



**GOVERNMENT OF ANAMBRA STATE, NIGERIA
NIGERIA EROSION AND WATERSHED
MANAGEMENT PROJECT (NEWMAP)**

**ENVIRONMENTAL AND SOCIAL MANAGEMENT
PLAN (ESMP)**

FOR:

**UMUDUNU-URUOKPALA GULLY EROSION PROJECT
ABAGANA, ANAMBRA STATE. NIGERIA**

FINAL REPORT



**ANAMBRA STATE NEWMAP
STATE PROJECT
MANAGEMENT UNIT (SPMU)
State Secretariat Building
Awka. Anambra State**



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LIST OF ABBREVIATIONS

ABEWAMA	Abagana Erosion and Watershed Management Association
ABSS	Abagana Girls Secondary School
ANSG	Anambra State Government
ARAP	Abbreviated Resettlement Action Plan
CAI	Community Administrative Institutions
CBO	Community-Based Organization
CDO	Community Development Organization
EIA	Environmental Impact Assessment
E&S	Environmental and Social
ES	Executive Summary
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
FBO	Faith-Based Organization
FGD	Focused Group Discussion
FGN	Federal Government of Nigeria
FME	Federal Ministry of Environment
GEF	Global Environmental Fund
GRASS	Gully Rapid Action and Slope Stabilization
GPS	Global Positioning System
GRM	Grievance Redress Mechanism
LGA	Local Government Area
IDF	International Development Fund
MDA	Ministries, Departments and Agencies of Government
MOE	Anambra State Ministry of Environment
MOH	Ministry of Health
MOLS	Ministry of Lands & Survey
MOW	Ministry of Works
NEWMAP	Nigeria Erosion and Watershed Management Program
NGO	Non-Governmental Organization
OP/BP	Operational Policy/Bank Policy
PCC	Project Complaints Committee
PAH	Project-Affected Household
PAP	Project-Affected Person

PIU	Project Implementation Unit
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SCCF	Special Climate Change Fund
SPMU	Anambra State Project Management Unit
TOR	Terms of Reference
WB	World Bank
WIEF	World Igbo Environmental Foundation

EXECUTIVE SUMMARY

Introduction

The Government of Anambra State (ANSG) of Nigeria is implementing the Nigeria Erosion and Watershed Management Project (NEWMAP) to help reduce soil erosion vulnerability and to develop her watersheds. NEWMAP was initiated by the Federal Government of Nigeria (FGN) to support initially, seven southern states of the country (Abia, **Anambra**, Cross River, Ebonyi, Edo, Enugu and Imo States) known to have severe flood and erosion problems, and is funded by the World Bank (WB) and the International Development Fund (IDF).

The implementation of projects under the NEWMAP is guided by the Environmental and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF) prepared for NEWMAP. In accordance with the provisions of the ESMF, an environmental and social management plan (ESMP) is required for the project. The ESMP ensures that specific project activities are in compliance with the relevant environmental and social safeguard requirements for sound project execution. Consistent with the ESMF, this ESMP has been prepared specifically to identify, evaluate and document the set of environmental and social impacts associated with the project activities. The mitigation measures necessary to address the impacts are also identified. The ESMP also provides necessary institutional framework and monitoring actions to be taken before, during and after the remedial construction and rehabilitation works to reduce the impacts to acceptable levels.

Project Location

The project is located in Abagana situated within latitude 6° 09¹ and 6° 11¹, and longitude 6° 56¹ and 6° 59¹ outside the Anambra State Capital Territory. The project site is located about two kilometers off the Old Onitsha-Enugu Road on the east highland side in front of the Njikoka LGA headquarters. Abagana is one of the many towns in Anambra State whose communities are perennially devastated by erosion gullies resulting from storm water flow. It is in the effort to reduce the impacts of erosion on the Abagana communities that ANSG has proposed to rehabilitate the existing major gully and its finger - Umudunu-Uruokpala erosion corridor through the NEWMAP opportunity.

