areas ONLY. • Untarred access roads shall be sprinkled with water frequently to suppress dust emissions. • The contractor must ensure that trucks carrying sand/soil to and from the sites are well covered in order not to cause injury to the public.	Contractor

		• Station flagmen at junctions, diversion points, near public crossings such as schools and speed bumps will be installed in built up areas and near public facilities such as schools, mosques, churches to reduce speed and dust • During peak periods, such as market days FRSC will also be involved in assisting traffic and road safety management. Furthermore, the contractor will engage the services of FRSC to train all project drivers.	
3	Training	• Hire drivers with appropriate driver's license. • Liaise with FRSC to train drivers • As part of refresher course for construction workers, train drivers on defensive driving and enforce speed limits	Contractor
4	Communication	• All Traffic and Safety signages should be boldly written in English & local languages. • Any incident/ accidents should be reported immediately to the SPMU within 24hrs. The SPMU will also report to the NPCU/WB within 48hrs including immediate action taken	Contractor SPMU Contractor
	Cost	**All actions and costs have been embedded in the ESMP Matrix Table**	

Security Management Plan

The contractor shall pay necessary attention to ensuring security of life & property during the execution of this contract according to the scope of works. In ensuring that this role is carried out, the following will be given priority:

1. Proposed Security Risk Mitigation Principle

Having identified the risk and possible impact on the project in the event of any breach of security and attack, this security risk assessment framework provides the guideline for the development of appropriate state level security assessments and management plans prior to the start of any activities in the relevant State. State Level Security Management Plan will also include clear escalation protocol and responsibility in the event that security situation worsens in any site.

To address identified risk at state level, the project will deploy both public and private security force to provide protection for the project. The use of these security forces will be guided by the following principles[NSM4]: Adherence to the Voluntary Principles of Security and Human Rights abuses and Code of Conduct. In addition,

All private and public security forces to be deployed or dedicated to the project must be subjected to screening for any past human rights violations and be trained on SEA/SH and GBV prevention, human rights and international humanitarian law, etc. All private and public security force to be deployed must be trained on conduct of conduct on the use of force and must have signed the required code of conduct before deployment to the project.

2. Institutional Arrangement

Setting up of a security management structure / forum at the federal and state levels. This structure will be an inter-agency security committee or forum that will be responsible for coordinating the operation of all security forces (private and public security) and for sharing security information and incident reports. The security focal person at the Federal level under the guidance of the National Project Coordinators will be in charge of facilitating the set up / collaboration and keeping records including those of stakeholders.

The security focal person at the federal level will be responsible for the security of the

project throughout the project's life. The federal security focal person and state level security officers who will oversee the day-to-day activities (including supervising the deployment of security officer - public and private) shall ensure coordination of all security requirements /activities with the relevant office/officer in charge of the state Government Security Agency/Agencies (GSAs).

Effective communications system is vital for personal safety and security of project personnel. In other to monitor staff movements more effectively, and to alert others or to be alerted in the event of potential insecurity and to avoid incident, the state level SMP will included an effective communication system such as cellular phones (with consideration for service providers with reliable coverage in the state) including computer enabled communication capability, land line and radio phones.

The state security focal persons will report all security, safety, and serious health incidences to the State project coordinator who will report to the relevant state security agency and National Project Coordinator at the Federal level, where appropriate. The confidentiality of the reporting will ultimately be the responsibility of the state security focal person. The basic principle will be to convey the required information quickly and efficiently to those responsible to provide help including escalation process if situation worsens. Reports must be kept in a secure location and only accessible to the appropriate authorities to ensure confidentiality.

The adoption of the 4Ds security strategy namely - deterrence, detection, delay

(Any security measures / device put in place to limit security threat before call for help), and denial (Any security measure / Action put in place to avoid any security

breach) against all hostile activities throughout the project lifecycle. To be ensured by project deployed security forces.

Escort security protocol of lead (Is the team of security officers responsible for leading a convoy movement from point A to Point B or from one location to another.) and chase (is a team of security officers responsible for deterring any potential threat during convoy movement from one location to another), to reduce risks associated with road travels in recent day Nigeria

Continuous threat forecast and appraisal through an intelligence risk management program.

Leveraging on the public and private security to provide protection and timely / actionable intelligence but ensuring strict observance of relevant human rights, limited use of force and personnel non-lethal requirements e.g batons, pepper spray, hand cuffs, whistles etc.

