Draft Final Report

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

UMUDA ISINGWU/UMUAGU IBEKU GULLY EROSION COMPLEX IN UMUAHIA NORTH LOCAL GOVERNMENT OF ABIA STATE

Abia State Nigeria Erosion and Watershed Management Project

October, 2017

Table of Contents

LIST OF PLATES

LIST OF TABLES

EXECUTIVE SUMMARY

The Government of Nigeria is implementing the multi-sectoral Nigeria Erosion and Watershed Management Project (NEWMAP), financed by the World Bank, Global Environment Facility, the Special Climate Change Fund, and the Government of Nigeria. The Project Development Objective (PDO) of the NEWMAP is to improve erosion management and gully rehabilitation; increase incomes for rural households from improved agricultural and forest practices through the use of conservation agriculture, agroforestry, natural regeneration, etc.; and gain efficiency in public administration and public spending through improved knowledge base, analytical tools, multi-sectoral coordination and stakeholder dialogue.

Various documents have been prepared in line with NEWMAP, and they include; Environmental and Social Management Framework (ESMF), Resettlement Policy Frameworks (RPF), Project Appraisal Document (PAD) prepared for the Nigerian Erosion and Watershed Management Project. This report focuses on the Environmental and Social management Plan (ESMP) developed for the Rehabilitation of the Umuda Isingwu/Umuagu Ibeku Gully Erosion Site, Umuahia North LGA of Abia State Nigeria.

Objectives of the Environmental and Social Management Plan

The objective of the **ESMP** is to develop procedures and plans to ensure that the mitigation measures will be implemented throughout the phases for the **Rehabilitation of the Umuda Isingwu/Umuagu Ibeku Gully Erosion Site.** It has also been prepared to ensure the effective long-term protection of the area and other biotic and abiotic components of the environment.

Description of the study area

Abia State is located in the south-eastern zone of Nigeria with a land mass of over 4902.24 sq. km. The state has a population of 2,845,380 (2006 Census). Abia state lies within the riverine part of Nigeria and shares boundaries with Anambra, Enugu, Ebonyi, Imo, Cross River, Akwa Ibom and Rivers states. The state consist of 17 Local Government Areas and they include; Aba North, Aba South, Arochukwu, Bende, Ikwuano, Isiala-Ngwa North, Isiala-Ngwa South, Isiukwuato, Obi Ngwa, Ohafia, Osisioma Ngwa, Ugwunagbo, Ukwa East, Ukwa West, Umuahia North, Umuahia South and Umu-Nneochi.

The Umuda Isingwu/Umuagu Ibeku gully erosion complex lies between longitude 05° 32' and 05° 34' North, and latitude 07° 28' and 07° 30' East. The Umuda Isingwu/Umuagu Ibeku gully erosion complex consists of Umuagu main gully and its tributary Umuda/Okengwu gully, and Isingwu main gully. They are located in Umuagu Ibeku and Umuda Isingwu communities in Umuahia North local government area of Abia State. This site has three different gully heads at Umuagu, Umuda and Isingwu villages. The Umuagu and Umuda/Okengwu gullies empty into Iyi Doti (De Oti) stream while Isingwu gully empties into the Obohu stream. The confluence of Iyi Doti and Obohu streams is at Nchi Isingwu Umuda Amafor and retains the name Obohu as it flows downstream.

Project Environment

The climate of Umuahia North is characteristically of the Equatorial type found in South-Eastern Nigeria, essentially warm and humid. This is a resultant effect of its prevailing seasonal wind, nearness to the seacoast and the relatively flat topography of the environment. A humid Tropical Maritime (mT) from across the Atlantic Ocean in the south dominates the region in the longer wet season (April to October). A drier Tropical Continental (cT) air mass blowing from the northeast direction controls the climate and meteorology of the area during the dry season (November to March).

The climate is tropical with two distinct seasons, the rainy season and the dry season. The rainy season begins around the first of May and continues into September while the dry season runs from November to April. Rainfall reaches its highest monthly maximum of 300 – 400mm during the month of June through September and drops to 0.0-1.0mm in December and January.

Social Baseline Environment

The socio-economic assessment studies were aimed at examining the socioeconomic conditions of the people living around the project site in Umuda Isingwu and Umuagu Ibeku both in Umuahia North LGA of Abia State. This is to ensure that the potential impacts of the proposed rehabilitation project is captured and described while proffering solutions to possible negative impacts to human habitat, health and livelihoods.

The specific objectives of the study include:

a. Describe the existing status of the sub watershed and gullies;
b. Identify the environmental and social issues/risks associated with the existing conditions;
c. Select and measure appropriate baseline indicators (for example, m3/sec of runoff collected in the sub watershed during a heavy hour-long rainfall);
d. 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;
e. Develop a time-bound plan for mitigating environmental and social risks associated with the sub-watershed management in consultation with relevant public and government agencies; Identify feasible and cost effective measures that may reduce potentially significant adverse environmental and social impacts to acceptable levels;
f. Identify monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed and the mitigation measures described above (as in a-e);
g. 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;
h. Define technical assistance programs that could strengthen environmental management capability in the agencies responsible for implementation;
i. 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
j. Provide the expected capital and recurrent cost estimates and sources of the funds for implementing the ESMP and inform accordingly the design consultants so that these costs are duly taken into consideration in the designs.

A random sampling survey was carried out within the community. Questionnaires were administered to a total of 515 respondents.

Project Description

Proposed solution to ameliorate the erosion problem is proper management of prevailing flood flow path to the gully and subsequently control the gully using adequate drainage systems such as culverts, drains, chute channels and stilling basins, rip-rap resting on geotextile, then gabion check dams placed along the gully bed to slow down the flow velocity, etc.

The principal components of the design works for the Erosion Complex are:

- Umuagu Ibeku gully - Design option 2: Conduct runoff safely through the gully to safely discharge into Iyi Doti stream using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams and retaining walls accompanied by earthworks and vegetation.

Umuda Isingwu gully – Design option2: Conduct runoff safely through the gully to safely discharge into the main gully using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams accompanied by earthworks and vegetation.

Policy, Legal, Regulatory and Institutional Framework

The section on Policy examined the various regulation and legal documents as it concerns Nigeria and Abia State. The World Bank Safeguards and other relevant International guidelines applicable to the sub-project intervention were also examined. The various institutional frameworks relevant to the NEWMAP were also evaluated in this section.

The Rehabilitation Project is rated a World Bank Category B (equivalent to Category II in the Nigeria EIA Act) project in accordance with the Environmental Assessment Policy of the World Bank, which will focus on mitigation and Environmental planning measures. The identified World Bank safeguard policies triggered by the rehabilitation of the gully site include; Environmental Assessment (OP 4.01); Natural Habitats (OP 4. 04) and Physical and Cultural Resources (OP 4.11 and Pest Management Safeguard Policy OP 4.09.

Summary of potential impacts for the Umuda Isingwu/Umuagu Ibeku Gully Erosion site

S/N	Positive Impacts	Adverse Impacts
1	Rehabilitation of the erosion menace in the community	Increase in fugitive dust emission during preconstruction and construction phases of the rehabilitation.
2	Repair of the watershed gullies	Waste generation especially construction wastes.
3	Connection and restoration of access to houses and villages already cut off by the erosion	Possibility of seepage of fuel from machineries and effluent discharge into the watershed, thus impacting on the water quality.
4	Provision of employment opportunities for both skilled and unskilled workers.	Site clearing will lead to loss of species diversity and abundance, including soil organisms, fungi, invertebrates, and bacteria.
5	Improved agricultural productivity within the community and Abia state at large.	Noise and vibration from heavy-duty project vehicles and equipment resulting in nuisance.
6	Community development programs.	The frequency and incidence of occupational hazards may rise during construction activities.
7	Reintegration of community and diversification of sources of livelihood.	Loss of employment for labourers after the completion of the rehabilitation works,
8	Reduction of mortality rate.	
9	Promotion of afforestation programs (with all its benefits)	

10	Minimization of flooding and control of overflow.	
11	Reduced fear perception of loss of property, inhabitation and ancestral origins of the communities.	
12	Control and Reduction of water body sedimentation rates due to erosion.	
13	Reduction in mortality/morbidity from landslides.	
14	Initiation/ kick-off of rapid production systems and agricultural practices.	
15	Increase in social interactions	
16	Improved livelihood enhancing activities	
17	Gender Issues: Construction activities will encourage economic activities, especially for women. Since there would be a large workforce, petty traders and food-spots owners will benefit immensely from the demand on site.	
18	Promotion of goodwill and community appreciation of the NEWMAP intervention in Abia State and Nigeria at large.	

This ESMP therefore will ensure that the adverse/negative impacts are reduced to the barest minimum while the beneficial impacts are enhanced.

Project Alternatives

Various alternatives to the planned rehabilitation of the Umuda Isingwu/Umuagu Ibeku Gully Erosion Site were evaluated. These include:

- Do nothing approach
- Rock lined chute
- Wood drop structure
- Vegetated overall structure

Also several technological and design options were analyzed for the project. These include:

- Rock lined chute
- Wood drop structures

The preferred alternative would be to implement the current project proposal, however with a combination of suitable alternatives to enable the project achieve its objectives. This is mainly based on cost benefit analysis as well as sustainability.

Environmental and Social Management Plan and Monitoring Plan Budget

The ESMP included the various impacts discussed according to the respective phases during project implementation. The impacts have been described, as they will impact on the different

environmental and social sensitivities. The mitigation measures, mitigation costs and institutional responsibilities were also highlighted in the ESMP matrix table.

The total cost for Implementing the ESMP and Monitoring Plan for the Umuda Isingwu/Umuagu Ibeku Gully Erosion Site Rehabilitation Works is estimated at

The ESMP matrix for the implementation of the Rehabilitation works is highlighted from Table 25-27. .

Item	Responsibility for implementation and Monitoring	Cost Breakdown	Cost Estimate in Nigerian Naira (₦)	Cost Estimate in Us Dollars (US$)
Enhancement ofPositive impacts and Mitigation of Negative impacts	Contractor, SPMU, SMENV, ASEPA, FRSC			
Management of ESMP Implementation	,SPMU SMENV, ASEPA			
Monitoring, Evaluation & Audit	SMENV, ASEPA, FERMA, SMW			
SUB- TOTAL				
Contingency				
TOTAL				

Institutional Arrangement for ESMP and Monitoring Plan

It is envisaged that the environmental and social impacts and their designed enhancement and mitigation measures shall be monitored during implementation of the construction/rehabilitation works and operation phases. The roles and responsibilities for monitoring the environmental and social impacts and the implementation of the ESMP are as follows.

Overall sub-project coordination will be housed in the State Project Management Unit (SPMU), of Abia State NEWMAP Office. They will oversee the day-day project management and ensure that environmental and socio-economic concerns and management as elucidated in the ESMP are integrated into all aspects of project implementation. The Federal Ministry of Environment (FMENV), The Abia State Ministry of Environment; herein referred to as State Ministry of Environment (SMENV); National Environmental Standards Regulatory Enforcement Agency (NESREA) at the state level, and Abia State Environmental Protection Agency (ASEPA) will monitor, evaluate and audit the implementation of the ESMP to ensure that the rehabilitation works and project operations meet “best environmental practices”. The SPMU (i.e. ESO and M&E Officers) will

also be engaged in monitoring at the state level while the FPMU M&E unit will oversee the M&E activities of the SPMU.

Awareness creation exercises on HIV/AIDS, environmental protection and personal hygiene and sanitation shall also be undertaken for contactors personnel and all stakeholders involved in project implementation.

Stakeholder Consultation

The public consultation strategy for the ESMP activities evolved around the provision of a full opportunity for involvement for all stakeholders, especially the PAPs. Concerns raised by the stakeholders are documented and incorporated in this report and used to develop mitigation and/or enhancement measures.

The stakeholders were informed of the visits through the existing communication line between the SPMU and the communities. The Community leaders through the use of town criers, church announcements and phone calls, informed the rest of the community of the proposed meetings.

Consultation Method: A combination of various consultation methods were used to assess knowledge, perception and attitude of the groups consulted concerning the project, and its potential environmental and social impacts. An Advocacy Visit, Focal group meetings, Town hall meeting and Feedback meetings were conducted.

The advocacy visit meeting was held on 5th April 2017 at the community and Town hall meeting was carried out on the 10th April 2017. In attendance were the President General of Umuda Development Association, Public Relation Officer of Umuda community, Chairmen of all villages affected by the project, Women and Youth Groups , Other Stakeholders are individuals who own properties that will be directly or indirectly affected by the project, Community Associations, Business Owners etc.

At this general meeting, all the stakeholders and community members were given a general overview of the project, the component and information regarding the ESMP and other relevant information in the TOR.

LIST OF ACRONYMS

AGO	Automotive Gas Oil
AIDS	Acquired Immune Deficiency Syndrome
ARAP	Abbreviated Resettlement Action Plan
ASEPA	Abia State Environmental Protection Agency
BOD	Biochemical Oxygen Demand
CASHES	Community Affairs, Safety, Health, Environment and Security
CBA	Cost Benefit Analysis,
CBO	Community Based Organizations
CDA	Community Development Associations
CDD	Community Driven Development
CO	Carbon monoxide
COD	Chemical Oxygen Demand
CPMC	Community Project Management Committee
CSO	Civil Society Organizations
DO	Dissolved Oxygen
EA	Environmental Assessment
EC	Electrical conductivity
EIA	Environmental Impact Assessment
ERIM	Emergency Response and Incident Management
ESA	Environmental and Social Assessment
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESO	Environmental safeguards Officer
FBO	Fixed-Base Operator
FMARD	Federal Ministry of Agriculture and Rural Development
FMW	Federal Ministry of Works
FEPA	Federal Environmental Protection Agency
FMENV	Federal Ministry of Environment
FMWR	Federal Ministry of Water Resources
FPMU	Federal Project Management Unit
FRSC	Federal Road Safety Corps
FSLC	First School Leaving Certificate
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Green House Gas

GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GSM	Global System for Mobile
HAZCOM	Hazard Communication Program
HC	Hydro Carbon
HCF	Health Care Facility
HIV	Human Immunodeficiency Virus
IDA	International Development Association
IFR	Interim Financial Reports
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature and Natural Resources
JHA	Job Hazard Analysis
LGA	Local Government Area
LGDO	Local Government Desk Office
LGRC	Local Government Review Committee
M&E	Monitoring and Evaluation
MDA	Ministries, Departments and Agencies
MSDS	Material Safety Data Sheets
NESREA	National Environmental Standards and Regulations Enforcement Agency
NEWMAP	Nigeria Erosion and Watershed Management Project
NGO	Non-Governmental Organizations
NIHSA	Nigeria Hydrological Services Agency
NIMET	Nigerian Meteorological Agency
OHRA	Occupational Health Risk Assessment
OHS	Occupational Health and Safety
OHSMPC	Occupational Health and Safety Management Plans
PAD	Project Appraisal Document
PAP	Project Affected Person
PDO	Project Development Objective
PHA	Process Hazard Analysis
PHC	Primary healthcare
PHCN	Power Holding Company of Nigeria
PHF	Primary Healthcare Facility
PIM	Product Information Management
PIU	Project Implementation Unit
PM	Particulate Matter
PMS	Purified Motor Spirit
PPE	Personal protective equipment

RAP	Resettlement Action Plan
RFP	Resettlement Policy Framework
ROI	Return on Investment
RPF	Resettlement Policy Framework
SA	Social Assessment
SCCF	Special Climate Change Fund
SLM	Sustainable Land Management
SMEnv	State Ministry of Environment
SPMU	State Project Management Unit
SPSS	Statistical Package for the Social Sciences
STD	Sexually Transmitted Disease
STI	Sexually transmitted infections
TDS	Total Dissolved Solid
TOR	Terms of Reference
UV	Ultraviolet
VES	Vehicle Exhaust Screening
VET	Vehicle Emission Testing
WASSCE	West African Senior School Examinations
WHO	World Health Organization
WRPP	Workers Respiratory Protection Program

1 CHAPTER ONE: INTRODUCTION

1.1 Background

The ecological menace of erosion is a major disaster that continues to threaten landmass in Nigeria. Some of these erosion have resulted due to natural and human causes. Over 6,000km^2 of land are affected by erosion and about 3,400km^2 are highly exposed. In some areas of southern Nigeria, farmland degradation has caused yield reductions of between 30% and 90%, and as much as a 5% drag on agricultural GDP. Erosion has a devastating effect on many peoples' lives and destroys infrastructure essential for economic development and poverty alleviation (NEWMAP ESMF, 2012).

Gully erosion contributes to environmental problems and damage estimated at over $100 million annually (mostly in South-Eastern Nigeria) (NEWMAP PIM, 2013). It creates channels of various sizes through concentrated runoff on definite routes, which result in systematic removal of soil particles, including plant nutrients, from one location to another, and even in worse cases destruction of lives and properties. In view of this, the Government of Nigeria is implementing the multi-sectoral Nigeria Erosion and Watershed Management Project (NEWMAP), financed by the World Bank, Global Environment Facility, the Special Climate Change Fund, and the Government of Nigeria. The NEWMAP is aimed at reducing vulnerability to soil erosion in targeted sub-catchments. The project is currently being implemented in 19 states namely Cross River, Abia, Ebonyi, Imo, Enugu, Anambra, Edo, Gombe, Kogi, Kano, Katsina, Nasarawa, Akwa Ibom, Bauchi, Borno, Plateau, Delta, Oyo and Sokoto, states. The NEWMAP finances activities implemented by State and Federal Government.

The Project Development Objective (PDO) of the NEWMAP is to improve erosion management and gully rehabilitation; increase incomes for rural households from improved agricultural and forest practices through the use of conservation agriculture, agroforestry, natural regeneration, etc.; and gain efficiency in public administration and public spending through improved knowledge base, analytical tools, multi-sectoral coordination and stakeholder dialogue.

NEWMAP Components are divided into 4 viz;

Component 1: Erosion and Catchment Management investment

Sub-component 1A Gully Rapid Action and Slope Stabilization

Sub-component 1B Integrated Catchment Management

Sub-component 1C Adaptive Livelihoods

Component 2: Erosion and Catchment Management Institutions and Information Services

Sub-component 2A Federal MDA Effectiveness and Services

Sub-component 2B State MDA Effectiveness and Services

Sub-component 2C Local Government Capacity

Sub-component 2D Private Sector Capacity

Component 3: Climate Change Agenda Support

Sub-component 3A Policy and Institutional Framework

Sub-component 3B Low Carbon Development

Component 4: Project Management

This program is financed through an 8-year Strategic Investment Loan (SIL) of $508.59M, consisting of a $500M IDA concessional loan blended with GEF and SCCF grants totalling $8.59M. The Government of Nigeria's contribution will amount to approximately $150M. This contribution only reflects the costs currently directly attributable to Project activities but will also include the cost of liaison officers from each MDA which is yet to be reflected. The calculated amount comprises (i) a federal contribution both cash and in-kind of $83.34 for duties, taxes, staff and

office costs and (ii) a cash and in-kind contribution by each state of approximately $6M (for each of 11 states totalling approximately $67M) for resettlement, staff and office costs and pre-feasibility designs of intervention sites. State contributions to project financing are an agreed

1.1 Environmental and Social Safeguard Concerns

The environmental and social safeguards concerns for NEWMAP are addressed through two national instruments already prepared under the project: an Environmental and Social Management Framework (ESMF) and a Resettlement Policy Framework (RPF).

1. **Environmental and Social Management Framework (ESMF)**: In general, the ESMF specifies the procedures to be used for preparing, approving and implementing
   a) **Environmental/Social Assessments** (ESAs, or alternately both an SA or an EA) and/or
   b) **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. The ESMF will serve as a guide for the preparation of this ESMP for Umuda Isingwu/Umuagu Ibeku gully Erosion site since the World Bank OP/BP 4.01-Environmental Assessment is triggered as a result of the civil works.

2. **Resettlement Policy Framework (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, organizational arrangements and design criteria to be applied to meet the needs of project-affected people, and specifies the contents of a Resettlement Action Plan (RAP) for each package of investments. A Resettlement Policy Framework (RPF), which serves as a practical tool during the programme formulation, design, implementation and monitoring, was prepared for NEWMAP, which serves as a guide for the present terms of reference. The activities of Component 1 will involve civil works in specific intervention sites – that is, construction of drainage works and/or rehabilitation of gullies. This could result in the acquisition of land or displacement of families, business or public infrastructure, thus triggering the World Bank OP/BP 4.12 – Involuntary Resettlement.

Various documents have been prepared in line with the NEWMAP, and they include; Environmental and Social Management Framework (ESMF), Resettlement Policy Frameworks (RPF), Project Appraisal Document (PAD) prepared for the Nigerian Erosion and Watershed Management Project.

This report focuses on the Environmental and Social Management Plan (ESMP) prepared for the Rehabilitation of the Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex in Umuahia North LGA of Abia State.

The Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex consists of Umuagu main gully and its tributary Umuda/Okengwu gully, and Isingwu main gully. They are located in Umuagu Ibeku and Umuda Isingwu communities in Umuahia North local government area of Abia State.

The NEWMAP intends to rehabilitate the gully erosion site and reduce longer-tern erosion vulnerability in the targeted areas. This activity will be employed through some civil works such as construction of infrastructure and stabilization of the gully. An engineering design report has already been prepared for the Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex, which highlights on the detailed civil works that will be carried out. This ESMP study will therefore, aim to identify potential and significant adverse environmental and social impacts that will be associated with the rehabilitation and to propose means of minimizing and/or mitigating them to acceptable levels.

1.2 Purpose of the ESMP

The Environmental and Social Management Plan (ESMP) is an instrument that details the measures to be taken during the implementation and operation of a project to eliminate or offset adverse environmental and social impacts or to reduce them to acceptable levels; and the actions needed to implement these measures. The ESMP is an integral part of Category "A" Environmental Assessments (EAs) (irrespective of other instruments used). EAs for Category "B" projects may also result in an ESMP. However, the impacts of the Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex rehabilitation project are considered to be mainly site specific. The project will concentrate mainly on the rehabilitation which will include the construction of a set of side drains, filling and compaction of fill to reclaim part of the gully head and its finger gully, construction of step-wise drop structure to dissipate a large part of the energy of flow, and re-vegetation of the gully site with local grass and trees within the distance of the gully and its finger. More on the project design is explained in Chapter 5 of this report.

The civil works will be concentrated at the areas closest to the erosion site and will ensure negligible adverse impacts on livelihood. The adverse impacts will be largely reversible, indirect and short term. Considering the aforementioned, the project falls suitably into the World Bank's category B; hence the most suitable safeguard instrument to address beneficial and adverse impacts is an Environmental and Social Management Plan (ESMP).

The ESMP provides a set of procedures through which NEWMAP will develop and implement environmental, social, health, and safety management systems, programs, processes and procedures that will establish a foundation for sound mitigation of adverse impacts, enhancement of positive impacts, institutional responsibilities, indicative costs for mitigation and eventual monitoring of the ESMP.

The ESMP outlines Abia State NEWMAP Project Management Unit's corporate commitment to managing the project in a responsible, safe and sustainable manner whereby the protection of the environment, safety of people and social concerns take priority above all other business concerns.

The ESMP will also ensure compliance with applicable environmental standards all through the life span of the project. The Bank will disclose the ESMP document publicly, in Nigeria and at the World Bank Info-shop before project appraisal.

1.3 Objectives of the Environmental and Social Management Plan

The objective of the ESMP is to develop procedures and plans to ensure that the mitigation measures will be implemented throughout the phases for the Rehabilitation of the Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex. It has also been prepared to ensure the effective long-term protection of the area and other biotic and abiotic components of the environment.

Specific objectives of this ESMP include the following:

- To examine the project in terms of its major activities and identify the aspects associated with the project construction which generate environmental impacts,
- Identify the environmental issues associated with the major activities,
- Develop mitigation measures for the aspects identified as having adverse environmental impacts,
- Incorporate environmental mitigation measures into activities and develop corrective actions and ensure monitoring.

- Define the specific actions required, roles and responsibilities for these actions, and associated costs and,
- Define a proposed institutional structure to govern the implementation of the ESMP and its monitoring.

1.4 Technical Approach and Methodology to the ESMP

The consultant carried out a reconnaissance exercise first to get a visual understanding of the project area. Subsequently, a more detailed assessment was carried out which has been integrated in this report. The environmental and social sensitivities of the project area and its surrounding environs were ascertained. Advocacy Visits, Stakeholder/Public Consultations were also carried out. The Advocacy visit was done with the major identified Focal Group Leaders in the communities, which included (Traditional Rulers of communities, Members of the Town Union executive council, Women and Youth Group leader of the Communities, etc.). A more detailed Consultation with a greater number of people from the communities was carried out subsequently as well as a feedback meeting. Information garnered from the exercise including their concerns regarding the intervention is documented in Chapter 7 of this report.

The methodology used in the conduct of the Environmental and Social Management Plan is based on guidelines as proposed by the following:

- Federal Government of Nigeria EIA Law and subsequent Federal Ministry of Environment standard procedure for conducting EIA/ESIA in Nigeria
- Guidelines documented under the World Bank Environmental Assessment Operational Policies OP 4.01.

The rehabilitation works will trigger some of the World Bank Safeguard Policies including Environmental Assessment OP 4.01; Natural Habitats OP 4.04; Physical and Cultural Resources OP 4.11 and Involuntary Resettlement OP 4.12 These guidelines collectively advise that Environmental and Social Management Plan studies are essential to examine the potential environmental and social threats and benefits (impacts) associated with rehabilitation works for the Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex.

It is worthy to state at this point that the SPMU is not responsible for any property destroyed by the contractor outside the scope of the approved design

2 CHAPTER TWO: INSTITUTIONAL AND LEGAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

2.1 Introduction

A number of national and international environmental guidelines are applicable to the operation of the NEWMAP. The policy and regulatory frameworks discussed in this section guided the preparation of this ESMP.

2.2 The Environmental and Social Management Framework (ESMF) for the NEWMAP

The ESMF was prepared as a guide to set out the general terms to achieve health, safety, and environmental regulatory compliance objectives to comply with the World Bank Operational Policy (OP 4.01 – Environmental Assessment). This will focus on specific steps to be taken, policy, competence building, communication with the public, and monitoring.

It shall identify the entity or entities responsible for carrying out the mitigating measures, any legal agreements required and a full budget for the capital and recurrent costs of mitigation. The ESMP shall also contain a monitoring plan indicating the responsible parties and the frequency of monitoring, key indicators.

The preparation of this ESMP is consistent with the guidelines and recommendations of the ESMF of NEWMAP, which is also found to be in agreement with the guidelines of the World Bank OP 4.01.

2.3 Relevant Nigeria Acts and Legislations

2.3.1 National Policy on Environment

*E*nvironmental consciousness and awareness regarding the adverse effects of development projects, including agricultural projects, resulted in the articulation of a national framework for environmental protection and national resources conservation. Decree No. 58 of 1988, as amended by Decree No. 59 of 1992, established the Federal Environmental Protection Agency (FEPA) as the main government structure for environmental matters in the country. The FEPA put in place the 1989 National Policy on the Environment, revised in 1995, with sustainable development as its goal. International agencies such as the World Bank, and other development partners usually set environmental criteria for projects they are involved in. The stated goal of the National Policy on the Environment is to achieve sustainable development in Nigeria, and in particular to:

- Secure a quality of environment adequate for good health and well-being;
- Conserve and use the environment and natural resources for the benefit of present and future generations;
- Restore, maintain and enhance the ecosystem and ecological processes essential for the functioning of the biosphere to preserve biological diversity, and the principle of optimum sustainable yield in the use of living natural resources and ecosystems;
- Raise public awareness and public understanding between the environment and development and encourage individual and community participation in environmental improvement efforts; and,

- Cooperate in good faith with other countries, international organizations and agencies to achieve optimum use of trans-boundary natural resources and the prevention or abatement of trans-boundary environmental degradation.

2.3.2 The Federal Ministry of Environment

The act establishing the Ministry places on it the responsibility of ensuring that all development and industry activity, operations and emissions are within the limits prescribed in the National Guidelines and Standards, and comply with relevant regulations for environmental pollution management in Nigeria as may be released by the Ministry. To fulfil this mandate a number of regulations/instruments are available (See section on National Legal Instruments on Environment), however for the main instruments in ensuring that environmental and social issues are mainstreamed into development projects is the Environmental Impact Assessment (EIA) Act No. 86 of 1992 See Annex 1. With this Act, the FMENV prohibits public and private sectors from embarking on major prospects or activities without due consideration, at early stages, of environmental and social impacts. The act makes an EIA mandatory for any development project, and prescribes the procedures for conducting and reporting EIA studies.

As part of the effective utilization of the EIA tool, the Ministry has produced Sectoral guidelines detailing the necessary requirements of the EIA process from each Sector. One of these Sectoral Guidelines that apply to the proposed project is the 'Sectoral Guidelines on Infrastructure Development.'

Procedurally, in Nigeria, it is worthy to note that before commencement of an EIA, the FMENV issues a letter of intent on notification by the proponent, approve the terms of reference, ensure public participation, review and mediate.

The possible technical activities expected for a proposed project include screening, full or partial EIA Study, Review, Decision-making, Monitoring Auditing and Decommissioning/Remediation post-closure.

2.3.3 National Legal Instruments on the Environment

Environmental Impact Assessment Act No. 86, 1992 (FMEnv)

This Act provides the guidelines for activities of development projects for which EIA is mandatory in Nigeria. The Act also stipulates the minimum content of an EIA and is intended to inform and assist proponents in conducting EIA studies as well as a schedule of projects, which require mandatory EIAs.

According to these guidelines:

- **Category I** projects will require a full Environmental Impact Assessment (EIA).
- **Category II** projects may require only a partial EIA, which will focus on mitigation and Environmental planning measures, unless the project is located near an environmentally sensitive area--in which case a full EIA is required.
- **Category III** projects are considered to have "essentially beneficial impacts" on the environment, for which the Federal Ministry of the Environment will prepare an Environmental Impact Statement.

Other National Legal Instruments on Environment

- Federal Environmental Protection Agency (Amendment) Act No 59 of 1992
- The National Guidelines and Standards for Environmental Pollution Control in Nigeria
- The National Effluents Limitations. Regulation 1991
- The National Environmental Policy (Pollution Abatement in Industries and
- Facilities Generating Waste) Regulations 1991
- The Management of Solid and Hazardous Wastes. Regulations 1991
- National Guidelines on Environmental Management Systems (1999)
- National Guidelines for Environmental Audit
- National Policy on Flood and Erosion Control 2006 (FMEnv)
- National Air Quality Standard Decree No. 59 of 1991
- National Environmental Standards and Regulations Enforcement Agency Act 2007 (NESREA Act)
- The Land Use Act of 2004, CAP L5.
- Water Resource Management Act, 2009
- The constitution of the Federal Republic of Nigeria 1999

2.4 State Legislations

Some of the functions of the State Ministries of Environment include:

- Liaising with the Federal Ministry of Environment, FMENV to achieve a healthy or better management of the environment via development of National Policy on Environment
- Co-operating with FMENV and other National Directorates/Agencies in the performance of environmental functions including environmental education/awareness to the citizenry
- Responsibility for monitoring waste management standards,
- Responsibility for general environmental matters in the State, and
- Monitoring the implementation of ESIA studies and other environmental studies for all development projects in the State.

Some laws in the state include:

Abia State Basic Environmental Law No. 1of 2004 amended in 2013

This law establishes the basic environmental sanitation practice (regulation and enforcement) in Abia State. The law spells out the Abia State Environmental Protection Agency (ASEPA) as a parastatal under the Office of the Governor, Government House Abia state, the individuals who shall by appointment (by the Governor) see to its management, the agency as an authorization, permission, registration and approval granting body as regards sitting of base stations and any other associated operations as well as penalties for any who contravenes the provisions of the same law which upholds basic environmental sanitation practice in Abia State.

Abia State Policy on Environment (2010)

This policy emphasizes state government efforts to sustainable management of the Abia environment with regards to Erosion control. The state government commits to:

- Seek the intervention of the Federal Government of Nigeria and relevant partner agencies in the control of Erosion, to compliment the effort of the state.
- Sensitize communities on erosion control efforts.
- Procure necessary refuse disposal equipment like trucks, pay loaders, giant bins etc.
- Involve households, communities, local governments and states in the joint clearance of drainages.
- Sensitization of households on waste disposal practices and management.
- Sponsor relevant environmental bills to the state assembly for enactment.

- Involve LGAs, communities, and civil society organizations (CSOs) in the enforcement of environmental laws.
- Embark on aggressive afforestation programmes involving LGAs, communities and civil society organizations (CSOs) in the state.

Abia State Flood and Erosion Control and Soil Conservation (2010)

This policy is to promote sustainable land use management by minimizing soil erosion and flooding hazards; achieving this through reducing soil exposure to rainstorms; reduction of surface run-offs and paved surfaces and restoration of degraded land mass.

Abia State Flood Control and Water Conservation (2010)

This policy is to forecast, prevent, monitor and manage flooding. Optimal utilization of floodwater for agricultural and other purposes as well as management of floodplains.

Abia Riverine Area Management Policy (2010)

This policy is to minimize riverine erosion and other forms of riverine degradation such as riverbank failures, landslides and alluvial deposits.

Abia State Watershed Management Policy (2010)

This policy enables the commencement of co-ordinated/holistic/integrated management of natural resources: Land, water, vegetation, etc. on a watershed basis to ensure resource conservation through the minimization of land and soil degradation and maintenance of water quality and yield for environmental sustainability.

Abia State Flood and Erosion Control Management Support System (2010)

This policy aims at supporting a reliable up-to-date database and integrated management system as tools to support all erosion and control programs.

Abia State Basic Environmental Law No. 1 of 2004 amended in 2013

This law focuses on the regulation and enforcement of Environmental Sanitation Practice in the state. It also spells out ASEPA as a parastatal under the office of the governor.

2.5 World Bank Environmental and Social Safeguards

The World Bank has in place a number of operational and safeguards policies, which aim to prevent and mitigate undue harm to people and their environment in any development initiative involving the Bank. The Nigerian EIA Act and the World Bank safeguard policies are similar; designed to help ensure that projects proposed for Bank financing are environmentally and socially sustainable, and thus improve decision-making. The Bank has twelve safeguards policies, however, this section focuses on the World Bank Environmental and Social Safeguard Policies applicable for to this sub-project.

Environmental Assessment (EA) (OP/BP 4.01)

Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental and social impacts associated with Bank's lending operations early on in the project cycle. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted and their concerns addressed. This policy is triggered if a project is likely to have potential adverse environmental and social risks and impacts in its area of influence. The EA has various tools that can be used,

including amongst others Environmental & Social Impact Assessment (ESIA) or Environmental and Social Management Plan (ESMP).

Natural Habitats (OP/BP 4.04)

Any project or sub-project with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).

Forests (OP 4.36)

This operational policy aims to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development. The policy recognizes the role forests play in poverty alleviation, economic development, and for providing local as well as global environmental services. Success in establishing sustainable forest conservation and management practices depends not only on changing the behaviour of all critical stakeholders, but also on a wide range of partnerships to accomplish what no country, government agency, donor, or interest group can do alone.

This policy applies to the following types of Bank financed investment projects:

a) Projects that have or may have impacts on the health and quality of forests;
b) Projects that affect the rights and welfare of people and their level of dependence upon or interaction with forests;
c) Projects that aim to bring about changes in the management, protection, or utilization of natural forests or plantations, whether they are publicly, privately, or communally owned.

Involuntary Resettlement (OP/BP 4.12)

This policy can be triggered if the project will involve involuntary taking of land and involuntary restrictions of access to property, protected areas, etc. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. It promotes participation of displaced people in resettlement planning and implementation. The main objective of this policy is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

Physical Cultural Heritage OP 4.11

This policy is to assist countries to avoid or mitigate adverse impacts of development projects on physical cultural resources. For purposes of this policy, “physical cultural resources” are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural interest may be at the local, provincial or national level, or within the international community.

2.6 International Guidelines

International Development Partners/Agencies such as World Bank and other financial organizations interested in development projects recognize this highly especially in development that result in involuntary resettlement. It is against this background that policies and guidelines have been set for managing such issues.

Nigeria is signatory to some international agreements and Protocols concerning the environment. Those identified and stated in the ESMF developed for NEWMAP include:

- International Union for Conservation of Nature and Natural Resources (IUCN) Guidelines
- Convention of Biological Diversity
- Convention Concerning the Protection of the World Cultural and National Heritage Sites (World Heritage Convention)
- United Nations Framework Convention on Climate Change (1992)

The World Bank's policies on Environmental Assessment will be applied in any sub-project of the NEWMAP that may impact on the integrity of the environment. Where there is conflict between national legislation and World Bank Operational Policies, the latter policies shall prevail.

2.7 Nigeria EIA Guidelines and World Bank EA Guidelines

The Environmental Impact Assessment Act No. 86 (Decree No. 86) of 1992 requires that developmental projects be screened for their potential impact. Guidelines issued in 1995 by the former Federal Environmental Protection Agency (FEPA) direct the screening process.

According to these guidelines:

Category I projects will require a full Environmental Impact Assessment (EIA).

Category II projects may require only a partial EIA, which will focus on mitigation and Environmental planning measures, unless the project is located near an environmentally sensitive area--in which case a full EIA is required.

Category III projects are considered to have "essentially beneficial impacts" on the environment, for which the Federal Ministry of the Environment will prepare an Environmental Impact Statement.

With regard to environmental assessment, the Bank has also categorized projects based on the type of EA required, namely:

Category A - projects are those whose impacts are sensitive, diverse, unprecedented, felt beyond the immediate project environment and are potentially irreversible over the long term. Such projects require full EA.

Category B - projects involve site specific and immediate project environment interactions, do not significantly affect human populations, do not significantly alter natural systems and resources, do not consume much natural resources (e.g., ground water) and have adverse impacts that are not sensitive, diverse, unprecedented and are mostly reversible. Category B projects will require partial EA, and Environmental and Social Management Plans.

Category C - Projects are mostly benign and are likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project, although some may require environmental and social action plans.

Category FI - A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

This World Bank categorization (A, B, & C) corresponds in principle with the Nigeria EIA

requirements of Category I, II and III, which in actual practice is done with regard to the level of impacts associated with a given project. However, in the event of divergence between the two, the World Bank safeguard policy shall take precedence over Nigeria EA laws, guidelines and or standards.

Thus for this ESMP, the Nigeria's *EIA* requirements and World Bank operational procedures were harmonized as far as possible, hence it is made responsive to the objectives of good practice. It is especially made responsive with regard to the followings:

- Early consideration of environmental and social issues;
- Identification and early consultation with stakeholders;
- Prevention of adverse impacts through the consideration of feasible alternatives; and
- Incorporation of mitigation measures into planning and (engineering) design.

The World Bank provides a number of operational and safeguard policies, which aim to prevent and mitigate undue harm to people and their environment in any development initiative involving the Bank. The Nigerian EIA Act and the World Bank safeguard policies are similar. OP.4.01 and Nigerian EIA Act are also similar. World Bank EA Screening Category A is similar to Nigerian EIA Act category I, World Bank EA Category B is equivalent to Nigeria EIA Act Category II, World Bank EA Category C is equivalent Nigeria EIA Act Category III. However in the event of divergence between World Bank safeguard policies and the Existing Environmental laws in Nigeria the more stringent requirement will take precedence.

3 CHAPTER THREE: DESCRIPTION BIOPHYSICAL ENVIRONMENT OF THE STUDY AREA

3.1 Abia State

Abia State is located in the south-eastern zone of Nigeria with a land mass of over 4902.24 sq. km. The state has a population of 2,845,380 (2006 Census). Abia state lies within the riverine part of Nigeria and shares boundaries with Anambra, Enugu, Ebonyi, Imo, Cross River, Akwa Ibom and Rivers states. The state consist of 17 Local Government Areas and they include; Aba North, Aba South, Arochukwu, Bende, Ikwuano, Isiala-Ngwa North, Isiala-Ngwa South, Isiukwuato, Obi Ngwa, Ohafia, Osisioma Ngwa, Ugwunagbo, Ukwa East, Ukwa West, Umuahia North, Umuahia South and Umu-Nneochi.

The Umuda Isingwu/Umuagu Ibeku gully erosion complex lies between longitude 05° 32' and 05° 34' North, and latitude 07° 28' and 07° 30' East. The Umuda Isingwu/Umuagu Ibeku gully erosion complex consists of Umuagu main gully and its tributary Umuda/Okengwu gully, and Isingwu main gully. They are located in Umuagu Ibeku and Umuda Isingwu communities in Umuahia North local government area of Abia State. This site has three different gully heads at Umuagu, Umuda and Isingwu villages. The Umuagu and Umuda/Okengwu gullies empty into Iyi Doti (De Oti) stream while Isingwu gully empties into the Obohu stream. The confluence of Iyi Doti and Obohu streams is at Nchi Isingwu Umuda Amafor and retains the name Obohu as it flows downstream.