Project Description

The project consists of remedial structural and non-structural developments that include civil works and vegetative restoration along two active (one main and one finger) gully corridors. The main gully has an average width of 90 meters at the top and average height of 18 meters, while the finger gully has an average width of 70 meters at the top and average height of 15 meters. The gully-heads are located at Umudunu village of Abagana while the outfall is located at Adagbe village of the town, meandering a total distance of about 4.46 kilometers through Uruokpala and Uru villages of the town. The main and finger gullies confluence at Uru village of Abagana close to the Abagana Girls Secondary School.

The key activities for the Civil Construction Works involve:

- cutting and filling for percentage recovery;
- compaction of soils;
- concrete casting;
- assembling of structures, and,
- slope stabilization.

The key non-structural work components (Biological Works) will involve:

- Terracing;

- Structured vegetation;
- Specific trees planting with known root strength
- Economic trees planting

It is envisaged that about 1.32 hectares of land will be required for stabilization of deep gully wall sections with the attendant loss of economic trees/crops and temporary loss of use of that portion of land.

Need for ESMP

The initial scoping of the sub-projects under NEWMAP, as contained in the ESMF indicates that NEWMAP is categorized as WB Category A project whose impacts are sensitive, diverse, unprecedented, felt beyond the immediate project environment and are potentially irreversible over the long term.

The erosion gullies run through Umudunu - the upper watershed of Abagana town which has significant population and critical infrastructures. This result in continued damage to existing infrastructures (roads, drainage channels and private properties) as water flows through the lower and upper watersheds.

Within the lower watershed, residential properties including the Palace of the Traditional Ruler (the Igwe) of the community and other key facilities along the corridor are also seriously threatened. These facilities include critical inter-community roadways and Abagana Girls Secondary School. The two major inter-community roadways that have been dislodged by erosion result in very long detours for community people who travel to neighboring communities to trade their goods. Large area of farmlands has been impacted with many families losing their primary means of livelihoods. Additionally, the Abagana erosion sub-project will result in a significant disturbance of the environmental conditions, with both localized and regional impacts. Consequently, the ESMP as a site-specific safeguard instrument is required to provide necessary procedures and criteria that will guide the proposed site interventions.