Constant engagements with the local communities and other relevant stakeholders if and when the need arises on any of the project sites as documented in the project SEP.

State level SMP will include a system to receive and address security / security force personnel related allegations / complain such as abuse of power, excessive use of force, retaliation, sexual harassment and exploitation, gender-based violence etc. Allegations or incidents related to security personnel must be documented and reported to the Bank through the federal level security focal persons within 48 hours of the incident occurring.

3. State Level Security Risk Assessment

Prior to commencement of state level SMP, the PIU through the security management structure / forum will conduct a security risk assessment (which will be on-going and the SMP revised accordingly) with all relevant stakeholders including community members, youth, traditional rulers and all relevant state security institution involved in security matters to determine the threat level of the security of the state. All developed security

management plan by each state will be reviewed and cleared by the state / federal security focal persons with guidance from the world Bank.

It may be difficult to have an adequate budget for security management plan. An estimated budget of thirty million naira (N30,000,000) can be budgeted for implementing this plan (the contractor should prepare the actual budget in line with the project security risk assessment and security management plan to be made available by the SPMU.

ANNEX XXI: CONTRACTORS ESMP

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Occupational Health and Safety				
Occupational Health and Safety	Provide H&S Training to the construction workforce (including sub-contractors, temporary workers and drivers)	Training performed and recorded	Contractor / SCO	Check Training Records
	Ensure site premises are provided with appropriate fencing (where applicable) and lighting. Use hazard notices/signs/barriers to prevent access to dangerous areas.	H & S planning of construction site done, items installed	Contractor	Random Site Inspection
	Ensure speed limits on site and on transporting routes	Speed signs installed	Contractor	Random Site Inspection
	Ensure the use of personal protective equipment (PPE) for workers	PPE used on-site by workers	Contractor	Random Site Inspection
	Maintain high standard in housekeeping on site	Good housekeeping on-site	Contractor	Random Site Inspection
	Ensure provision of Health and Safety (H&S) facilities at the project site, including shaded welfare areas, bathrooms and potable water	H & S Facilities provided at site	Contractor	Random Site Inspection
	Ensure that the workers camp and construction areas are open only to formal employees	Access controlled	Contractor	Random Site Inspection
Fire Prevention	Provide necessary fire prevention equipment on site in line with applicable regulations	Fire prevention equipment in place	Contractor	Regular Site Inspection
Labour Rights	Ensure that workers have access to and are aware about the grievance mechanism	Grievance mechanism in place and grievance recorded	SCO/Contractor	Review of grievance register
	Ensure minimum legal labour standards as per ILO regulations (child/forced labour, no discrimination, working hours, minimum wages) are met	Grievance mechanism records Training recorded	Contractor	Inspection reports (also from labour authorities), review of grievance register and training record
	Provide hygienic, adequate facilities for workers, ensuring toilets and changing rooms are separated to male and female employees	Appropriate facilities in place	Contractor	Random site inspection
	Ensure the workforce has access to primary healthcare on site, providing prescriptions	Healthcare available on site	Contractor	Random site inspection
	Provide housing conditions in accordance with all applicable health and safety regulations and norms by ensuring the provision of	Appropriate housing conditions for workers	Contractor	Random site inspection Worker interviews

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
	adequate space, supply of water, adequate sewage and garbage disposal system, appropriate protection against heat, cold, damp, noise, fire and disease-carrying animals, adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting, and in some cases basic medical services			
Ambient Air				
Dust emissions (especially in dry conditions)	Ensure watering of transportation roads during dry and windy conditions. Generally, keep roads in good condition	Watering conducted, roads in good conditions	Contractor	Random site inspection, inspection of roads
	Cover truck loads with canvas to avoid dust blow	Trucks covered	Contractor	Random site inspection
	Ensure optimal traffic routes. Enforce vehicle speed limits on unpaved roads	Speed limit signs Driver training records	Contractor	Random site inspection
	Ensure appropriate stockpile management (friable materials) to minimize dust blow. Minimize drop heights for material transfer activities such as unloading of friable materials	No extensive dust blow	Contractor	Random site inspection
Emissions from equipment and vehicles	Use equipment and vehicles in appropriate technical conditions. Provide emissions control equipment where applicable (e.g. filters)	Technical specification sheet	Contractor	Each time new equipment/vehicle is used at the site Random site inspection
	Use low sulphur content fuels, in line with legal provisions in force as well as local availability	Technical specification sheet	Contractor	Random site inspection
	Ensure optimal traffic routes to minimize lengths of travel while avoiding settlements if possible	Optimal routes chosen	Contractor	Random site inspection
	Ensure vehicles and equipment are switched off when not in use	Engines switched off	Contractor	Random site inspection
Noise and Vibrations				
Noise and vibration impact at the construction sites and from constructio	Limit the hours of operations for specific pieces of equipment or operations, especially mobile sources operating through community areas or close to residential houses (typically between 10pm and 7am). Avoid vehicle movements at night	No work conducted between 10pm and 7am / grievance mechanism	Contractor	Random site inspection, Review of filed grievances, review of timesheets of workers