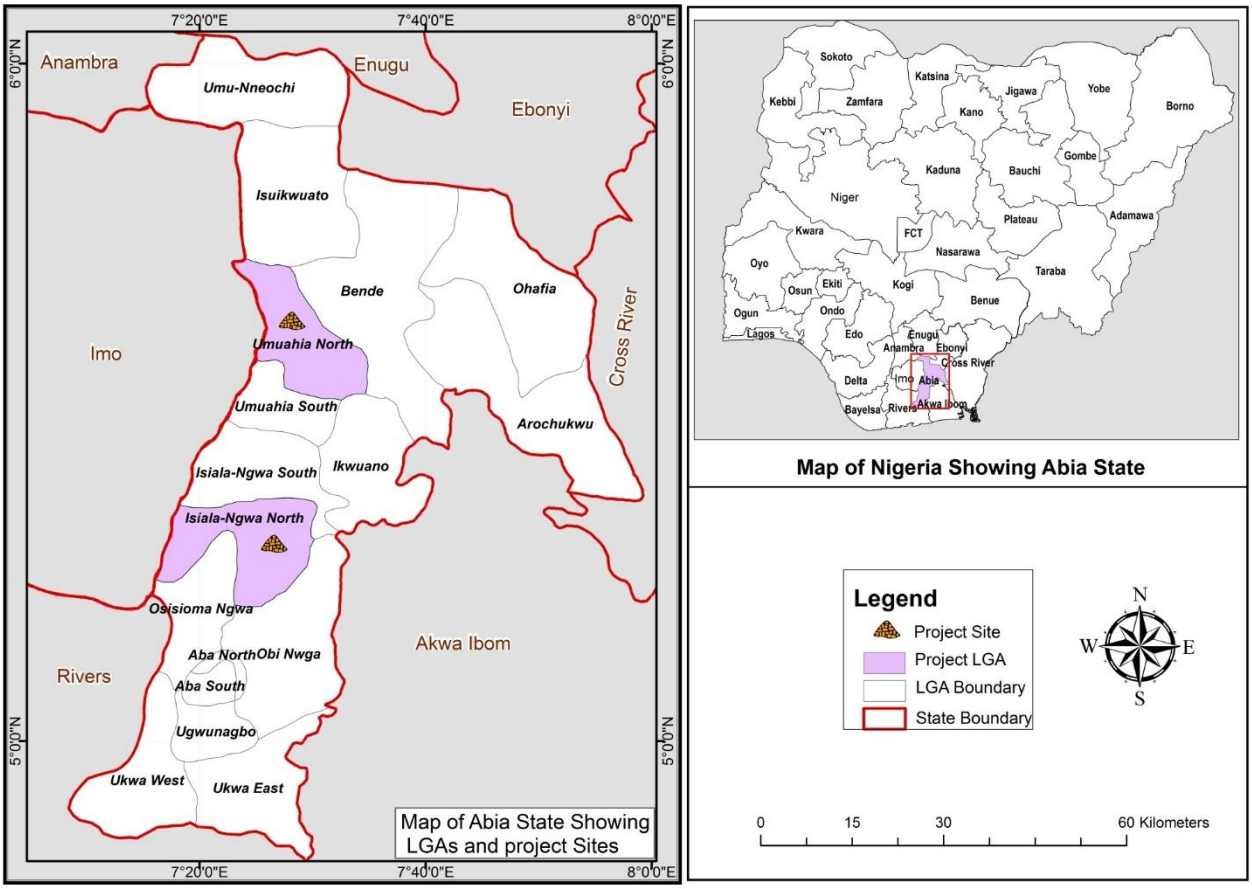


Plate 1 Map of Abia State showing the Project site

3.1.1 2.1.1 Physical Environment of Abia State

Geology

Abia state has two principal geological formations in the state namely Bende-Ameki and the Coastal Plain Sands otherwise known as Benin Formation. The Bende-Ameki Formation of Eocene to Oligocene age consists of medium–coarse-grained white sand stones. The late Tetiary-Early Quaternary Benin Formation is the most predominant and completely overlies the Bende Ameki Formation with a southwestward dip. The Formation is about 200m thick. The lithology is unconsolidated fine-medium-coarse-grained cross-bedded sands occasionally pebbly with localized clay and shale.

The two principal geological Formations have a comparative groundwater regime. They both have reliable groundwater that can sustain regional borehole production. The Bende-Ameki Formation has less groundwater when compared to the Benin Formation. The numerous lenticular sand bodies within the Bende- Ameki Formation are not extensive and constitute minor aquifer with narrow zones of sub-artesian condition. Specific capacities are in the range of 3 - 6 m^3/hr. On the other hand, the high permeability of Benin Formation, the overlying lateritic earth, and the weathered top of this Formation as well as the underlying clay shale member of Bende-Ameki series provide the hydrogeological condition favouring the aquifer formation in the area.

Landforms and Drainage

The topography of Abia State dominated by flat and low-lying land, generally less than 120m above sea level. The low-lying plain is the inland extension of the coastal plain from the Bight of Benin. The central part of the state is characterized by undulating land with many hills. The highland areas are part of the Enugu - Nsukka - Okigwe cuesta. This area has an average height of between 120m and 180m above sea level. From Okigwe (Imo State), this escarpment extends in a west-east direction and, on getting to Afikpo (Ebonyi State), veers southeastwards to Arochukwu where it terminates.

The principal rivers in Abia State are the Imo River and its tributary; the Aba River. Imo River originates from the northwestern part of the state and flows southwest through Abia and Imo states towards the Atlantic Ocean passing through the southern parts of Ukwa-West and Ukwa-East local government areas. Other important rivers include Igwu, Azumiri, Blue River an AKWA Ibo River.

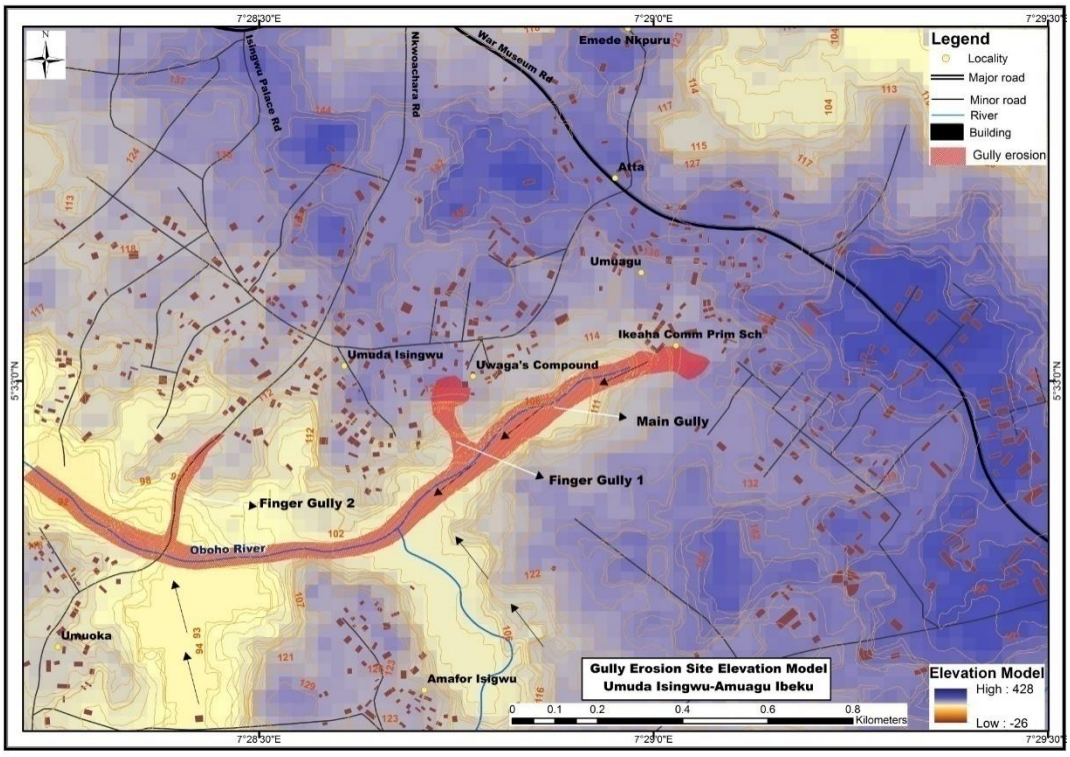


Plate 2 Elevation Map of the Project Community

3.1.2 Physical Environment

Soils

The soils of Abia State fall within the broad group of ferrallitic soils of the coastal plain sand and escarpment. Other soil types include alluvial soils found along the low terrace of the Cross River and other rivers. The soils are not particularly fertile and are prone to leaching due to the heavy rainfall experience in the region. This leads further to sheet and gully erosion.

Mineral Resources

Abia State falls under the Niger-Delta state in Nigeria, thus the state is an oil producing state. Other minerals found in the state includes lead, iron ore, gypsum, limestone, kaolin, laterite, zinc and copper.

Ecological Issues

Abia state is prone to flooding and erosion, which can be attributed to the soil types found in the areas, the low-lying topography, increased rainfalls and poor sanitation, credited to behavioural practices of the people. In place like Aba, drainages are not maintained properly as such, roads are heavily flooded after the rains.

3.2 Overview of Umuahia

Umuahia comprises of two local government areas; Umuahia North and Umuahia South. These local governments are also composed of clans such as the Umuopara, Ibeku, Olokoro, Ubakala and Ohuhu communities. The Project area, Amuzukwu village falls under Umuahia North LGA.

Umuahia is the administrative headquarters of Abia State. Major occupation of the people includes civil Servants, trading and farming. There are several institutions in Umuahia and they include, Government College, Umuahia, National Root Crops Research Institute – Umudike as well as Trinity College (theological).

Similar to other areas in the southeast, Umuahia experiences some ecological menace such as flooding and erosion. Extensive forest clearing, often by bush burning, and continuous cropping with little or no replenishment of soil nutrients, resulted in the disruption of the ecological equilibrium of the natural forest ecosystem.

Many of the gullies are at the head streams of the rivers that flow down the cuestas. The head streams carve their valleys deep into the deeply weathered red earth; developing dendritic patterns of gullies.

3.3 Overview of the Project Area

Umuda Isingwu/Umuagu Ibeku are located in Umuagu Ibeku and Umuda Isingwu communities in Umuahia North local government area of Abia State. The Umuda Isingwu/Umuagu Ibeku gully erosion complex lies between longitude 05° 32’ and 05° 34’ North, and latitude 07° 28’ and 07° 30’ East.

The Umuda Isingwu/Umuagu Ibeku gully erosion complex consists of Umuagu main gully and its tributary Umuda/Okengwu gully, and Isingwu main gully. This site has three different gully heads at Umuagu, Umuda and Isingwu villages. The Umuagu and Umuda/Okengwu gullies empty into Iyi Doti (De Oti) stream while Isingwu gully empties into the Obohu stream. The confluence of Iyi Doti and Obohu streams is at Nchi Isingwu Umuda Amafor and retains the name Obohu as it flows downstream.

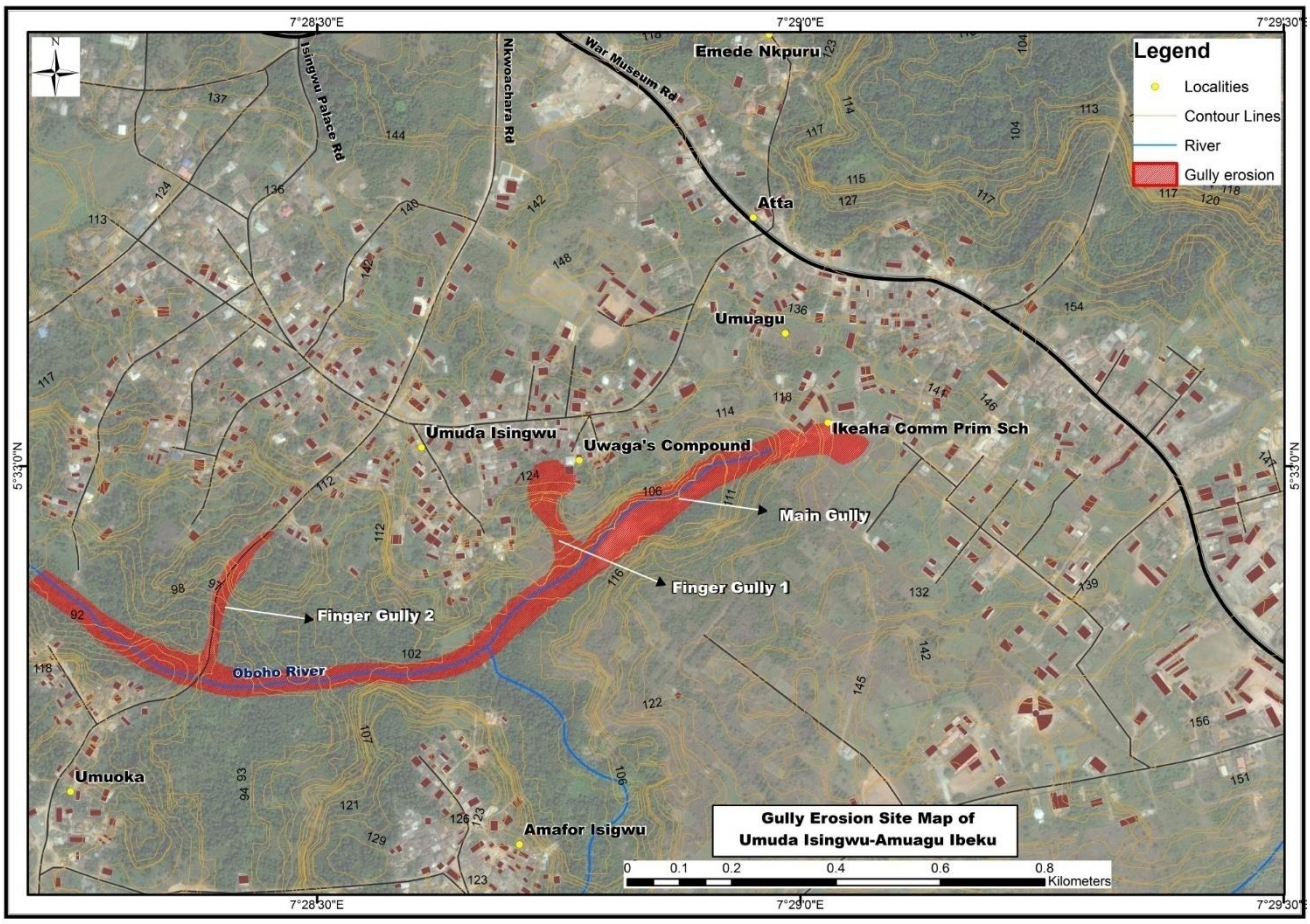


Plate 3 Map showing the Gully Complex

a. Umuagu Gully Erosion Site

The gully may have started as a result of runoff from a collection of reinforced concrete drains on both sides of an asphalt paved road that stopped at a culvert and those from an earth road with concrete lined drain on one side. The 2.4 x 1.0 m culvert is located at the intersection of the asphalt road and the earth road leading to the house of the Pastor of Behold He Cometh Pentecostal Church and Theological Seminary, Umuagu, about 200m upstream of the gully head. Runoff from the three stretches of drains pass through the culvert and flow partly over farmland before encountering a sudden steep slope. The result is undercutting and the development of the gully head and subsequently the development of the Umuagu gully which is threatening the community primary school buildings. Other major cause of the gully includes additional runoff from the side of the earth road without drain, as the alignment of the earth road follows the route of the runoff that terminated at the gully head.

The shape of the gully is trapezoidal and it has an estimated bottom width of 2m - 4m, top width of 30m – 40m and depth of 30m – 35m. The soil formation as observed is predominantly sandy soil and easily erodible. The distance from the gully head to Iyi Doti is about 850m.

b. Umuda Isingwu Gully Erosion Site

The gully may have been caused by poor and inadequate construction of drainage structures on the Umuda – Isingwu road that branched off from the Umuahia – Uzuakoli road. Runoff from 600mm wide by 600mm deep reinforced concrete rectangular drains on both sides of the road is drained by a 600mm diameter reinforced concrete pipe culvert along Umuda – Isingwu road close

to Chief Friday Okengwu's compound. The discharge from the culvert flows directly over open farm land without any protective measures.

c. Isingwu Gully Erosion Site

The Isingwu gully may have been caused by the abrupt termination of the short length of reinforced concrete roadside drainage channel which led to the development of the gully head and subsequently expansion as gully fingers of different sizes, as one moved downwards along the earth road, over a steep slope towards the Obuhu stream. The gully has cut the road surface in many sections preventing the people of Isingwu from going to Obuhu to fetch water for domestic use and from communicating with the communities across the stream. Other major cause of the gully is the steep slope topography of the site and collection of runoff from the higher elevation paved roads and residences flowing over the abandoned earth road and drains.

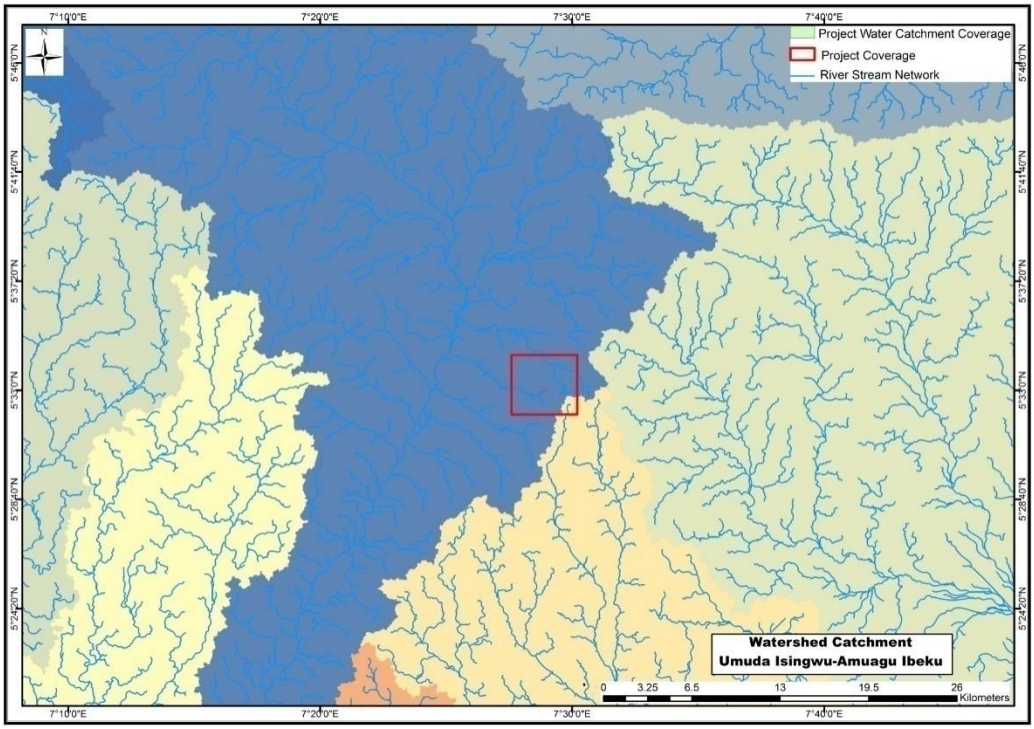


Plate 4 Watershed Map of the Community

The gully has various shapes and is still active and has its outlet at Obuhu stream, a distance of about 950m. A section of the gullied road is currently being used as dumping ground for solid waste.

Except for vegetation that covered the area on its own, no past efforts have been made to check the propagation of the gullies; rather another road alignment that avoided the gullied sections was set out and graded leading to Obuhu stream.

Members of the community have carried out some palliative measure by the use bamboo) to mitigate the impact of the gully at different sections. This gully if not checked will result to a major disaster in the communities.

The NEWMAP intends to rehabilitate the erosion gully site and reduce longer-tern erosion vulnerability in the targeted areas. This activity will be employed through some civil works such as construction of infrastructure and stabilization of the gully. An engineering design report has already been prepared for the erosion gully intervention, which highlights the detailed civil works that will be carried out.

The rehabilitation works will trigger some of the World Bank Safeguard Policies including Environmental Assessment OP 4.01; Natural Habitats OP 4.04; Physical and Cultural Resources OP 4.11 and Involuntary Resettlement OP 4.12.

3.4 Baseline Information

This section gives a general description of the Physical, biological and socio-economic environment of the project area.

3.4.1 Physical Environment

Climate

The climate is characteristically of the Equatorial type found in South-Eastern Nigeria, essentially warm and humid. This is a resultant effect of its prevailing seasonal wind, nearness to the sea coast and the relatively flat topography of the environment. A humid Tropical Maritime (mT) from across the Atlantic Ocean in the south dominates the region in the longer wet season (April to October). A drier Tropical Continental (cT) air mass blowing from the northeast direction controls the climate and meteorology of the area during the dry season (November to March). Around December, it culminates into a very hungry (i.e. dry) and foggy harmattan wind as it blows right from across the continental region of the West African sub-region.

Most of the original Rain forest in the project community has been lost due to clearing for farming and human settlement.

Temperature

Air temperature has seasonal and diurnal variations. On the average, the ambient maximum air temperature in the area varies from 28.0^{0}C to 37.5^{0}C while the minimum temperature varies from about 22^{0}C to 27^{0}C. Lowest values are recorded in the month of July through August. This coincides with the peak of the rainy season. The diurnal range is kept at a low 4^{0}C. The temperature of the area is influenced primarily by the apparent movement of the sun, wind direction and speed as well as land configuration (NIMET).

Rainfall

The climate is tropical with two distinct seasons, the rainy season and the dry season. The rainy season begins around the first of May and continues into September while the dry season runs from November to April. Rainfall reaches its highest monthly maximum of 300 – 400mm during the month of June through September and drops to 0.0-1.0mm in December and January. During the rainy season, a marked interruption in the rains occurs during August, resulting in a short dry season often referred to as the “August break”, though for years now this has not been consistent in August due to climate change.

The dry season is characterized by the cold dry “Harmattan” from the Sahara Desert. During this period, which begins in November and runs through January a dry and dust laden wind blows from the Sahara Desert. This sometimes makes the hills obscure due to the poor visibility. The sun is also obscured during this period by the prevailing dust haze.

Relative humidity

Relative humidity is high both day and night. It is greater than 85% at night, above 81% in the mornings and between 60% and 75% in the evenings. Generally the drier months (December to February) have lower values.

Wind Speed

Wind speed is generally low and usually less than 3 m/s under calm conditions most of the year. Relatively higher wind speeds may occur mainly in the afternoons inducing convective activities and creating diffusion characteristics. Incidences of these are often associated with thunder and lightning especially during changing seasons. Atmospheric disturbances such as line squalls and disturbance lines often induce the variability that results in speeds higher than 5 m/s. Such increases characterize the beginning of rainy season (March-April) and end of heavy rains (September-October), during which storms are more frequent. The harmattan season (December to February) can give rise to occasional high wind regimes.

Wind Direction

Wind directions are quite variable over the region. Data shows that about 60% of the winds are south-westerlies and westerlies during the day in the wet season (NIMET). Southerlies, south easterlies and south westerlies prevail more in the night during the period. This implies that directions are usually more variable in the nights than in the mornings.

The winds are mostly northerlies, north easterlies and north westerlies in the dry season particularly in the mornings. They are more of southerlies, south easterlies and/or westerlies during the evenings, indicating the fairly strong influences of the adjoining maritime oceanic air masses, contrasting land and sea breezes as well as appreciable degree of differential heating of the two surfaces.

Geology

Abia state has two principal geological formations in the state namely Bende-Ameki and the Coastal Plain Sands otherwise known as Benin Formation. The Bende-Ameki Formation of Eocene to Oligocene age consists of medium–coarse-grained white sand stones. The late Tetiary-Early Quaternary Benin Formation is the most predominant and completely overlies the Bende Ameki Formation with a southwestward dip. The Formation is about 200m thick. The lithology is unconsolidated fine-medium-coarse-grained cross-bedded sands occasionally pebbly with localized clay and shale.

The two principal geological Formations have a comparative groundwater regime. They both have reliable groundwater that can sustain regional borehole production. The Bende-Ameki Formation has less groundwater when compared to the Benin Formation. The numerous lenticular sand bodies within the Bende- Ameki Formation are not extensive and constitute minor aquifer with narrow zones of sub-artesian condition. Specific capacities are in the range of 3 - 6 m^3/hr. On the other hand, the high permeability of Benin Formation, the overlying lateritic earth, and the weathered top of this Formation as well as the underlying clay shale member of Bende-Ameki series provide the hydrogeological condition favouring the aquifer formation in the area.

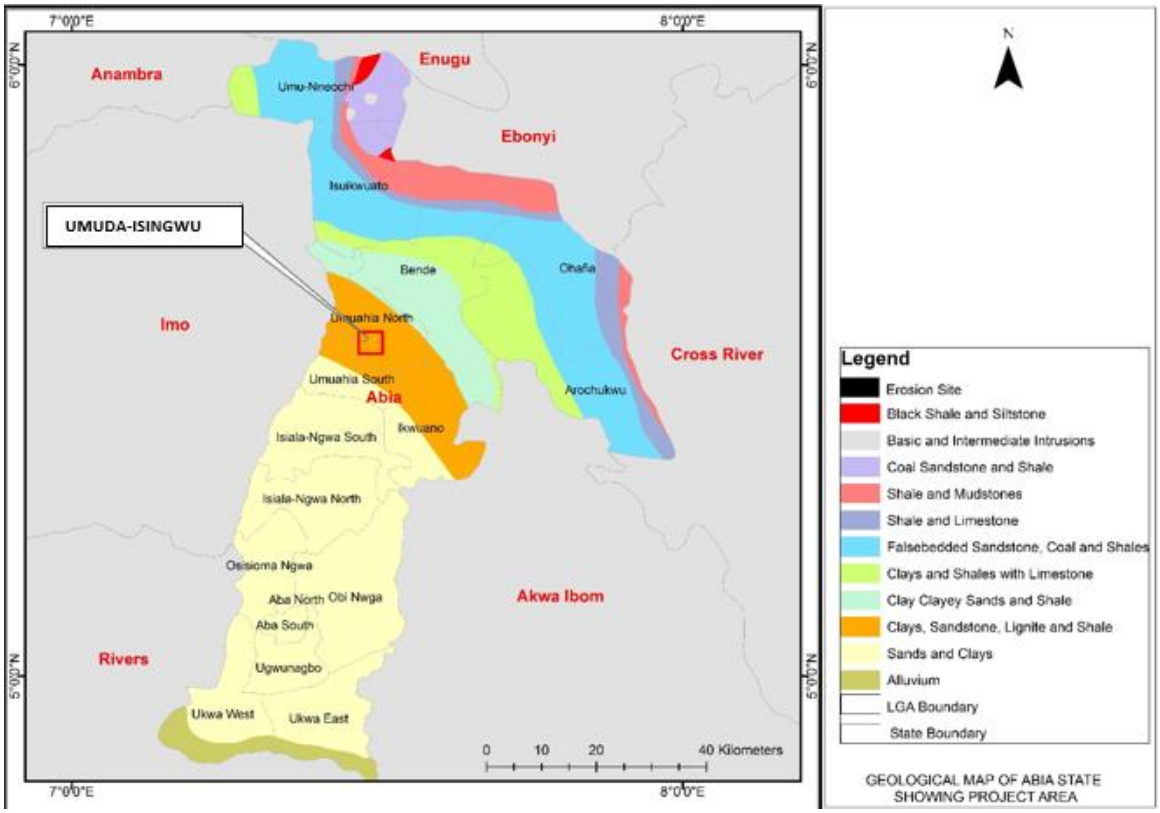


Plate 5: Geological map of the project area

3.4.2 Biological Environment

Flora

The project area belongs to the tropical rain forest belt covering a zone of unconsolidated sedimentary rock and soil structures easily prone to massive sheet and gully erosion. Until quite recently, the dominant features of the local vegetation were such deciduous plant species as the oil bean tree, the silk-cotton and the Iroko timber trees, the oil palms and the raffia palms, and the coconut trees.

However, population pressure drastically reducing land space for farming and forest cover has caused the decimation of most plant species generally, not least these dominant ones.

The vegetation types encountered within the Study Area are as follows:

- Areas of fallow bush of varying ages
- Fields used for rotational subsistence farming
- Degraded secondary rainforest as well as statutory and communal forests

Economic trees found within the community include avocado pear, oranges, mangos, guava, pawpaw, plaintain, banana coconut, kola nut, raphire palms, palen trees, local pear, mahogany, Melina etc. Also some cash crops include mainly Cassava, yams cocoyam, maize, pepper, sweet potatoes, melon, pumkin, and okra.The table below gives some of these major crops found within the project area

Table 1: Major crops found within the project community

S/NO	COMMON NAME	BOTANICAL NAME
1.	Maize /corn	*Zeamays*
2.	Cassava	*Manihot esculenta*
3.	Banana	*Musa sapientum*
4.	Water leaf	*Talinum triangulare*
5.	Okro	*Abelmoschusesculentus*
6.	Pineapple	*Ananascomosus*
7.	Guava	*Psidiumguajava*
8.	Cocoyam	*Colocasiaesculenta*
9.	Pumpkin	*Cocurbitapepo*
10.	Melon	*Citrullusvulgaris*
11.	Pepper (small)	*Capsicumannuum*
12.	Mango	*Magniferaindica*
13.	Pawpaw	*Caricapapaya*
14.	Bitter leaf	*Vernoniaamygdalina*
15	Oil Palm	*Elaeisguineensis*
16	Mango	*Mangiferaindica*
17	Avocado Pear	*Perseaamericana*
18	Plantain	*Musaparadisiaca*
19	Coconut	*Cocosnucifera*

Fauna

An intensive interview was held with the project beneficiaries and also an in depth forest survey was also conducted as well as focus group discussion with some hunters, elders, women farmers and the young people. Some wildlife found in the project area include Antelope, rabbit, mgbada, wild pigs, glasscutters, Guinea fowls, (ogazi), etc. Most of these have long been chased out by ever-growing human activity on a much limited land space. Furthermore, Sheep, goats, chicken, turkey, pigs, dogs, cats were some of the livestock sited within the project area.

Demographics

The study intends to identify and document the demographic data of the project communities such as population, literacy level, occupation, dependency level, housing and social amenities. These data will be useful not only in establishing the importance of the rehabilitation of the Umuda Isingwu/Umuagu Ibeku gully erosion site but equally in quantifying the environmental and social impacts of the planned works which will help determine the management plans for the said project.

More importantly, the baseline data will be useful for monitoring and evaluating the post implementation condition of the community and by implication the success of the project. Umuda Isingwu/Umuagu Ibeku, the primary project area, is mostly semi-urban with some rural communities.

Local Economy

The primary engagement of the Umuda Isingwu/Umuagu Ibeku people is agriculture and trading. The diverse vegetation and soil types in the project state encourage the practice of a variety of agricultural activities like crop farming, forestry, fishery and animal husbandry. Some of the crops include maize, cassava, yam, palm produce and vegetables. Some few others are into palm oil and Artisanship. Commercial activities vary and include mainly trading which can be found in all nooks and cranny in the project area.

Land Use/Tenure

While majority of the land use is for agricultural purposes others are for residential settlement, market places and public reserve for future development uses. The farm lands are quite some distance from the homestead. Some of farmlands are however very close the homestead; these ones are called Egbere Uhu. A combination of traditional land ownership system and government ownership of land is observed in the area. However, the Umuda Isingwu/Umuagu Ibeku community practices the traditional land ownership system. Those who do not have land in any area the community approved for farming in a given year will resort to buying land in the approved location to farm for that year only. It is known as ‘’Akwukwo ohia. It can also be by temporarily pledging a piece of land for a fee Igbaibe). Such arrangement reverts to the original owner as soon as he refunds the amount.

Historic and Cultural Resources

Umuda Isingwu/Umuagu Ibeku, as a historical city, has many cultural events and places adorned with festivities and cultural monuments.

In the average home of any Umuahia citizen, they usually keep kola nuts, garden egg and peanut butter in their refrigerator in case any stranger or visitor should visit their home. Every visitation to their home begins with the offering of the kola nuts to the visitor. The kola nut is indicating that the visitor is very much welcomed. The ritual of the offering of kola nut is inspired with the giving in prayers and blessing or lobby to the supreme God and other deities, for the protection of the visitor and the host. It seems to be a custom to the people of the community in any of their traditional ceremonies.

The age grade system is very strong in the project area and have over the year’s engendered healthy competition among both the male and female age grades. The celebration of new yam is the most outstanding cultural heritage but this is now dying down as a result of the present thinking that it is a fetish ceremony.

Traditional marriage is considered important and involve introduction/acceptance by the immediate family, the kindred and family the whole village. Incest is a taboo in the community and it is considered an abomination.

The extended family relationship is quite strong as the families in the kindred lines are closely knit.

Burials and funeral ceremonies are observed strictly throughout the community irrespective of the particular village directly affected. Again the age grades and the development union play vital roles here.

Christianity has almost entirely wiped our shrines as those still have anything to do with shrines are very few.

The traditional leader of the community is referred to as the Eze. Each of the component villages have village heads that represent the village in the cabinet of the traditional ruler (EZE). Representatives of women are also members of the cabinet as well as some notable persons conserved by the Eze as for and proper persons, all make up the Eze's cabinet which is the highest policy making body. The cabinet as adjudicate in cases and dispute between individuals.

HEALTH INSTITUTIONS

Apart from the Umuaha North Local Government owned health center at Emede Nkpuru Ikeaha people go to Umuaha town which is less than one kilometer away to attend to or seek for treatment in private or government owned hospitals as well as medical laboratories.

3.5 Objective and Scope of the Consultancy

The objective of the consulting services is to prepare an Environmental and Social Management Plan (ESMP) for Umuda Isingwu/Umuagu Ibeku gully erosion sites in Abia State.

The ESMP will consist of a well-documented set of mitigation, 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 needed to implement these actions, addressing the adequacy of the monitoring and institutional arrangements for the upper and lower watersheds in the intervention site.

The above stated is in line with the requirements for projects that may Impact on the Environment thereby triggering OP 4.01 (Environmental Assessment) of The World Bank polices.

3.6 Rational for the ESMP

The destructive effects of this Gully erosion is not only the annual washing away of the soil and nutrients which decreases the productivity of the soil and yields from agricultural crops, but extends to lives and properties of people around this community. They gully erosion problem is critically studied and appropriate erosion control structures sited at right places within the study area. Umuagu primary school will be saved from gully threat Umuagu primary school will reclaim the school playground and pupils resume their games' programme several residential buildings, valuable residential plots of land and economic trees will be secured. As the Isingwu – Ossah road will be motorable; there will be improved transport and communication system between the villagers and neighbouring communities. Health benefits will include reduction of malaria and other diseases as the stagnant pools of water on the gullies which have been breeding grounds for mosquitoes and other disease vectors would disappear.

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 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 an Abbreviated Resettlement Action Plan (ARAP) 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.

Other tasks:

The consultant shall assist the SPMU to: (i) Register the ESMP with the environmental assessment (EA) departments at Federal and State levels; and (ii) Disclose the finalized ESMP at National, State, LGA and Community levels.

3.7 Specific Task

Tasks of the consultant include the following:

- Describe the existing status of the sub-watershed and gullies;
- Identify the environmental and social issues/risks associated with the existing conditions;
- Select and measure appropriate baseline indicators (for example, m3/sec of runoff collected in the sub-watershed during a heavy hour-long rainfall);
- 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;
- 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 monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed and the mitigation measures described above (in a-e);
- 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 implementation agency;
- Define technical assistance programs that could strengthen environmental management capacity 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.

3.8 Technical Approach and Methodology to the Reconnaissance Exercise

The methodology used in the conduct of the Reconnaissance exercise for the sub-project is based on guidelines as proposed by the following:

- Federal Government of Nigeria EIA Law and subsequent Federal Ministry of Environment standard procedure for conducting EIA/ESIA in Nigeria

- Guidelines documented under the World Bank **Environmental Assessment** Operational Policies OP 4.01.

3.8.1 Preliminary Site Visit/Scoping and Reconnaissance Exercise

A preliminary site visit/scoping will enable an understanding of the project area and its environs and identification of Project Affected Persons (PAPs) as well as Vulnerable groups at risk of involuntary resettlement. This visit created an opportunity for the consultants to have a first-hand view of the erosion site.

The methodology used in the conduct of the Reconnaissance exercise for the sub-project is based on guidelines documented under the World Bank Operational Policies OP 4.01.

The reconnaissance exercise for this project has been approached as a communication, disclosure and consultation process, in which the project proponents, and different stakeholders including Project Affected Persons (PAPs) exchange information with the aim of mutual understanding and setting up of the RAP process as consultation is a critical key to the actualization of the NEWMAP.

The Community leaders (The Eze, Site committee members and community leaders for the Community,,Women and Youth Leaders etc.) were engaged in a public forum during the reconnaissance visit. This served as the first point of entry as Stakeholder engagement and consultation is highly critical for the success of the rehabilitation of the erosion. Stakeholder consultation will be a continuous exercise for the successful achievement of the ESMP process.

Plate 7 A section of the gully with a threatened building

Plate 6 A Section of the gully

Plate 8 The team with some community members during ground trothing

Plate 9 The Consultant and SPMU at the Eze's Palace for Advocacy Visit

The consultant also performed some ground trothing with site committee leaders as some identified PAPs so as to have a better understanding of the extent of the proposed works for the intervention.

During the reconnaissance visit effort was made in highlighting envisaged impacts associated with the sub-project. Also a date was agreed upon by the community and the consultant to conduct a large stakeholder's consultation where the full details of the project will be discussed with the community especially the PAPs.

The details of these are presented in Chapter 7 of this report.

3.9 Impact Identification

The proposed Rehabilitation of the **UMUDA ISINGWU/UMUAGU IBEKU GULLY EROSION COMPLEX** will lead to several changes in the environment and socio-economic aspect of the project area. A good number of these changes will be beneficial, especially the impacts of rehabilitating degraded land and reducing longer-term erosion vulnerability in the community.

3.9.1 Impact Identification and Assessment Tool

For the identification of these potential impacts, the most useful tools in identifying, assessing, and managing the impacts will be fully engaged so that critical social and environmental issues associated with the rehabilitation project will be fully identified, and ensure that all positive impacts are optimized and negative impacts mitigated.

During the reconnaissance visit to the Umuda Isingwu/Umuagu Ibeku gully site, a number of potential and associated impacts were revealed and carefully noted by the use of a Checklist as enumerated in Annex 1. The use of checklist adopted for the evaluation of the potential impacts posed by the project was based on its comprehensiveness, selectivity, mutual exclusivity, objectivity, confidence limit and ability to deduce and predict interactions.

Identified impacts are further discussed in Chapter 9 of this report.

3.10 Environmental Baseline Survey

Baseline data were acquired during field visits within the project area and affected communities.

3.11 Sampling Methodology

Soil and water samples were collected. A total number of Twelve (12) samples from six (6) soil-sampling points were collected. Two (2) samples (topsoil and sub-soil) were taken at each point. The list of sampling points and their GPS coordinates are presented in Table 3 below. Ground and Surface water samples were collected from randomly selected locations of boreholes and Iyi Dioti respectively within the project area. Noise level (6 nos.) and Air quality (6 Nos.) samples were collected at the same location as the soil samples. All samples were and analysed at Coslab Laboratory Services, in Umuahia.

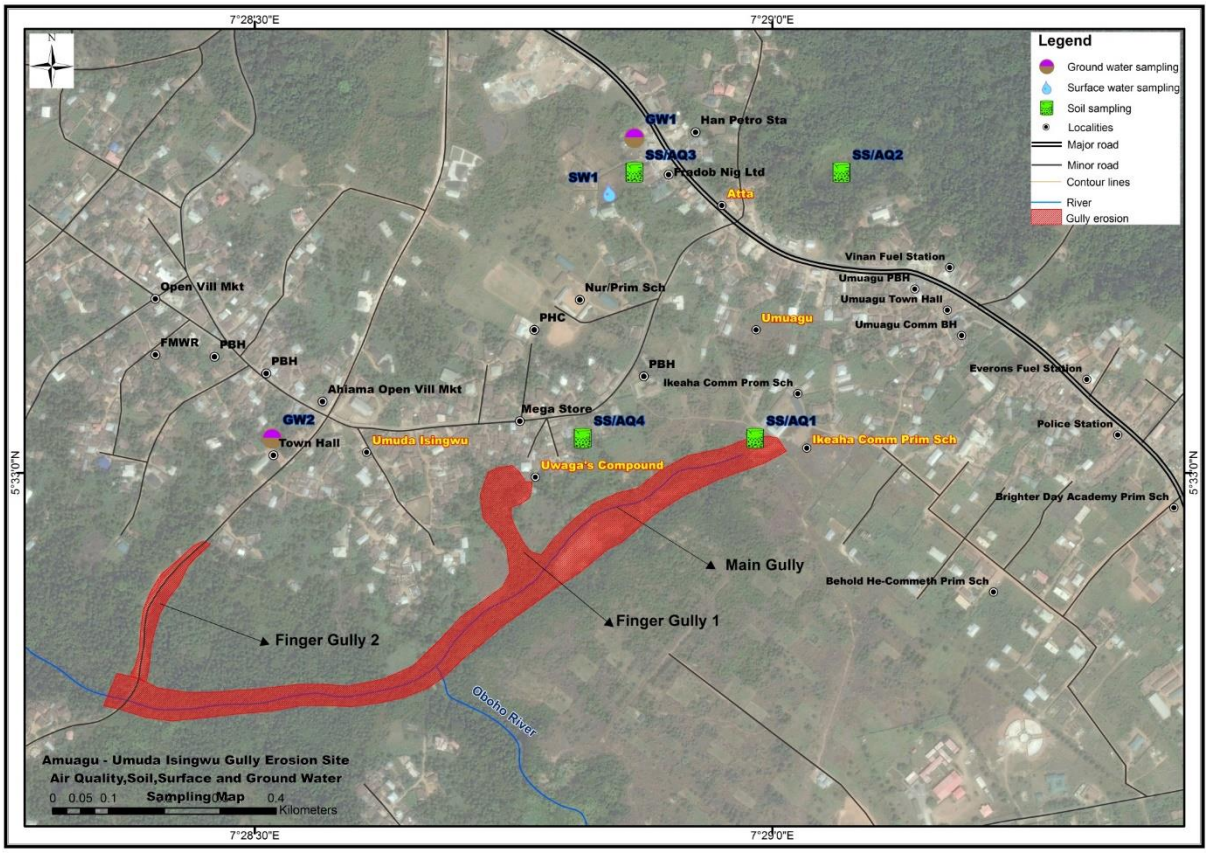


Plate 10: Map showing sample location points

Table 2 Soil, Noise and Air quality sample locations

COORDINATES	SAMPLE CODE		
	Soil	Noise	Air quality
5⁰33'2''N 7⁰28'59''E	UM1	NL1	AQ1
5⁰32'57''N 7⁰29'4''E	UM2	NL2	AQ2
5⁰33'2''N 7⁰28'49''E	UM3	NL3	AQ3

5⁰32’57’’N 7⁰28’52’’E	UM4	NL4	AQ4
5⁰32’59’’N 7⁰29’5’’E	UM5	NL5	AQ5
5⁰33’2’’N 7⁰28’31’’E	UM6	NL6	AQ6

3.11.1 Soil Sample Collection

A total number of Twelve (12) samples from six (6) soil-sampling points were collected. Two (2) samples (topsoil and sub-soil) were taken at each point. Surface soil samples were collected within a soil depth of 0-15cm, while sub-soil samples were collected within a soil depth of 15-30cm. Samples for physico-chemical analysis were collected into coded plastic bags after being wrapped in aluminium foil to help reduce water transfer as well as inhibition of oxidation in the presence of Nitrogen.