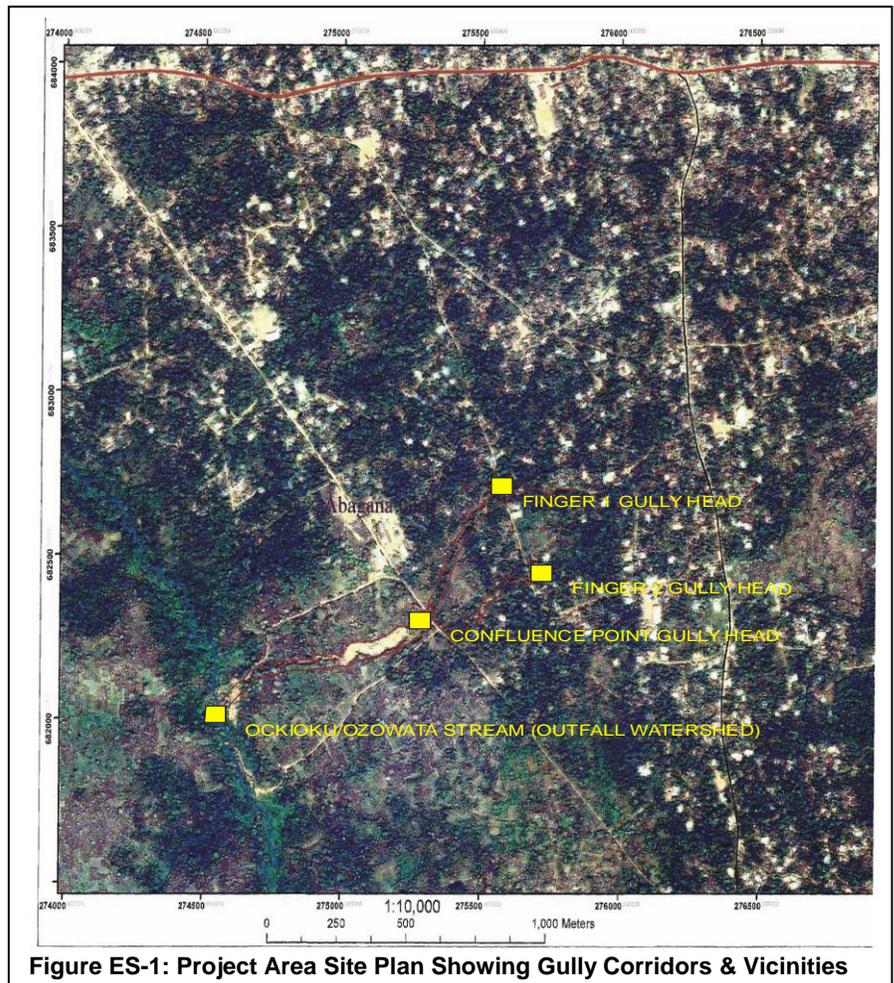


Figure ES-1: Project Area Site Plan Showing Gully Corridors & Vicinities

Based on the environmental and social effects of the project the two triggered WB safeguard operational policies (OPs) include:

- Environmental Assessment (OP/BP 4.01)

- Involuntary Resettlement (OP/BP 4.12)

Project Area Information

The Umudunu-Uruokpala gully erosion corridor runs southwestward from the northeastern section of Abagana town at elevation of 790 feet (263m) to terminate at the Oshoku/Ozowata stream in the southwestern section at an elevation of 430 feet (143 m). (See Figure ES-1). The stream floor is now heavily silted and little or no water currently flows through the stream. This stream which in the past served as a major source of drinking water for a significant portion of Abagana community is now extinct. The Abagana watershed is drained by the Mamu River together with its main tributary, the Odo River and their numerous smaller tributaries.

The climatic condition of the project area is characterized by uniformly high temperatures and a seasonal distribution of precipitation. A tropical wet and dry season prevails in the project area. The dry season runs through the months of October to March and the rainy season that begins in March and ends in October. The months of July and August are usually the wettest period of the rainy season. The conventional nature of the heavy rainfall results in alternating periods of sunny and rainy conditions. Some of the rainfall occurs as violent downpours accompanied by heavy flooding, soil leaching, extensive sheet wash, groundwater infiltration and percolation.

The project area lies within the humid tropical rainforest belt of southeastern Nigeria and evidences savannah type vegetation. But pressure on land in form of agriculture and commerce has largely reduced the vegetation to mixed savanna. The vegetation cover is highly heterogeneous due to intense disturbance arising from human activities. Six vegetative categories were identified during this study. A listing of plant species with frequent or abundant distribution in the various categories are shown in Chapter 2. Other plants of the watershed include: cotton tree (akpu ogwu), iroko tree (orji), bamboo tree, tridax, ufii, water lily, bulrush, reeds, icheku, assorted grasses, shrubs etc.

The animal inventories identified in the watershed include the following:

- Soil Arthropods: such as Oprillion, Geophiles, Spiders, Scorpions, Centipedes (myriapoda), and Millipedes.
- Gastropods: Snails, crabs.
- Snakes - e.g. Viper, Rattle snake, Grass snake, (Ophidia), Lizard, (Monitor, Agama etc), tortoise, Slow Worm (Iacertilian), Rhizolriga Duphcata (Tutuntu), Rove Beetle
- Assorted types of Ants, Napa, Dystiers, Toad, Frogs, Water Scorpions, Butterflies
- Fishes (e.g. Tilapia, Catfish), Alligator, Crocodiles.
- Birds- Owl, Kite, Hawk, Sparrow, Partridge, Wild Dove (Ndo ofia), Vulture, Robin, Obu, Apia, Elo, Ugene-oma etc.
- Other Land Animals include Wild Rabbits, Hare (Ikpikpa), Grass Cutter, Wild Rat (Eyi), Rats, Mouse, Domestic Fowl and Goats, Dogs, Cats, Edi etc.