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
n traffic	Use of state-of-the-art technology and limit the number of machines operated simultaneously	Grievance Mechanism	Contractor	Spot checks, review of filed grievances
	Ensure the use of modern and well-maintained equipment (e.g. use of silencers)	Technical specification sheet	Contractor	Random site inspection
	Set traffic speed limits. Verify drivers' behaviour with respect to driving speed and safety	Speed limit signs Driver training Records as part of induction training	Contractor	Random site inspection, review of training records
	Plan vehicle routes to avoid settlements where possible	Safest routes selected, Grievance Mechanism	Contractor	Review of traffic routes, review of filed grievances
	Use protective hearing equipment for workers conducting noisy activities	Protective hearing equipment used	Contractor	Random site inspection
Traffic and Transport				
Disruption, noise and increased air pollution	Schedule traffic activities to avoid peak hours on local roads if feasible	Peak hours on local roads avoided,Grievance Mechanism	Contractor	Review of filed grievances
	Ensure safe driving by project personnel (e.g. through training/induction)	Driver training Records as part of induction training	Contractor	Review of training records
	Organize carpools/buses for worker transportation where possible to avoid additional traffic pressure	Carpools/buses used	Contractor	None
	Prevent storage of construction materials, equipment and machineries on traffic lanes	Dedicated storage areas in place	Contractor	Random site inspection
Soil and Groundwater				
Environmental contamination / spills	Collect and segregate wastes and ensure safe storage and in line with legal requirements	Waste collection areas existent, waste inventories	Contractor	Random site inspection, review of waste inventories
	Ensure disposal through waste contractors licensed for treatment / removal/recycling of each of the waste types	Disposal through licensed contractors	Contractor	Random site inspection, Inspect offsite waste disposal facilities if feasible
	Ensure appropriate containment and disposal of construction wastewater, including sanitary water	Water disposal compliant with legal requirements	Contractor	Random site inspection
	Ensure appropriate and safe storage of contaminants such as fuels,	Safe storage of hazardous	Contractor	Random site inspection

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
	construction materials and wastes. Provide absorbent and intervention materials in sufficient quantities and at relevant locations for intervention in case of leakages/spills	materials, spill remediation equipment in place		
	Implement appropriate secondary containment and spill controls for maintenance or refuelling works	Containment and spill controls in place	Contractor	Random site inspection
	Ensure immediate cleaning of any spills and remediation of contaminated areas after construction	Workers trained	Contractor /SCO	Random site inspection One-time inspection after construction
Best practice soil handling	Ensure appropriate storing of topsoil removed. After construction topsoil will be used as backfill for restoration of the area	Topsoil stored and re-used	Contractor	Random site inspection
	Limit stockpile height to 2m maximum to avoid soil compensation	Stockpile height	Contractor	Random site inspection
	Reinstatement of construction working area to the best possible after construction activities are completed.	Reinstatement completed	Contractor /SCO	One-time inspection after construction
	If construction takes place on inclined surfaces/slopes, ensure preventive erosion control measures are applied (e.g. plan to retain trees and other vegetation, use of natural contours for roads and drainage networks, excavated drainage channels)	Preventive erosion control measures in place	Contractor	Random site inspection
Water and Hydrology				
Surface Water Quality	Prioritise the use of rainwater/stormwater over surface water/groundwater abstraction by using harvesting equipment and systems on site	Water harvesting conducted	Contractor	Random site inspection
	Restrict excavation activities during periods of intense rainfall. Use temporary bunding to reduce the risk of sediment, oil or chemical spills to the receiving waters	No excavation during intense rainfall	Contractor	Random site inspection
	Carry out excavation works in cut off ditches to prevent water from entering excavations	No water entering excavations	Contractor	Random site inspection
	Reuse wastewater wherever feasible	Wastewater reused	Contractor	Random site inspection
Flora and Fauna				
Areas of high	Assess the occurrence of protected areas and/or natural/critical habitats	Areas of ecological	Contractor /SCO	Random site inspection