Table 3 Particles size grading of the soils

COORDINATES	SAMPLE POINT	DEPTH (cm)	CLAY (%)	SILT (%)	SAND (%)
5⁰33’2’’N 7⁰28’59’’E	UM1	0-15	19.30	7.00	73.70
		15-30	12.10	2.90	85.00
5⁰32’57’’N 7⁰29’4’’E	UM2	0-15	14.60	3.30	82.10
		15-30	10.30	3.70	86.00
5⁰33’2’’N 7⁰28’49’’E	UM3	0-15	6.60	2.00	91.40
		15-30	6.10	3.00	90.90
5⁰32’57’’N 7⁰28’52’’E	UM4	0-15	15.10	6.10	78.80
		15-30	6.70	4.10	89.20
5⁰32’59’’N 7⁰29’5’’E	UM5	0-15	13.20	2.50	84.30
		15-30	10.00	2.90	87.10
5⁰33’2’’N 7⁰28’31’’E	UM6	0-15	17.10	2.90	80.00
		15-30	5.50	1.00	93.50

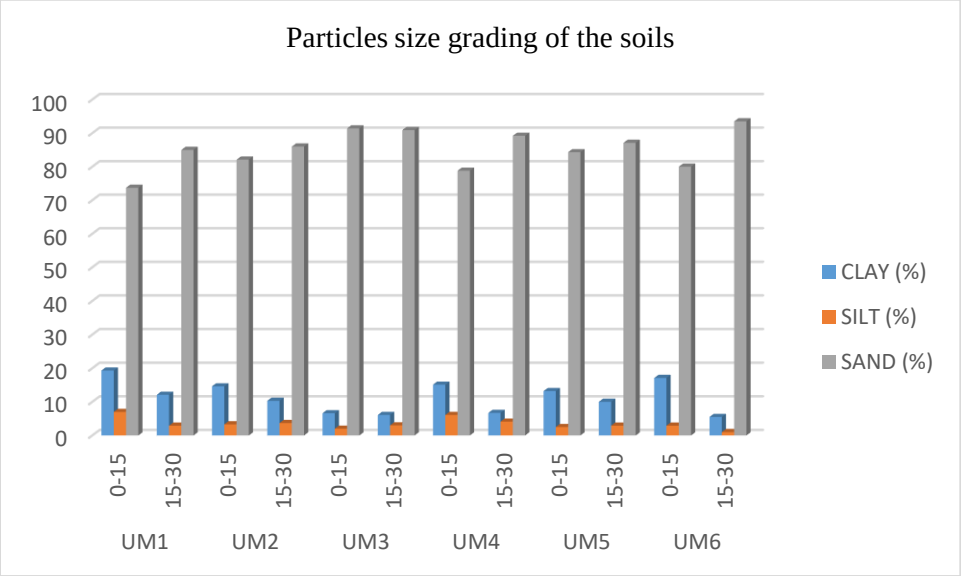


Plate 11: Particles size grading of the soils

3.11.2 Water Sample Collection

Surface and Groundwater samples were collected using sterile 100 ml bijou bottles (made of high UV resistant material) and 75 cl plastic bottles. Surface water was collected from Iyi Dioti as it was the only surface water within the project community. Fast changing physicochemical parameters such as pH, Dissolved Oxygen, Conductivity and Total Dissolved Solid (TDS) were measured in-situ using an in-situ water analyzer. Samples for physicochemical studies were stored in cooler boxes with ice and later transferred to the laboratory and preserved in refrigerators at 4^{o}C prior to analyses. A total of three (3) water samples were collected for laboratory analyses of various parameters (1 surface water and 2 borehole). Hanna HI 991300 PH/EC/TDS Meter was used for water sample analysis.

3.11.3 Air Quality Sample Collection

Air quality analysis was carried out using a Testo 350 XL. Measurements were taken at different locations around the project area with the same coordinates as stated above.

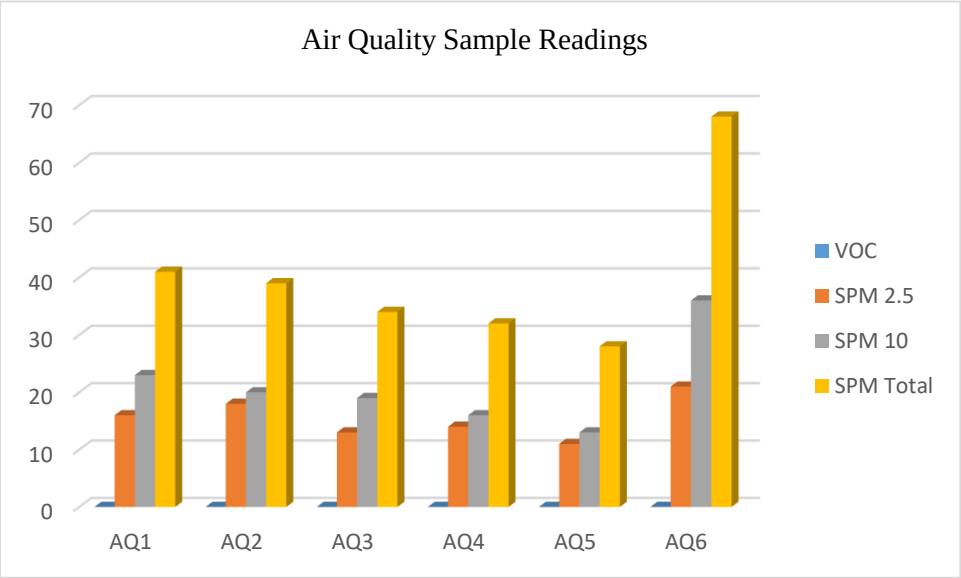


Plate 12: Air Quality Sample Readings

3.11.4 Noise Level Measurement

Noise levels were measured using a Testo 815 Noise meter. Noise samples were collected at the locations around and near the gull with the corresponding Coordinates mentioned in the table below.

Table 4 Noise levels at different locations around the gully

CODE	Max	Min	GPS
NL1.	51.7	45.2	5°33'2''N 7°28'59''E
NL2.	57.6	50.1	5°32'57''N 7°29'4''E
NL3.	57.7	49.7	5°33'2''N 7°28'49''E
NL4	55.7	54.1	5°32'57''N 7°28'52''E
NL5	57.6	51.1	5°32'59''N 7°29'5''E
NL6	51.6	44.7	5°33'2''N 7°28'31''E

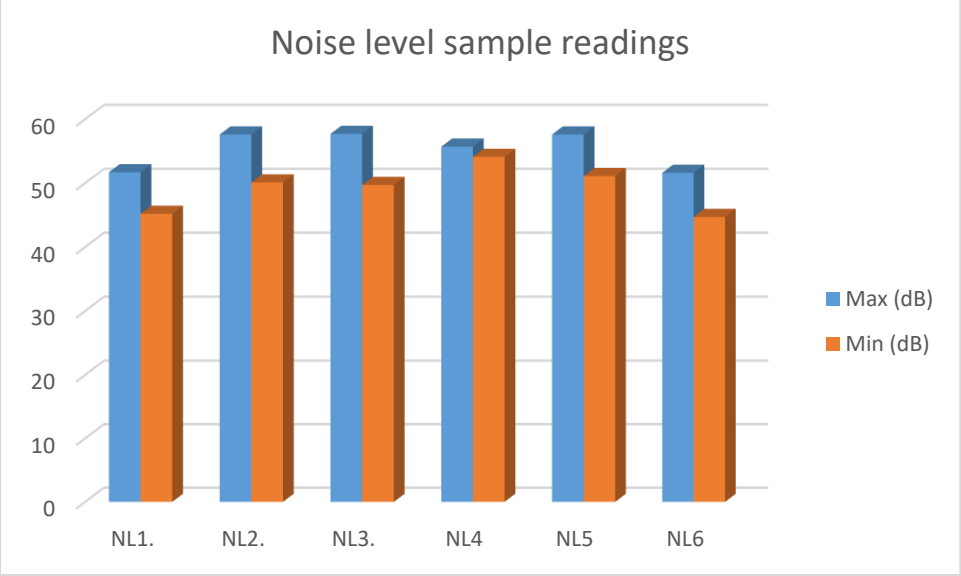


Plate 13: Noise level readings

3.12 Discussion on Findings from Soil Sample Analysis

Summary of soil sample result is presented in Table 9 below.

Table 5 Physiochemical properties of soils

Sample No	Depth (cm)	pH	OC %	N %	P Mg/kg	Ca Meq/100g	Mg Meq/100g	Na Meq/100g	K Meq/100g	Copper	Iron	Chronium	EC Ug/cm
UM1	0-15	5.3	0.8	0.13	23.80	3.0	0.70	0.15	0.048	0.20	0.09	0.034	19
	15-30	5.6	0.63	0.09	25.70	2.60	0.60	0.16	0.045	0.26	0.07	0.047	23
UM2	0-15	6.01	1.15	0.14	28.68	5.7	2.8	0.35	0.17	0.47	0.10	0.082	12
	15-30	6.14	0.89	0.11	28.68	2.6	1.86	0.35	0.08	0.54	0.14	0.093	18
UM3	0-15	5.4	0.69	0.084	19.80	2.40	0.68	0.19	0.051	0.24	0.03	0.049	16
	15-30	5.72	0.70	0.076	24.50	2.0	1.04	0.23	0.043	0.31	0.01	0.053	7
UM4	0-15	5.5	1.06	0.10	24.50	2.0	1.20	0.22	0.087	0.21	0.09	0.065	13
	15-30	5.8	0.86	0.064	25.73	3.40	0.75	0.21	0.056	0.25	0.06	0.043	10
UM5	0-15	6.00	0.88	0.07	26.50	6.3	2.2	0.15	0.039	0.62	0.12	0.074	36
	15-30	6.12	0.75	0.067	25.60	5.7	1.85	0.14	0.033	0.62	0.12	0.088	37
UM6	0-15	4.63	0.89	0.098	20.83	2.8	1.60	0.20	0.067	0.13	0.01	0.021	11
	15-30	4.88	0.80	0.080	20.76	2.55	1.60	0.17	0.055	0.18	0.02	0.018	9
FME Limit		6-9		<1	0.1	100		200	-	1000	-	-	

pH

The physico-chemical properties of soils from the sample locations revealed that the pH of the surface soil ranged from 4.63 - 6.01 while the sub surface soil ranged from 4.88 - 6.14. The lowest pH value of 4.63 was found at the brink of the gully erosion floor while the maximum pH value of 6.14 was at a farmland 10 meters away from the major gully. The Low value of the soil pH is a strong indication that the soil is acidic. Thus, revealing intensive leaching and low microbial activity.

Color

The color of the surface soil ranged from grayish brown to dark reddish brown while the subsurface soil ranged from reddish brown to yellowish gray.

Phosphorus (P) and Potassium (K) values were slightly above the limits and this can be attributed to the use of agrochemicals and could be associated with the use of pesticide in the farms. Fixation reactions in the soils may allow only a small fraction (10 to 15%) of the P and K in fertilizers and manures to be taken up by plants in the year of application. Consequently, most farmers apply two to four times the amount of P and K as is removed in the crop harvest. Repeated over many years, such practices may have saturated the phosphorus fixation capacity and built up the level of available phosphorus and potassium in the soil, hence the high concentration.

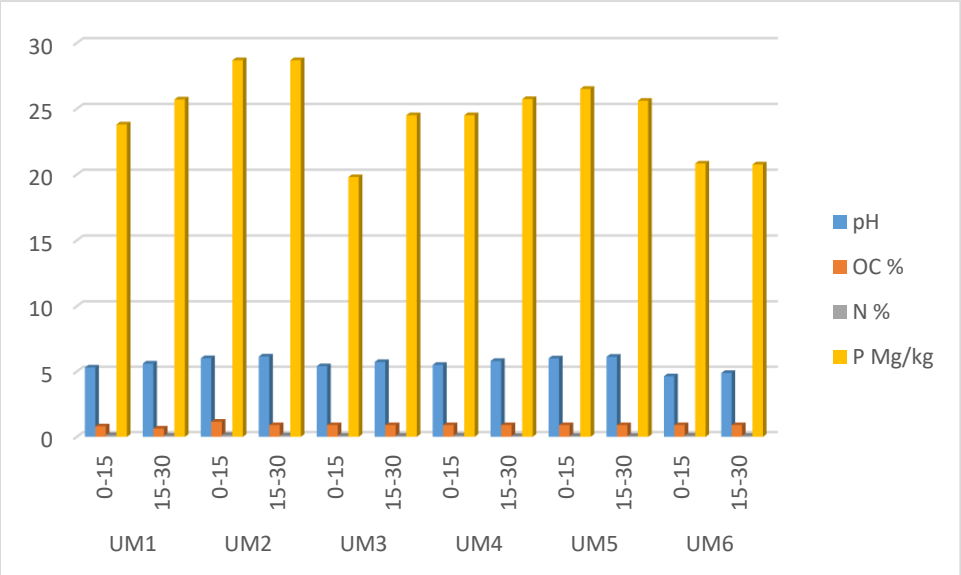
The level of chloride, total nitrogen, calcium and sodium were all within the FMEnv prescribed limits.

Heavy Metals

The heavy metals concentrations in soils from sampling locations were also assessed. The values of some of the heavy metals (Copper, Iron and Chronium) were all within the FMEnv limits. These metals often form soluble compounds in the soil and contribute in various amounts to the fertility of soil and growth of plants.

Electrical conductivity

Electrical conductivity (EC) is a measure of the amount of soluble salts present in the soil; The EC varied from 7-36 µS/cm, which is within acceptable FMEnv limits.



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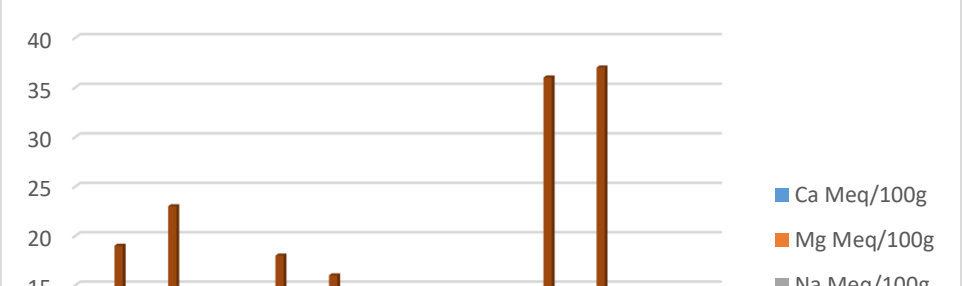


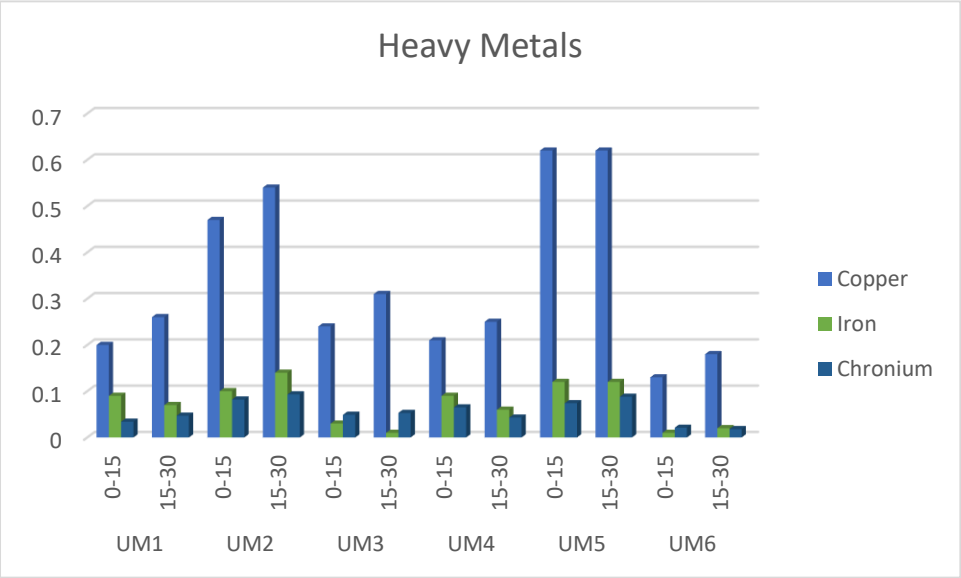


Plate 16: Results for Soil Heavy metals

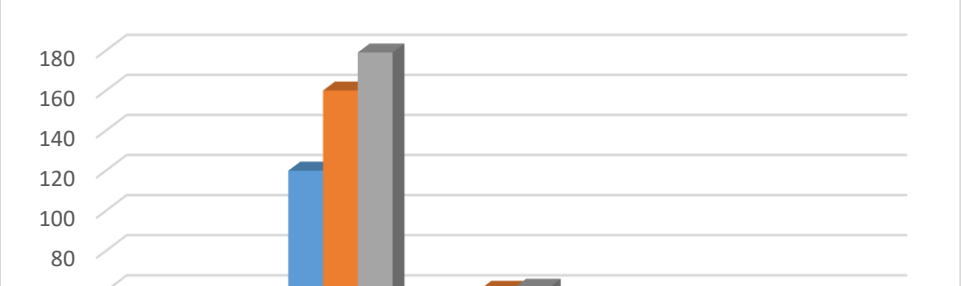
3.13 Discussion of Results of Water Quality Analysis

This section seeks to discuss the results from the water samples analyse. Table 10 shows samples collected as well as physiochemical properties analysed.

Table 6 Physiochemical properties of water sources

S/N	PARAMETERS	SW1	GW1	GW2	FMEnv LIMIT
1	pH	6.3	6.83	6.83	6-9
2	Conductivity (ug/cm)	120	160	179	1000
3	TDS (mg/l)	35.7	60.6	61.6	1000

S/N	PARAMETERS	SW1	GW1	GW2	FMEnv LIMIT
5	Chlorine (mg/l)	16.5	344	357	250
6	Salinity (mg/l)	0.06	0	0	0.1
7	Nitrate (mg/l)	0.3	0.06	0.08	20
8	Sulphate (mg/l)	183	291	300	500
9	Calcium (mg/l)	29.6	50.0	51.7	150
10	Magnesium (mg/l)	11.4	5.32	5.19	50
11	Sodium (mg/l)	0.25	3.2	3.2	200
12	Potassium (mg/l)	1.9	1.35	1.35	<1
13	Total Hardness (mg/l)	18.3	73	70	200
14	Dissolved Oxygen (mg/l)	4.1	1.4	1.7	>2
15	BOD_5 (mg/l)	12.8	0.15	0.15	30
16	COD (mg/l)	27.5	1.6	1.8	80
17	Phosphate (mg/l)	0.02	1.6	1.8	5
18	Turbidity (NTU)	18.6	1.6	1.6	100
19	Yeast and Mould (cfu/ml)	Nil	Nil	Nil	
20	Coliform (cfu/ml)	374	Nil	Nil	
21	Salmonella (cfu/ml)	Nil	Nil	Nil	
22	E.coli (cfu/ml)	150	Nil	Nil	
23	Faecal Streptococcus (cfu/ml)	Nil	Nil	Nil	



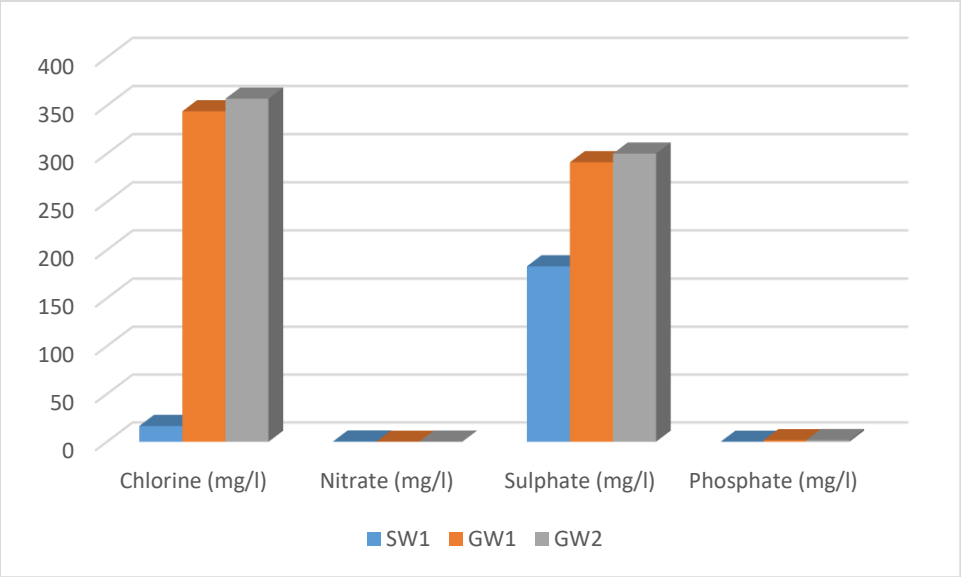


Figure 18: Chlorine, Nitrate, Sulphate and Phosphate levels of Water Samples

Dissolved Oxygen (DO)

Dissolved oxygen is the oxygen molecule present in water. The samples collected had a range from 1.7mg/l – 4.1mg/l. These findings entail that aquatic organisms can survive and strife in the environment

Turbidity

Turbidity is the measure of relative clarity of a liquid. It is an optical characteristic of water and is an expression of the amount of light that is scattered by material which include clay, silt, and finely divided inorganic and organic matter, algae, soluble colored organic compounds, and plankton and other microscopic organisms in the water when a light is shined through the water sample. The measured turbidity value for the surface water ranged from 3.6 to 15.6NTU and 1.6 NTU for ground

water. The turbidities are all within the FMEnv limits, but the downstream surface water is not permissible under WHO limits.

Salinity

Salinity is the total concentration of all dissolved salts in water, the salinity values were low and within range the FMEnv in all the sampling points for surface water and ground water.

Calcium and Magnesium

The levels of Ca^{2+} and Mg^{2+} ions are within the FMEnv limits, However the levels Ca^{2+} in the ground water sample is a bit high in concentration leading to hardness of water.

Sulphate and Chloride

The values for sulphate and chloride for the surface water where within the FMEnv limits. The value of sulphate for the ground water was within the limits while the value of chloride (357mg/l) for the ground water was way above the prescribed FMEnv limits this could be attributed to the high chlorinated solvents as a result of regular discharge of dry-cleaning fluids in the vicinity where the sample was gotten.

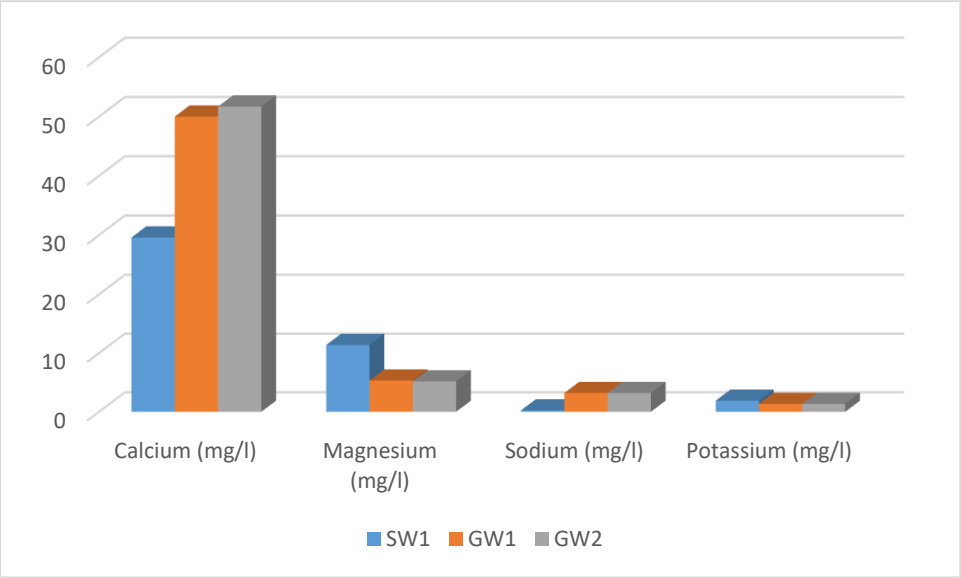


Figure 19: Calcium, Magnesium, Sodium and Potassium level for water samples

pH

The pH for the surface water was 6.3 and the ground water was 6.83 were both within the FMEnv limits. The pH values indicated that the surface water is slightly acidic and the ground water fairly neutral. A pH value above or below this is a warning than an abnormal situation exists and needs either further evaluation or immediate remedial measures.

Total Dissolved Solids (TDS)

Total Dissolved Solids (TDS) usually refers to the mineral content and dissolved organic material contained in liquid in molecular, ionized or micro-granular suspended form in the water. The TDS concentration of both the surface and groundwater were found to be below the FMEnv limit of

1,000mg/l. A TDS concentration over the recommended limit of 1,000mg/l may cause gastrointestinal problems in humans and animals.

Conductivity

Conductivity is a measure of water's capability to pass electrical flow. This ability is directly related to the concentration of ions in the water. High level of conductivity values of the waters is a reflection of the chemical richness of the water body of the study areas. The conductivity value for the Iyi Dioti and the ground water are within the FMEnv limits. The ground water had a higher conductivity value of 61.6mg/l, this could be attributed to the minerals present in the substratum of project area.

Biochemical Oxygen Demand (BOD5)

Biochemical Oxygen Demand is a measure of the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period (usually for 5 days) and also the oxygen utilized to oxidize inorganic material such as sulphate and ferrous ion. The ground water sample BOD value of 0.15 and the Iyi Dioti BOD value of 7.8 and 12.8mg/l all fell within the FMEnv range.

Chemical Oxygen Demand (COD)

The COD measures the number of organic compounds present in a water sample. The COD values of the surface water were very moderate ranging from 28.7 – 37.5 mg/l and 1.8mg/L at the ground water. This can be attributed to the increase in human activities such as washing, and possible movement of fertilizer into the water.

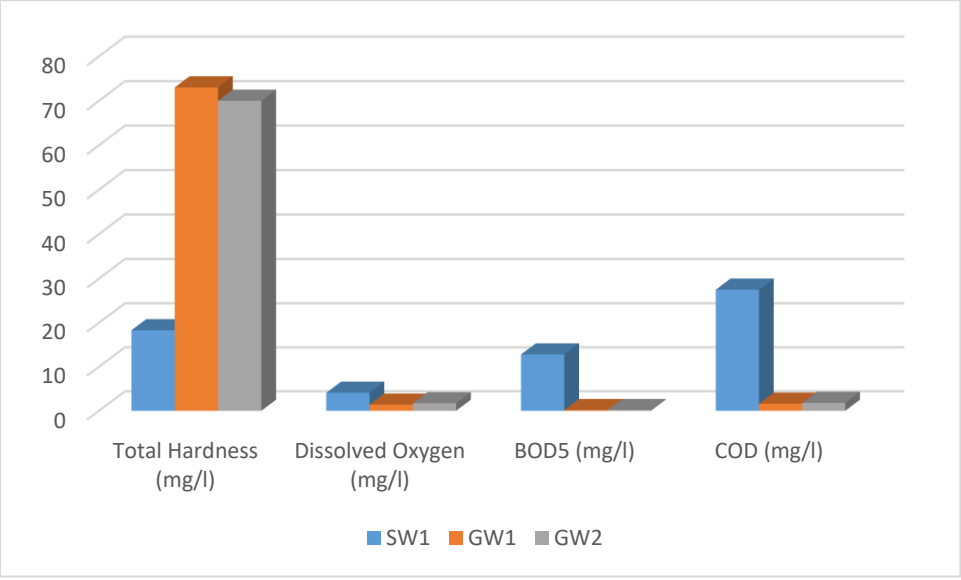


Figure 20: Total hardness, DO, BOD and COD levels for water Samples

Microbial Contamination

Bacteriological results for Surface Water sources presented above may be due to increased anthropogenic and socio-cultural activities. Rapid development of town ships and industries in the

surrounding vicinity, nearby lands and or in water bodies as experienced in some sampling points degrades water quality and may also have added strains in the water bodies to an extent resulting in the degradation of its water quality.

Total coliform count used as indicator to measure the degree of pollution and sanitary quality of the water sources was tested. Total coliform bacteria are not likely to cause illness, but their presence especially in the Surface water indicates that the water in the area may be vulnerable to contamination by more harmful microorganisms. The total coliform presence in samples confirms microbial contamination of the Iyi Dioti.

Escherichia coli, Enterobacter, (Salmonella, Shigella), and Enterobacter aerogenes (Enterococcus) were equally present. They are facultative aerobic, gram- negative, non-sporing, rod shaped bacteria that ferment lactose with gas formation within 48 hours at 35 ºC. Incidentally, the coliforms include a wide range of bacteria whose primary source may not be the intestinal tract. Escherichia coli are most commonly used as indicators of fecal pollution but this was absent from the borehole samples that is widely consumed.

4 CHAPTER FOUR: SOCIO-ECONOMIC CHARACTERISTICS AND CONSULTATION WITH STAKEHOLDERS

4.1 Introduction

The socio-economic assessment studies were aimed at examining the socioeconomic conditions of the people living around the project environment. This is to ensure that the potential impacts of the proposed rehabilitation of the Umuda Isingwu/Umuagu Ibeku Erosion Site project is captured and described while proffering solutions to possible negative impacts to human habitat, health and livelihoods.

The specific objectives of the study include:

- To elicit information about the existing socioeconomic and demographic characteristics of the inhabitants living within the community
- To document the distributional characteristics of the socioeconomic components in the project area
- To analyse the patterns of the relationships of the socioeconomic components
- To discuss and deduce the effect of the patterns on the environment of the proposed Project through the perceptions of the respondents
- To provide a baseline data for the assessment of the environmental and socioeconomic impacts of the proposed project
- Suggest mitigation measures and environmental management plan for the proposed project.

4.2 Methodology for the Socio-economic survey

The general methodology used for the socio-economic impact assessment employed the collection of primary and secondary source data. The primary sources data gathering comprised of questionnaire administration, group interviews Ground trothing/Reconnaissance survey for identification and Disclosure (awareness creation), discussions and direct observations. Secondary data was obtained from the National Population Commission and desktop literature review. Structured questionnaire was designed and uploaded in an open source data collection application. This was administered to people living around the project area. The population of the study area was estimated to ba over ten thousand based on the study by the feasibility/design engineers (Diyokes, 2016). Data collected was analysed using SPSS.

4.3 Primary Data

A random sampling survey was carried out within the project community. Questionnaires were administered to a total of 515 respondents. This survey was designed to have an understanding of the socio-economic attributes of the people within the community and not specifically for information regarding the gully. However, those living within the gully corridor were part of the population sampled. The population of the project community is estimated at over 10,000 people (Diyokes, 2016).

4.3.1 Gender Distribution of Respondents

It was gathered from the field survey that majority of the Respondents (about 53.26%) are females while males are 46.74% as depicted in plate 21 below. Secondary data of population within the local government shows a different picture. This may be attributed to the willingness of the respondents to fill the questionnaires. Most of the women in this community were housewives, and were found mostly at home.

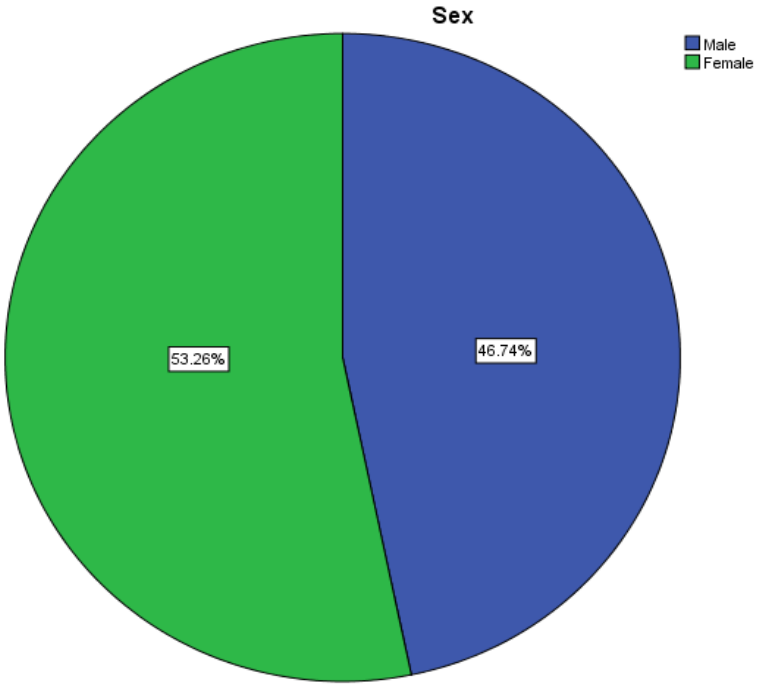


Plate 21 Sex of Respondents

4.3.2 Age Distribution of Respondents

As shown in Plate 6 below, respondents range from 1 to above 61 years. The chart shows that those between ages 46-60 years and those above 61 years constitute the dominant population of Respondents with a combined proportion of about 70.66%. The least age group among Respondents belongs to those from 0-15 with a population of 0.35%. The highest population of Respondents (39.86%) were within 60years and above. The younger population are predominant around the residential areas or schools while the more elderly are visible in the around the Market and centre of the town.

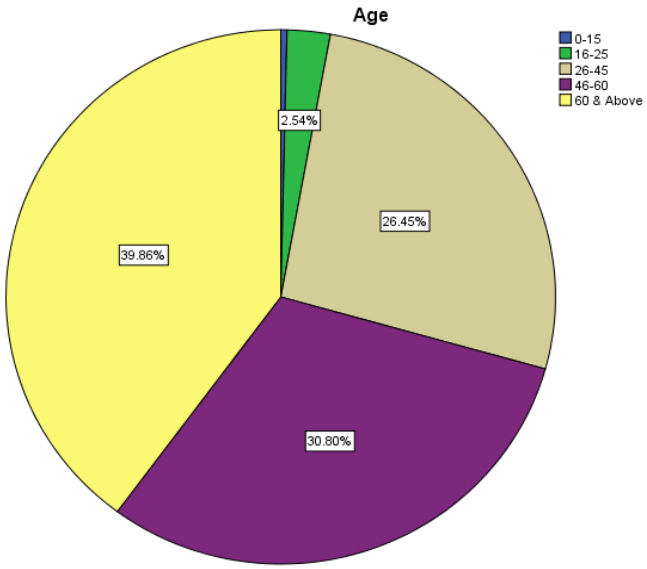


Plate 22 Age of Respondents

4.3.3 Marital status of Respondents

Respondents are predominantly married people (about 89.86%) as depicted in plate 23 below. Singles are the other marital status that featured among the Respondents. The significance of this result is that Respondents are majorly men and women who are the breadwinners and help mates in their respective households. Sampling was performed within the project environment and not the entire Umuahia. This is due to the fact that the area selected is the area of envisaged impact. Though the data collected and reviewed shows that there is no widow among the respondents, this does not mean that the entire community does not have widows/widowers as observed among the vulnerable groups.

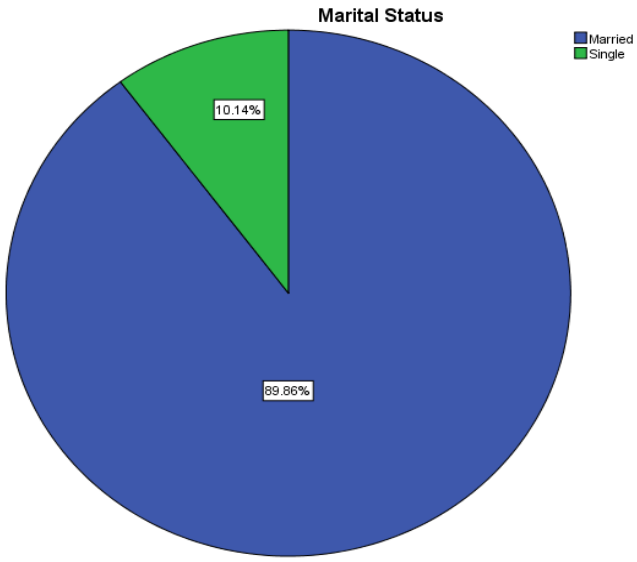


Plate 23 Marital Status of Respondents

4.3.4 Religious practice of Respondents

All but very few of the respondents are Christians. No Muslim was among the Respondents. The only none Christians that responded to the questionnaires practice African Traditional Religion. It goes to show that cultural heritage is an integral part of some of the Respondents even though Christianity is practiced in the community.

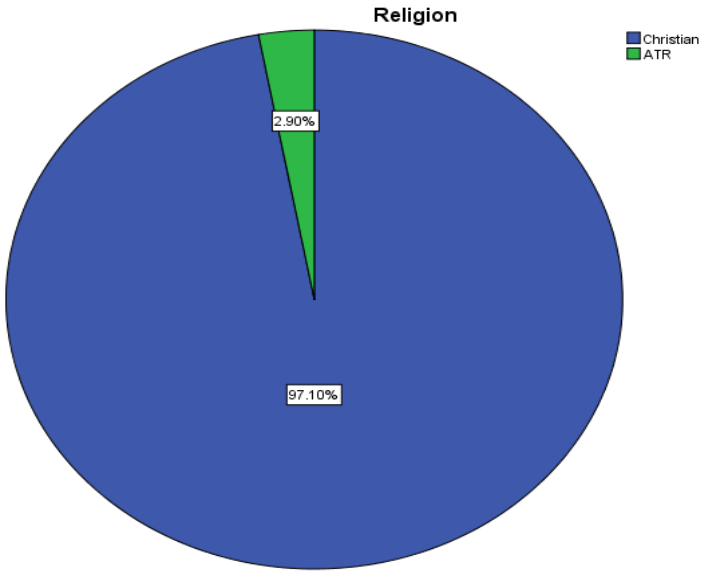


Plate 24 Religion of Respondents

4.3.5 Literacy Level and Educational Infrastructure

Most people or Respondents have some form of education (95.68%). The highest number of Respondents (38.95%) Indicated that their highest level of academic qualification is FSLC (Plate 25). About 6.32% of the Respondents don't have any form of formal education. This shows that majority of Respondents have the minimum level of education that might help them in making informed decision, or participate meaningfully during discussions as it affects the project implementation.

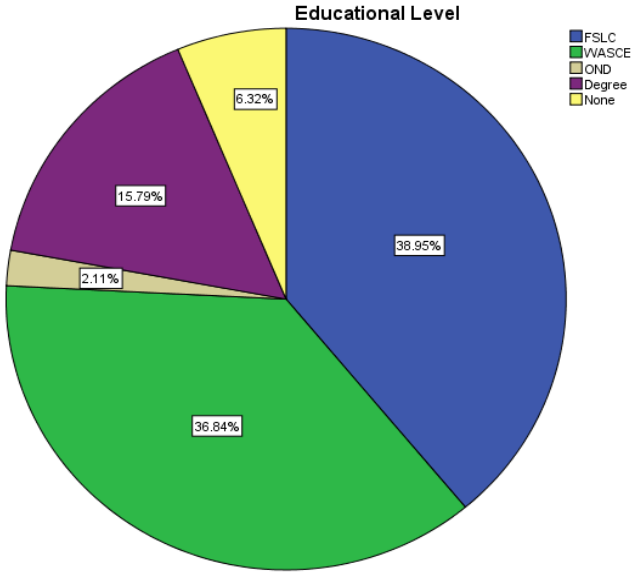


Plate 25 Educational Level of Respondents

4.3.6 Water and Sanitation

28.62% of respondents get domestic water from privately owned boreholes while 55.43% of the respondents from the project community get their water from Rivers (Plate 26 below). About 15.94% of respondents use water from other sources which include a combination of commercial boreholes and public pipe borne water.

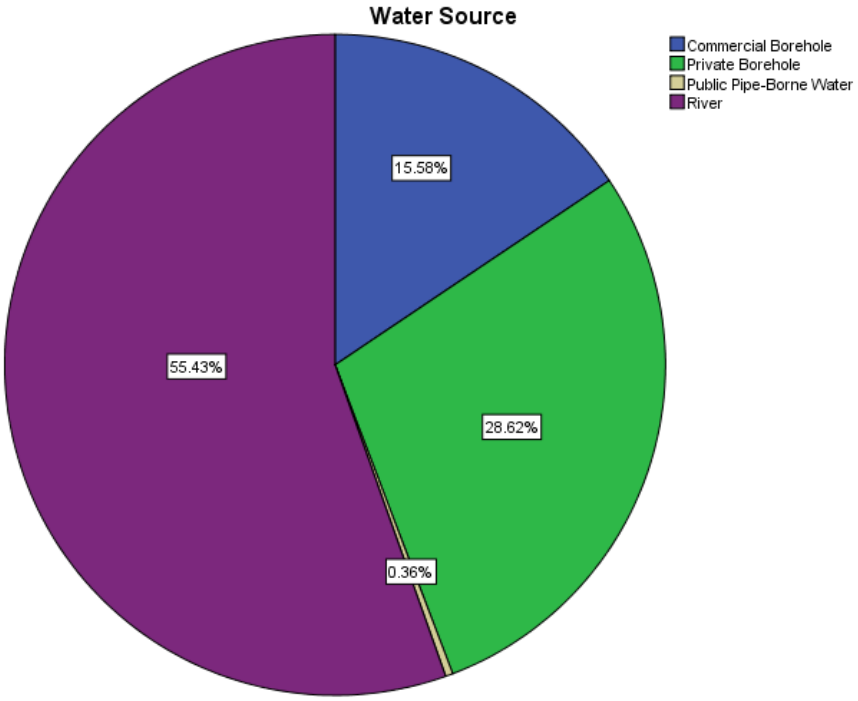


Plate 26 Water Source

It was also deduced from the field work that about 86.23% of the respondents use Pit latrines while 13.41% make use of water closet as seen in the plate below.

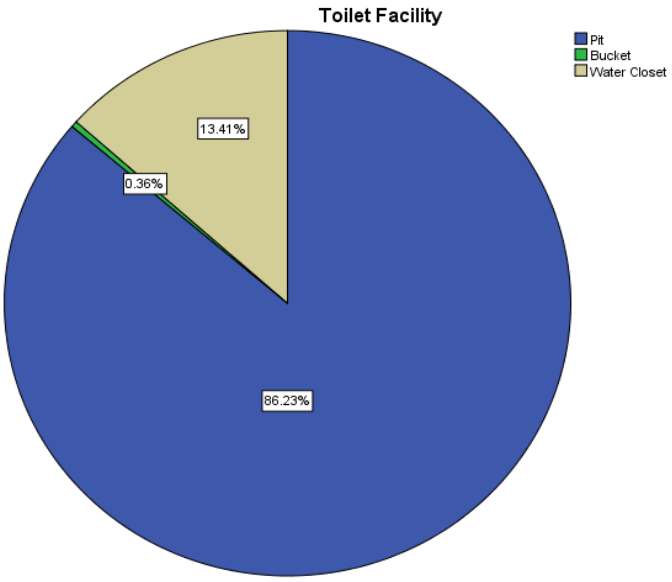


Plate 27 Type of Toilet Facility

4.3.7 Household Waste Disposal, Cooking Fuel and Electricity

Majority (53.62%) of the respondents in the area dispose their household waste in the bush. 27.90% dispose their refuse in private open dumps which while 15.58% bury their refuse. About 95.65% of the respondents make use of firewood for cooking while the rest use either kerosene or Gas as shown in plate below. The survey also showed that electricity is obtained from the national grid within the project communities, of which 97.10% of respondents are connected to it. However, their services are epileptic. As an alternative source of electricity, few people alternate with generator and hurricane lamps.

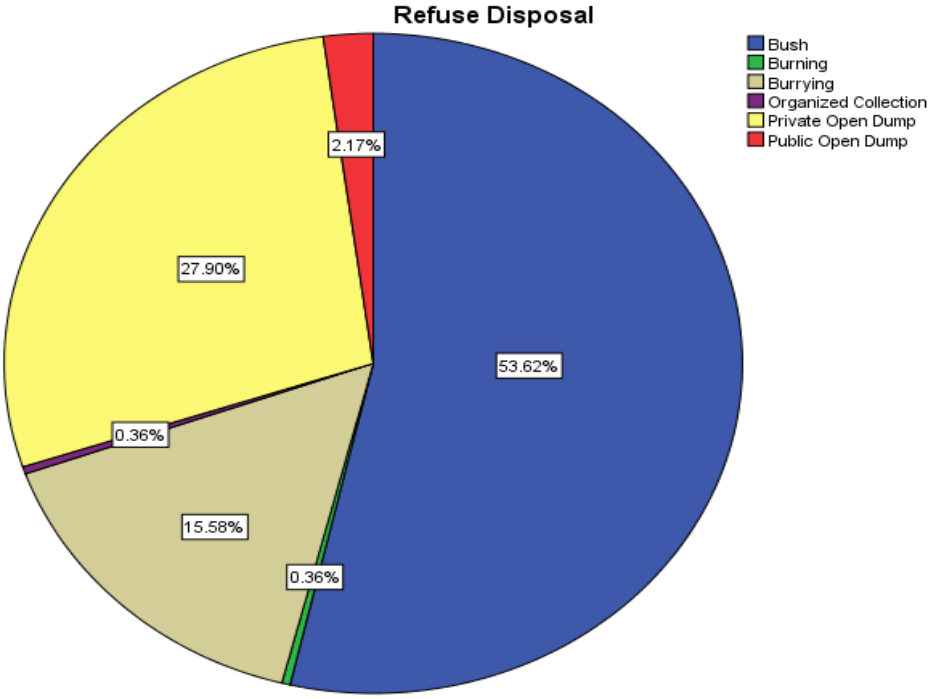


Plate 28 Method of refuse disposal

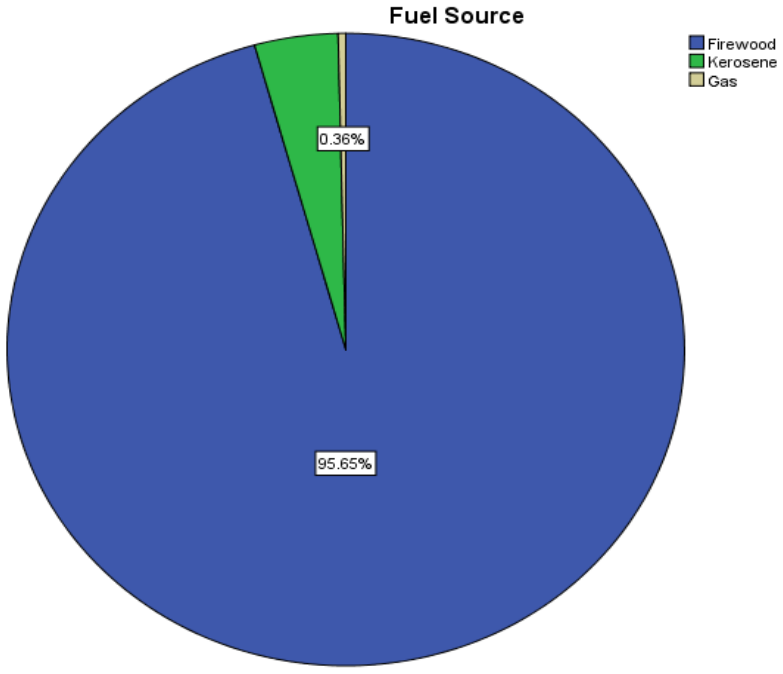


Plate 29 Type of Fuel for cooking

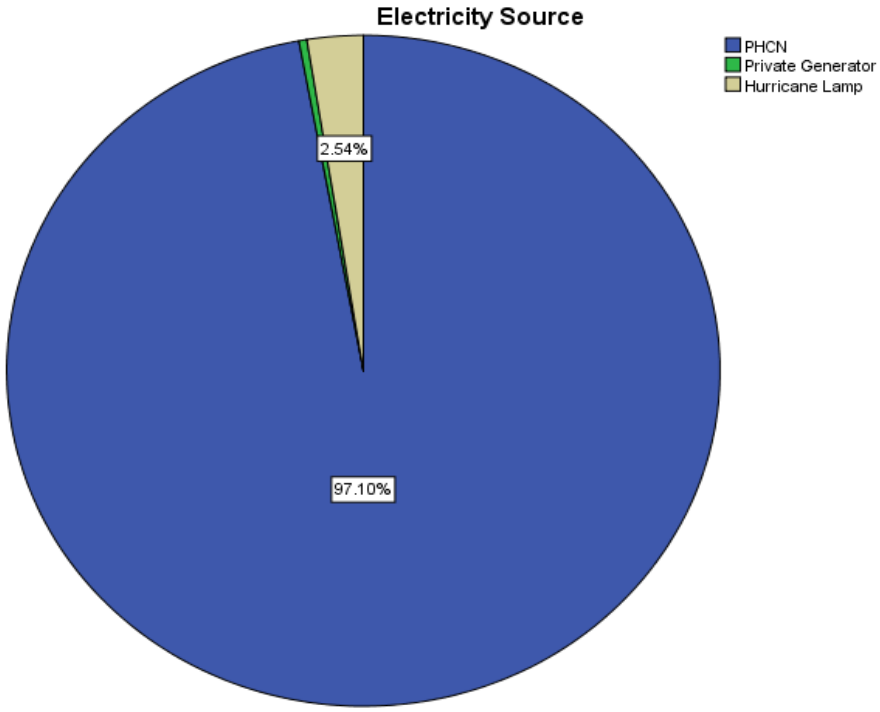


Plate 30 Electricity Source

4.3.8 Average household size of Respondents

The survey shows that most of the Respondents (53.99%) run small sized households (Plate 31 below). 30.43% of the Respondents have medium sized households while 15.58% have large families. This goes to show that the level of dependent on the Head of Household won't be much and there will not be a heavy burden on the family if involuntary displacement occurs.

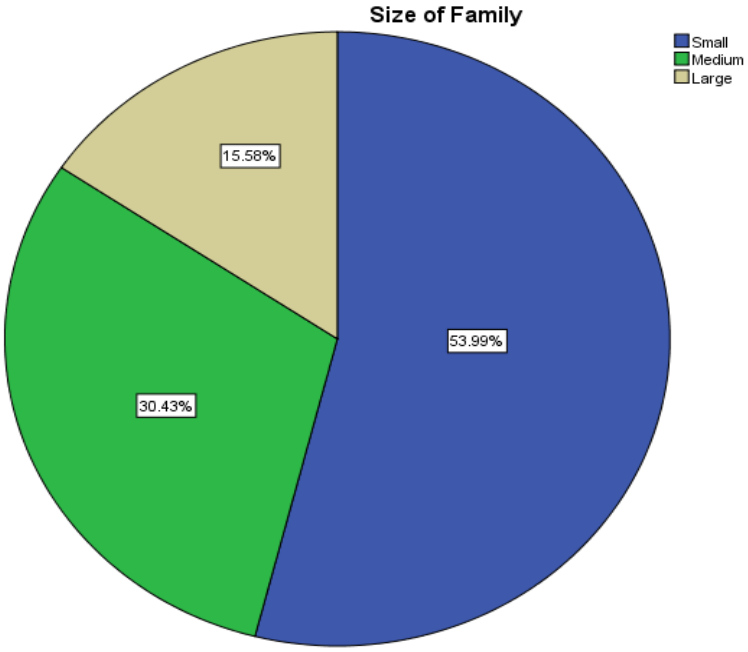


Plate 31 Respondents Family size

4.3.9 Occupation

Plate 32 below shows that majority (80.44%) of the Respondents in this community are self-employed with 8.70% engaged in all sort of business and trading, 61.96% are farmers, while 9.78% of the respondents are artisans. 5.07% of the Respondents are public servants, 5.80% are private sector workers, then the remaining (8.70%) are unemployed.

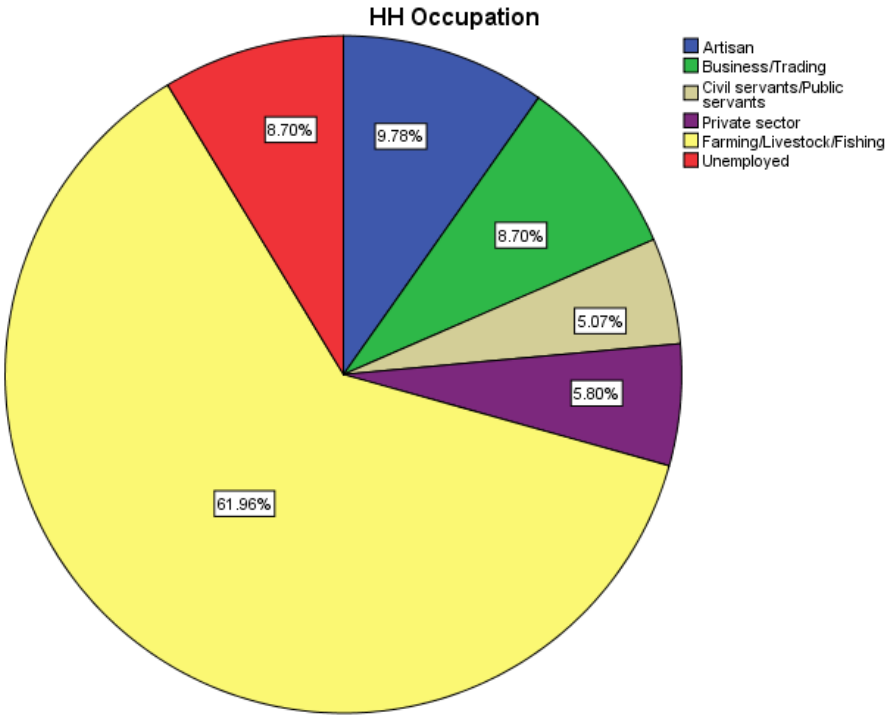


Plate 32 Main Occupation of Respondents

4.3.10 Average Monthly Income status of Respondents

Field survey (depicted in Plate 33 below) shows that dominant income groups amongst Respondents fall within ₦0-17,900 per Month. The survey also shows that about 19.93% fall within the income of ₦18,000-₦30,000 per month while about 9.42% of Respondents earn ₦31,000 to ₦60,000 per month.

Average income of Respondents in the project area were measured at two levels; the overall average which indicates an aggregation of middle and low level income earning Respondents and the low income groups with lowest limit of N500 per day. The outcome is that on the overall aggregation, Respondents mean income is ₦4,000 or $10 per day (for middle and low income combined) and ₦1200 or $3 per day for lower income group using an exchange rate of ₦400/1$.

Based on the later statistic, Respondents in the project area earn on the average, about $2,640 per annum. This Plate puts Respondents in the class of middle-income economy group according to World Bank development indicators (World Bank, 2016) Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4,125.

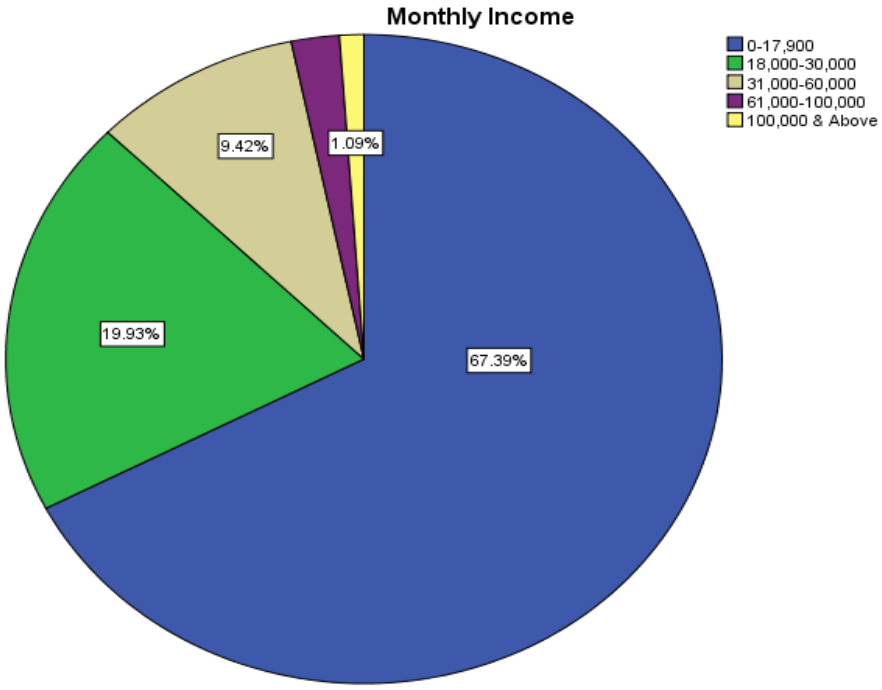


Plate 33 Average Monthly Income

Although these results imply that Respondents can maintain reasonably, good standard of living, it is however, not inconceivable that impacts on their sources of livelihood may have adverse impacts on their income sustenance and standard of living, especially with the dependence on trading, farming as well as low rate of saving culture in the less developed countries.

4.3.11 Infrastructural Development

Most of the roads leading to the project community are tarred through state and LGA efforts. However, most of the roads within the community have been washed off by flood. There is GSM telecommunication facilities of various networks available in the area. However, 40.58% of community respondents believe it's just fair, while 10.51% believe it's poor. Umuahia have over many Nursery and Primary Schools. There are also some Secondary schools within the community. About 30.80% believe that these institutions are in fair conditions while 68.48% of respondents believe the institutions are in Poor conditions.

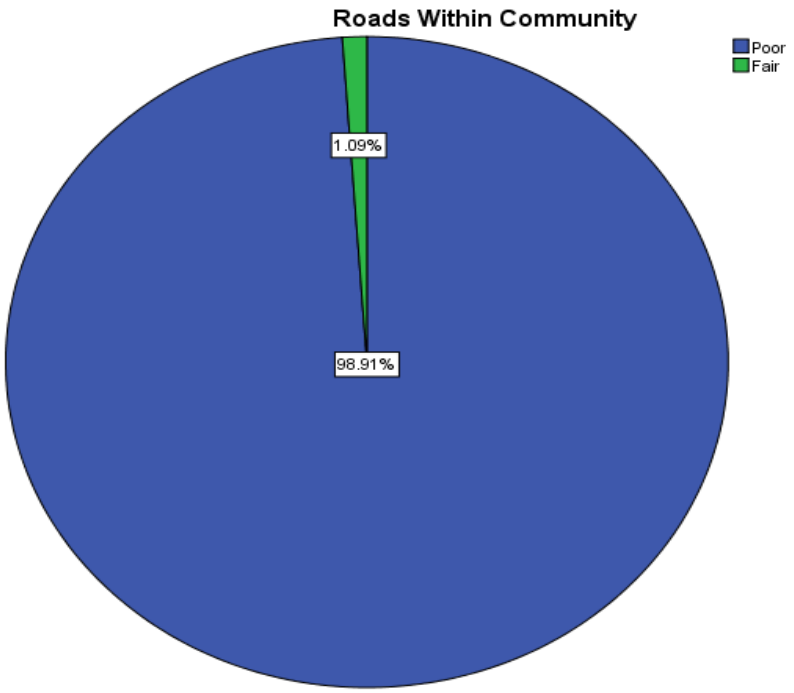


Plate 34 Roads within Community

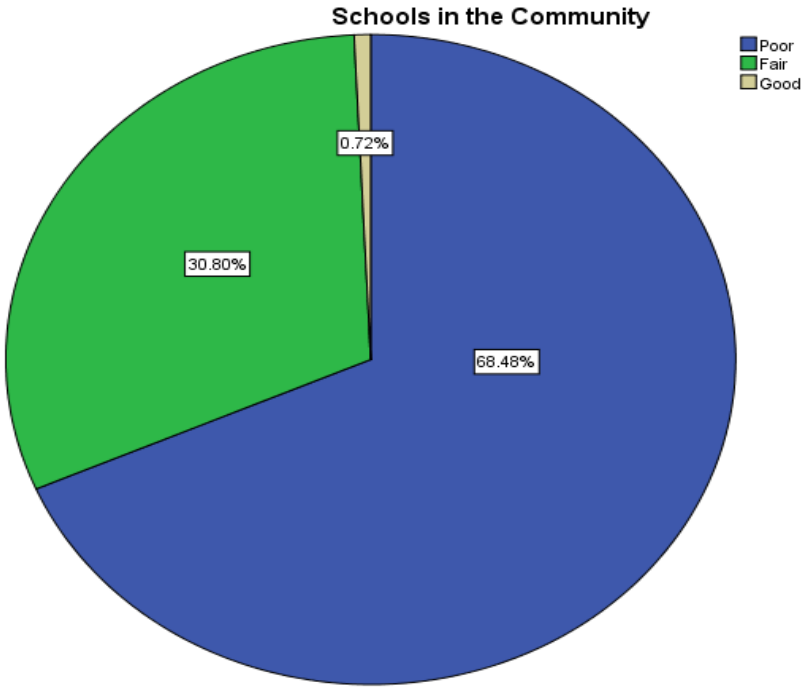


Plate 35 Schools within Community

4.3.12 Desirability of the Project

All the respondents showed high level of acceptance of the project stating that the gully erosion site poses high risk for the members of the community. They also indicated that the gully has denied them several social amenities and access into neighbouring Villages.

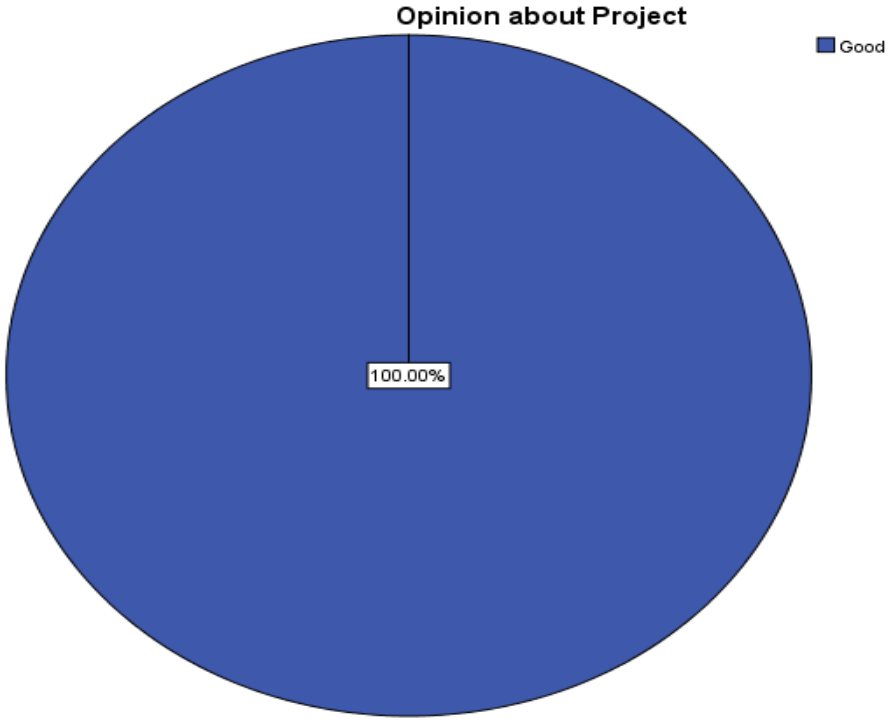


Plate 36 Perception about the project

4.3.13 Health Status Survey

For the purpose of this ESMP, a Rapid appraisal was adopted as the health impact is envisaged to be minimal. A Rapid Health Impact Assessment checklist designed in consideration of the environmental and social determinants of health as it affects the sub-project was used for the assessment.

Consultations with the members of the project community and the health centres revealed that all wards in the LGAs within the project area have at least a PHF. This was confirmed from the Federal Ministry of Health Directory of Health Facilities (2011). Some of the PHC visited showed some level of under staffing. They all lacked medical doctors on call however, some consultants come in once in a while. The PHC have mainly community health workers and midwives.

Services provided at the PHC in the project community include but are not limited to child health and antenatal services, vaccination, anti-malarial treatment, antibacterial intervention services, etc. More serious ailments are referred to the General hospitals or the Federal Medical Center, Umuahia. The Table below shows responses received from households on awareness and use of healthcare facilities.

Table 7: Healthcare Assessment

ITEMS	RESPONSES (%)		
	Yes	No	Indifferent
Awareness / existence of HCFs	100	0	0
Satisfaction with proximity of HCF to household	80	10	10
Adequacy of HCF personnel	10	90	0
Availability of drugs	40	60	0
Affordability of drugs	30	50	20
Households that attend antenatal	100	0	0

The Table above shows that All of the households are aware of the availability of HCFs in their community, although adequate staffing, cost/availability of drugs may be a challenge to many.

Malaria is prevalent in the area. This may be as a result of the presence of breeding sites for the vector within the project areas (potholes on access roads etc.). Other diseases reported include Typhoid, Cough, Eye infections and Pneumonia. Arthritis is a common condition found among the older members of the community.

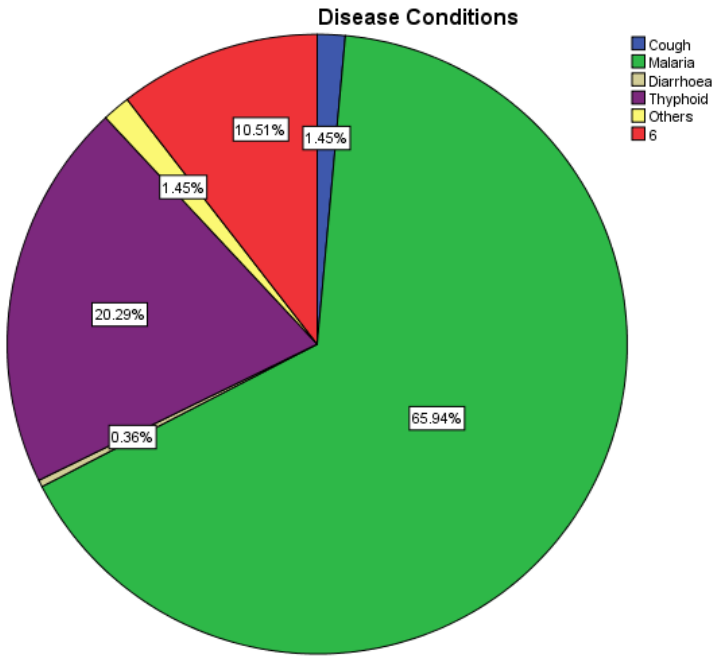


Plate 37 Disease conditions

4.3.14 Replacement Options

Most project affected persons interviewed preferred cash assistance as replacements options. While some of the PAPs prefer not to be compensated less than 1% of the PAPs would prefer Land for Land replacement or House for House replacement as the case may be.

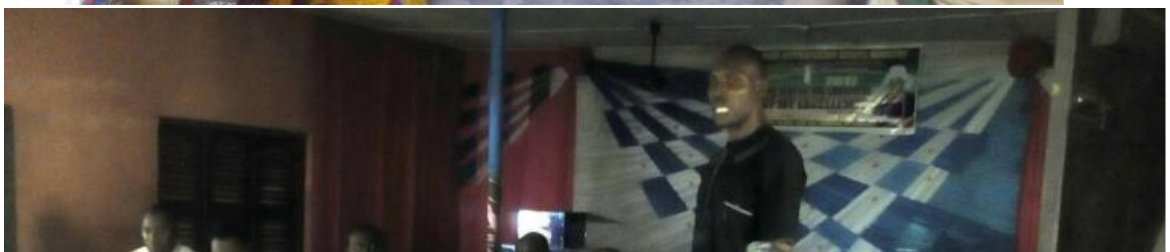
4.4 Stakeholders Consultation

The stakeholder engagement and consultation process adopted in this consultancy was keen towards identifying and working with the Project Affected Persons (PAPs), project affected communities and other stakeholders who may be directly or indirectly affected during the rehabilitation works for the Umuda Isingwu/Umuagu Ibeku Erosion Site. These include:

i. Individuals or group of persons living in close proximity to the project area
ii. Individuals or group of persons who may have cumulative impacts during development
iii. Individuals or group of persons who may be temporarily relocated as a result of the project
iv. Individuals or group of persons who occasionally utilize the land on which the project is located
v. Traditional and Administrative classes involved in developmental activities or policy changes in the project area

The consultation process was necessary in order to encourage active and sustained participation of the community members and residents through which the erosion menace traverses. The consultation promoted community ownership of the project and in addition enhanced sustainability. Involved in the consultation process were the administration of pre-defined socio-economic questionnaires at the household level for the PAPs particularly residents living along the gully corridor.

Stakeholder involvement in the project is expected to continue in a manner that gives the communities and the project affected persons (PAPs) the opportunity to make contributions aimed at strengthening the development project while avoiding negative impacts as well as reducing possible conflicts. In addition, the consultations will remain active (i.e. on-going exercise) throughout the duration of the entire project. Issues relating to project displacements and compensations to PAPs and any vulnerable groups will be handled efficiently in the RAP report to minimize chances of possible conflicts.



4.5 Identification of Stakeholders

Generally, five (5) broad categories of stakeholders were identified for this project based on the degree to which the project activities may affect or involve such persons or group of persons.

These stakeholders are grouped as shown in Table 3 below. The identification followed the following considerations:

i) Any persons or parties whose line of duties whether officially, socially, economically or culturally has direct or indirect bearing on any aspects of project activities. These parties may include individuals, groups, institutions or organizations that may be affected by the gully rehabilitation activities; and,

ii) Any persons or parties whose specific interests in the project results from: (a) the project's benefit(s) to such persons; (b) potential changes that may occur to the routine activities of the persons due to the project; and, (c) the project activities that may cause damage or conflict for the persons. The identified persons or group of persons in this category will ultimately represent the project Affected Persons (PAPs) or Households (PAHs)

4.6 Identified Stakeholder Groups

Several groups of stakeholders were identified and are summarised in the table below.

Table 8: Identified Stakeholder Groups

Group	Description	Role(s) In Community Process
Group-1	Individuals or group of persons whose day-to-day traditional or administrative functions include oversight of developmental activities within the project areas.	This category of persons served as mobilization points around which the Consultant reached out to the other members of the community

Group-2	Individuals or group of persons whose day-to-day lives/livelihoods may be directly affected by project activities. These people either reside or carry out their daily livelihood activities within 50m of the erosion gully edge.	The identified persons or group of persons in this category will ultimately represent the Project Affected Persons (PAPs) or Households (PAHs)
Group-3	Individuals or group of persons whose daily activities (including farming) bring them in close proximity to the project area. These people may either reside or carry out their daily livelihood activities outside of the erosion gully but within the communities in which the project is located.	The category of persons may or may not be affected by the project but may be significant contributors to the long-term sustainability of the project.
Group-4	CBOs, FBOs and NGOs who provided frequent interface with the community members who may be directly or indirectly affected by the project activities.	This group of organizations essentially contributes to and/or provide on a regular basis to the spiritual and physical welfare as well as environmental health of the community (Focal NGO engaged PMU was duly consulted).
Group-5	Individuals or group of persons who are political office holders and have significant responsibilities toward community members within the project area.	This group of individuals is collectively responsible for the political and general socio-economic development of the communities among others within their respective political zones.

The identified groups includes:

- Abia State NEWMAP SPMU
- Chiefs/Elders
- President General and Village Chairmen
- Youth group leaders
- Women group Leaders
- Town Associations/ Community Based Organization Leaders etc.

4.7 Community Consultations

All consultations in the period of the consultancy were initiated by the Consultant and established by the SPMU. The direct involvement and active participation of relevant stakeholders and the local level people in the planning and management processes of the project, guarantees that any potential disharmonious issues will be resolved swiftly. Also, there will be maximization of resource use, increased benefits and expanded opportunities for the communities in the project area.

Community participation will certainly help improve understanding of the project and communication between the SPMU, the contractors and the community. The decision making process for the project will be enhanced by actively involving relevant stakeholders, especially the project affected persons and organizations with stakes in the project.

4.7.1 Objective of Community Consultation

The aims of the community consultation process are:

- Implore inputs, views and concerns within the project community as they relate to the project and obtain local and traditional knowledge that may be useful for decision making;

- Enable consideration of alternatives, modification measures and trade-offs and ensure that important impacts are not overlooked and benefits are maximized;
- Mitigate conflict through early identification of contentious issues and increase public confidence in the project.
- Provide an opportunity for the public to influence the designs and implementation in a positive manner and improve transparency and accountability in decision-making;

4.7.2 The Stakeholders Consulted and their Concerns

The consultations involved independent and frequent meetings between the Consultant team, Traditional and Administrative leaderships of Umagu Ibeku and Umuda Isingwu which included the President General and Village Chairmen.

The key stakeholders identified and consulted in the area include:

- President General of Umuda Community Associationi.
- Public Relation Officer of Umuda community
- Chairmen of all villages affected by the project
- Women and Youth Groups
- Other Stakeholders are individuals who own properties that will be directly or indirectly affected by the project, Community Associations, Business Owners etc.

During consultation meetings, the NEWMAP overview, the Proposed Project, World Bank safeguard policies as they involved the rehabilitation works as well as the challenges that could impede the implementation of the project were presented. The support needed from all stakeholders to ensure effective project and successful implementation were also discussed.

4.7.3 Summary of Meetings with Stakeholders

The consultant warmly welcomed every stakeholder present. He explained the rationale behind World Bank Operational Procedure 4.01 (Environmental Assessment), thus informed the stakeholders that his assignments will focus on Environmental and Social Management Plan (ESMP)

He stated that World Bank has in place a number of operational and safeguards policies, which aim to prevent and mitigate undue harm to people and their environment in any development initiative involving the Bank. He told the stakeholders that the Nigerian EIA Act and the World Bank safeguard policies are similar; designed to help ensure that projects proposed for Bank financing are environmentally and socially sustainable, and thus improve decision-making. He said although Bank has various safeguards policies but his assignment is limited to Environmental and Social Safeguard Policies as applicable for to the Project.

He informed the stakeholders that Environmental Assessment (OP 4.01) is used in the World Bank to identify, avoid, and mitigate the potential negative environmental and social impacts associated with Bank's lending operations early in the project cycle. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted and their concerns addressed. This policy is triggered if a project is likely to have potential adverse environmental and social risks and impacts in its area of influence. The EA has various tools that can be used, including amongst others Environmental & Social Impact Assessment (ESIA) or Environmental and Social Management Plan (ESMP).

He described Environmental and Social Management Plan (ESMP) as an instrument that details the measures to be taken during the implementation and operation of a project to eliminate or

offset adverse environmental and social impacts or to reduce them to acceptable levels; and the actions needed to implement these measures. The ESMP is an integral part of Category "A" Environmental Assessments (EAs) (irrespective of other instruments used). EAs for Category "B" projects May also result in an ESMP. However, the impacts of the Umuda Isingwu/Umuagu Ibeku Gully Erosion rehabilitation project are considered to be mainly site specific. He stated that the paramount objective of his ESMP assignment is to develop procedures and plans to ensure that the mitigation measures would be implemented throughout the phases for the Rehabilitation of the Umuda Isingwu/Umuagu Gully Erosion site. He stated that the ESMP report will ensure the effective long-term protection of the area and other biotic and abiotic components of the environment.

He stated that Stakeholder engagement and involvement is important in the Umuda Isingwu/Umuagu Gully Erosion rehabilitation project and therefore expected to continue in a manner that gives the communities and the project affected persons (PAPs) the opportunity to make contributions aimed at strengthening the development project while avoiding negative impacts as well as reducing possible conflicts. In addition, the consultations will remain active (i.e on-going exercise) throughout the duration of the entire project.

The consultant called on the project community to take the ownership of the NEWMAP projects. He also advised the community to protect the project equipment during construction works. He pleaded with the community members to welcome and give attention to Enumerators who would be coming to their various homes for data collection.

The consultant also enlightened the stakeholders on the NEWMAP livelihood restoration plans. He reiterated that NEWMAP has livelihood activities projects that focused on alleviating the sufferings impended on the PAPs and project communities by the lingering erosion menace. Finally, the consultant urged the community members and stakeholders to participate fully in the consultation exercise by answering questions and raising their concerns.

Comments, Concerns, Questions Raised at the Community Meetings and Consultations

Comments/Concerns/Questions Raised	Consultant's Responses to Issues Raised
The Stakeholders welcomed the proposed project and were very much delighted and positive with regards to the approach undertaken by the ABIA-NEWMAP and World Bank to address the current problems of watershed and erosion, which are currently affecting their lives negatively.	The consultant acknowledged the residents widespread support for the proposed project and encouraged them to sustain it throughout the project life cycle
Onuoha Nduka James sought to know if the entire communities in Umuagu are affected by the project	ABIA-NEWMAP ESO informed the stakeholders that feasibility study has been undertaken and captured all the affected sites.
Hon. Ejike Ekwuribe pledged to give an unflinching support and to ensure that youth group will participate immensely throughout the project cycle. He also implored the ABIA-NEWMAP representatives to ensure that PAPs should not be left worse off.	Noted and endorsed.
Okailu Chinedu (Youth Leader) advised that those appraised by the enumerators/ Consultant should be the ones to answer the proposed questions to avoid conflicting ideas.	Endorsed.

Okwuchi Joy Obike (Women Group) Pleaded that the project should commence immediately to avoid further damages.	ABIA-NEWMAP ESO informed the stakeholders that World Bank projects involves processes and due diligence. She maintained that ESMP is one of the integral reports that must be submitted before rehabilitation works. She stated the SPMU is doing everything within its power to expedite actions in all these processes.
Ifeanyi Okugo stated that the youth group will resist any attempt by anyone who will be against the project. He maintained that the youths are solidly behind the project.	Noted and endorsed
Nwachilam Nwaogu thanked the World Bank, NEWMAP and Consultants for the rescue mission. He also advised the youths of the project community to be committed and shun violence throughout the exercise.	Noted and endorsed
The ABIA-NEWMAP M&E Officer in his closing remarks thanked everyone that has participated and expressed hope that the project will see the light of the day.	Noted and endorsed

4.8 Description of the Rehabilitation Project

Proposed solution to ameliorate the erosion problem is proper management of prevailing flood flow path to the gully and subsequently control the gully using adequate drainage systems such as culverts, drains, chute channels and stilling basins, rip-rap resting on geotextile, then gabion check dams placed along the gully bed to slow down the flow velocity, etc.

The principal components of the design works for the Erosion Complex are:

- Umuagu Ibeku gully - Design option 2: Conduct runoff safely through the gully to safely discharge into Iyi Doti stream using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams and retaining walls accompanied by earthworks and vegetation. Estimated total cost is N 240,456,720.00
- Umuda Isingwu gully – Design option2: Conduct runoff safely through the gully to safely discharge into the main gully using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams accompanied by earthworks and vegetation. The estimated total cost of this design alternative is N 41,995,987.50

Field investigation and literature showed that the Umuagu gully may have started as a result of runoff from a collection of reinforced concrete drains on both sides of an asphalt paved road that stopped at a culvert and those from an earth road with concrete lined drain on one side. The result is undercutting and the development of the gully head and subsequently the development of the Umuagu gully which is threatening the community primary school buildings.

The gully may have been caused by poor and inadequate construction of drainage structures on the Umuda – Isingwu road that branched off from the Umuahia – Uzuakoli road. The discharge from the culvert flows directly over open farm land without any protective measures.

The Isingwu gully may have been caused by the abrupt termination of the short length of reinforced concrete roadside drainage channel which led to the development of the gully head and subsequently expansion as gully fingers of different sizes, as one moved downwards along the earth road, over a steep slope towards the Obuhu stream. The gully has cut the road surface in

many sections preventing the people of Isingwu from going to Obuhu to fetch water for domestic use and from communicating with the communities across the stream.

The Abia State Nigerian Erosion and Watershed Management Project through the World Bank intervention has Proposed solution to ameliorate the erosion problem in Umuagu Ibeku/Umuda Isingwu by proper management of prevailing flood flow path to the gully and subsequently controlling the gully using adequate drainage systems such as culverts, drains, chute channels and stilling basins to slow down the flow velocity, re-vegetation etc. After comparison and evaluation of the design options, the following mitigation measures were recommended for the three gully erosion sites:

1. Umuagu Ibeku gully - Conduct runoff safely through the gully to safely discharge into Iyi Doti stream using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams and retaining walls, with earthworks and vegetation.
2. Umuda Isingwu gully – Conduct runoff safely through the gully to safely discharge into the main gully using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams with earthworks and vegetation.

4.9 Hydrological data design return period

The hydrological conditions of the area are the main reasons explaining the erosion problem. The area receives high and intensive rainfall. In addition, rainfall is often frequent creating wet antecedent moisture conditions which favour low infiltration and high runoff. The catchment area draining to the gully is largely dominated by residential areas and relatively steep slopes, as shown in hydrology section.

The proposed hydraulic structures within each section were designed based on the design discharge for that location. Based on discussion with NEWMAP personnel, the canals and other hydraulic structures, including cross-drainage culverts, stilling basins (energy dissipaters), chutes and detention ponds, cascade and check dams and retaining walls were designed for 50 year return period and checked for 100 years return period.

4.10 Geotechnical data and material property

The geological parameters are other major factors affecting the erosion susceptibility of the area. The geology of the area is predominantly sandy formation with low clay content. The material is generally unstable and can easily be detached by external effect such as surface runoff, shear stress, groundwater movement and structural loading. Some key geotechnical parameters are summarized in the Geotechnical Section in the feasibility study report.

4.11 Proposed gully protection concept design

4.11.1 General Concept

The main objective of the project is to design gully erosion mitigation measures to stop the erosion process and stabilize the actual eroded areas of the Umuda Isingwu/Umuagu Ibeku complex gully erosion site. Three conceptual design proposals for the mitigation of Umuda Isingwu/Umuagu Ibeku complex gully erosion problem were considered and the accepted design is summarized below.

Umuagu Ibeku gully

The proposed gully mitigation works for the Umuagu Ibeku gully encompass the construction of runoff conveyance facilities to conduct runoff safely through the gully; to safely discharge into Iyi Doti stream, using drainage channels, chute spillways, stilling basins and outlet protection works; as well as installing check dams and retaining walls accompanied by earthworks and vegetation.