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
ecological value	at and around the construction site. Avoid these areas where possible through traffic management and site setup	value avoided		
Site clearance – vegetation removal and habitat disturbance	Limit vegetation clearing to areas within the site boundary where it is absolutely necessary	Vegetation clearing minimal	Contractor	Random site inspection
	Avoid clearing mature trees	No mature trees cleared	Contractor	Random site inspection
	Avoid off-road vehicle traffic. Use existing roads	No off-road traffic	Contractor	Random site inspection
	Ensure revegetation of cleared areas where possible after construction using native species	Revegetation completed	Contractor /SCO	One-time inspection after construction
Light	Shield lighting downwards towards the site to avoid side-spill. Avoid tall masts where possible	Light nuisance minimised	Contractor	Random site inspection
Pesticide use and management	If pesticides are to be used for agriculture program, only those that are low in human toxicity, that are known to be effective against the target species, and that have minimal effects on non-target species and the environment shall be used.	Pesticide specification sheet	Contractor	Random site inspection
Socio-Economic				
Stakeholder Engagement and Grievance Mechanism	Engage / communicate with communities and plan sufficient time for participation. Ensure regular consultations with the local authorities and communities regarding the management of construction. See also planning state (Chapter 6)	Minutes of Meetings Grievance Mechanisms	SCO / Contractor	Review of grievance register
	Initiate an efficient Grievance Mechanism to allow potentially affected individuals to voice their concerns on the project. See also planning stage (Chapter 6)	Grievance Mechanisms in place, grievances recorded	SCO / Contractor	Review of grievance register
Local Employment & Procurement	Ensure local communities are preferred for the supply of goods and services to the project and project personnel, where appropriate	Local Procurement and Employment Records	Contractor	Review procurement and employment rules and records
Land Acquisition and Compensation, Physical Displaceme	Avoid land take and hereby avoid physical relocation of both, formal and informal land-owners / land users Engage with the local community and potential affected households to understand the land ownership and	Grievance Mechanisms recorded Management Plan for Land Acquisition and		

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
nt / Economic Displacement	land use Should land acquisition and displacement be inevitable, prepare a Management Plan for Land Acquisition and Compensation including provisions for resettlement	Compensation if needed		
Impacts on Livelihoods / Economic Displacement	Engage with the local community and potential affected households to understand their needs and identify the risk of damage to their livelihood basis through the project (e.g. take of pasture land, lack of access to water) Should land acquisition and displacement be inevitable, prepare a Management Plan for Land Acquisition and Compensation including provisions for livelihood support for the affected parties	Minutes of Meetings Grievance Mechanisms recorded Management Plan for Land Acquisition and Compensation if needed	Contractor / SCO	Review of grievance register and meeting minutes
Community Health and Safety	Ensure all contractors implement codes of conduct concerning employment and workforce behaviour (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible diseases and HIV/AIDS, gender equality and sexual harassment, respect for the beliefs and customs of the populations and community relations in general)	Workers Code of Conduct Grievance Mechanism recorded	Contractor / SCO	Workers interviews, review of grievance register
	Target signage and outreach activities to improve public awareness of traffic changes and potential hazards for high-risk sections of public roads, including near the site and laydown areas	Warning signs Minutes of Meetings	Contractor	Inspection if traffic routes, review of grievance register
	In case of security personnel at the size, ensure proper training and in the use of force and appropriate conduct toward workers and affected communities	Training Records	Contractor	Review of training records and grievance register
Communicable Diseases	Report any occurrence of any communicable diseases amongst the workforce (STD, HIV/AIDS, TB, Malaria and Hepatitis B and C) and set up diseases prevention programme if needed	Communicable Diseases Register	Contractor	Review of diseases register and disease prevention programme if available
Cultural Heritage				
Damage of Cultural	Ensure all chance finds of cultural heritage (e.g. graves, old ceramic,	Training records, records	Contractor / SCO	Random site inspection

Topic / Potential Impact	Mitigation, Management and Enhancement Measures	Means of Verification	Responsibility	Monitoring Procedure
Heritage	old building fragments) are reported immediately to the relevant authority. If possible, avoid excavation in the ultimate neighbourhood of a chance find, fence the chance find and await instructions from the competent authority.	about chance fiends		