Umuda Isingwu gully

The proposed gully mitigation works for Umuda Isingwu gully comprise the construction of runoff conveyance facilities to conduct runoff safely through the gully; to safely discharge into the main Umuagu gully, using drainage channels, chute spillways, stilling basins and outlet protection works; as well as installing check dams and retaining walls accompanied by earthworks and vegetation.

4.11.2 Bio-remediation (Vetiver grass and bamboo)

The non-vegetated slopes are prone to frequent and sometimes serious erosion process. Bio-remediation measures can be used to protect gully bank walls and prevent erosion. They provide important resistance to erosion forces and more aesthetic and environmentally friendly than other structures. Terracing is also proposed to reduce bank slopes and provide more stability.

Vetiver grass was researched, tested, and developed throughout the tropical regions. Accordingly, the main bio-remedial measure proposed is Vetiver grass and bamboo trees on the gully bank slopes of less than 40^{o}. Bamboos are also used as an efficient erosion protection work in the local area, particularly when they are planted at the bottom of the slope. Specific design effort is made to use the Vetiver and Bamboo combined on the slope and bottom of the gully bank respectively.

All designs are based on the Engineering Design Report prepared by DYOKE, 2016.

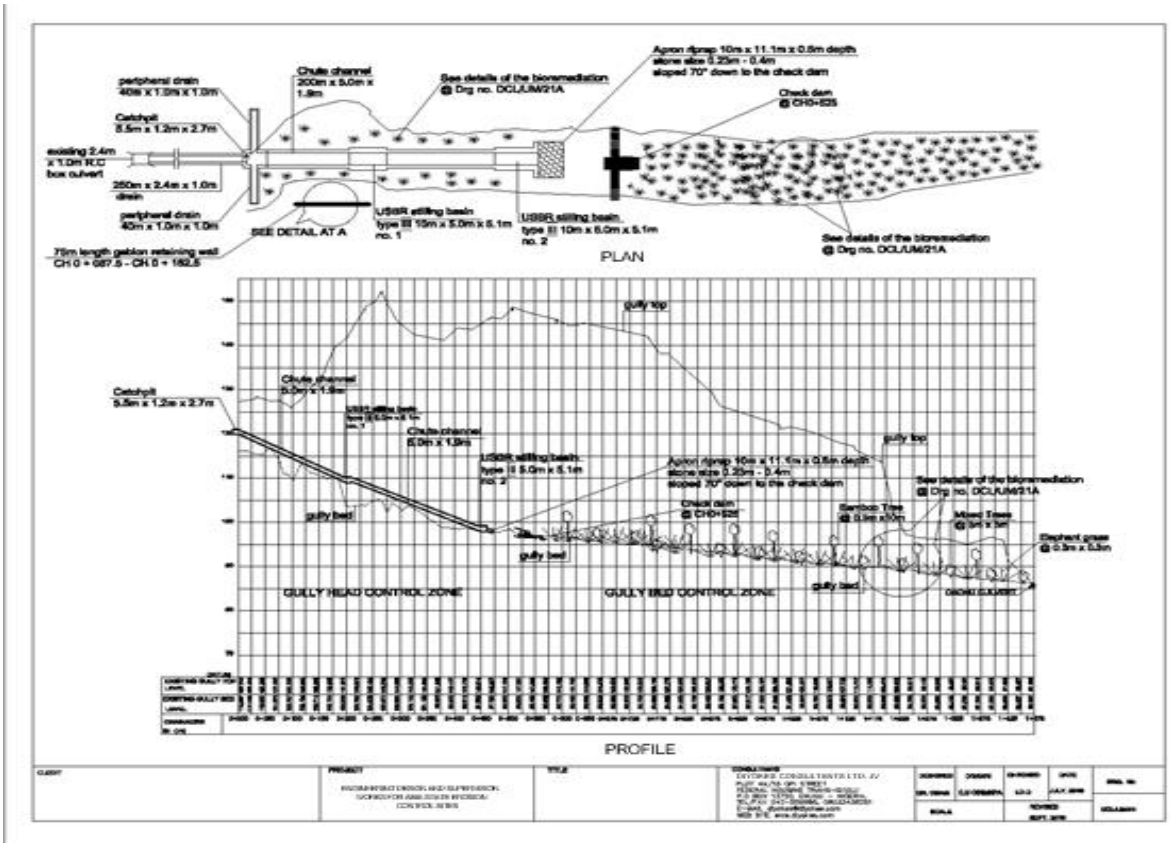


Plate 40: General layout design of Control measure, Dyoke, 2016

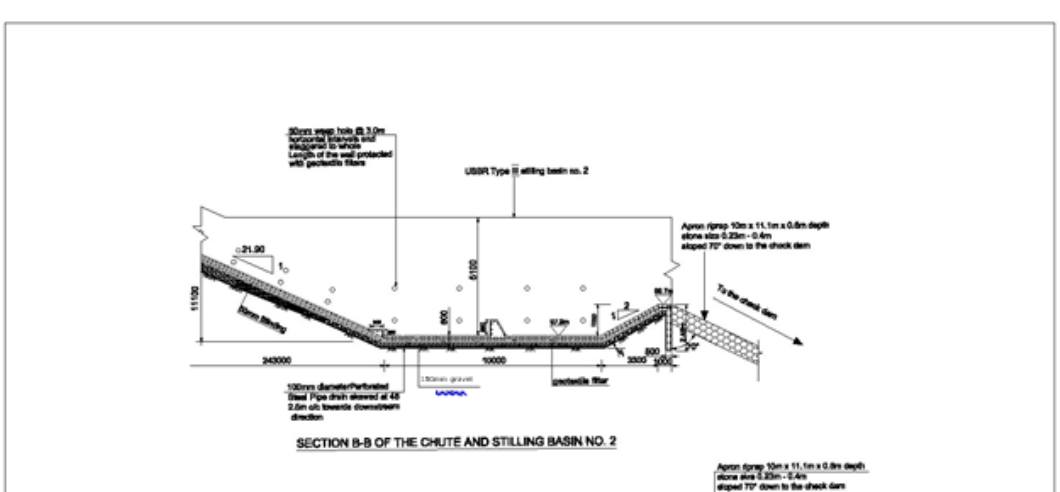


Plate 41: Design Plan for Chute and stilling basin, Dyoke, 2016

4.12 Project Options and Alternatives

In the context of this ESMP, analysis of project alternatives refers to the performance of the natural and socio-economic resources with or without the project or with or without the implementation of the measures of this ESMP and/or other safeguard instrument considered appropriate.

For intervention work of this nature, there are usually a number of viable options that can be considered. These alternatives include: the no project option; delayed project; alternative site/location and project execution options. For this project, analysis of the various alternatives is presented as follows:

4.13 No Project Option

The no project option implies that the intervention work shall not be executed; hence there is no need to carry out this study. This implies the site will remain in its current state and perhaps widen due to natural forces without even any interference from man. Nevertheless, this situation will worsen and put the activities of man and the environment into further jeopardy since the area is already exposed to the forces of erosion. The intervention work is designed to stop these forces and mitigate any negative impacts that may arise.

Therefore, choosing the no project option will mean a loss of efforts made by all parties to ensure the erosive forces do not continue to pose risk to lives and the environment and even loss of job opportunity to Nigerians. The 'no project option' is therefore not considered a viable option.

4.14 Delayed Project Option

This option implies that the planned intervention be delayed until a much later date. Such option is usually taken when conditions are unfavourable to project implementation such as in heavy rainfall, war situation, or where the host community is deeply resentful to it. Also, if the prevailing economic climate is not quite favourable, then delayed option may be feasible. None of these conditions is applicable at present.

Further delay will mean the onset of heavy rainfall that is not favourable for the proposed treatment method. At present, both the economic and the political environment and natural environmental phenomena are most favourably disposed towards it. Therefore, the implication of delayed project option will mean that all the preliminary work and associated efforts/ costs incurred would have come to nothing.

Also, because of inflationary trends, such a delay may result in unanticipated increase in project costs, which may affect the final target from the project. These, and other related problems make adopting the delayed option impracticable.

4.15 Do project Option

This option means going ahead to implement the intervention work. This also entails incorporating professional advice on the most practicable option such as are spelt out in this ESMP and other relevant safeguard instruments and/or best practices relating to the execution of the intervention. This will definitely reassure the public of their safety and the environment. It will also aid employment creation. The environmental threats from the gully erosion will be reduced drastically, if not totally solved in that area. The devastation by erosion that has rendered the existing road impassable will be addressed and solved.

This option is therefore considered the most viable and recommended for implementation. However, in going ahead, appropriate measures for the gully treatment must be adopted and applied.

4.16 Gully Treatment Options

Treatment of gullies depends on a range of factors including: the size of the gully, whether it is actively eroding or not, the soil type, the size and frequency of water flow, the gradient of the area and the desired use of the land after rehabilitation. The situation of the proposed intervention area shows that the best option or combination of the following options should be employed:

1. The do nothing
    a. Applicable when assets are not at risk from erosion.
    b. This option can result in downstream significant sedimentation problems.
    c. Generally the slowest option to achieve a stable gully.
2. Backfilling the gully and forming a stable drainage state
    a. Generally only viable for small gullies.
    b. This option requires only cheap supplies of materials for gully/earth filling
    c. Generally the quickest Option to achieve a stable gully.
3. Partially backfilling the gullies using natural sedimentation processes
    a. This is usually the cheapest option in the long run.
    b. This option relies on the on-going supply of sediments from the upstream gully erosion. If the upstream gully is stabilized as part of the overall gully rehabilitation, then there may be insufficient sediments to backfill the weirs.
    c. This option is often adopted, when the gully extends upstream of a given property.
4. Partially backfilling using local or imported materials
    a. This option requires heavy machinery.
    b. High safety risks are often associated with such project and Earth works.
    c. Battering the gully bank to provide a source of fill usually accelerate the rehabilitation of the gully bank.
5. Stabilization of gully without partial backfilling of the beds or battering of the banks
    a. This option can result in a long drawn-out process, requiring planting and replanting.
    b. Significant sediment loss can occur before the gully bank reaches a stable form

4.17 Alternative Technologies/Designs

The stabilization of an active gully requires an understanding of the various erosion processes that can occur within a gully, plus the ability to recognize the cause of the erosion and identify appropriate treatment measures. Management options for the Umuagu Isingwu/Umuda Ibeku gully erosion Complex may include the following:

4.17.1 Option One: Rock Lined Chute

The rock-lined chute as seen in Plate below is used to lower surface water into the open channel where a gully has developed. The chute is sized according to drainage area and site factors. Proper sizing of the rock to withstand the expected velocity of water in the chute is the key factor. For the installation of this structure a good source of rock must be available in the area. Rock lined chutes as seen in are an essential item in the stabilization of gullies. Wherever practical erosion problems should be stabilized synthetic material should only be used in circumstances where natural based solutions fail to achieve the required stability.

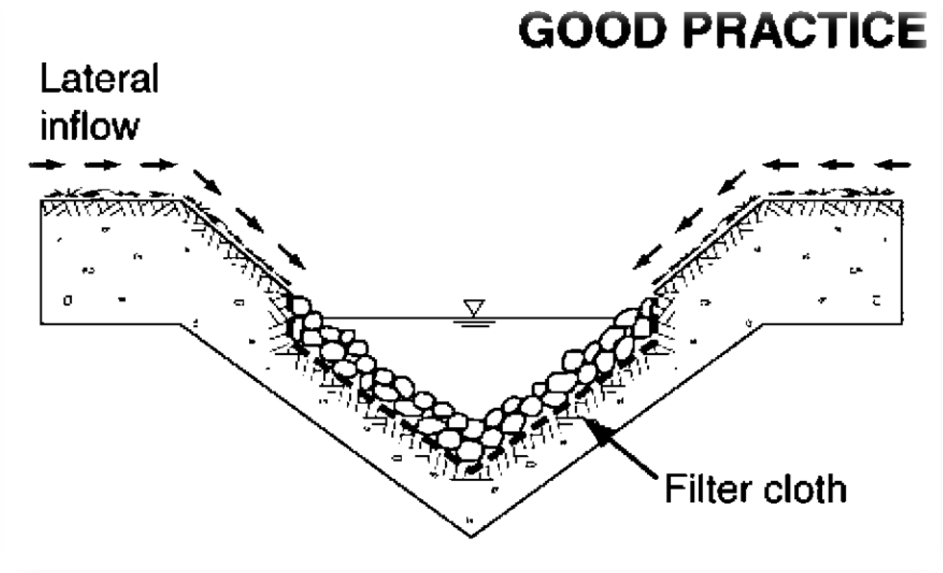


Plate 42 Schematic diagram of a rock lined chute

Most rock chute fail as a result of poor construction practices and from water passing around the chute or the use of inadequately sized rock (as a result of either a design or construction problems). The critical components of the rock chute design are:

- Control of flow entry into the chute;
- Determination of an appropriate rock size; and
- The design of energy dissipation measures at the base of the chute to prevent undermining of the chute and damage to the gully banks.

The upper surface of the rock chute must blend with the surrounding land to allow water to freely enter the chute without being diverted along the edge of the rock lining.

The rock size must be based on the flow conditions down the chute, the slope of the chute, the shape of the rocks (i.e. round or angular), and the degree of variability in rock size. The recommended mean rock size for long, straight chutes may be determined.

Constraints

- The non-availability of rocks in the area could be step back in the use of this alternative

4.17.2 Option Two: Wood Drop Structure

Wood has been used in various ways to control soil erosion. Over the past few years, the wood drop structure has been used with much success. The wood must be adequately treated to withstand contact with the soil in a wet condition and adequate drainage around this structure required.

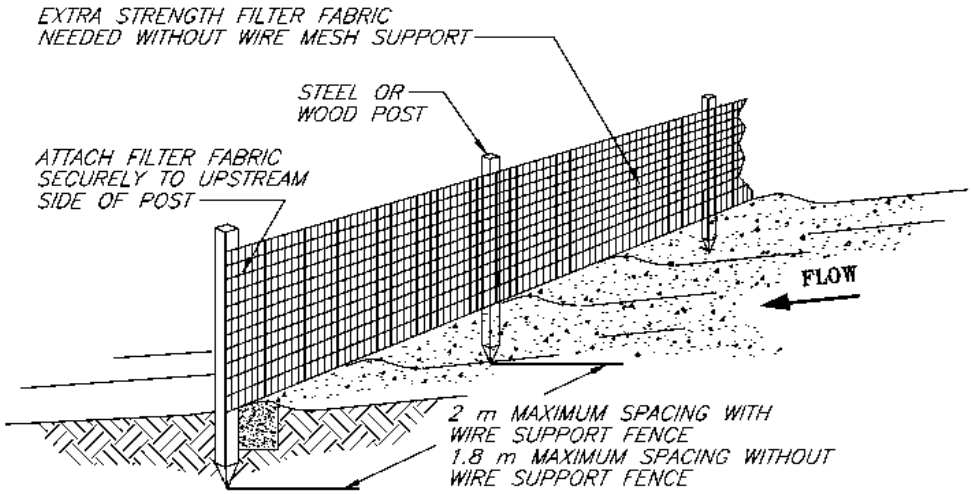


Plate 43 Schematic diagram of a wood Drop structure

Constraints

- As the gully is deep and very wide its encroachment would be continuous with the use of this alternative. Since trapping of sand would be a dependent factor.

4.17.3 Option Three: Do Nothing Option

The "do-nothing" option would involve maintaining the status quo. This would mean that no further rehabilitation of the erosion site will be done. This would actually lead to degradation of un-eroded areas thereby causing more harm than good to the immediate environment.

4.18 The Preferred Alternative

The preferred alternative would be to implement the current project proposal. This involves civil works as well as revegetation using deep rooted crops (eg vetiverr grass) to stabilize the gully. Also the design will help control run-off and prevent washing off of soil thereby preventing further occurrence of erosion on the site.

5 CHAPTER FIVE: ASSESSMENT OF POTENTIAL ADVERSE IMPACTS AND ANALYSIS OF ALTERNATIVES

5.1 Introduction

The proposed Rehabilitation of the Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex will lead to several changes in the environment and socio-economic aspect of the project area. A good

number of these changes will be beneficial, especially the impacts of rehabilitating degraded land and reducing longer-term erosion vulnerability in the project community.

There are a number of approaches for the prediction and evaluation of impacts. The ISO 14001 method is simple to apply and provides a high level of details and also relies on limited data, unlike the other methods that require the availability of large historical data. The ISO 14001 method, therefore, is selected for the identification and evaluation of impacts for the proposed gully rehabilitation project.

5.2 Impact Identification and Evaluation

In line with general guidelines for an Environmental Impact Assessment (EIA) process, the following were the basic steps adopted for identification and evaluation of impacts:

- Impact identification
- Impact qualification
- Impact rating
- Impact description

5.2.1 Impact Identification

The aim of impact identification is to account for the entire potential and associated bio-physical, social and health impacts making sure that both significant and insignificant impacts are accounted for. The anticipated impacts were determined based on the interaction between project activities and environmental sensitivities. The identified potential impacts during the different phases of the proposed project are listed in tables 18-20.

5.2.2 Impact Qualification

The identified impacts of the project were qualified based on the following four criteria:

- Positive or negative
- Short-term or long-term
- Reversible or irreversible
- Direct or indirect

Negative impacts are those that adversely affect the biophysical, health, and social environments, while positive impacts are those, which enhance the quality of the environment. For this study, short-term means a period of time less than three months while any period greater than three months is considered long-term. By reversible/irreversible, is meant whether the environment can either revert to previous conditions or remain permanent when the activity causing the impact is terminated.

5.2.3 Impact Rating

This stage involves evaluation of the impact to determine whether or not it is significant. The quantification scale of 0, 3 and 5 was used. The system of rating employed was adapted from The International Organization for Standardization ISO 14001– Environmental Management System Approach. The criteria and weighting scale used in evaluating significance are as follows:

- Legal/regulatory requirements (L)
- Risk factor (R)
- Frequency of occurrence of impact (F)
- Importance of impact on an affected environmental components (I)
- Public perception/interest (P)

Legal /Regulatory Requirements (L)

This seeks to address the question 'if there is a legal/regulatory requirement or a permit required?' The scoring is as follows:

0= There is no legal/regulatory requirement

3= There is legal/regulatory requirement

5= There is a legal/regulatory requirement and permit required

The legal/regulatory requirements were identified based on national laws/guidelines/standards (FMEnv) relating to the project activity.

Risk (R)

This uses a matrix based on the interaction of the probability of occurrence of the impact (Table 9) against consequences of the impact (Table 10). The matrix (Table 11) is referred to as the Risk Assessment Matrix (RAM). Five probability categories are interacted against four groups of consequences. The resultant outcomes are given scores with colour-coding. High-risk categories are red; intermediate risks, yellow and low risks, green as follows:

1=Low risk (green)

3=Intermediate risk (yellow)

5=High risk (red)

Table 9: Probability of Occurrence

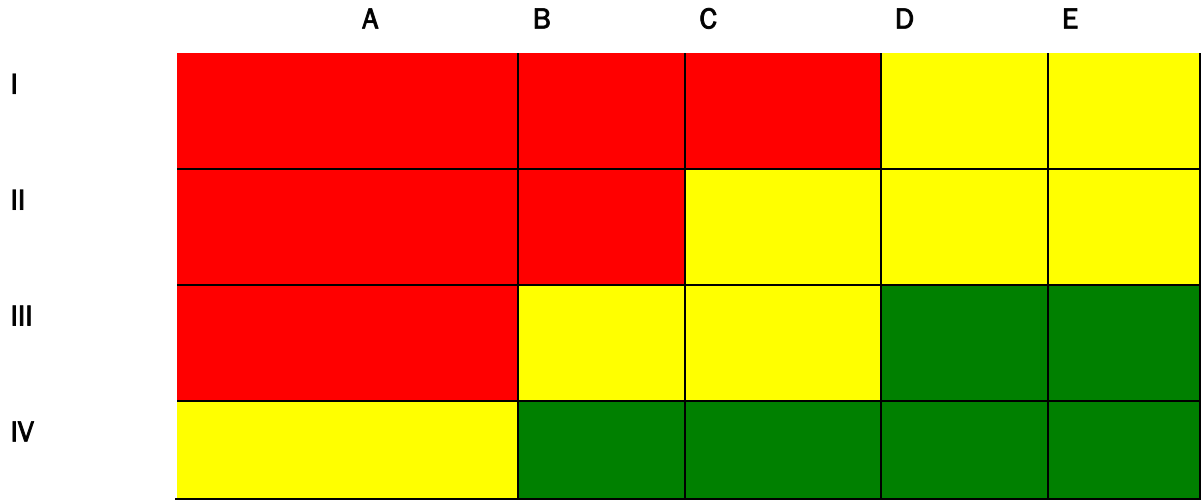
Probability Category	Definition
A	Possibility of Repeated Incidents
B	Possibility of Isolated Incidents
C	Possibility of Occurring Sometime
D	Not Likely to Occur
E	Practically Impossible

Table 10: Consequences of Impact

	Considerations

Consequence Category	Safety / Health	Public Disruption	Environmental Aspects	Financial Implications
I	Fatalities / Serious Impact on Public	Large Community	Major/Extended Duration/Full Scale Response	High
II	Serious Injury to Personnel / Limited Impact on Public	Small Community	Serious / Significant Resource Commitment	Medium
III	Medical Treatment for Personnel / No Impact on Public	Minor	Moderate / Limited Response of Short Duration	Low
IV	Minor Impact on Personnel	Minimal to None	Minor / Little or No Response Needed	None

Table 11: Risk Assessment Matrix



Key to Colours

Low

Medium

High

Positive

Frequency of Impact (F)

Frequency of impact refers to the number of occurrence of impact. The frequency of impact was determined using historical records of occurrence of impacts, and consultation with experts and local communities. The criteria for rating the frequency of impacts are outlined in Table 12.

Table 12: Frequency rating Criteria

Frequency	Rating	Criteria
Low	1	Rare, not likely to happen within project lifespan
Medium	3	Likely to happen ≥ 5 years
High	5	Very likely to happen throughout the project lifespan

Importance of Affected Environmental Component and Impact (I)

The importance of the affected environmental components was determined through consultation and consensus of opinions. This was also further facilitated by information on experiences on the impacts of already existing facilities in the proposed project area. The rating of the importance of impacts is shown in Table 13.

Table 13: Importance Criteria

Importance	Rating	Criteria
Low	1	• Imperceptible outcome • Insignificant alteration in value, function or service of impacted resource • Within compliance, no controls required
Medium	3	• Negative outcome • Measurable reduction or disruption in value, function or service of impacted resource • Potential for non-compliance
High	5	• Highly undesirable outcome (e.g., impairment of endangered species and protected habitat) • Detrimental, extended animal behavioural change (breeding, spawning, moulting) • Major reduction or disruption in value, function or service of impacted valued ecosystem resource • Impact during environmentally sensitive period • Continuous non-compliance with existing statutes

Public Perception (P)

The consensus of opinions among the project stakeholders were used to determine the public perception on the potential impacts and the following criteria were applied (Table 16)

The combination of the five impact rating weights forms the basis for judging the level of significance of each impact. A matrix displaying the combination based on the ISO 14001 tool is shown in Table 17.

The final ratings of the identified impacts are presented in Tables 17 - 19. *In this report, medium and high significant negative impacts were judged to require mitigation, and all positive impacts required enhancement.*

Table 14: Perception Criteria

Public Perception	Rating	Criteria
Low	1	• No risk to human health, acute and/or chronic • No possibility of life endangerment for residents, associated communities • Minor reduction in social, cultural, economic values • Unlikely adverse perception among population
Medium	3	• Limited incremental risk to human health, acute and/or chronic • Unlikely life endangerment for residents, abutting communities • Some reduction in social, cultural, economic value • Possibility of adverse perception among population • Potential for non-compliance
High	5	• Elevated incremental risk to human health, acute and/or chronic • Possibility of life endangerment for residents, abutting communities • Major reduction in social, cultural, economic value • Continuous non-compliance with statute • Any major public concern among population in study area

Table 15: Impact Value and Rating Colour Code

Impact Value	Cut off Values	Impact Rating
L+R+F+I+P	<8	Low
L+R+F+I+P	≥8 but <15	Medium
L+R+F+I+P	≥15	High
F + I	>6	
P	= 5	
Positive		Positive

5.3 Summary of Associated and Potential Impacts Determination

The results of the evaluation of the interactions between the proposed activities and their impacts on environmental and social sensitivities are shown in subsequent pages of this chapter. The identified negative impacts were rated as **minor, moderate and major**. Beneficial impacts arising

from the project were rated as positive. Hence, no further classifications were made on the beneficial impacts.

The project is envisaged to have a range of positive environmental and social impacts. Some of these are a function of the objectives of the project, while others are a function of the way in which the project is designed to meet its objectives.

Some adverse impacts that may be associated with the rehabilitation of the gully site are highlighted in this subsection (Table 16). Notwithstanding, the ESMP will be prepared to ensure that these impacts are reduced to the barest minimum.

Table 16: Summary of Beneficial and Adverse Impacts

S/N	Positive Impacts	Adverse Impacts
1	Community development programs.	The frequency and incidence of occupational hazards may rise with during construction activities.
2	Connection and restoration of access to houses and villages already cut off by the erosion	Possibility of seepage of fuel from machineries and effluent discharge into the watershed, thus impacting on the water quality.
3	Control and Reduction of water body sedimentation rates due to erosion.	Contaminated (with human waste) water run-off into surface water, etc.
4	Gender Issues: Construction activities will encourage economic activities, especially for women. Since there would be a large workforce, petty traders and food-spots owners will benefit immensely from the demand on site.	Soil destabilization due to vibrations from construction equipment use.
5	Improved agricultural productivity within the community and Abia state at large.	Noise and vibration from heavy-duty project vehicles and equipment resulting in nuisance.
6	Improved livelihood enhancing activities.	Disruptions to resident activities within the project area.
7	Increase in social interactions	Delayed travel time due to movement of construction equipment or vehicles
8	Initiation/ kick-off of rapid production systems and agricultural practices.	Increase in sexual activities leading to possible spread of STIs.
9	Minimization of flooding and control of overflow.	Grievance and resistance from communities
10	Promotion of afforestation programs (with all its benefits)	Green House Gas (GHG) emissions from vehicular and construction equipment would be generated during the pre-construction,

S/N	Positive Impacts	Adverse Impacts
		construction and subsequently, operational phases of the project
11	Promotion of goodwill and community appreciation of the NEWMAP intervention in Abia State and Nigeria at large.	Increased generation of solid and liquid wastes.
12	Provision of employment opportunities for both skilled and unskilled workers.	Site clearing will lead to loss of species diversity and abundance, including soil organisms, fungi, invertebrates, and bacteria.
13	Reduced fear perception of loss of property, inhabitation and ancestral origins of the communities.	Injuries, falls, accidents, explosions, fires, leakages, accidents etc.
14	Reduction in mortality/morbidity from landslides.	Occurrence of social vices (e.g. theft, drug use, etc.).
15	Reduction of mortality rate.	Increase in turbidity of river waters from storm water/ runoff during preconstruction and construction phase.
16	Rehabilitation of the erosion menace in the community	Increase in fugitive dust emission during preconstruction and construction phases of the rehabilitation.
17	Reintegration of community and diversification of sources of livelihood.	Loss of employment for labourers after the completion of the rehabilitation works,
18	Repair of the watershed gullies	Waste generation especially construction wastes.

Identified Potential Impacts (by Project Phases)

Pre-Construction Phase

A. Environmental Impacts

Positive

- Prior to the commencement of rehabilitation works, a feasibility study and environmental assessment are required to describe the proposed project needs, aid project design, and ensure environmental and socio-economic sustainability of the project and the project community.
- The project will undertake a stakeholders/public consultation exercise to sensitize the stakeholders in the project command area and beyond on the environmental safeguards

components of the project. The public consultation process is seen to be a positive impact, as it will form a basis for project design and implementation of decision-making.

Negative

a. Air Quality

- The pre-construction phase will give rise to fugitive dusts and frequent exhaust emissions into the atmosphere as equipment is delivered to the Site and along access roads where the proposed rehabilitation works will take place.

b. Soil

- Leakages may occur from stacked equipment containing oil such as engine oil. This could result in the seeping-through of oil into the soil, thereby leading to possible contamination of soil, surface water and ground water.
- Soil compaction and soil structure changes may occur due to influx and stationary positioning of heavy duty equipment and vehicles

Surface Water

- Leakages may occur from stacked equipment containing oil such as engine oil. This could result in surface water contamination by run-off.

c. Noise and Vibration

- During the pre-construction activities the WHO/FMEnv permissible noise level (90dB) may be exceeded due to mobilization of heavy machinery to the rehabilitation site.

B. Social Impacts

Positive

- The project will undertake a stakeholders/public consultation exercise to sensitize stakeholders in the project command area and beyond on the social safeguards to ensure project sustainability. The public consultation process is seen to be a positive impact, as it will form a basis for project concept decision-making and implementation.

Negative

a. Land Acquisition

- Possible unresolved issues during land acquisition process from members of the community which may result in conflict between contractors and land owners.
- Hostile and unfriendly community attitudes during land acquisition process.
- Decrease in accruable income from land

b. Noise

- Noise from heavy-duty project vehicles and equipment may exceed the WHO/FMEnv acceptable noise level limits, resulting in nuisance.

c. Others

- Possible disruptions of movement of residents within the project area to places of work, and businesses, as a result of movement of equipment and materials along access

roads, resulting in loss of man-hours and negative perception of the project amongst road users and residents.

- Properties particularly farmlands may be accidentally damaged or destroyed during the movement of heavy duty vehicles and equipment.
- Accidents involving vehicles or pedestrians may occur during vehicle and equipment movement to site.

C. Occupational Health and Safety

Positive

- During the pre-construction phase, Occupational Health and Safety (OHS) awareness programs will be conducted. Awareness programs and interactive sessions will benefit primarily the contractors' personnel, schools, residents and businesses. Guidelines on safe practices and safe behaviours will be made available to these groups in order to minimize the occurrence of occupational incidents or accidents in the course of implementing project activities

Negative

- During the pre-construction phase air pollution from exhaust fumes of vehicles and release of fugitive dust as a result of equipment moving to the work area may occur. This will pose an occupational health risk (*respiratory infections and diseases*), especially for people residing in and carrying out activities around the project rehabilitation area and also, contractor personnel, and personnel conveying equipment.
- Exposure to noise pollution, injuries and accidents during movement of equipment to the work areas.

Construction Phase

A. Environmental Impacts

Positive

- Channelization of flood waters: Drainage channels will be constructed, to channel storm water to collector drains at the gully head.
- Construction of suitable sized and aligned collector drains at the gully head to collect and lead the storm water/runoff from the roads into drop structures.
- A chute will be constructed to channel water into the stilling basin. This will enable the controlled flow of water from the collector drain to the stilling basin.
- The phase will allow for recovery works for land located within the gully, so as to safeguard residential properties at risk of erosion.
- Re-vegetation activities will be carried out, to provide cover for the eased out slopes, channels, chute and the stilling basin. The structured vegetation to be applied include sand bags, erosion resistance trees, plants and grasses in other to make the area environmental friendly and to improve the aesthetic of the project area.

- Stabilization (even out/ uniformity) of the slopes, where feasible to prevent further collapse of the slopes

Negative

a. Climate Change

- Climate change impacts need to be assessed from two perspectives. Firstly the impact of the project on climate change and secondly the impact of climatic change on the project scheme and its infrastructure.
- Green House Gas (GHG) emissions from vehicular and construction equipment would be generated during the pre-construction, construction and subsequently, operational phases of the project. These emissions would be the primary impact of the project on climate change. GHG emissions are considered based on three "scopes" – Scope 1 (direct emissions), Scope 2 (indirect emissions) from the consumption of purchased energy [Purified Motor Spirit {PMS}, diesel] and Scope 3 (other indirect emissions)

b. Air Quality

- Emission of Green House Gases, Dust and Particulates: Emissions from exhaust fumes will originate from mobile sources including vehicles, trucks and heavy equipment during construction works.
- Excavation and other civil works will lead to the increase in fugitive dust.
- Civil works will cause changes in the air and atmospheric conditions of the project area and surrounding environment. Fugitive dusts, machinery exhaust fumes [nitrogen oxides (NOX), carbon monoxide (CO), sulphur oxides (SOx), hydrocarbons and suspended particulates], and dusts from rehabilitation/construction activities will impact negatively on air quality. Air pollution from machineries will be short-termed, moderate and localized.

c. Soil

- Construction machinery stationed and moving around the area can create soil compaction, which may harm the soil's future potential as farmland, impair drainage and increase the risk of flooding.
- Excavation and compaction activities through construction works will alter the soil properties including loss of valuable top soils.
- Accidental spillage of chemicals and fuels from the operation and maintenance of construction vehicles and equipment will pose negative impacts to surface and future groundwater quality.

d. Water Quality and Hydrology

- Increased pressure on water resources during construction works
- During construction works, seepage of fuel from machineries and effluent discharge into the watershed may occur, thus impacting on the water quality
- During the rehabilitation works, there may be potential for sediment/contaminant laden water runoff to impact on water quality. The contaminants in water runoff may

have the potential to enter existing drainage channels and into local watercourses, affecting downstream users and aquatic life.

- Flood draining activities may introduce chemicals into water bodies leading to possible changes in water colour and pH levels, pollution and eutrophication in surface water.

e. Noise and Vibration

- The project area is a built-up area with residential houses, schools, market and a hotel. The civil works will generate noise and vibrations on site and surrounding environment. Most activities associated with road project starting from the pre-construction phase to the construction phase would generate relatively high levels of noise and would be mainly from heavy equipment. The noise levels generated by construction equipment would vary significantly, depending on such factors as type, model, size, and condition of the equipment, operation schedule, and condition of the area being worked. Accordingly, potential impacts of site monitoring and testing activities on ambient noise level would be expected to be temporary and intermittent in nature.
- Vibrations resulting from construction equipment may cause further soil destabilization and consequent erosion.

f. Waste

- Construction activities will lead to the production of solid wastes - soil excavated debris, metal scraps, plastics, wood, waste concrete, papers and cartons, etc.
- Increased generation of liquid waste – concrete washings, canal watering, etc.
- Construction crews may generate solid and liquid wastes (sewages). Uncontrolled and untreated, these wastes are major sources of pollution, disrupting the ecosystem and contributing to local (and sometimes much broader) health problems.

g. Flora and Fauna

- Alteration of habitat and biodiversity may occur, due to human activities and disturbance on the natural habitat. Site clearing will lead to loss of species diversity and abundance, including soil organisms, fungi, invertebrates, and bacteria. It will also lead to loss of food sources, fauna habitat, breeding grounds and nesting sites.
- Reduction in the number of native wildlife
- During mobilization of equipment, construction activities such as grading, dredging, filling, excavation etc., Weed invasion/proliferation of opportunist species (weeds & pests) may occur.

h. Topography

- Scarification of natural landscape of the project site.

B. Social Impacts

<u>Positive</u>

a. Employment

- Employment of skilled and unskilled labour will be promoted. Artisans and professionals from the project area will be provided contractual employment during this phase. This will help promote community goodwill.

b. Economic Benefits

- This phase will encourage economic activities within and around work areas. Petty traders, food vendors and other small businesses will benefit from the demands at the work site.

c. Waste Management

- The construction phase will see to the implementation of a viable waste management plan for project activities.

d. Occupational, Health and Safety

- Occupational health and safety efforts will be intensified during the construction phase as signage, warning and hazard signs will be put up to inform residents and others, about the on-going rehabilitation works in sensitive areas.
- The phase will encourage the conduct of Occupational Health Risk Assessment (OHRA), Job Hazard Analysis (JHA), Hazard Communication Program (HAZCOM), OHS trainings and other proactive safety strategies (fulfilling the social and fiscal imperatives) which will help reduce the occurrence of on-site incidents/accidents and the resultant burden of direct or indirect compensation costs.

Negative

a. Impact on Livelihood/Community Activities/Social Stress

- During the rehabilitation works there are bound to be restriction in movement, which will affect residents and business owners in the project area.
- Gully rehabilitation activities may disrupt use of access roads by other users including travellers. There may be occurrences of traffic congestion on access roads as a result of intermittent movement of equipment and materials into and from the rehabilitation work area. There is high likelihood that when moving these equipment and personnel along these roads, the transport activities of the community could be disrupted and this could have impact on the socio-economic activities of the community.
- Flooding in other areas may occur during construction activities (construction of drainage), which can lead to destruction of lands, and properties.
- Human Displacement: Civil, re-vegetative, and watershed management may require the relocation of surrounding residents and their sources of livelihood.
- Social unrest as a result of non-participation/hiring of locals in the construction/ rehabilitation project.

b. Social Vices

- The project will attract a significant workforce. Associations between workers and local residents may lead to casual sexual relationships, thereby increasing the risks of sexually transmitted infections *(STIs*) and *HIV*
- Vices such as theft, drug use, casual sex *(with minors, prostitutes, etc.*), small scale gambling, rape, etc., may arise due to the influx of project workforce into the area.

c. Health and Safety

- Incidences of respiratory conditions and respiratory diseases (silicosis, asthma, bronchitis, upper respiratory infections may occur due to air contamination by exhaust fumes and dust resulting from civil works.
- Possible spread of water borne diseases (e.g. Cholera, Dysentery, Amoebiasis, Salmonellosis etc.) may occur.
- Possible outbreak of HIV/AIDS and other STDs.
- During construction activity through creation of pools of stagnant water there may be an increase in malaria cases
- Exposure of workforce to attack by poisonous insects, reptiles and other dangerous wild animals. These attacks could result in injuries, poisoning or even death.
- The frequency and incidence of occupational hazards may rise with during construction activities.
- Accidents may occur during the construction phase as a result of increased vehicular movements

d. Noise and Vibrations

- This phase will cause noise and vibration nuisance

e. Waste

- The construction phase will give rise to increased generation of waste from construction activities

f. Archaeological and Cultural Loss

- Construction works may impact on sensitive sites such as shrines, graves etc.

g. Conflict

- Conflict may arise between community members and contractor. This may hinder or slow down project implementation activities.

h. Traffic

- Existing travel patterns will be negatively impacted during the construction phase of the project.

C. *Occupational Health and Safety*

Negative

- In the course of rehabilitation works, there would be a moderate to severe likelihood of the occurrence of workplace hazards. Activities using heavy and light equipment such as graders and bulldozers could predispose personnel to hazards. “Unsafe behaviours” and “unsafe conditions” will pose serious occupational health and safety risks.
- Contact with natural hazards such as animals, insects, poisonous plants and reptiles.

Operational Phase

A. Environmental Impacts

Positive

- Repair of watershed gullies and rehabilitation of erosion menace. Proper erosion and watershed management as flood waters and run-off will be efficiently controlled.
- Improved access road for between villages in the communities. This will immensely benefit community residents and other road users.
- Stabilization of the gully erosion, this preventing further erosion from occurring.
- Aesthetic modifications will promote good ambience within the gully erosion.
- Availability of water (in the stilling basin) for agricultural use.
- Control and reduction of water body sedimentation rates due to erosion.
- Promotion of afforestation programs

Negative

a. Water Quality

- Roadway runoff, wastes (municipal solid wastes, agricultural wastes, effluent, hazardous wastes etc.) may cause turbidity, changes in water colour and in pH levels.

b. Odour

- Release of foul smell from the collector drains, chute and stilling basin as a result of runoff/storm water containing decaying matter.

c. Blocked Drains

- There may be sediment laden run-off/storm water which may block the collector drains whereby affecting water flow.

B. Social Impacts

Positive

a. Livelihood

- Proper erosion and watershed management as flood waters and run-off will be controlled.
- With the rehabilitation of the gully, the risk of land and properties being carried away will be significantly reduced. Reduced fear perception of loss of property, inhabitation and ancestral origins of the communities.
- Increase in project area development and business opportunities
- Improved access between villages and communities thus increasing social interactions. Reintegration of community and diversification of sources of livelihood.
- Improved agricultural productivity within the community and Abia state at large.
- Initiation/ kick-off of rapid production systems and agricultural practices.
- Reduction in mortality/morbidity from landslides.

b. Education

- The rehabilitation in the gully area will lead to educational and social tourism to the project (for example university students studying various the fields of erosion and watershed management and engineering), and Industrial Training and those requiring hands-on experience.
- Increase in community development programs

c. Traffic

- Increase in traffic within the roads and access roads of the project

d. Control

- Control and monitoring of human activity e.g. farming, building etc. within the recovered areas and eased out side slopes

Negative

a. Loss of Employment

- At the end of the project lifetime the project workforce will be demobilized. This will bring about loss of jobs for the project workers. This will translate to loss in income and business opportunities. Most of the small scale businesses that provided goods and services to the road crew members will either windup or experience significant reduction in the volume of business with the demobilization of the project and this too will translate to loss of income

b. Air Quality

- Increase vehicular emissions from road users

c. Waste

- Indiscriminate dumping of waste may lead to blocking of drainage channels and sanitation issues.

d. Conflict

- There may be land use conflict in managing the erosion site e.g. ecological, grazing and farming

e. Health and Safety

- The stilling basin could become a breeding site for disease vectors e.g. flies and mosquitoes. Possible spread of water borne diseases (e.g. Cholera, Dysentery, Amoebiasis, Salmonellosis etc.) may occur.
- Increase in respiratory problems amongst local residents as a result of increase in road users.
- Increase in vehicular accidents along constructed/rehabilitated access roads.

C. *Occupational Health and Safety*

Positive

- Implementation of site-specific occupational health and safety management plans (OHSMPs)

- Monitoring for occupational health and safety risk assessment (OHSRA) report data.
- Continuous job hazard analysis and process hazard analysis (JHA and PHA)
- Implementation of a hazard communication program (HazCom)
- Reduced direct and indirect costs as a result of pro-active safety strategies.
- OHS Training
- PPE availability

Negative

- There may be flood risk associated with the stilling basin. This is likely to occur when the impoundment level of the stilling basin exceeds the safety level.
- Injury of workers and the public during the operation and maintenance activities.

Table 17 Identified Potential Impacts and Rating - Pre Construction Phase

Project Phase	Component	Sub-component	Potential Impact	Description	Likelihood	Consequence	Rating
Pre-construction Phase	Environment	Air	Fugitive dust and exhaust fumes from vehicles	Direct Negative Short-term/long-term Local/widespread Reversible	Medium	Considerable	Moderate
		Soil	Soil compaction and soil structure changes due to influx and stationary positioning of heavy duty equipment and vehicles	Direct Negative Short-term Local Reversible	Medium Low	Considerable	Moderate
			Leakages from stacked equipment and subsequent seeping through of contaminated oils and chemicals	Direct Negative Short-term Local Reversible	Medium	Considerable	Moderate
		Noise	Increase above permissible noise level, (90dB) due to movement of vehicles, equipment and machines to the gully erosion site	Direct Negative Short-term Local/widespread Reversible	Medium	Considerable	Moderate
		Vegetation	De-vegetation – Loss of flora and fauna	Direct Negative Short-term Local/widespread Reversible/Irreversible	Medium	Little	Minor
Project Phase	**Component**	**Sub-component**	**Potential Impact**	**Description**	**Likelihood**	**Consequence**	**Rating**
Pre-construction Phase	Social	Land Acquisition	Conflict between contractor and land owners, due to unresolved issues during land acquisition process	Direct Negative Short-term Local Reversible	Medium	Considerable	Moderate
			Decrease in accruable income due to sale of land	Direct Negative Short-term/Long-term Local Reversible	Medium	Considerable	Moderate
		Traffic	Traffic congestion/travel delay	Direct Negative Short-term Local/widespread	Medium	Considerable	Moderate

				Reversible			
		Noise	Nuisance to surrounding residents/ communities	Direct Negative Short-term Local Reversible	Medium	Considerable	Moderate
		Others	Accidental destruction of property such as farmlands	Direct Negative Short-term Local Reversible	Medium low	Little	Minor
			Grievances	Direct/Indirect Negative Short-term Local Reversible	Low	Little	Minor
			Accidents involving vehicles or pedestrians	Direct/Indirect Negative Short-term Local Reversible	Medium Low	Considerable	Minor
Pre-construction Phase	**Social**	Others	Blocked access route to places of work, residence and business	Direct/Indirect Negative Short-term Local Reversible	Medium Low	Considerable	Minor
Pre-Construction	**Occupational Health and Safety**	Air	Exposure to respiratory disease risks from dusts, exhaust fumes of equipment and vehicles	Direct Negative Short-term /long-term Local/wide spread Reversible	Medium	Considerable	Moderate
		Health and Safety	Exposure to injuries and accidents during movement of equipment	Direct Negative Short-term /long-term Local/wide spread Reversible	Medium	Great	Major

Table 18 Identified Potential Impacts and Rating - Construction Phase

Project Phase	Component	Sub-component	Potential Impact	Description	Likelihood	Consequence	Rating
Construction Phase	Environment	Climate Change	GHG Emissions	Direct /indirect Negative short-term/Long-term Local/widespread Irreversible	Medium low	Considerable	Minor
		Air	Cement dust, fugitive dust, welding fumes, exhaust fumes, hazardous gases (NOx, CO, SOx, PM $_{2.5}$, PM $_{10}$)	Direct Negative short-term/Long-term Local/widespread Irreversible	Moderate	Considerable	Moderate
		Soil	Destabilization of soil structure/ Increase of erosion site	Direct Negative short-term Local Reversible	Medium	Considerable	Moderate
			Compaction of top soil due to movement of heavy vehicles and equipment	Direct Negative short-term Local Reversible	Medium-high	Considerable	Moderate
			Contamination of soil by oil spills, fuel, etc.	Direct Negative short-term Local Reversible	Medium-low	Considerable	Minor
		Water quality/hydrology	Discharge of sediment laden run-off into water bodies	Direct/Indirect Negative Short-term/Long-term Local/Widespread Reversible	Medium	Considerable	Moderate
			Contamination from (oils, fuel, chemical substances etc.)	Direct/indirect Negative short-term/long-term Local/widespread Reversible	Medium	Considerable	Moderate
Construction Phase	Environment	Water quality/hydrology	Contamination by human faecal wastes	Direct/indirect Negative short-term/long-term Local/widespread Reversible	Medium	Considerable	Moderate

		Noise and Vibration	Noise pollution and vibration nuisance as a result of on-going rehabilitation works.	Direct Negative short-term Local Reversible	Medium-high	Considerable	Moderate
			Soil destabilization due to vibrations from construction equipment use	Direct Negative short-term Local Reversible	Medium low	Considerable	Minor
		Waste	Increased generation of solid and liquid wastes	Direct Negative short-term Local Reversible	Medium	Considerable	Moderate
		Biodiversity	Loss of flora and fauna	Direct Negative short-term /Long term Local Reversible/irreversible	Medium High	Considerable	Moderate
Project Phase	**Component**	**Sub-component**	**Potential Impact**	**Description**	**Likelihood**	**Consequence**	**Rating**
Construction Phase	**Social**	Socio-economic activities	Disruptions to resident activities within the project area	Direct Negative short-term Local Reversible	Medium	Considerable	Moderate
			Blocked access route/Restricted access	Direct Negative short-term Local Reversible	Medium	Considerable	Moderate
Construction Phase	**Social**	Public	Negative perception among residents and commercial establishments etc. about the project.	Direct Negative short-term Local Reversible	Medium	Little	Minor
			Possible human displacement	Indirect Negative short-term Local Reversible	Medium	Great	Moderate

		Traffic	Delay in travel time	Direct Negative short-term Local Reversible	Medium low	Little	Minor
		Education	Noise disturbances to the serene learning environments . (name of school)	Direct Negative short-term Local Reversible	Medium	Considerable	Moderate
		Health and Safety	Increase in sexual activities leading to possible spread of STDSI	Indirect Negative short-term Local/widespread Reversible	Medium high	Great	Major
			Incidence of respiratory diseases due to air contaminatio n by fugitive dusts and exhaust fumes	Direct Negative short-term Local Reversible	Medium	Considerable	Moderate
			Residents and workforce exposed to accidents and injuries	Direct Negative short-term Local Reversible	Medium	Great	Moderate
			Incidence of water borne diseases (e.g., dysentery, typhoid, cholera)	Direct Negative short-term Local Reversible	Medium	Considerable	Moderate
Constructio n Phase	**Social**	Behaviour	Occurrence of social vices (e.g. theft, drug use etc.)	Indirect Negative short-term Local Reversible	Medium	Considerable	Moderate
		Noise	Nuisance due to increase in noise levels	Direct Negative short-term Local Reversible	Medium	Little	Minor
		Project Performance	Conflict between community members and contractor	Direct Negative short-term Local	Medium	Considerable	Moderate

				Reversible			
			Grievance and resistance from communities	Direct/Indirect Negative Short-term/long-term Local Reversible	Medium	Considerable	Moderate
Construction Phase	**Occupational Health and Safety**	Personnel safety	Injuries, falls, accidents, explosions, fires, leakages, accidents etc.	Direct/Indirect Negative Short-term/Long-term Local/widespread Reversible	Medium high	Considerable	Moderate

Table 19 Identified Potential Impacts and their Ratings - Operational Phase

Project Phase	Component	Sub-component	Potential Impact	Description	Likelihood	Consequence	Rating
Operational Phase	**Environment**	Air	Exhaust fumes from road users	Indirect Negative Short-term/long-term Local/widespread Irreversible	Medium	Considerable	Moderate
		Noise	Nuisance due to increase in noise levels	Indirect Negative Short-term/long-term Local Reversible	Medium	Considerable	Moderate
		Water quality and hydrology	Contaminated (*with human waste*) water run-off into surface water etc.	Indirect Negative Short-term/long-term Local/widespread Reversible	Medium	Considerable	Moderate
		Water flow	Blocked drains (with sediment) impeding water flow	Indirect Negative Short-term Local Reversible	Medium	Considerable	Moderate
	Social	Employment	Loss of employment (engaged contract staff on the project)	Indirect Negative short-term Local Reversible	High	Little	Moderate

		Health and Safety	Increase in water borne diseases (malaria, typhoid, cholera)	Indirect Negative short-term Local Reversible	Medium	Considerable	Moderate
			Increase in vehicular related accidents	Indirect Negative short-term Local Reversible	Medium	Considerable	Moderate
			Increase in respiratory problems amongst local residents due to increase of road users	Indirect Negative short-term Local Reversible	Medium	Considerable	Moderate
	Occupational Health and Safety	Personnel safety	Injury of workers during operation and maintenance activities	Direct Negative short-term/Long-term Local/widespread Reversible	Low	Considerable	Minor

5.4 Mitigation Measures for Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex

Gully control is one of the most important restoration methods used in watershed management, and timing is an essential element. The civil work in all structural and vegetative control measures selected should be completed during the dry and early rainy season. Otherwise, the incomplete structural work can easily be destroyed during the first rainy season. In addition, vegetative measures such as the planting of tree seedlings and shrub and grass cuttings cannot begin until structural work is complete. Each continuous gully in the gully system should be regarded as a basic treatment unit, and all the control measures in that unit should be finished before the rainy season. This is important because any continuous gully head that is left behind is capable of affecting the watershed again.

5.4.1 Selection of Mitigation Measures

The duty of selection of Mitigation Measures is bound on the Client (SPMU/World Bank) as recommended by the ESMP Consultant. The main criteria for selecting structural control measures (See Table 20) should be based on:

(a) The size of the gully catchment area,
(b) The gradient and the length of the gully channel.

The various portions of the main gully channel and finger gullies should be stabilized either by brush fills; earth plugs and brushwood, log, and loose-stone check dams. The lower parts are treated with loose-stone or boulder check dams. At a stable point in the lowest section of the main gully channel, for example, on a rock outcrop, a gabion check dam or cement masonry check dam

should be constructed. If there is no stable point, a counter-dam (gabion or cement masonry) must be constructed in front of the first check dam. The points where the other check dams will be constructed are determined according to the compensation gradient of the gully channel and the effective height of the check dams.

Table 20: Criteria for Selection of Control Measures for a Continuous Gully

Length of main gully channel portions (m)	Gradient of main gully channel portions (%)	Catchment area of gully portions (ha)	Required structural measures for each portion of main gully channel
-	-	2 or less	Above gully heads: Diversion ditches or channels
100 or less (from gully head)	Various	2 or less	Maximum 100m from gully head: Brush fills, earth plugs, woven-wire, brushwood, log and loose stone check dams. These measures can also be constructed in branch gullies.
900	70 or less	2 - 20	Between 100m – 1000m: Boulder check dams, retaining walls between check dams if necessary, one gabion or cement-masonry check dam is usually constructed as a first check dam instead of a boulder one.

Note: All structural measures must be accompanied with vegetative/bio-remediation measures (planting of tree seedlings, shrub and grass cuttings, and sowing of tree, shrub and grass seeds).

5.5 Risk and Danger Assessment/Management

Development projects of this magnitude often have associated risks or dangers. These could be commonplace risks that are almost inevitable, such as the risk that a member of the team is sick for part of the project. There may be some unlikely but high impact risks such as the risk that the rehabilitation could cause the loss of source of livelihood. Therefore there is the need to constantly assess the risks and take action as needed.

Three possible outcomes can be envisaged for the risk;

(a) Take action now to avoid the risk, to reduce its likelihood, or to reduce its impact,

(b) Make contingency plans so that the team is ready to deal with the impact and mitigate the risk should it occur,

(c) Agree that it is an acceptable risk to take no action and hope that the risk does not occur.

Risks can then be managed as follows;

(a) Identify all realistic risks

(b) Analyse their probability and potential impact

(c) Decide whether mitigating action should be taken now to avoid or reduce the risk and to reduce the impact if it does occur

(d) Where appropriate, make plans now so that the proponent is prepared to deal with the risk should it occur

(e) Constantly monitor the situation to watch for risks occurring, new risks emerging, or changes in the assessment of existing risks.

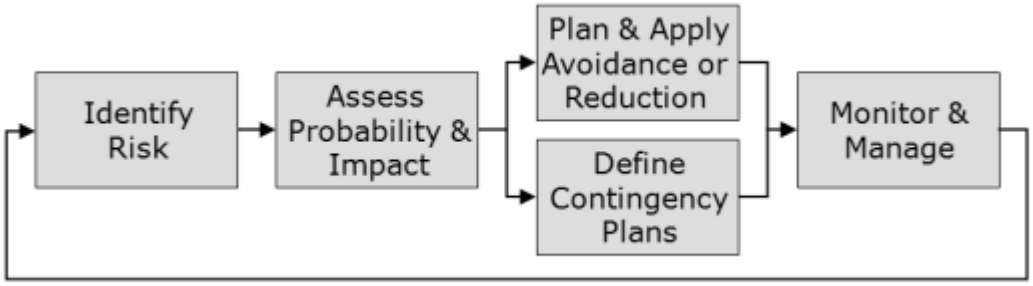


Plate 44: Risk Assessment Process

5.5.1 Assessing risks at the start of a project

It is expected that during the Project conception, the headline risks should be considered as part of the overall benefit model. At this stage, one will not be dealing with a full catalogue of risks, consequences and actions. You will focus on the main areas that affect either the justification of the project or the manner in which it will be carried out.

Also it will be necessary to instigate some specific activities to examine risk, for example additional interviews, workshops and brainstorming sessions. Where there is a specialist area involved, you should consult with an appropriate expert.

A good technique for presenting these issues is to use a risk matrix showing the probability of different headline risks in comparison with their relative impact on the project's goals.

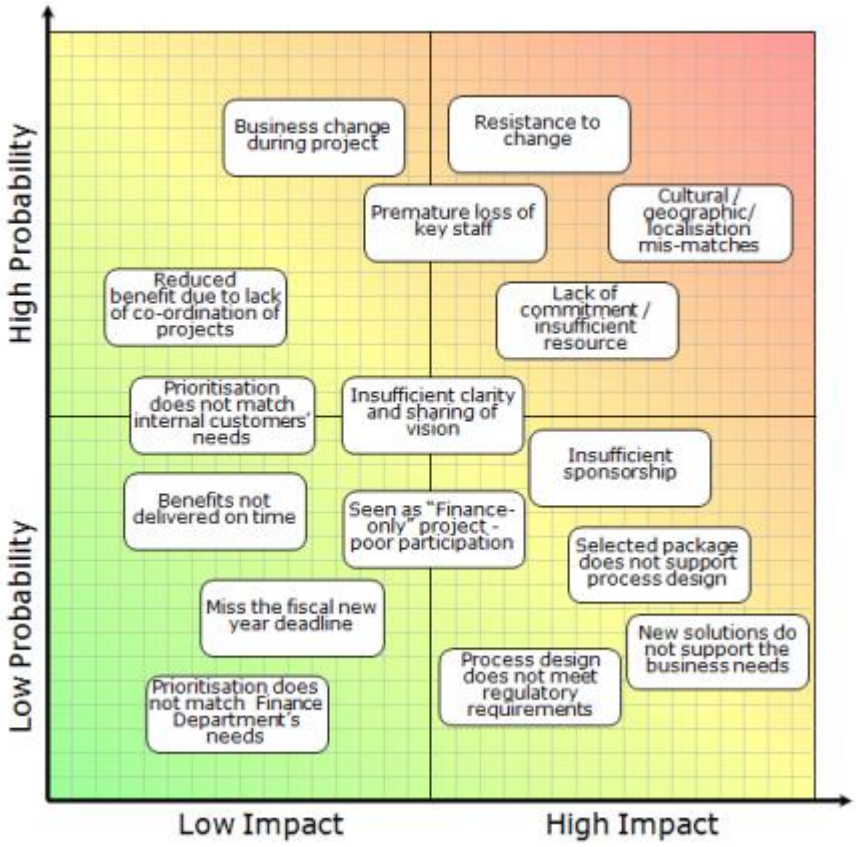


Plate 45: Risk Matrix

This focuses attention on the areas where the project plan will need to address key issues and where specific actions and techniques may be required. Note how this example suggests that the biggest area of concern tends to be with the "people issues". The human element of a solution is often the most overlooked aspect.

Sponsors and steering committee members are often very busy people and want the key risks spelt out into maybe the top ten they should consider. You can use these to raise the most vital points that need executive attention, but remember it is your job to make sure all significant risks are considered and dealt with.

The other thing you should do early on is to decide upon the procedures and technology for managing risk. In most cases you will use some form of technology, preferably as part of a set of integrated Project Office tools. The procedures should make it easy for all participants to submit their thoughts and concerns. Always capture the thought. You may dismiss it later if appropriate, but you should always consider and assess the input.

5.5.2 Assessing risks at the start of each phase

When you prepare in detail for each phase of work you should look at the risks in detail. Try to identify all realistic risks that should be considered. In most cases, it will be worth capturing the information electronically in a risk register. It should include:

(a) A reference code for the risk

(b) A description of the risk;

(c) Who owns this risk (i.e. who is accountable for monitoring it and taking action);

(d) The probability of the risk occurring;

(e) A description and quantification of the potential impact of the risk;

(f) The likely cost to the project if that risk occurs;

(g) Optionally, the proximity of the risk (i.e. how soon could it strike);

(h) The severity of the risk and/or priority for dealing with it;

(i) What actions should be taken now to reduce the probability and/or impact and by whom;

(j) Optionally, a re-assessment of the probability, impact and priority of the risk after those planned mitigation actions have been taken;

(k) What contingency plans should be formulated now so that NEWMAP is ready to act if the risk occurs;

(l) Optionally, tracking information for the actions proposed above (who, when, status, etc.);

(m) When the risk should next be assessed (timing or trigger).

In a quantitative risk assessment, considerable evidence is gathered to quantify the probability and impact of the risk. This is a specialised area and uses specialised tools, but the simple logic is

impact x probability = expected cost.

The purpose of qualitative risk management is to focus leadership attention on risks that merit their attention. It is not helpful to present a high degree of precision since the risks have not been thoroughly quantified and the point is not to calculate their precise expected impact. Often the probability and impact are simplified to categories such as High, Medium and Low - or maybe 3, 2 and 1. Most people want to multiply qualitative probabilities with qualitative impacts to show severity. Mathematically, this is not logical as we are not dealing with quantified values. Some

people prefer to add the scores or you could use a look-up table, but any way of focusing attention can be used if it conveys the key points to the leadership. The example below shows a risk severity prioritisation table used to identify Risk Level from Probability and Impact.

Table 21: Risk severity prioritization table

		Impact				
		1	2	3	4	5
Probability		Negligible	Minor	Moderate	Significant	Severe
5	Very Likely	Low Medium	Medium	Medium High	High	High
4	Likely	Low	Low Medium	Medium	Medium High	High
3	Possible	Low	Low Medium	Medium	Medium High	Medium High
2	Unlikely	Low	Low Medium	Low Medium	Medium	Medium High
1	Very Unlikley	Low	Low	Low Medium	Medium	Medium

The table below shows some specific risks identified for the rehabilitation project

Table 22: Identified Risk, Ratings and Response to Risk

IDENTIFIED RISKS	PROBABILITY	IMPACT	RESPONSE
Team members leave or become sick	High	Low	Ensure the plan has contingency built into it to allow for less than expected resource availability
Key team member becomes available	Medium	Medium	Ensure project procedures include good knowledge sharing and documentation so that the thought process, designs and decisions are not lost.
Solution does not meet the project needs	Low	High	Ensure good participation and collaboration involving representatives and resources from all stakeholders
Insufficient participation from stakeholders	High	Medium	Ensure the Project Sponsor and supporting sponsors are aware of the importance of promoting and rewarding participation. This message should be conveyed to the stakeholders.
Significant change in the project and its consequent needs (eg restructuring)	Medium	High	Project needs may sometimes change, so plan the project so that it could adjust rapidly at relatively low cost, for example, a number of short

IDENTIFIED RISKS	PROBABILITY	IMPACT	RESPONSE
			incremental steps towards the goal could be easier and cheaper to re-direct than one enormously long delivery project.
Technical solution has major flaws	Low	High	Invest in appropriate levels of testing. Consider a period of parallel running. Have a fallback contingency plan to revert to a previous system if necessary
Technical solution has operational flaws	High	Low	Put in place an "early care" programme to deal with immediate snags. Ensure processes, resources and responsibilities for on-going maintenance are established well before live date
System failures	High	Medium	Invest now in fault tolerant components and adequate redundant contingency resources. Ensure the plan includes appropriate backup, recovery, and disaster recovery procedures (and tests them).
PAPs fail to use the alternative livelihood options effectively and efficiently	Medium	Medium	Plan for a detailed Training Needs Analysis and put in place an appropriate training programme. Consider how to coach and support users after live date
PAPs resist the changes	High	High	Use change management experts to assess the issues and create a change programme. Co-ordinate communications and sponsorship activities to convey the message. Confront big issues early in the project (not just before live operation).
Dependency with other systems and projects	Low	Medium	Plan to accommodate other projects with minimal or no negative impact on the proposed sub project.
Degree of executive support required to succeed	High	High	Ensure that the executive is carried along from project conception all through the life cycle of the project.

These risks and implications should be discussed with the relevant leaders and participants. Planned responses to those risks should be agreed by the World Bank and NEWMAP.

5.5.3 Managing the risks

Risk management should be seen as a continuous process throughout the project. Once the initial risk register and procedures have been established the PMU, and all project participants should be alert for new, changing or occurring risks. Participants should be briefed on the importance of this and the specific procedures. Procedures for reporting risk should be as easy as possible. Feedback from all participants should be encouraged and rewarded.

The PMU should review the risk register proactively on a regular basis. They should check the status of potential issues, for example, by calling the responsible party and checking if there has been any change in status. The Project Coordinator should also review the register on a regular basis and take action as required. Headline information on risks would be reported to the leadership along with the other project performance data.

Where risks occur, they need to be managed therefore a contingency plan should be formulated and the Project Coordinator should be able to take immediate action to mitigate the impact. Some of these methods stated below can be employed also in the management of risk for the rehabilitation project;

Transfer of risk

Contractual clauses are intended to transfer risks. When laying-off risks, weigh up the frequency of occurrence against the level of premium paid for the transfer. It can be unwise to pass a risk that is difficult to assess to the contractor as they may either increase their prices, or disregard it when preparing their bid and then find they are in difficulty later.

Acceptance of risk

The client may carry highly unpredictable and poorly defined risks as the alternative might be to unacceptably inflate tenders.

Avoidance of risk

Redefine the project goes a long way in helping avoid risk. Clarification of responsibilities, remuneration, and expenditure at the beginning of the project will help avoid problems.

Insuring against risk

Most standard form contracts insist on certain types of insurance, such as; insurance against fire, professional indemnity insurance and so on.

Doing nothing about risk

Either none of the project team considers the risk, or they consider the risk and decided that they already lie with those who could best control them.

Allocating risk through methods of payment

One of these two ways can be used in allocating risk through payment method.

(a) Fixed price: items paid for based on the contractor's predetermined estimate
(b) Cost reimbursement: items paid for based on what the contractor spends in executing the work.

However, there will be need to balance the envisaged risk. This can be achieved through one of the following contractual approach

Design and build

There is a single point of responsibility with the contractor for both the design of the project and operations on site. As such, most of the risk lies with the contractor, particularly where the contract is let on a lump sum basis. However, risk is increasingly transferred back to the employer as more preparatory design work is carried out before the contract is let.

Traditional contract

With traditional lump-sum contracts, the intention is that there should be a fair balance of risk between the parties. The employer is responsible for the design and the contractor for the operations on site (although this is complicated when nominated sub-contractors and suppliers are included). The balance can be adjusted as required, but the greater the risk assigned to the contractor, the higher the tender Plate is likely to be. The risk to the employer is lessened by the contract being let on a lump-sum basis, although in reality, no price is 'fixed'.

Management contracting

In management contracting the balance of risk lies with the employer. Separate works contracts are let, and the employer may continue to develop the design during construction, hence there may be little certainty about cost or time. However, the risk of delays and defects are associated with the responsibility for the works contract. In some cases the management contractor may absorb this risk and with a resulting increase in price, although this may compromise their 'impartiality'.

6 CHAPTER SIX: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.1 Overview

The range of environmental, social and occupational health and safety issues associated with the rehabilitation works for the Umuda Isingwu/Umuagu Ibeku Gully Erosion Complex will be described in a *matrix table format* for the environmental and social management plan (ESMP). The table (23-25) also includes columns for Monitoring Indicators, monitoring parameters, monitoring instruments, monitoring locations, Monitoring Frequencies, monitoring responsibilities and costs.

It outlines the corresponding mitigation measures for potential environmental and social impacts; and occupational health and safety risks that are envisaged to occur during activities. Since the project consists of civil rehabilitation works basically, majority of the environmental and social impacts and occupational hazards will be expected to arise during the construction phase of the project. The ESMP also covers potential impacts as perceived during the pre-construction and operation phases.

6.2 Institutional Arrangement for ESMP and Monitoring Plan

It is envisaged that the environmental and social impacts and their designed enhancement and mitigation measures shall be monitored during implementation of the construction/rehabilitation works and operation phases. The roles and responsibilities for monitoring the environmental and social impacts and the implementation of the ESMP are as follows.

Overall sub-project coordination will be housed in the State Project Management Unit (SPMU), of Abia State NEWMAP Office. They will oversee the day-to-day project management and ensure that environmental and socio-economic concerns and management as elucidated in the ESMP are integrated into all aspects of project implementation. The Abia State Ministry of Environment; herein referred to as State Ministry of Environment (SMEnv); National Environmental Standards Regulatory Enforcement Agency (NESREA), and Abia State Environmental Protection Agency (ASEPA) will monitor, evaluate and audit the implementation of the ESMP to ensure that the rehabilitation works and project operations meet “best environmental practices”.

Awareness creation exercises on HIV/AIDS, environmental protection and personal hygiene and sanitation shall also be undertaken for contactors personnel and all stakeholders involved in project implementation.

Table 23 ESMP - Pre-Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
Environment	Air	Mobilization of workers, equipment and other materials into Umuda Isingwu/ Umuagu Ibeku Erosion Site	Increase in amounts of fugitive dusts and exhaust fumes from movement of heavy-duty vehicles and equipment into work areas.	Sprinkling of water via spraying devices to limit dusts.	Air quality parameters are within permissible Limits	2-3km Radius of project area	Air quality test	Twice monthly	Mitigation: Contractor	Monitoring: FMENV, SMENV, PMU, Contractor	
				Ensure that vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES) as laid down in the NESREA guidelines.	Ensure that vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES) as laid down in the NESREA guidelines.	2-3km Radius of project area	Air quality test	Every two months			

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
	Soil	Mobilization of workers, equipment and other materials into Umuda Isingwu/ Umuagu Ibeku Erosion Site	Loss of top soil and soil compaction due to movement of vehicles to site and stacking of heavy-duty equipment	Limit zone of vehicle and equipment weight impacts (designate an area for parking and stacking equipment)	Visible demarcation of vehicles and equipment limit zone Warning signs, flags will be utilized to alert users, so as to reduce risks associated with the rehabilitation of the project	Project camp sites and equipment packing zones	Visual observation, Soil Compaction test	Weekly	Mitigation: PMU and Contractors		
			Leakages from stacked equipment and subsequent intrusion of oil and chemical substances into soil.	Ensure fastening of loose parts (bolts, nuts); Install impermeable surface at the limit zone to contain potential leakages	Installation of impermeable platform at limit zone.	Project camp sites and equipment packing zones	Soil quality test	Weekly		Monitoring: SMENV, ASEPA, PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
Environment	Noise	Mobilization of workers, equipment and other materials into Umuda Isingwu/ Umuagu Ibeku Erosion Site	Increase above permissible noise level, (90dB) during movement of vehicles, equipment and machines (site-specific and widespread). A Logarithmic scale in decibels (ie Decibel Sound Pressure Level) was used.	The effective control of noise from vehicles and equipment during this phase may be achieved by considering the following techniques: • Alternative design options; • Mitigation at the source; • Mitigation along the path; and • Mitigation at the receiver For minimal disturbance it will be advised that equipment is transported when it will cause least disturbance	Options for noise impact mitigation are being implemented	2-3Km Radius of project site	Noise level testing	Weekly	Mitigation: PMU, Contractor	Monitoring: SMEnv, ASEPA	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
	Vegetation	Vegetation clearing	Displacement of soil fauna and damage to flora.	Contractors should limit vegetation clearing to minimum areas required particularly areas with indigenous vegetation	Vegetation clearing is limited to precise areas	Project Community especially access routes to gully as well as gully corridors	For a and fauna studies in selected areas	Monthly	Mitigation: Contractors	Monitoring: PMU	
			Predisposing of soils to erosion	Cleared areas should be re-vegetated with beneficial local species known to mitigate against erosion	Re-vegetation is ongoing where appropriate.	Community especially access routes to gully	Ground trotting	Monthly			
SUB-TOTAL :											

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Traffic	Mobilization of workers, equipment and other materials into Umuda Isingwu/Umuagu Ibeku Erosion Site	Traffic congestion/travel delay along some major roads	Apply lane configuration changes to affected roads and streets.	Lane configuration changes are being made where applicable.	Project routes within community	Site visits and observation	Daily	Mitigation: Contractors, FRSC (Federal Road Safety Corps)	Monitoring: FRSC;	
	Noise	Mobilization of workers, equipment and other materials into Umuda Isingwu/Umuagu Ibeku Erosion Site	Nuisance to nearby residential areas	Retrofit with suitable cost effective vehicle sound proofing materials/ technologies.	Retrofitting with vehicle sound proof materials is being performed	Project community	Inspect Contractors equipment	Daily	Mitigation: Contractors	Monitoring: SMENV, ASEPA	
Social	Air	Mobilization of workers, equipment and other materials into Umuda	Exposure to health risks from fugitive dusts and exhausts fumes.	Provision of facemasks to residents and project personnel.	Provision of face masks and appropriate PPEs are being provided.	Project area	Site visits and inspections	Weekly	Mitigation: SMENV, PMU, Public Health depts. Umuahia North LGA	Monitoring: ASEPA	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
		Isingwu/Umuagu Ibeku Erosion Site		Restrict access of non-project personnel to work areas where dusts and emissions exist/persist from project works.	Restriction barrier are being installed.	Project site	Site visits and inspection				
	Land	Land Acquisition	Conflict owing to unresolved land acquisition and involuntary displacement during the construction	The PMU will carry out an extensive enlightenment program to inform farmers and communities on the aim, scope and nature of the work	Documented evidence of enlightenment carried out showing method, coverage and dates of programs	Project community	Examine grievance redress reports	Monthly for 6months before and during construction/rehabilitation phase	Mitigation: PMU	Monitoring: PMU, Independent Consultant, Contractors	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Construction camping	Transportation and movement of heavy equipment	Public Safety and Traffic congestion	Transportation of heavy equipment will be carried out during off pick hours when it will not disturb public movement Where movement cannot be avoided during work hour, the contractor must attach a warning signal	Evidence of warning signal Log record of time of lorry arrival/discharge of equipment	Project communities and transport routes	Site visits and inspections	Weekly during pre-construction phase	Mitigation: Contractor PMU	Monitoring: PMU,	-
	Others	Mobilization of workers, equipment and other materials into Umuda Isingwu/Umuagu Ibeku Erosion Site .	Disruption of vehicle and pedestrian access to where rehabilitation works will be conducted	Adequate and timely sensitization of identified Respondents; Lane configuration	Adequate and timely sensitization program is being conducted Lane configuration change have been made	Project communities and transport routes	Site visits and inspections	Monthly	Mitigation: Contractor, PMU	Monitoring: PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			Grievances and negative community perception about the project.	Adequate and timely sensitization of identified Respondents	Sensitization exercise are conducted	Project communities and transport routes	Examine Awareness reports, site visits and consultations			Monitoring: PMU	2,250
SUB TOTAL – 11,050											
Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Air	Mobilization of workers, equipment and other materials into gully erosion site	Respiratory disease risks from exposure to exhaust fumes of equipment and vehicles	Institute workers respiratory protection program (WRPP)	Institution of WRPP	Contractors project camp/office	Examine contractors WRPP	Weekly	Mitigation: Independent Consultant, Contractors	Monitoring: ASEPA, PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Noise	Mobilization of workers, equipment and other materials into gully erosion site	Noise pollution	Institute noise control plan	Institution of noise control plan	Contractors project camp/office	Examine Contractors Noise control plan	Weekly	Mitigation: Independent Consultant, Contractor	Monitoring: ASEPA, PMU	
	Accidents	Mobilization of workers, equipment and other materials into gully erosion site	Accidents involving pedestrians	Education and training of Respondents about the project and accident occurrence	Education and training has been conducted	Contractors project camp/office	Examine Contractors Accident prevention plan	One-off	PMU, Contractor, Independent Consultant	PMU	
				Contractor(s) education and training on pedestrian safety	Training has been conducted	Contractors project camp/office	Examine Contractors Accident prevention plan	One-off	PMU	PMU	
				Install safety signage	Safety signage have been installed	Project site	Site visits and inspection	Weekly	PMU, Contractor	PMU	
			Collapse of heavy equipment etc.	Conduct haulage safety training	Training has been conducted	Contractors project	Inspection and consultati	One-off	Contractor	PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			being conveyed to rehabilitation work area			camp/office	on with workers				
				Enhanced fastening of equipment to carriage section of vehicles.	Contractor(s) Compliance	Contractors project camp/office	Site visits and inspection	Weekly	Contractor	PMU	
	Personnel Safety		Attack from dangerous animals during de-vegetation activities	Conduct safety and first aid training	Training has been conducted	Contractors project camp/office	Inspection and consultation with workers	One-off	Contractor	PMU	
SUB-TOTAL –											
PRE-CONSTRUCTION PHASE TOTAL -											

Table 24 ESMP - Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Climate Change	Operation of equipment used during the construction phase	GHG Emissions	Fuel switching- Fuel switching from high- to low-carbon content fuels (where available) can be a relatively cost effective means to mitigate GHG emissions during this phase. Transition to renewable energy sources i.e. solar energy (where applicable) Energy efficiency- Machines e.g. generator plants could be turned off when not in use, in order to reduce carbon emissions. Multiple trips reduction: In order to reduce vehicular movement and subsequent	Compliance to proffered mitigation measures.	2-3km Radius of project area Project site	Air quality test Site visits and inspection	Weekly	Mitigation: PMU, Contractors	Monitoring: ASEPA, PMU¸FMENV	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				increased carbon emissions. Hire vehicles, plants and equipment that are in good condition (current models) generally less than 3 yrs. old.							
	Air	Operation of equipment used during the constructio n phase	Fugitive and cement dusts	Routine watering of the rehabilitation site	Contractors Compliance	2-3km Radius of project area	Air quality test	Daily	Mitigation: Contractors	Monitoring: ASEPA, PMU (Especially the ESO)	-
		Rehabilitati on works – including filling and compaction activities, constructio n of side drains, culverts and other hydraulic structures						Daily	Mitigation: Contractors	Monitoring: ASEPA, PMU (Especially the ESO)	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Air	Heavy equipment operations during construction	Exhaust fumes, hazardous gases (NOx, CO, SOx, SPM,), Oxides from welding activities.	Wet Right-of-Way to reduce dust production	QC and QA are in practice	Project site	Site Visit and inspection	Monthly	Mitigation: PMU, Contractors	Monitoring: PMU (Especially the ESO), Contractors	
				Test Procedures – Routine measuring of HC and CO concentrations during rehabilitation works should be employed for PMS powered vehicles. Diesel (AGO) vehicles should be tested for exhaust opacity during unloaded engine free acceleration periods.	Contractors Compliance			Monthly		Monitoring: PMU (Especially the ESO), SMEnv	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				Quality Control – Routine equipment efficiency audits Quality Assurance – Continuous training of contractor(s) personnel on air quality management	Contractors Compliance	Project site	Site visits, inspection and consultation with workers	Monthly	Mitigation: Contractors	Monitoring: PMU, SMEnv	-
	Water quality/Hydrology	All rehabilitation works	Contamination of surface water (discharge of sediment laden run-off into drainages, waterways etc)	Attempts to dispose of sediment-laden run-off into surface water should be discouraged and prevented. Implement site-specific waste management plans	Contractors Compliance	Surface water within project area	Water quality test	Daily	Mitigation: Contractors	Monitoring: PMU, SMEnv	-
		Defecation near gully erosion site	Generation of sewage overtime (from use of temporary mobile toilets by personnel	Liaise with the municipal sewage collection authorities for collection and treatment of waste with ASEPA	PMU Compliance	Surface water within project area	Water quality test, consulatation with monitoring agency	Monthly	Mitigation: Contractor	Monitoring: SMENV, ASEPA	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			involved in civil works)								

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Soil/geology	Movement of heavy vehicles/Stationary vehicles and equipment	Surface soil compaction	Creation of limit zones Minimize compaction during stockpiling by working the soil in the dry state. Rip compacted areas to reduce runoff and re-vegetate where necessary All topsoil and other soil profiles must be managed strictly	PMU, and Contractor's Compliance	Project site and routes	Site visits and inspection, soil testing	Monthly	PMU, Contractors	Monitoring: SMENV, PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
		Contamination by oil spills, lubricants and other chemicals	Pollution of soil and groundwater	All oil and lubricants should be sited on an impervious base and should have drip pans The storage area should be far from water course All containers should be clearly labelled	Contractor Compliance	Project site and routes	Site visits and inspection, soil and groundwater testing	Periodically	Mitigation: Contractor	Monitoring: SMENV, PMU	
		Filling and Compaction activities for gully head and finger gullies reclamation	Loss of top soil ; possible minor to moderate soil instability	Ensure excavation is limited to desired areas Filling and compaction in layers must range between 150-200mm thicknesses as recommended.	Contractor Compliance	Project site and routes	Site visits and inspection	Monthly	Contractor	Monitoring: PMU	
		Erosion management	Erosion management	The contractor must implement appropriate erosion control measures to avoid	Contractor Compliance	Project site and routes	Site visits and inspection	Weekly	Contractor	Monitoring: SMENV, PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				further erosion in this watershed. Construct soil conservation measures at appropriate locations Execution of major works that would impact on soil structure should be carried out during the dry season. If done during the wet season, temporal drain should precede the permanent drain so that run-off from rain can be managed properly.							

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Noise	Construction of all hydraulic structures Rehabilitation and stabilization of gully	Extensive noise site-specific pollution as a result of on-going construction works.	Mitigation at source (for all activities) A noise barrier or acoustic shield will reduce noise by interrupting the propagation of sound waves.	Contractors Compliance	Project site and routes	Site visits and inspection, of equipment	Weekly	Mitigation: PMU, Contractors	Monitoring: SMENV, Monitoring: SMENV,	
	Waste	All rehabilitation /construction works	Increase in waste generated	Implement site-specific waste management plan Liaise with ASEPA for effective waste management	Contractors Compliance	Project site	Site visits, inspection, and consultation with monitoring agencies	Weekly	Mitigation: Contractor	Monitoring: SMENV, ASEPA,	
	Sanitary Concerns	Increased human faecal waste	Increased human faecal waste	Provision of on-site sanitary facilities	Contractors Compliance	Project community	Site visits and inspection	One-off	Mitigation: Contractor	Monitoring: SMENV, ASEPA,	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Design	All Rehabilitation Works	Interference with the physical setting	The design shall in no way propose to implement developments that will hinder drainage, change the topography or introduce physical changes that are not in harmony with the physical setting of the Project area. The structures to be developed should be aesthetically acceptable to blend in with the surrounding. These structures should not form or end up being used by the resident population as access or bridges. No residential facilities shall be erected on site and the proponent shall as much as possible complete the works in such a way that natural aesthetics shall	Contractors Compliance	Project site	Site visit and inspection	During Design	Monitoring: Contractor	PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				be retained at the locations. Restoration shall be undertaken to ensure that the original setting is as much as possible retained.							
SUB-TOTAL –											

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Livelihood Impacts	Rehabilitation/ Construction of drainage network	Disruptions to residents activities – (e.g. blocked access to residents)	Conduct survey to identify best alternatives to prevent disruptions to livelihood within on & off-site work areas before commencement of rehabilitation works.	Independent Consultants Compliance	Project community	Examine Community Livelihood enhancement plan	One-off	Mitigation: PMU, Independent Consultant	Monitoring: PMU (Especially the SLO)	
	Traffic	Mobilization of equipment and other materials	Loss of travel time due to heavy concentration of construction/project vehicles on and off the project site	Lane configuration changes	Contractors Compliance	Project area	Site visits and inspection	Weekly	Mitigation: FRSC	Monitoring: PMU,	
			Grievances and negative perception among residents and commercial establishments about the project	Involve Respondents at certain levels of decision making and implementation of activities	PMU Compliance	Project community	Site visit and consultation with community	Monthly	Mitigation: PMU, Contractors	Mitigation: PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Education	Extensive civil work/rehabilitation activities	Noise disturbances to the serene environments for the residence	Mitigation at source Inform residents prior to commencement of works	Compliance	Academic institutions within project area	Visits , inspevtyion and consultation with institutions	Monthly	Mitigation: PMU, Contractors	Monitoring: Umuahia North LGA	
Social	Health	Continuous civil work activities and steady influx of workforce	Increase in sexual activities leading to possible spread of STIs	Awareness campaign on sexual diseases, and distribution of male and female condoms.	Conduct of awareness campaigns	Project community, contractors camp	Consultations,	Quarterly	Mitigation: MWR, Public Health dept. of the Umuahia North LGA.	Monitoring: SMH	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Health	Continuous civil work activities and steady influx of workforce	Incidence of respiratory diseases due to air contamination by fugitive dusts and exhaust fumes	Distribute facemasks to residents as a means to reduce allergic reactions and respiratory disease occurrence. Regular sprinkling of water in during construction works.	Facemasks are being distributed	Project community	Site visits and inspection	Monthly	Mitigation: PMU, Contractors	Monitoring: SMH, Public Health dept. of the Umuahia North LGA,	
		Blocked drainage channel	Possible spread of water borne diseases	Creation of temporary channels to collect flood water	Compliance	Project community	Site visits and inspection		Mitigation: Contractors	Monitoring: SMENV, SMH	
	Environmental hygiene and aesthetics	Waste management	Increase in waste generated from construction works	Ensure that all construction wastes are gathered on-site and disposed off according through the available waste disposal operation in	Contractors Compliance	Project community	Site visits and inspection	Weekly	Contractors	Monitoring: SMENV, ASEPA	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				the project area.							
	Behaviour	Implementation of civil works and Rest periods	Occurrence of on-site/off-site social vices (Fights, rape, harassments, theft, vandalism, drug use etc.	Enforce and ensure proper orientation on acceptable behaviours for construction personnel on/off-site.	Compliance	Project community	Site visits and inspection and consultations	Monthly	Contractors	PMU (Especially the SLO)	
	Project performance	Implementation of all construction phase activities	Conflicts between contractors, communities etc. may disrupt completion of tasks.	Good work enforcement program	Compliance	Project community	Site visits and iconsultations	Monthly	Contractors	PMU(Especially the M&E officer)	
				Conflict resolution							
				Regular stakeholders meetings							

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Noise	Massive use of heavy machinery for land clearing, levelling and excavation of soil	Hearing impairment for machinery operators	Operators of heavy duty machines must wear ear muffs They must not exceed 8 working hours per day	Evidence of procurement of ear muffs Evidence of use of the PPE Record of signing out time	Project community	Site visits and inspection and consultation	Daily	Contractor	Monitoring: SMENV, PMU	
			Noise nuisance for Residents.	Mitigation at source Inform residents prior to commencement of works	Compliance	Project community	Site visits and inspection, consultation	Monthly	Mitigation: PMU, Contractors	Monitoring: PMU	
	Loss of occupation	Land Acquisition	Disincentive to land owners	The pastoralist must be carried along all through	Minutes of meetings with land owners	Project community	consultation	monthly	Mitigation: Contractor	Monitoring: PMU	-
SUB-TOTAL –											

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Personnel safety	All construction activities	Fugitive dust and fumes from grinding, welding, cutting, or brazing surfaces coated with lead-based paint; Silica dust from cutting concrete; solvent vapours from adhesives, paints, strippers, cleaning solvents, and spray coatings; and isocyanate vapours from spray foam insulation	Develop and implement on-site occupational health and safety management plan; Routine OHS training and education; Conduct routine JHA/PHA; Use of PPE; Establish electrical safety program; Establish fall protection program; Establish fleet safety management program; Establish and implement HazCom; Conduct hazard identification, control and analysis; Establish fire prevention program; Use material safety data sheets (MSDS); Employ hierarchy of controls procedure; Conduct OHSRA, Cost Benefit Analysis(CBA), Return on Investment(ROI)/pa	Independent Consultants/ Contractors Compliance	Project community	Inspection and consultation with contractor, examining contractors health and Safety management plan and consultants report	Monthly	Independent Consultant, Contractors	Monitoring: PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			and certain spray paints or coatings.	y-back period analysis							
				Contractors should prepare and implement a Community Affairs, Safety, Health, Environment and Security (CASHES) manual, to coordinate OHS issues during the construction phase.				Monthly	Contractors	Monitoring: PMU	
SUB-TOTAL -											
CONSTRUCTION PHASE TOTAL -											

Table 25 ESMP - Operational Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Air	Increased Vehicle movement	Increase of road users on Access Road	Air sampling and monitoring	Compliance	Project community	Air quality testing	Monthly	Monitoring: SMENV	Monitoring: SMENV, ASEPA	-
	Soil	Change of topography	Change in soil profile	Training on Sustainable Land Management (SLM) practices	Trainings are conducted	Project community	Soil quality testing	Monthly	Mitigation: PMU, SMENV	Monitoring: SMENV, ASEPA	
			Increase in soil salinity							Monitoring: SMENV, ASEPA	
			Change in land use							Monitoring: SMENV, ASEPA	
	Noise	Increase of road users on Access Road	Noise nuisance to local residents	Noise sampling and monitoring		Project community	Noise level testing	One-off	Mitigation: PMU, SMENV	Monitoring: SMENV, , ASEPA	
	Water Quality	Roadway runoff	Potential surface water pollution	Water sampling and monitoring	Compliance	Project community, surface water	Water quality testing	Bi-Annual	Mitigation: PMU, SMENV	Monitoring: SMENV, , ASEPA	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Waste	Waste generation	Social and health concerns arising due to poor waste management practices	Dispose waste streams through the municipal waste management system in the project area.	Proper waste management	Project community	Visits and Inspections	Monthly	Mitigation: PMU, SMENV	Monitoring: SMENV, ASEPA, ESO & SL	
			Blocked drainage due to poor waste disposal	Flooding on roads						Monitoring: SMENV, , ASEPA, ESOs	
Environment	Others	Negligence of rehabilitated Umuda Isingwu/Umuagu Ibeku Erosion Site	Negligence of rehabilitated Umuda Isingwu/Umuagu Ibeku Erosion Site	Regular maintenance and dredging of sediments in drainage channels and chute	PMU Compliance	Project community	Visits and Inspections	Monthly Weekly Monthly	PMU		
SUB-TOTAL –											

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Employment	Closure of civil works	Loss of employment	Inform personnel that employment is short-term prior to their engagement.	Proper engagement of service documentation	Project community	Consultations	One-off	Contractors	Monitoring: PMU	
	Health	Operation of rehabilitated gully site	Blocked drainage structure Breeding site for disease vectors Possible increase of malaria cases due to stagnant water in drainage structures	Regular maintenance of drainage structures	Compliance	Project community	Visits and Inspections and consultation with health institutions and community members		Independent consultant, PMU	Monitoring: SMH, ESOs	-
		Increase in number of vehicles	Increase in respiratory problems amongst local residents	Regular sampling and monitoring	Regular monitoring	Project community	Visits and Inspections and tests			Monitoring: NESREA, SMH, PMU(ESO)	-

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
		using roads									
	Land use conflicts	Land use conflicts	Land use conflict	Control land use conflicts through Land use planning that should be participatory to designate areas for ecological, grazing and farming	Inspections are conducted	Project community	Visits and Inspections and consultations		Contractors	Monitoring: PMU	
	Safety	Increase in number of road users	Increase in vehicular accidents	Use of road safety signage	Compliance	Project community	Visits and Inspections	One-off		Monitoring: FRSC, ESO	
		Operation of rehabilitated gully site	Seepage or flow back action Collapse of rehabilitated gully head or finger gullies	Re-vegetation activities using approved plant/tree species to establish green belt along the gully as a stabilization measure	Compliance	Project site	Visits and Inspections	One-off		Monitoring: PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
SUB-TOTAL –											

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Personnel safety	Tasks implementation	Injuries, accidents, deaths	Implement on-site occupational health and safety management plan; Routine OHS training and education; Conduct routine JHA/PHA; Use of PPE; Establish electrical safety program; Implement fall protection program; fleet safety management program; Implement HazCom; Conduct hazard identification, control and analysis; Implement fire prevention program; Use material safety data sheets	Independent Consultants, Contractors Compliance.	Project community	Site Inspections	Monthly	SMEnv	PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				(MSDS); Implement hierarchy of controls procedure; Conduct OHSRA, Cost Benefit Analysis(CBA), Return on Investment (ROI)/pay-back period analysis							
SUB-TOTAL –											
OPERATIONAL PHASE TOTAL –											

6.3 ESMP and Monitoring Budget

Table 26: Summary of ESMP and Monitoring Budget

Item	Responsibility for implementation and Monitoring	Cost Breakdown	Cost Estimate in Nigerian Naira (₦)	Cost Estimate in Us Dollars (US$)
Enhancement of +ve impacts and Mitigation of –ve impacts	Contractor, PMU, SMEnvr, ASEPA, FRSC			
Management of ESMP Implementation	PMU, SMEnvr, ASEPA			
Monitoring, Evaluation & Audit	SMEnvr, ASEPA, FERMA, SMW			
SUB- TOTAL				
Contingency				
TOTAL				

The total cost for Implementing the ESMP and Monitoring Plan for the Umuda Isingwu/Umuagu Ibeku Erosion Site Rehabilitation Works is estimated at

The ESMP matrix for the implementation of the Rehabilitation works for the Umuda Isingwu/Umuagu Ibeku Erosion Site is highlighted from Table 25-27. NB:

6.4 Environmental and Social Management Monitoring Plan

Some specific Management plans have been described in the sections below.

6.4.1 Waste Management Plan

The ESMP had provided detailed information on waste management including the amount and type of waste to be generated, the sources and proffered mitigation measures, among other measures to be considered include:

- Sensitization amongst the labourers on the need for effective waste management throughout the sub-project activity.
- Sensitization and mobilization on the adverse consequences of poor waste management.
- It is important that the Abia State Ministry of Environment and ASEPA ensure that appropriate waste management control is employed.

6.4.2 Recommended Measures for Waste Management

The ESMP details how wastes that will be generated at the project sites will be managed in an environmentally sustainable and socially acceptable manner. To be practical and effective in handling of wastes, (Solid and liquid) the ESMP follows the fundamental principles of waste management:

- Identify and classify the type of waste generated. Proper procedures must be taken regarding their storage, collection, transportation and disposal
- Identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each.
- Dispose all wastes in authorized areas, metals, used oils, etc.
- Identify and demarcate equipment maintenance areas (>15m from rivers, streams, lakes or wetlands).
- Identify, demarcate and enforce the use of within-site access routes to limit impact to farm.
- Erect erosion control barriers around perimeter of cuts, disposal pits, and roadways.
- Spray water on dirt roads and stockpiled soil to reduce wind-induced erosion and particulates dispersal, as needed.
- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.

The management of other kinds of waste that will be generated from the rehabilitation works is highlighted below:

a. General Waste

- There should be adequate number of garbage bins and containers made available at strategic areas of the site. The use of plastic bin liners should be encouraged.
- All organic and inorganic materials will be placed and/or disposed of so as not to directly or indirectly impact any watercourse or groundwater. The placement and disposal of all such products and materials will be done in an environmentally acceptable manner.
- Solids, sludge and other pollutants generated as a result of construction or those removed during the course of treatment or control of wastewaters will be disposed of in a manner that prevents their direct or indirect re-entry into any watercourse or ground waters.
- Any waste material that is inadvertently disposed of in or adjacent to watercourses will be removed immediately in a manner that minimizes adverse impacts, and the original drainage pattern should be restored.
- Waste materials should be placed and stored in suitable containers. Storage areas and containers will be maintained in a sanitary condition and shall be covered to prevent spreading of wastes by water, wind or animals.
- All food wastes should be collected and stored in containers at appropriate locations and should be emptied at regular intervals and the collected waste should be transported to Government designated waste management facilities.

b. Oil waste

- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas designated for such.
- Ensure that oil or other lubricants are never dumped on the ground, but only in designated areas.

e. Vegetative waste

- The land clearing of the vegetation will be performed in accordance with stipulated standards in order to mitigate negative impact that maybe associated with the activity to the environments.

6.5 Emergency Response and Incidence Management

In the context of this sub-project, the purpose of Emergency Response and Incident Management (ERIM) is to ensure that well developed and rehearsed emergency procedures assist Abia NEWMAP and inhabitants of the project community to:

- Effectively respond to emergencies and critical incidents in the project area
- Reduce the risk of severe injuries.
- Limit potential harm to the environment & surrounding infrastructure.
- Minimise disruption to the community and surrounding businesses through the effective implementation of this ERIM procedures

As much as possible ERIM procedures should address:

- Community security and public safety actions to be taken in the case of an emergency
- Effective spill containment and management
- Effective fire-fighting
- Effective response to emergencies and critical incidents

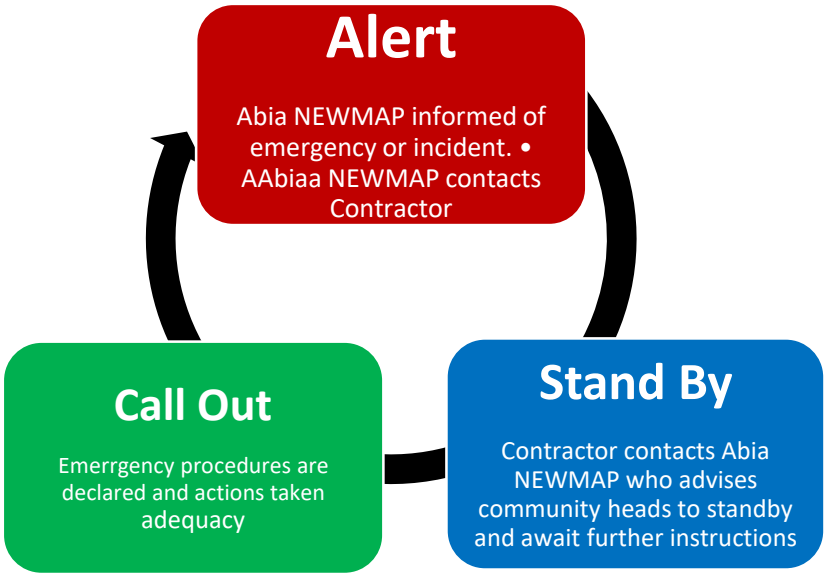
Incident Prevention

Incident preparedness procedures for potential incidents and emergencies include:

- Ongoing training for project personnel;

- Periodic Desktop and field exercises to uncover work place risks and hazards;
- Regular auditing of construction activities;
- Ongoing liaison with Emergency Services
- Identifying key roles and responsibilities and effective methods of communication;
- Monitoring of activities and documentation and ongoing compliance checks with statutory OHS and Environmental requirements.

Stages of Activation



6.6 Recommended Measures for Chance Find/Cultural Heritage Management

In the event of chance finds of items of cultural significance, all forms of excavation in and around the site will be stopped. Subsequently, experienced archaeologist and anthropologist would be recruited to carry out an investigation and proposed plans for the preservation of such cultural artefacts.

During the project site induction meeting, all contractors will be made aware of the presence of an on-site archaeologist who will monitor earthmoving and excavation activities.

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction activity in the vicinity of the find/feature/site will cease immediately.
- Delineate the discovered find/ feature/ site will be delineated.
- Record the find location, and all remains are to be left in place.
- Secure the area to prevent any damage or loss of removable objects.
- The on-site archaeologist will assess, record and photograph the find/feature/ site.
- The on-site archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.

In consultation with the statutory authorities the on-site and Project Archaeologist will determine the appropriate course of action to take.

6.7 Reasons for Failure in Gully Rehabilitation

Gully control can be tedious where executed measures do not seem to work. Failure in control brings losses of material, time, money and sometimes makes the gully erosion even worse. Actually, failure can be avoided if appropriate measures are taken and proper techniques are applied. From experience, the following problems can be taken as the major reasons for the failure of most of the gully rehabilitation schemes and they must be avoided in this project.

- Poor consideration for upper catchment treatment
- Poor installation of check-dams that is related to lack of keying the check-dam to the floor and sidewalls of the gully
- Lack of apron. If there is no apron, water falling from the check-dam spillway erodes the area below and undermines the structure. If the apron is not keyed or secured into the gully, it will be washed away.
- Lack of spillway. The check-dam tends to impede the flow of water. This leads to the water exerting pressure on the dam that can weaken it. A spillway will discharge the runoff thus protecting the check-dam.
- Poor maintenance. The life and effectiveness of control measures are extended by regular maintenance. Any shortcomings in the control structures should be corrected before they develop into serious problems. Any grass, shrub/bush and tree planted which dies should be replaced.
- Improper spacing of check-dams. Proper spacing is crucial if the check-dams are to serve their purpose. Inappropriate and irregular spacing of the check-dams may lead to their being washed away.
- Failure to complete the work. In some instances, the gully rehabilitation schemes may not be completed because of various reasons. Half measures do not offer the required protection and are a waste of time and resources.
- Structures are sometimes made too high and the water that ponds causes instability of the soil and piping underneath or around the structure.
- Poor integration between physical and biological measures.

6.7.1 Management of Rehabilitated Erosion Site

Management of gully control structures is a very important point worth to be emphasized. Treated gullies should be checked regularly and the healing process monitored closely. Structures built in the gully for stabilization purpose should be observed for damage especially during rainy seasons and after heavy storms. Damaged check-dams should be repaired immediately to avoid further damage and the eventual collapse.

The use of gully will depend on whether it has been established for a protected waterway or the water has been diverted and the gully stabilized for other uses. Under the condition when the water is discharged through the gully after the necessary stabilization activities have been undertaken, the side of the gully can be used for growing of grass or fodder. But, in conditions when the gully is not used as a waterway, it can be used for growing horticultural crops or plants such as banana or other fruit trees. Wide gullies can have tree planted on the side slopes provided they are not too steep.

The other important issue for sustainable gully rehabilitation scheme is the identification of users and development of a use concept or management plan. In most cases, gullies are crossing different land uses owned by many land users. Therefore, before treatment of gullies, the users should be identified and the boundaries should be clearly demarcated, the gully rehabilitation process should be objective oriented and responsibilities of owners in managing, maintaining and utilizing the gully and its produces should be elaborated and agreed upon.

Experiences have shown that most of the gully rehabilitation efforts are made accidentally without having clear purposes. As a result, it is common to see gullies with a huge biomass, mostly of one species (*Sesbania sesban or Elephant grass*) but not harvested and after all owners are not known.

This has forced the community members into conflict and hence destruction of the whole endeavour.

In view of this fact, the identification of land owners along gully areas and demarcation of their boundary, development of a management plan and formulating user's agreement (on maintenance and proper utilization of the gully) should come before any treatment effort. It is always crucial to remember that before deciding to undertake gully control measures one has to plan first for what purpose the gully is intended to be used after treatment and then try to take measures relevant to the future strategy.

6.8 Grievance Redress mechanism

To operationalise the GRM effectively, grievances have to be classified according to their potential severity or complications. One of the most common ground for grievances is land compensation entitlement and disbursement. This is likely going to generate grievances more constantly than any other issues about the project.

More complicated matters like RAP and implementation issues that may involve private sector entities and third party agencies are likely to require the attention of the PMU.

For the GRM to be effective as an all-inclusive engagement instrument that effectively handle the grievances of women, there has to be a deliberate structuring to include Women in Grievance Redress Committee, who will easily be approached by women for the purpose of presenting their grievances.

Grievance Procedures

Registration

It may be less depending on the severity of the matter under consideration. The first step is the presentation of a grievance at the uptake point at any level. The social contact person will receive grievance from the complainant clarify primary information, register and acknowledge receipt of it to the grievant within two days. The registration will capture the following data: Name of the complainant, Date of the grievance, Category of the grievance, Persons involved, Impact on complainant's life, Proofs and witnesses. A registration form will have all these bits of information.

Verification

The verification will determine among other things whether the matter has any relationship with the Project and whether the level at which it is presented can handle it. This will mean a quick referral of the case either to the next level or the traditional rulers or to law enforcement. Part of investigation will also be assessing the cost of loss or risk involved in the grievance.

Processing

The processing step is when options for the approach to resolving the case are weighed and determined. Parties involved in the case are brought together for a first attempt at resolution with suggestion from the parties by the social contact personnel. The social personnel at a certain level then decide where the case should go to for hearing and resolution if complainant decides to pursue the matter further. This should happen within five days from investigation.

Implementation and case closing

The social contact personnel then refer the case to the responding authority within the level for GRM implementation. This authority may be the chairman of the GRC or the officers with direct responsibility over the nature of the case within the PMU. Putting this in writing makes the appeal

process faster in case of dissatisfaction on the part of the complainant. And in the case of satisfaction, it is an instrument to compel execution of decision. The outcome of the Grievance Redress process is therefore communicated to the complainant and other concerned party. The result of the process can vary. The request of the complainant may be turned down, compensation may be recommended, or Management may simply apologise to the grievant.

Feedback

All responses to the complainant in a grievance redress process that moves beyond the unit level must be communicated in writing and/or by verbal presentation to the complainant. This will include a follow up on the corresponding authority where cases are referred to ascertain the status of reported cases. Feedback on outcome of each case should get to the complainant through the social contact person at all levels.

Guiding Principles

Having a grievance redress measure connotes readiness for plain fairness. This GRM has to be based on the following universal principles that guide fairness in these matters:

Accessibility and social inclusion: The process has to be accessible to everybody that feels aggrieved and affected by the project components in anyway regardless of their age, gender or economic status within the communities. Vulnerable groups including women, children and the physically challenged should have opportunities to present their complaints without complications.

Simplicity: the filing of complaints and grievances will be kept simple and the process of redress will be easy to understand by stakeholders. Suggestions complaints and queries may be presented through different accessible channels

Transparency: The system will encourage feedback of any kind (negative or positive) as long as it has bearing on the project. These feedbacks will be made available to all stakeholders to put them abreast of issues that may stall or enhance the sustenance of the project. It is important that representatives of the community be involved in the redress of grievances and everybody kept informed on any progress made on them.

Due process and impartiality: Every grievant will have the right to be present and be heard before a duly constituted body saddled with the responsibility of hearing and managing their complaints or grievances. The system will view and analyse all issues with transparent objectivity. This will enhance responsiveness of all parties concerned and build trust. The mechanism will be independent so that it will be perceived as fair by all.

Quick action: Response to grievance and feedbacks will be prompt and direct to the grievant or the feedback provider. Grievances will be acknowledged at the point of uptake and the ensuing decisions will be communicated within 48 hours of reaching them.

People: It is important that all stakeholders, including project personnel be involved in the process of grievance redress. Grievant lodgers or feedback providers will assume full responsibility for their filings. Personnel that would be involved in grievance redress on the supply side have to have basic communications skills. Key persons on the redress team will need to acquire skills for mediation, conciliation and negotiation. Grievance redress policy will be sustained by the commitment of persons involved both on the demand and supply side. There is need for personnel who will be providing grievance redress services to have knowledge of the already disclosed policies guiding resettlement for NEWMAP.

Process: This GRM will have a predictable process that will operate in all the intervention sites and in all the components of the project. There will be specified grievance uptake points where

grievances/complaints will be lodged. The time frame for a response will be known to the grievant. Investigation and deliberations on the complaint will be open and communicated promptly.

Analysis: In grievance redress it is important for handlers to be clear on all the issues. A first step is an honest appraisal of whether the feedback is proactive or reactive. Facts have to be established against the interest and goal of grievant. Fact-finding is essential for meaningful and sustainable grievance/conflict redress. Grievances spring from differences in expectations, interests, knowledge or lack of it, needs and fears. Questions arise in the process that must be taken into account. Are the complainants digging in or unforgiving or are they unwilling to accept the outcomes?

The handlers of grievance redress also need to appraise the complaints against relevance to the project and the project policies. This will need to be done with reference to the already prepared RPF, ESMF and the RAP. This requires a thorough knowledge of various policies and guidelines of NEWMAP.

Grievance handlers also need to know the category of grievance involved and treat accordingly. Grievances need to be characterised both for the sake of proper redress and for evaluation purpose.

6.9 Community Security, Health and Safety Management

Sub-project activities, equipment, and infrastructure can increase community exposure to risks and impacts. While acknowledging the role of public authorities' in promoting the health, safety, and security of the public, Abia NEWMAP through the Contractor(s) will be directly responsible for avoiding or minimizing the risks and impacts of community health, safety, and security that may arise from project related-activities, with particular attention to vulnerable groups.

Major Objectives of Community Security, Health and Safety Management include:

- To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

Community Security, Health and Safety Management should be established during the environmental and social risks and impacts identification process. The implementation of the actions necessary to meet the community security, health and safety should be managed by Abia NEWMAP's Environmental and Social safeguards officers.

It is necessary that trainings be delivered for the Community, Contractors and the SPMU with regards to Health and Safety. The SPMU should procure a consultant that will carry out these trainings before the contractors are mobilized to sight. This will help prepare the SPMU and Communities in handling HSE issues that may arise during project implementation. Below is a guide to some of the trainings and timeline for delivery;

S/N	Module	Topics	Duration	Participants
1	**Construction Safety**	Fall Protection	2days	Contractor, SPMU, Community,
		Equipment safety and Handling	1day	Contractor, SPMU, Community,
		Excavation Waste management	3days	Contractor, SPMU, Community,
		Permit to work	1day	Contractor, SPMU,
2	**Fleet Safety**	Vehicle Parking and Operations	2days	Contractor, SPMU, Community,
		Sight specific and Perimeter Safety Signage communication for communities	2days	Contractor, SPMU, Community,
		Emissions Management	1day	Contractor, SPMU, Community,
3	**Hazard Communication**	Effective hazard Communication for contractor Personnel/Workers	1day	Contractor, SPMU
		Effective hazard Communication for Communities	1day	Community,
4	**Job Hazard Analysis**	Job Hazard Analysis	1 day	Contractor, SPMU, Community,
5	**Disaster management**	Hazard Preparedness and Response	1day	Contractor, SPMU, Community,
		Emergency Planning and Communication	1day	Contractor, SPMU, Community,
6	**Accident Investigation**	Accident Investigation	1day	Contractor, SPMU
		Accident Analysis and Report Writing	I day	Contractor, SPMU

6.10 Stakeholders Engagement Plan

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 includes but not limited to the following;

1. To create general public awareness and understanding of the project, and ensure its acceptance;
2. 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;
3. 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;
4. To document the concerns raised by stakeholders and PAPs so that their views and proposals are mainstreamed to formulate mitigation and benefit enhancement measures;
5. 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
6. Reducing conflict between stakeholders, project proponents PAPs.

In summary, it goes to spell out the role of stakeholders in the project planning, implementation and monitoring.

Envisaged Benefits

The envisaged benefits of the Stakeholders engagement and sensitization exercises includes;

- 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.

6.11 Fundamentals of Stakeholder Engagement Approach

Consultations

Meaningful consultations can contribute to improved design, implementation, and sustainability of development interventions. The objectives of consultations include receiving input for improved decision-making about the design and implementation arrangements of a development program or project, to contribute to improved results and sustainability. In this context, consultations can potentially give voice to the needs of different population groups, including vulnerable and marginalized 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 project-affected people and civil society, are mandatory in development projects so as to satisfy *"best practices"*. Consultation methods include

public hearings or 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 women's groups. Good practice approaches to consultation, including closing the feedback loop, need to be applied more systematically.

Collaboration

Collaboration with stakeholders in decision-making processes and events can make decisions more responsive to stakeholder needs and improve the sustainability of program and project outcomes through increased ownership by stakeholders. Mechanisms for collaboration 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

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

Grievance Redress Mechanisms

Generally, Grievance Redress Mechanisms (GRM) succeed when the client and the task team are both committed to using such a mechanism and follow good practice principles: providing multiple channels for soliciting complaints; registering complaints in a log; publishing timely and service standards for acknowledgement, response, and resolution; and ensuring transparency about the grievance procedure as well as options for mediation and appeal. The capacity of local and national institutions to address grievances also needs to be assessed.

Recognizing the benefits of identifying and responding to complaints early, it is important to adopt a more proactive approach to focus systematically on GRMs in projects and encourage opportunities for alternative dispute resolution, where appropriate. GRMs are increasingly recognized as a means to address complaints early on and manage risks in project preparation and implementation before they escalate. Grievance forms a central part of the monitoring process, with grievance tracking forms and indicators for a number of cases, meetings and field visits, and satisfactory disposition of cases.

Grievances and Appeals Procedure

This grievance procedure is prepared in line with the provision of the RPF of NEWMAP. The need to provide a forum locally to receive, hear and resolve disputes is in the best interest of all parties to forestall the lengthy process of litigation, which could affect the progress of project. Therefore, the setting of grievance redress committee early during RAP implementation is desirable.

Grievance Redress Process

There is no ideal model or one-size-fits-all approach to grievance resolution. The best solutions to conflicts are generally achieved through localized mechanisms that take account of the specific issues, cultural context, local customs, and project conditions and scale.

In its simplest form, grievance mechanisms can be broken down into the following primary components:

- Receiving and registering a complaint.
- Screening and assessing the complaint.

- Formulating a response.
- Selecting a resolution approach.
- Implementing the approach.
- Announcing the result.
- Tracking and evaluating the results.
- Learning from the experience and communicate back to all parties involved.
- Preparing a timely report to management on the nature and resolution of grievances.

Procedure for Effective Local Resolution of Grievance

The following steps and procedures will apply in this project to ensure that grievances are settled within PMU and /or at the level of the Grievance Redress Committee as much as possible:

- An accessible and affordable complaints mechanism will be in place as soon as this report is disclosed, and will enable people with claims against the process to make their complaints
- At the first stage, aggrieved persons will register their complaints and grievances to the Safeguard Officer in PIU (contact address to be provided to aggrieved persons).The Safeguard Officer is required to in consultation with the Project Coordinator provide a written response to the PAP within fourteen (14) calendar days of receiving the complaint.
- If the aggrieved person is not satisfied with the decision of the PIU, the aggrieved person should present the case to the independent Grievance Redress Committee (GRC). The GRC upon receiving the complaint should write to acknowledge the receipt within one week.
- A record should be kept for hearing concerning the complaint, as well as of the reasons for filing the complaint
- The matter so complained should be verified with the PIU
- Mediation efforts at the discretion of the GRC should be embarked upon within three weeks of receiving the complaint

Where a matter is not satisfactorily resolved at this level, the GRC should assist aggrieved persons to seek redress through the court of justice.

Court Resolution of Grievance Matters

The possibility of seeking for grievance resolution in the court may be a last resort and should be expected, especially, where the complainant felt dissatisfied with resolution of the GRC.

The provision of the RPF of NEWMAP on this matter is that grievances concerning non-fulfilment of contracts, levels of compensation, or seizure of assets without compensation shall be addressed to the state local courts system of administration of justice. The court hierarchy would in ascending order therefore, be land dispute tribunals/chiefs, followed by magistrate courts and then finally the high courts. The high court of the state is being designated as the highest appellate court to settle grievances.

This, admittedly, is a costly and time-consuming procedure. Nevertheless, affected persons will be exempted from administrative and legal fees incurred pursuant to this grievance redress procedure.

A comprehensive GRM has been developed for this project and is well documented in the Resettlement Action Plan developed for the project site.

Stakeholders-led Monitoring

Involving stakeholders in monitoring service delivery, revenues, budget execution, procurement, contract awards, and reform policies can increase transparency, improve efficiency of service

delivery or budget execution, and reduce opportunities for corruption. Some mechanisms for stakeholders-led monitoring include public expenditure tracking surveys, social audits, or stakeholder report cards.

Additional entry points for stakeholder's engagement 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 for Stakeholder Engagement

Capacity building for stakeholders, CBOs, communities, government officials, and national accountability institutions to engage and participate in service delivery, natural resource management, public financial management, or CDD projects can also contribute to improved project outcomes. Capacity-building components are therefore included in a number of World Bank-supported operations. Capacity building for all relevant stakeholders is particularly necessary and needs to be systematically integrated into WBG supported operations where SE approaches are introduced for the first time at scale at the national, sectoral, program, or project level. A focus on building government capacity is also important to ensure the sustainability of engagement processes beyond the life of a project intervention.

6.12 Social Investment Plan

Social investment refers to philanthropy, charitable giving, corporate social responsibility, community programs and social contributions to contribute to society that is not primarily motivated by generating a direct financial return. NEWMAP should employ a three phased approach strategy which includes community investment, social investment and philanthropy.

The potential benefit of NEWMAP social investments in the community will create significant opportunities for businesses, including enabling them to meet regulatory requirements, secure a social license to operate, improve reputation, attract talented employees, increase workforce engagement and develop new products and markets. The areas for social investment include education, health, disaster relief, environment, community welfare, housing, infrastructure & energy, sports & recreation, food and agriculture.

NEWMAP should work in conjunction with existing community NGOs/CBO in achieving the investment plan. This social investment plan is further delineated in the RAP/ARAP developed in the framework of this subproject.

6.13 Project Coordination and Implementation Arrangements

It is necessary to highlight and define the roles, responsibilities and institutional arrangements for the implementation of the NEWMAP, as they are fundamental to the effective implementation of the environmental safeguard measures outlined in this ESMP. Accordingly, details of institutional arrangements and the roles and responsibilities of the various institutions in the implementation of the ESMP are highlighted below.

6.14 NEWMAP Institutional Arrangement

Generally, the NEWMAP project is expected to run at two levels, namely the Federal and State. At the Federal level, the Federal Project Management Unit (FPMU) supervised by the Federal Ministry of Finance will manage the Coordination and Program Support. The FPMU will establish coordination and support relationship with the State counterpart Agencies. Thus at the State level, the governments of the 194 States have set up by State Law, agencies that would work in

collaboration with the FPMU, though operating independently. Albeit, the Ministry of Finance, Budget and /Economic Planning, as the case may be in the various State is at present taking the lead in the coordination of the NEWMAP preparatory programmes.

The law or legal agreement used in establishing the agencies will insulate the agencies and specifically the management unit from undue political or administrative interference. In addition, to implement the NEWMAP program according to the agreed terms and conditions, a formal agreement is needed between the State Governments, the Implementing Agencies (PMU) and other MDAs outlining the tasks, responsibilities, schedules, procedures, deliverables etc., required for preparation and implementation of the approved sub-projects.

Furthermore, the State Agency/Project Management Unit (PMU) will have an advisory board or a technical steering committee and a management unit. The board will include representatives from civil society and the government.

The Project Management Unit (PMU) headed by a Project Coordinator who will supervise activities of staff within three (3) major departments of the Agency, namely: Operations, Finance and Administration, and Monitoring and Evaluation (all three departments will cater for the environmental and social components/issues as concerns the NEWMAP).

To capture the inflow and use of credit proceeds in a transparent manner through the Office of the Accountant General [Project Financial Management Unit (PFMU) set up for financial management of donor assisted projects at the state level], the PMU shall establish a relationship with PFMU. This relationship would entail:

- A copy of the annual budget and work plan will be made available to the PFMU by the PMU;
- FPMU internal auditors will be responsible for regular internal audit in the PMU and submit quarterly reports to the government (copied to IDA).
- A copy of monthly progress reports, quarterly reviews and interim Financial Reports (IFRs) shall be sent regularly to the PFMU;
- The PFMU internal auditors shall participate in quarterly monitoring visits to communities as organized by the PMU.

6.15 Roles and Responsibilities

The successful implementation of the ESMP depends on the commitment of the sector and related institutions, and the capacity within the institutions to apply or use the ESMP effectively, and the appropriate and functional institutional arrangements, among others. Thus, details of institutional arrangements, the roles and responsibilities of the institutions that would be involved in the implementation of the ESMP are highlighted below. For the purpose of this ESMP, the institutions identified include;

- Federal Level Institutions: Federal Ministry of Environment and other relevant Ministries, Departments and Agencies (MDAs).
- State Level Institutions: SPMU and other relevant Ministries, Departments and Agencies (MDAs).
- Local Government Level Institutions: Local Government Review Committee
- (LGRC); Local Government Desk Office (LGDO)
- Community Level and other Institutions
- Direct and Other Stakeholder/Groups: Community Project Management Committee (CPMC); CDA; CBO/NGOs
- Consultants, Contractors and Site Engineers
- World Bank and Other Development Partners Their roles and responsibilities are highlighted below

6.16 Federal Level Institutions

The institutions at the federal level are responsible for the establishment of national policy goals and objectives and the appropriate provision of technical and financial assistance to State and local governments. For this ESMP specifically, the Federal Ministry of Environment and her relevant agencies like Department of Erosion, Flood and Costal Management shall play the role of lead environmental regulator, overseeing compliance requirements, granting consent and also monitoring or providing supervisory oversight for the NEWMAP projects. It also shall receive comments from stakeholders, public hearing of project proposals, and convening technical decision-making panel as well as provide approval and needed clearance for EA/EMP or other environmental clearance.

6.16.1 Federal Ministry of Environment (FMEnv)

Federal Ministry of Environment (FMEnv) is mandated by the Federal Republic of Nigeria to ensure environmental protection and natural resources conservation for a sustainable development in the country. They promote cooperation in environmental science and conservation technology with similar bodies in other countries and with international bodies connected with the protection of the environment and the conservation of natural resources. The Ministry also cooperates with Federal and State Ministries, Local Government, statutory bodies and research agencies on matters and facilities relating to the protection of the environment and the conservation of natural resources.

6.16.2 Department of Erosion, Flood and Costal Management

The Department is the lead agency at the federal level for this project. The department is ultimately responsible for monitoring, assessing, mapping, inventory and generation of baseline environment data for the prevention, mitigation and control of hydro- meteorological related disasters in Nigeria. Other responsibilities include:

- Monitoring the impact of global change and associated impacts on flood, inland and coastal Erosion
- Land reclamation
- Development of Soil Conservation policy and master plan towards efficient land use practices in Nigeria
- Processing and management of satellite data for management of hydro-metrological related disasters in Nigeria-flood, erosion, water harvest & Coastal Erosion
- Inter-basin water transfer from regions of surpluses to region of deficits for water harvesting for flesh flood prevention
- Formulation of resettlement strategies, emergency preparedness plans, and sociological aspects of coping with flood in affected areas in the country in cooperation with other related agencies.
- Development and operation of flood, early warning systems.
- Studies and designs for control of Soil Erosion, Flood Coastal Zones Management water harvesting and management.
- Public enlightenment on prevention, mitigation and control of Flood Erosion and Coastal Zone Degradation.
- Operation and Maintenance of installed physical structures for control of flood and erosion, to ensure optimum efficiency and achievement of designed life spans of such structures.
- Protection and management of coastal shoreline against coastal erosion and coastal degradation.
- Establishing linkages with agencies with similar mandates.

6.16.3 Federal Ministry of Water Resources (FMWR)

The Federal Ministry of Water Resources is the umbrella government organ under which all water resources activities at the Federal levels, including hydrological activities, operate. The Nigerian Hydrological Services Agency and Integrated Water Resources Commission and River Basin Development Authorities are under the Ministry.

6.16.4 Nigerian Hydrological Services Agency (NIHSA)

The Nigeria Hydrological Services Agency (NIHSA) operates and maintains hydrological stations nation-wide for gauging of surface water points. The agency also undertakes groundwater exploration and monitoring. The data collected is stored in robust database system, analyzed and processed for the purpose of mapping all the nation's water deposits and also to provide the vital hydrological and hydrogeological data required for sustainable water resources budgeting for various purposes such as domestic, irrigation/agricultural development (for food security and poverty alleviation), hydroelectricity generation, industrialization, tourism and recreation among others.

6.16.5 Integrated Water Resources Commission

The commission ensures the effective monitoring and evaluating of water sector program, and also receives and investigates complaints from consumers and other persons in the water resources sector.

6.16.6 Federal Ministry of Works (FMW)

The Federal Ministry of Works is engaged to ensure modern and reliable national road transport network in the country. They are also charged with Federal Highways and Bridges (Planning & Design, Construction & Rehabilitation, Monitoring and Maintenance of Federal Roads nationwide, Provision of Highway Engineering Infrastructure, Surveying and mapping the nation’s internal and international boundaries. Under the ministry they have several departments and agencies.

6.16.7 Federal Ministry of Agriculture and Rural Development (FMARD)

The Federal Ministry of Agriculture and Rural Development ensures that the citizenry are provided with credible and timely information on government activities, programs and initiatives; while creating an enabling technological environment for socio-economic development of the nation.

6.16.8 National Environmental Standards and Regulatory Enforcement Agency (NESREA)

The agency is chiefly responsible for the protection and development of the environmental, biodiversity conservation and sustainable development of Nigeria’s natural resources in general and environmental technology including liaison with relevant stakeholders within and outside Nigeria on matter of enforcement of environmental standards, regulations, rules, laws, policies and guidelines.

The safeguard responsibilities for the NEWMAP are highlighted in the table 5.0 below

Table 27: Safeguard Responsibilities for NEWMAP

S/No	Category	Roles
I	Federal Government MDAs (Federal Ministry of Environment and her agencies (Such as NESREA)	Lead role -provision of advice on screening, scoping, review of Draft RAP/EA report (in liaison with State Ministry of Environment), receiving comments from stakeholders, public hearing of the project proposals, and convening a technical decision-making panel, Project categorization for EA, Applicable standards, Environmental and social liability investigations, Monitoring and evaluation process and criteria
II	State Government MDAs (Ministry of Lands, Survey and Urban Development, Ministry of Environment, etc.	Compliance overseer at State Level, on matters of Land Acquisition and compensation and other resettlement issues, Lead role -provision of advice on screening, scoping, review of Draft RAP/EA report (in liaison with Federal Ministry of Environment), receiving comments from stakeholders, public hearing of the project proposals, and convening a technical decision-making panel, Monitoring and evaluation process and criteria.
	Other MDAs	The MDAs applies when relevant areas or resources under their jurisdiction are likely to be affected by or implicated sub-projects. They participate in the EA processes and in project decision making that helps prevent or minimize impacts and to mitigate them. These institutions may also be required, issue a consent or approval for an aspect of a project; allow an area to be included in a project; or allow impact to a certain extent or impose restrictions or conditions, monitoring responsibility or supervisory oversight.
III	World Bank	Assess implementation Recommend additional measures for strengthening the management framework and implementation performance.
IV	NEWMAP SPMU Safeguards Unit	Liaise closely with Ministry of Environment in preparing a coordinated response on the environmental and social aspects of project development.
V	Local government	Liaising with the PMU to verify adequacy of resettlement location and provide approval for such sites, Providing additional resettlement area if the designated locations are not adequate, Provide necessary infrastructures in relocated areas, engage and encourage carrying out comprehensive and practical awareness campaign for the proposed sub-projects, amongst the various relevant grass roots interest groups.

VI	CDA (Community Development Organisations) Consultants, Contractors, and Site Engineers	Ensure Community participation by mobilizing, sensitizing community members; Will work with the PMUs at Federal and State levels, and other stakeholders. They are to ensure effective project delivery in a timely, safe and environmentally sound manner.
VII	NGOs/CSOs	Assisting in their respective ways to ensure effective response actions, Conducting scientific researches alongside government groups to evolve and devise sustainable environmental strategies and rehabilitation techniques, Organizing, coordinating and ensuring safe use of volunteers in a response action, and actually identifying where these volunteers can best render services effectively & Providing wide support assistance helpful in management planning, institutional/governance issues and other livelihood related matter, Project impacts and mitigation measure, Awareness campaigns
VIII	The General Public	Same as above

The other institutions, on the other hand, come in as and when relevant areas or resources under their jurisdiction or management are likely to be affected by or implicated in the execution of the project. These institutions are grouped broadly into two – resource based ones and the utility service providers. They all have a significant role and are consulted as appropriate. They participate in the EIA processes and in project decision-making that helps prevent or minimize impacts and to mitigate them. These institutions may also be required:

- To issue a consent or approval for an aspect of a sub- project;
- To allow impact to a certain extent or impose restrictions or conditions.

Furthermore, the institutions may have monitoring responsibility or supervisory oversight in an area of concern or interest to them during implementation.

6.17 State Level Institutions

The State level institutions include the SPMUs and other relevant Ministries, Departments and Agencies (MDAs). Some relevant agencies include:

6.17.1 Abia State Environmental Protection Agency (ASEPA)

This serves as the regulatory body to protect and manage the environmental issues in the state. The functions of the ASEPA include:

- Enforcement of all environmental legislations in the states
- Minimization of impacts of physical development on the ecosystem
- Preservation, conservation and restoration to pre-impact status of all ecological process essential for the preservation of biological diversity.
- Protection of air, water, land, forest and wildlife within the state.

- Pollution control and environmental health in the state.

6.17.2 Abia State Ministry of Agriculture

The state ministry promote accelerated agricultural development, increase production in all the sub sectors; and realization of the structural transformation in the socio-economic development of the rural areas.

6.17.3 Abia State Ministry of Works

The Ministry of Works the State level ensures the construction and maintenance of rural and urban road networks as well as transportation issues. They are also responsible for the physical development of the States specifically the duties of Planning, Researching, Formulation, Implementation and evaluation and evaluation of policies on roads, electrical and Mechanical installations as well as the acquisition of earthmoving equipment and other machines needed in survey and Civil Engineering works.

6.17.4 Abia State Ministry of Land and Survey

The major function of the Ministry of Land and Survey is to ensure that there is optimal utilization of land resources in their states in order to achieve development. For the NEWMAP purpose, the State Ministry of land will provide proper guidelines in acquiring land from the members of the community for the purpose of the work.

6.17.5 Abia State Ministry of Information

The State Ministry of Information will be responsible for the dissemination of information that will enhance and facilitate project understanding and acceptance at the level of the state. It will have an idea on the language of the community members and the culture of its local people. The ministry will utilize the use of radios, television media, public awareness campaigns and jingles; going into the communities and informing the people and other communication media to educate the community members on the importance of the NEWMAP in their community. This ministry will play a vital role in community involvement mechanism.

6.17.6 Abia State Ministry of Youth Development

This ministry will work with the State NEWMAP to ensure that youths of the local communities gain occupational benefits from sub-project implementation.

6.17.7 Abia State Ministry of Rural Development and Poverty Alleviation

The ministry is responsible for community-based matters such as community mobilization; self-help projects, rural industrialization, neighbourhood watch, training and workshop for community development associations, listing of community development associations in the State etc. It will assist in educating the community members on the importance of the NEWMAP. It will provide indigenous communities with assurance. For example: that the NEWMAP will not disrupt any farming practices but rather provide a better environment for production systems to thrive.

6.17.8 State Project Management Unit (PMU)

The PMU, as the implementing authority, has the mandate to:

- Co-ordinate all policies, programmes and actions of all related agencies in the States
- Ensure the smooth and efficient implementation of the project's various technical programmes
- Cooperate through a Steering Committee that provides guidance to the technical aspects of all project activities;

- Maintain and manage all funds effectively and efficiently for the sub-projects
- Plan, coordinate, manage and develop NEWMAP projects to ensure success.
- Coordinate activities of the State Licensing Authority and all vehicle inspection units.
- Recommend on policy issues to the Governor including mechanisms for implementation.
- Prepare plans for the management and development of NEWMAP project.
- Facilitate the discussion between PAPs and communities regarding compensation for land acquired for the subprojects micro-projects;
- Monitor the project work to ensure that the activities are carried out in a satisfactory manner;
- Organize the necessary orientation and training for the departmental officials so that they can carry out consultations with communities, support communities in carrying out RAPs and implement the payment of compensation and other measures
- (relocation and rehabilitation entitlement) to PAPs in a timely manner;
- 1Ensure that progress reports are submitted to the World Bank regularly

SPMU Safeguard Units

To ensure sustainability in all the NEWMAP projects, an Environmental/Social and Livelihood Safeguards Unit that reports directly to the Project Coordinator exists. The paramount objective of the Environmental/Social and Safeguards unit is to ensure the effective consideration and management of environmental/social concerns in all aspects of NEWMAP project, from the design, planning, implementation, monitoring and evaluation of initiatives in the State. Thus a key function of the Unit is to engender a broad consensus, through participatory methods and extensive dialogue with affected and interested parties, on fair and adequate methods by which rights of way can be cleared of occupants as needed, taking account of international standards for involuntary displacement as incorporated into the World Bank's OP 4.12 on Involuntary Resettlement and environmental compliance with the EA.

With this, particular attention is directed at minimizing environmental/social risks associated with the development of sub-project initiatives, as well as the identification and maximization of social development opportunities arising from investments.

In the implementation of the NEWMAP, the Safeguard Unit will be expected to advise on the environmental and social costs/benefits of the different options and audit environmental and social safeguards compliance of sub-projects. The PMU Safeguards Unit will function as an independent unit. For all environmental and social issues, the Safeguard Unit shall work closely with other relevant MDAs in preparing a coordinated response on the environmental and social aspects of the NEWMAP sub-projects. In order to achieve this made, the PMU would have in each State Steering Committee (Board) and a Project Implementation Unit (PIU) for coordinating the day to day activities with the relevant line departments.. Two members of the PMU will be designated as Environmental & Social Officers to oversee the implementation of Safeguard instrument for the ESMP and the RPF as well as any other environmental and social provisions as deemed fit for project implementation as per the regulations of the World Bank and Government of Nigeria and the respective State government. The roles and responsibilities of the Safeguard Specialists (Environmental and Social Officers to anchor environmental and social issues distinctively) are described below;

Roles & Responsibilities of Safeguard Specialists

- Review all EA / SA Documents prepared by consultants and ensure adequacy under the World Bank Safeguard policies including the OP4.01;
- Ensure that the project design and specifications adequately reflect the recommendations of the EIA / ESIA;

- Co-ordinate application, follow up processing and obtain requisite clearances required for the project, if required;
- Prepare compliance reports with statutory requirements;
- Develop, organize and deliver training programme for the PIU staff, the contractors and others involved in the project implementation, in collaboration with the PMU;
- Review and approve the Contractor's Implementation Plan for the environmental measures, as per the ESIA and any other supplementary environmental studies that may need to be carried out by the PIU;
- Liaise with the Contractors and the PIU / State Implementing agency on implementation of the ESMP / RAP;
- Liaise with various Central and State Government agencies on environmental, resettlement and other regulatory matters;
- Continuously interact with the NGOs and Community groups that would be involved in the project;
- Establish dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project;
- Review the performance of the project through an assessment of the periodic environmental monitoring reports; provide a summary of the same to the Project Manager, and initiate necessary follow-up actions;
- Provide support and assistance to the Government Agencies and the World Bank to supervise the implementation.

Note: Because of the sectoral nature of the NEWMAP and anticipated project types, and given the number of safeguard policies, a safeguards manual will be prepared by the proponent.

6.18 Local Government Level Institutions

The Local Government has become accepted as the government nearest to the people or the masses. For any meaningful development to take place, this level of government needs to be galvanized, to execute people oriented programs, which seek to lower poverty level as is designed in NEWMAP. The LG governs the affairs in the various communities. It is expected that it serve as an inter-phase between the community members and the SPMU. The LG can assist in the implementation of the proper community mechanism. Members of the local government are mostly people from the community and can easily win the trust of the people. Their staff can work together with the other MDAs and CBOs.

The Local Government Council has to be fully briefed and enlightened in the process and steps to be taken in the ESMP/EA/ESMP and the overall project execution. The Council should in turn engage and should be encouraged to carry out a comprehensive and practical awareness campaign for the proposed project, amongst the various relevant grass roots interest groups.

6.18.1 Community Level and other Institutions

This includes direct and other concerned stakeholders/groups. This may have complaints/views that need to be resolved in the choosing and execution of the various subprojects. It is obvious that villages and youth leaders shall ensure that social values are not interfered with.

6.18.2 Community Based Organizations (CBO)

These are organizations based in the communities. Organizations in the community can serve as an inter-phase and can speak for the people. They can communicate to the SNEWMAP, the intentions and needs of the people and vice versa.

6.19 World Bank

The World Bank will assess the implementation of the ESMP and recommend additional measures for strengthening the management framework and implementation performance, where need be. The reporting framework, screening procedures and preparation of management and mitigation plans shall be discussed and agreed upon by the Bank team and PMU during the early part of project implementation.

6.20 Consultants, Contractors and Site Engineers

The Consultant and Contractor will work with the PMU and other stakeholders in prompt and effective projects delivery.

6.21 Safeguards Manual

A Safeguard manual will be prepared in order to enable the FPMU, SPMU, Safeguards PMU and implementers of sub-projects, ensure that all sub-project activities comply with environmental and social safeguards requirements of the World Bank.

7 CHAPTER SEVEN: RECOMMENDATIONS

The following recommendations are for the consideration of the Abia State NEWMAP PMU towards ensuring the improvement of decisions and filling of gaps identified by the ESMP study.

Improvement of capacity of the Project site committee members is important to ensure that they deliver their duties as expected.

Also there should be adequate awareness creation in the area of water harvesting as this will reduce surface run-off especially during the rainy season thereby preventing flooding and subsequent erosion.

Residents should be enlightened on the anthropogenic causes of erosion and ways to prevent them especially in alternative ways of doing things.

There is a need to enlighten the residents of the community on SLM practices that will maintain or improve a balanced soil organic material-nutrient cycle as well as reduce vulnerability to erosion

There is also a need to create more awareness on the anthropogenic causes of soil erosion and flooding with a bid to prevent future occurrence after the rehabilitation works.

Waste management is also a serious issue in the area as residents tend to dump refuse either in the gully or drainages. These should be discouraged and programmes designed to enlighten them n best practice for refuse disposal.

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ANNEX ONE: ESMP TEMPLATE

Chapter 1: Background of ESMP Activity

Chapter 2: Institutional and legal framework for environmental management

- Discussions on World Bank safeguard policies triggered by NEWMAP and the proposed activity.
- Summary of relevant local and federal policy legal regulatory and administrative frameworks.

Chapter 3: Biophysical Environment

- Description of the area of influence and environmental baseline conditions.

Chapter 4: Socio-economic Characteristics & Consultation with Stakeholders

- Analysis of existing livelihoods opportunities, income, and gender characteristics, age profile, health, transport and access to existing community structures at watershed community, household and individual levels.
- Analysis of existing formal and informal grievance redresses mechanisms in and around the intervention areas.
- Presentation of consultants with relevant stakeholders and affected persons.
- Other topics as relevant

Chapter 5: Assessment of potential adverse impacts and analysis of alternatives

- Methods and techniques used in assessing and analyzing the environmental and social impacts of the proposed project.
- Discussion of alternatives to the current project and reasons for their rejection including short description of likely future scenario without intervention.
- Discussion of the potentially significant adverse environmental and social impacts of the proposed project.

Chapter 6: Environmental & Social Management Plan (ESMP) including:

- Discussion of the proposed mitigation measures
- Institutional responsibilities and accountabilities
- Capacity building plan
- Public consultation plan
- Description of “Grievance Redress Mechanism” in alignment with the ESMF, RPF, RAP and project implementation manual to address situations of conflicts or disagreements about some of the project activities.
- Monitoring and Evaluation plan including suitable indicators for the proposed project

- Cost of implementing the ESMP

Chapter 7: Summary, Recommendations and Conclusion

Annex 1: List of Persons Met

Annex 2: Summary of World Bank Safeguard Policies

Annex 3: General Environmental Management Conditions for Construction Contracts/Civil Works.

Annex 4: References

Annex 5: Summary of the database of information collected for ESMP

Annex 6: Maps

Annex 7: Photos/Videos

COMMENTS

- The logo of Hospitalia Consultaire should be removed from the work
- How many enumerators did you use to get to this no 515, please their names, Age and sex are required.
- No abbreviations – This should come after the executive summary.
- The font size of this report should be increased.
- Include list of names of the stakeholders.
- Include list of economic trees with their botanical names in tabular form.
- A bar chart representation is needed.
- In xii the number in Plate does not tally with the words.
- There is no delineated map of the site in question.
- Please include the name of the laboratory where the samples collected were taken to arrive at these results.

ANNEX TWO: TERMS OF REFERENCE FOR THE PREPARATION OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

BACKGROUND

The Government of Nigeria is implementing the multi-sectorial Nigeria Erosion and Watershed Management Project (NEWMAP), which is financed by the World Bank, Global Environment Facility, the special climate change fund, and the Government of Nigeria. NEWMAP Finances activities implemented by states and activities implemented by the Federal Government. The project currently includes 7 mover states, namely Anambra, Abia, Cross River, Edo, Enugu, Ebonyi, and Imo, and recently additional 12 states have been added namely Delta, Oyo, Sokoto, Gombe, Plateau, Kogi, Kano, Akwa Ibom, Borno, Nasarrawa, Katsina and Niger states.

The lead agency at the Federal level is the Federal Ministry of Environment (FME), Department of Erosion, Flood and Coastal Zone Management. State and local governments, local communities and CSOs are or will be involved in the project, given that the project is a multi-sector operation involving MDAs concerned with water resources management, public works, agriculture, regional and town planning, earth and natural resources information, and disaster risk management.

The development objective of NEWMAP is to reduce vulnerability to soil erosion in targeted sub-watersheds. At state level, NEWMAP activities involve medium-sized civil works such as construction of infrastructure and/or stabilization or rehabilitation in and around the gullies themselves, as well as small works in the small watershed where gullies form and expand. These works trigger the World Bank's Safeguard policies including Environmental Assessment Op4.01, Natural Habitats Op 4.04, Cultural Property OP 11.03, Involuntary Resettlement OP 4.12 Safety of Dams OP 4.37; Pest Management Safeguard Policy OP 4.09 and Projects on International Waterways OP 7.50.

The Environmental and Social Safeguards concerns are being 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 need to be translated into specific costed, measurable, and monitorable actions for specific management and action plans.

ESMF: In general, the ESMF specified the procedures to be used for preparing, approving and implementing (i) **environmental/social assessments** (ESAs, alternatively both an SA or an EA) and/or (ii) **environmental/social management plans** (ESMPs, or alternatively both an EMP and SMP) for individual civil works packages developed for each project. ESMPs are essential elements for category B projects.

OBJECTIVE AND SCOPE OF THE CONSULTANCY

The objective of the consulting services is to prepare an Environmental and Social Management Plan (ESMP) for Umuda Isingwu / Umuagu Ibeku gully erosion complex in Umuahia North Local Government of Abia State intervention site(s).

Each 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 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 for the upper and lower watersheds in the intervention site.

The consultant will work in close collaboration with the Engineering Design Consultants and NEWMAP State Project Management Unit's (SPMU) safeguard team, and with other actors as directed by the SPMU. In that respect the sequencing of the technical/feasibility studies and the ESMP will be critical. The consultant will have to receive the draft technical/feasibility studies in order to take into account the technical variants of the proposed activities and also in return inform the technical design consultants of any major constraint that may arise due to the social and environmental situation on the ground.

In each intervention site, the consultant will visit the full sub-watershed as delineated in the given gully stabilization design. These sub-watersheds are an average of four square kilometers in southern Nigeria. The consultant will take into account the proposed civil engineering designs, vegetative land management measures and other activities aimed at reducing or managing runoff that would be carried out within the sub-watershed. The consultant will assess natural resources and infrastructure potentially affected during project implementation and operation and selects the management strategies needed to ensure that environmental risks are appropriately mitigated.

Tasks of the consultant include the following:

- Describe the existing status of the sub-watershed and gullies;
- Identify the environmental and social issues/risks associated with the existing conditions;
- Select and measure appropriate baseline indicators (for example, m3/sec of runoff collected in the sub-watershed during a heavy hour-long rainfall);
- 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;
- 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 monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed and the mitigation measures described above (in a-e);
- 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 implementation agency;
- Define technical assistance programs that could strengthen environmental management capacity 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.

UMUDA ISINGWU/UMUAGU IBEKU GULLY EROSION COMPLEX

The Umuda Isingwu/Umuagu Ibeku gully erosion complex lies between longitude 05^{o} 32' and 05^{o} 34' North, and latitude 07^{o} 28' and 07^{o} 30' East. The Umuda Isingwu/Umuagu Ibeku gully erosion complex consists of Umuagu main gully and its tributary

Umuda/Okengwu gully, and Isingwu main gully. They are located in Umuagu Ibeku and Umuda Isingwu communities in Umuahia North local government area of Abia State. This site has three different gully heads at Umuagu, Umuda and Isingwu villages. The Umuagu and Umuda/Okengwu gullies empty into Iyi Doti (De Oti) stream while Isingwu gully empties into the Obohu stream. The confluence of Iyi Doti and Obohu streams is at Nchi Isingwu Umuda Amafor and retains the name Obohu as it flows downstream.

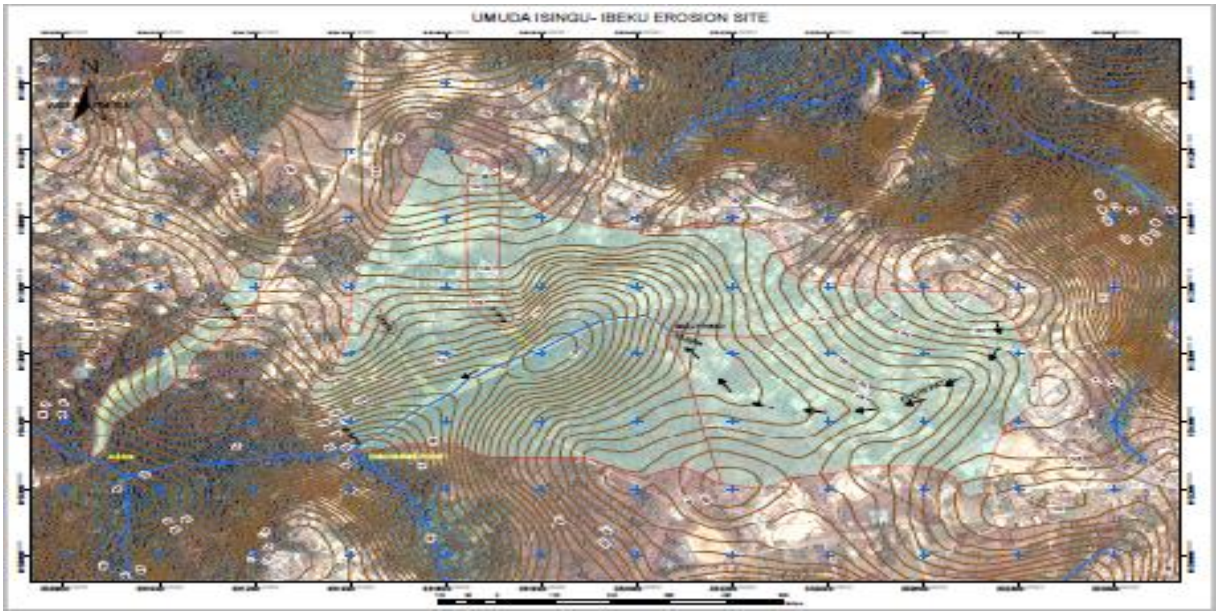

Fig. 1: The Erosion and watershed map of Umuda Isingwu/Umuagu Ibeku Complex gully erosion is shown

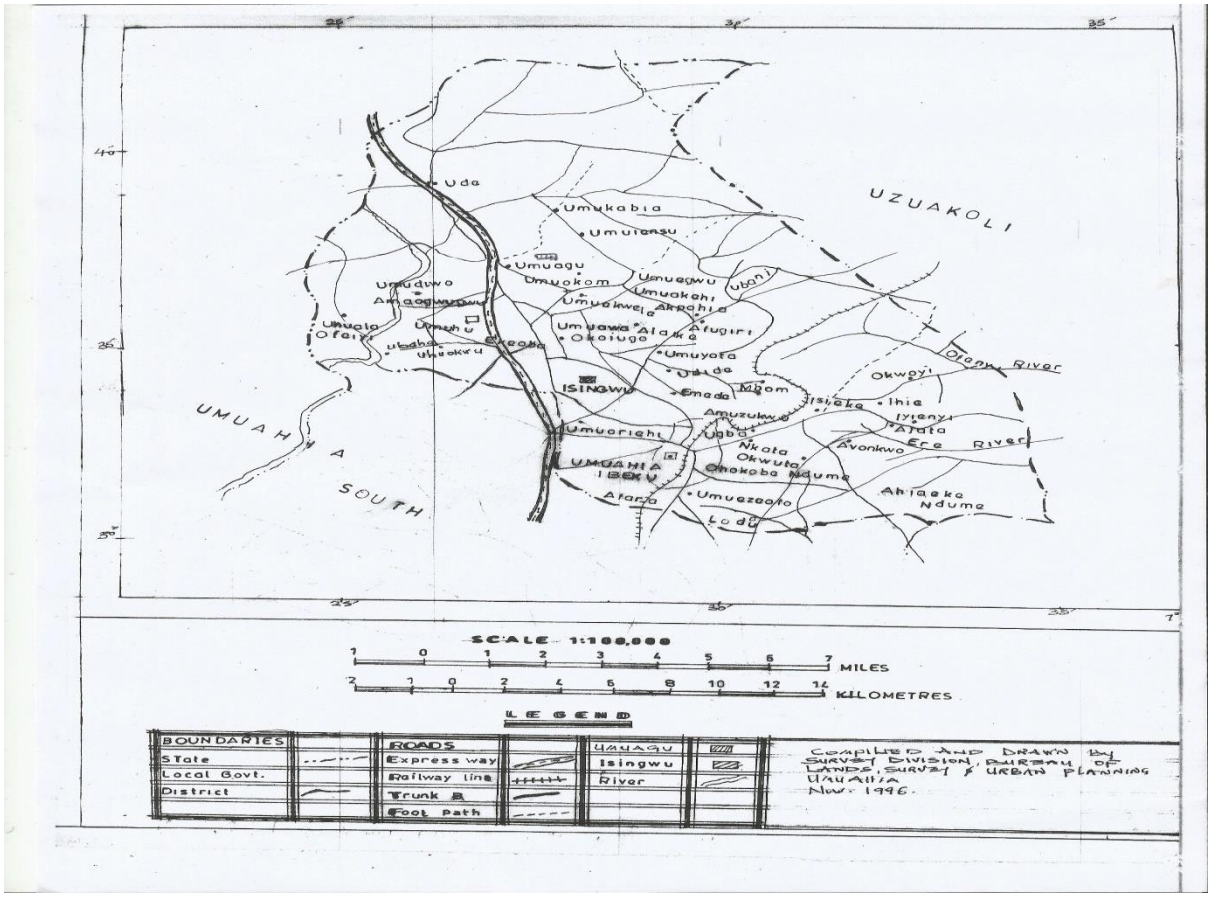

Fig 2: Delineated map of Umuda Isingwu/Umuagu


Fig. 3 & 4: Umuagu gully head


Fig. 4 & 5: Umuagu primary school buildings under threat of the gully

1.1.1. THE PROBLEM

d. Umuagu Gully Erosion Site

The gully may have started as a result of runoff from a collection of reinforced concrete drains on both sides of an asphalt paved road that stopped at a culvert and those from an earth road with concrete lined drain on one side. The 2.4 x 1.0 m culvert is located at the intersection of the asphalt road and the earth road leading to the house of the Pastor of Behold He Cometh Pentecostal Church and Theological Seminary, Umuagu, about 200m upstream of the gully head. Runoff from the three stretches of drains pass through the culvert and flow partly over farmland before encountering a sudden steep slope. The result is undercutting and the development of the gully head and subsequently the development of the Umuagu gully which is threatening the community primary school buildings. Other major cause of the gully includes additional runoff from the side of the earth road without drain, as the alignment of the earth road follows the route of the runoff that terminated at the gully head.

The shape of the gully is trapezoidal and it has an estimated bottom width of 2m - 4m, top width of 30m – 40m and depth of 30m – 35m. The soil formation as observed is

predominantly sandy soil and easily erodible. The distance from the gully head to Iyi Doti is about 850m.

e. Umuda Isingwu Gully Erosion Site

The gully may have been caused by poor and inadequate construction of drainage structures on the Umuda – Isingwu road that branched off from the Umuahia – Uzuakoli road. Runoff from 600mm wide by 600mm deep reinforced concrete rectangular drains on both sides of the road is drained by a 600mm diameter reinforced concrete pipe culvert along Umuda – Isingwu road close to Chief Friday Okengwu's compound. The discharge from the culvert flows directly over open farm land without any protective measures.

f. Isingwu Gully Erosion Site

The Isingwu gully may have been caused by the abrupt termination of the short length of reinforced concrete roadside drainage channel which led to the development of the gully head and subsequently expansion as gully fingers of different sizes, as one moved downwards along the earth road, over a steep slope towards the Obuhu stream. The gully has cut the road surface in many sections preventing the people of Isingwu from going to Obuhu to fetch water for domestic use and from communicating with the communities across the stream. Other major cause of the gully is the steep slope topography of the site and collection of runoff from the higher elevation paved roads and residences flowing over the abandoned earth road and drains.

The gully has various shapes and is still active and has its outlet at Obuhu stream, a distance of about 950m. A section of the gullied road is currently being used as dumping ground for solid waste.

Except for vegetation that covered the area on its own, no past efforts have been made to check the propagation of the gullies; rather another road alignment that avoided the gullied sections was set out and graded leading to Obuhu stream.

1.2.2. THE SOLUTIONS

a. Umuagu Ibeku gully - Conduct runoff safely through the gully to safely discharge into Iyi Doti stream using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams and retaining walls accompanied by earthworks and vegetation.
b. Umuda Isingwu gully – Conduct runoff safely through the gully to safely discharge into the main gully using drainage channels, chute spillways, stilling basins and outlet protection works; install check dams accompanied by earthworks and vegetation.
c. Isingwu-Ossah road gully - Fill up every gully and reconstruct road with drainage structures as if new project and plant vegetation.

1.2. RATIONALE FOR THE STUDY

The destructive effects of this Gully erosion is not only the annual washing away of the soil and nutrients which decreases the productivity of the soil and yields from agricultural crops, but extends to lives and properties of people around this community. They gully erosion problem is critically studied and appropriate erosion control structures sited at right places within the study area. Umuagu primary school will be saved from gully threat Umuagu primary school will reclaim the school playground and pupils resume their games'

programme several residential buildings, valuable residential plots of land and economic trees will be secured. As the Isingwu – Ossah road will be motorable; there will be improved transport and communication system between the villagers and neighbouring communities. Health benefits will include reduction of malaria and other diseases as the stagnant pools of water on the gullies which have been breeding grounds for mosquitoes and other disease vectors would disappear.

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 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 an Abbreviated Resettlement Action Plan (ARAP) 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.

Other tasks:

The consultant shall assist the SPMU to: (i) Register the ESMP with the environmental assessment (EA) departments at Federal and State levels; and (ii) Disclose the finalized ESMP at National, State, LGA and Community levels.

1.3. QUALIFICATIONS

The consultant(s) must have expertise and advanced degrees earned in relevant fields including but not limited to: civil/environmental engineering, environmental sciences, or the social sciences.

Minimum experience should be eight (8) years with a minimum specific experience of four (4) years on planning related to infrastructure development or disaster response.

The consultant(s) must have experience in design and preparation of an Environmental and Social Management Plan (ESMP) for infrastructure projects. The consultant(s) must have competency and documented experience in social and environmental scientific analysis and development of operational action plans.

The consultant(s) must have a working knowledge of World Bank operational safeguards policies gained through hands-on experience in the preparation and implementation of environmental and social management plans in an urban area.

1.4. DELIVERABLES AND TIMING

- **Inception Report**: One week after contract signing.

- **Week 4:** A draft ESMP will be submitted for comments in four weeks from the date of signing the contract.
- **Week 6:** The draft final ESMP Report will take into account all comments, and will be submitted to the SPMU.
- **Week 8:** The Final ESMP acceptable to SPMU Abia State and to the World Bank. A comprehensive database of relevant information collected in Excel format

NB

- All reports shall be submitted in hard and soft copies (in flash drives)

1.5. PROJECT-SPECIFIC

- Environmental and Social Management Framework (ESMF)
- Resettlement Policy Framework (RPF)
- NEWMAP Project Appraisal Document (PAD)
- NEWMAP Project Implementation Manual (PIM)
- World Bank safeguards policies
- Intervention design

1.6. ESTIMATED COST

It is estimated that the duration and cost of consultancy for the preparation of this Environmental and Social Management Plan (ESMP) will be for 56 days at N---------- Naira per day which comes to N---------- Naira.
Associated field research costs will also be covered under the terms of the assignment including payment for field researchers and associated travel costs.
Below is a detailed breakdown of cost:

i. Payment of field researchers: N----------
ii. Acquisition of Analysis high resolution imageries for the referenced depiction of site characteristics: N----------
iii. Analysis and establishment of critical baseline: N----------
iv. Refreshment and logistics for consultations: N----------
v. Transportation cost: N----------
vi. Hotels, Food and incidentals: N----------
vii. Contingencies: N----------
viii. Production of report/deliverables: N----------

1.7. PAYMENT SCHEDULE

10% of Contract sum on successful conclusion of inception deliverable
20 % of Contract sum on submission of Draft Report
40% of Contract sum on submission of Draft Final Report

30% of Contract sum of submission and Acceptance of Final Report.

ANNEX THREE: SAMPLE SOCIO-ECONOMIC DATA COLLECTION FORM

IDENTIFICATION

Affix Passport Here

Community: _____ Date_____

Name of Interviewer_____

Name of the Respondent: _____

Phone No_____

Relationship to Household head_____

Age___ Sex___

Address: _____

Nationality_____ Nativity _____

Length of stay within the community_____

GENERAL INFORMATION

Religious Group: Christians____Muslim___ATR___Others (specify) ___

Social Group: Vulnerable___General___

Family Pattern: Joint___Nuclear___Individual_____

Size of Family: Small (2-4) ____Medium (5-7) ____Large (Above7) ____

FAMILY PARTICULARS (Start from head of the household)

S/N	Name of Member	Sex	Age	Marital Status	Relationship to HH-head	Educational Level	Occupation	
							Primary	Secondary

Household's Main Occupation_____and Monthly income (₦)_____Secondary Source_____and Monthly Income (₦)_____No. of Adult earning members:_____ No. of dependents:___ Family annual expenditure: (₦)_____

COMMERCIAL/SELF EMPLOYMENT ACTIVITIES

Type of Shop/Business Enterprises (SBEs)

Hotel____Provision store____Repair & Workshop____ Other Shops (Specify) _____Other Enterprise (Specify) _____No. of Partners: ___

Employment Pattern

Owner/Operator____Employed 1 to 5 persons___Employed above 5____

VULNERABILITY

HH becoming BPL as a result of loss of livelihood/asset___ Female headed household___

PUBLIC UTILITIES

How would you describe the condition of the following amenities in town you live/community?

Amenities	Very Good	Good	Fair	Poor
Roads to the community				
Roads within the community				
Schools in the community				
Public Health Institutions				
Potable Water				
Public Electricity				
Communication facilities (Postal Service, Telephone)				
Public recreation facilities				

What is the major source of water available to your household?

(i)River____ (ii)Borehole (commercial)____ (iii)Borehole (private)___ (iv)Public pipe-borne water___(v)Pond___ (vi)Water Vendor___ (vii)Well water___

How long does it take you in minutes/hours to get to your water source___

What is your primary source of electricity

(i)Hurricane Lamp___(ii) Private Generators___ (iii)Community Generators___ (iv)State Government Utilities Board___ (v)Company Operating in your community___ (vi) PHCN (National Grid)___

What is your secondary source of electricity?

(i)Hurricane Lamp___ (ii) Private Generators___ (iii)Community Generators___ (iv)Company Operating in your community___

What is the main fuel you use for cooking?

(i)Firewood___(ii)Charcoal___ (iii)Kerosene___ (iv)Gas___ (v)Electricity___(vi)Crop residue/ Saw dust___(vii) Animal Wastes___(viii)Others___

HEALTH AND SANITATION

What type of toilet facility do you use?

(i)Pit___(ii) Bush___(iii)Bucket___(iv) Water Closet___(v)Others (Specify).....

How do you dispose of your household refuse?

(i)Private Open Dump___(ii) Public Open Dump___(iii) Organized Collection___(iv)Burning___(v) Bush___(vi)Burying___

Which of the following diseases/condition is most common in your area

(i)Malaria___(ii)Typhoid___(iii)Diarrhoea___(iv)Cough___(v) Respiratory Disturbance___(vi)Others__

PROJECT PERCEPTION

Are you aware of the proposed Erosion Rehabilitation Project? Yes___No__

If Yes, Source of information_____

What is your opinion about the project? Good____ Bad____ Can't say____

If good, what positive impacts do you perceive? _____

If bad, what negative impacts do you perceive? _____

INFORMATION ON AFFECTED PROPERTY

GPS Coordinates: _____

Name of PAP_____

Phone No_____

Category of PAP: Titleholder___ Encroacher___ Tenant___ Squatter____ others (specify) _____

Type of document possessed to certify ownership type_____

If not owned, state name and Address of owner_____

_____

If informal use right, state type of agreement_____

Number of years used_____ Rent paid/month (₦) _____

Details of the structure

Type of Use: Residential____Commercial___Residential/Commercial___Other (Specify) __

Construction Type: Mud___Brick___Mud/Thatched roof__Brick/Zinc roof____

No. of Rooms/Storey___Impacted Area (m^2) _____Total Impacted Area (m^2) ____

Utility Connection: Electricity____Water___Phone__ (P-Partially F-Fully)

Other Affected Assets

Compound wall/fence___ Tree___ Farmland____ Borehole/well___ Others (Specify) ____

Replacement Value (₦) _____

Assets distance to the wall edge_____

Agricultural Products

Type of Crop						
Owner of Crop						
Total yearly production						
Average yield						
Average value of crop						
Number of labor used for production						
Crop products sold at market (%)						

Average yearly household income from agriculture (₦) _____

Trees

Type of Tree						
Number of affected Tree						
Average yield of fruit bearing trees						
Average yearly income from fruit tree						

RESETTLEMENT AND REHABILITATION

In case you are displaced (residentially) where and how far do you prefer to be located?

Within the area___ Outside the area____ Place name_____ Distance___ (km)

Which is your preferred replacement Option?

Land for land lost ___Cash Assistance ___House in Resettlement Site ___Shop in Resettlement Site __Other (Specify) ___

Factors to be considered in providing alternate place

Access to family/friends _____Income from friends___ Income from Business activity___ Daily Job___ Close to Market___ Other (Specify) _____

ANNEX FOUR: LIST OF STAKEHOLDERS MET

KLORIEM

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ &UMUAGU COMMUNITY ---------- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
1	Ogbonna Ezimne	~	07034351227	
2	Rose Uzah	~	~	Rose
3.	Racheal Mbamg	~	~	~

WOMEN

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ &UMUAGU COMMUNITY ---------- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
	Justina Onwuka		08149552401	Jus
	Josphine Mpama		—	Josephine
	Stella Mark		08146962492	
	Mercy Ozuah		08166952368	
	Cupe Mark		09033024713	

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ &UMUAGU COMMUNITY ---------- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
	Okafa Chinedum Johnson	PG	07036432588	
	Chibueze Allison	Member	08030768822	
	Ununna Uzoaka	member	08035318893	
	Friday Nwadundu	member	08	
	Onyeyechi Ogbonna	member	08030566945	
	Corlance Ogbonna	member	09044933978	
	Sarlas Uzoaka	member	08069167170	
	Chinkere Nwoke	youth Chairman	08069290470	
	Amaka Akwuruoha	Member	—	
	Okwudiogbo Mama	member	—	
	Onyekere Mama	Member	—	

FOR MEN

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ &UMUAGU COMMUNITY ---------- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
1	Mr Ikechi Okezie	Umuogo	07068128070	I.C.Okezie
2	Mr Loveday Nwaogu	Umuogele	07032951997	
3	Ms, Young Nnoko	Umuogele	08140621967	
4	Mr Isaac C. Onuekwe	Umuogele		
5	Mr Ngozi Eluwa	✓	07068224446	✓
6	Amaju Akwunuoha	✓		
7	Mr Silas Ozuah	✓	08[illegible]70	
8	✓ Abel Mpamo	✓		
✓	Chief Emmanuel Ogbonna	08035247313		
10	CHIBUEZE Robert	07036835[illegible]6		
11	Emeka Nwankpa	Umuogele	08134743548[illegible]82	

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ &UMUAGU COMMUNITY ~~10/4/2017~~ APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
	Ozuoma Ogbonna	member	07066290256	
	Elder Uwachala Nwaorgu	member	08024415325	
	Elder Samuel Mpama	Secretary	07069277770	Mpama
	Obioha Elder Onwuka	member	08130486042	
	Comfort Ogbonna	member	07033752748	
	Ngozie ~~Peter~~ Victor	member	07033026388	
	Ezinne Uche	member	07038453447	
	Blessing Ozuahe	member	—	
	Peace Uche	member	08145151489	
	Ugochukwu Akwuraola	member	08105744407	
	Ekwa Mpama	member	—	

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ UMUAGU COMMUNITY ----10th---- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
	Theanyi Nwoko	MEMBER	07034784555	
	Amarachi Ozuah	✓	-	
	Bridget Nwosu	✓	08065287772	
	Evelin Egbulefu	✓	08115827078	
	Ngozika Anwodo	✓	08064658508	
	Rosekine Akwarandu	✓	✓	RA

KIOMTEN

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ &UMUAGU COMMUNITY ---------- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
	Lovelyn Ogbonna		07033771216	- L.O.
	Gift Agbakwue		07030186164	- ~~G. Agba~~
	Agnes Bamgh		—	—
	Rhonda Nwoke		—	—
	Justina Ozu		—	—
	Abigail ~~Judge~~ George		—	—
	Comfort Ozuah		—	—
	Chinyere Nwoke		—	—
	Jay Onwukwe		08102451745	
	Oluchi Elewuchi		09093597830	
	Anna Ozuah		—	—

WOMEN

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~ &UMUAGU COMMUNITY ---10th--- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
1.	Uchechi Nsuoa		08062730442	
2	Nkasiobi Nwankpa		08137095819	
3	Salomi Azua		-	
4	Ngozi Ekeuwa		07035691064	
5.	Chidiadi Nwachukwu		-	-
6.	NKiru Ozuah		08130505927	
7	Obioma Mbuku		08136582074	
8	Martha Onuoha		-	-
9.	Grace Oriaku			
10	Uzoma Aguwamba		08073425874	
11	Christiana Adiele			

ABIA NEWMAP ATTENDANCE SHEET FOR ESMP FOR ~~UMUOGELE/UMUAGWU~~
&UMUAGU COMMUNITY ---------- APRIL, 2017

S/N	NAME	POSITION	PHONE NUMBER	SIGNATURE
	Elder Usuwa B. I.	member	07033030320	
	Ikemyi Nwokoro	"	08039[illegible]	
	Uwadiegwu Ulelu	"	-	
	Kingsley O. Ulelu	"	08134602039	
	Elder James Ozuah	✓	08139363[illegible]5	
	Deacon Monday Nwachukwu	"	08160395724	
	Sunday ~~Ike~~ Ibekwe	"	-	
	Ikechukwu [illegible]	✓	07098722680.	
	Onyekachi mpama	✓	07035712111	
	Peace Ibekwe	✓	-	
	Chinaza Nwagu	✓	08145837479	

ANNEX FIVE: LIST OF ENUMERATORS

S/N	NAME	GENDER	AGE
1	CHINASA CHIKEZIE	FEMALE	22
2	ANYAELE CHUKS PETER	MALE	22
3	OSIM OBINNA O	MALE	23
4	MPAMAH IHUOMA CHASTE	FEMALE	25
5	GERALD-GRACE U NMAH	FEMALE	30
6	KALU SARAH CHIDINMA	FEMALE	23
7	AGBAI CHITURU IRO	FEMALE	23
8	IDIKA UGOCHUKWU	MALE	24
9	OKEZUE NNEOMA	FEMALE	32
10	THOMAS MARY C	FEMALE	23
11	MAX EMEKA UMA	MALE	26
12	EKEKE ROLAND	MALE	45
13	DADA ABIGAIL A	FEMALE	28
14	OMEGA HUMPHREY C	MALE	24
15	CHIKA ONYINYE BLESSING	FEMALE	22