Socioeconomic Analysis

Based on the socioeconomic survey conducted for the project area, the findings from the analysis of data provided by respondents are summarized in Table ES-1.

Table ES-1: Summary of Findings for All Socioeconomic Indicators

S/No	Socioeconomic Indicator	Findings
1	Population	Abagana has a total population of 46,136 people. Male population is 22,973 (49.79%) while the female population is 23,163 (50.21%).

S/No	Socioeconomic Indicator	Findings
2	Ethnic Groups and Language Spoken	The people of Abagana consist of one major Nigerian ethnic group – the Igbos. The people generally speak and write mainly the Ibo and English languages. Abagana town is made up nine villages. Clanism and kinship are strong elements and driving forces in control of political and cultural institutions and service points. The villages consist of groups of households whose families are inter-related.
3	Religion	The people of Abagana people are predominantly of Christians, mostly Catholics and Anglicans with some traditionalists and negligible Muslim community.
4	Land Use System	Three major types of customary land tenure system exist in Abagana – (1) individual land ownership; (2) family land ownership; and. (3) communal land ownership. Individual ownership may be for indigenes or for residents of the community. Family lands (as well as individual lands) are inherited from generational relatives. Communities retain family lands which may never be sold but mostly used for agricultural purposes. About 80% of land is committed to agricultural production of food crops which include maize, cassava, yams, plantain, vegetables, etc.
5	Household Distribution in Project Area	Based on surveyed households in the project area, about 71% of households are from Umudunu village, 22% from Uruokpala village, 5% from Uru village and 1% from Adagbe village. This data appears to reflect development/infrastructural densities of the respective villages within the project corridors.
6	Gender, Age and Household Size of Respondents	86% of respondents are males while 14% are females Age distribution shows 29% of households are below 18 years old; 52% are between the ages of 19 to 30 years; 30% are between the ages of 31 and 65 years while 6% are over 65 years of age. Household distribution in project area range from 1-10 persons with an average household size of 5 persons.
7	Marital Status of Respondents	About 90% of the respondents are married while 5% are single and about 5% are widowed.
8	Access to Education	There is high literacy level within the project area which also reflects the literacy rate in Abagana as a whole. 95% of respondents have attained the minimum of primary education with only 5% of the population of schooling age has never attended school Several educational facilities are readily available in Abagana resulting in the net high level of basic and primary education levels with 45% at secondary education level
9	Occupational and Income Distribution of Respondents	The occupational distribution data from the questionnaire indicates 40.0% of respondents are self-employed or own their businesses; 31.0% are engaged in farming; 15.0% are civil/public servants with 2.0% engaged in private sector work and 12.0% are unemployed. Income data by respondents shows 12% of respondents earn over N60,000 monthly; 78% earn between N19,000 and N48,000 monthly; 4% earn between N49,000 and N60,000; and 6% earn N18,000 and below.
10	Household Waste Disposal	Household wastes are indiscriminately dumped at illegal dumpsites adjacent to the gully in the project area. Solid

S/No	Socioeconomic Indicator	Findings
		waste management is a considerable hazard to health and the effective functioning of the storm water drainage systems. Unmanaged refuse disposal causes regular obstruction of the storm water drainage systems.
11	Health Services	Records show that common diseases in project area include diarrhea, malaria, typhoid, pneumonia, cough, skin diseases, deficiency diseases, eye diseases, ear diseases, and waterborne diseases due to malnutrition and lack of hygiene. The quality of the health services in the project area is generally poor. Most people go to quacks and medicine shops for minor medical treatment.
12	Desirability of Project	99% of survey respondents indicated immense desirability for the project to proceed.
13	Conflict Resolution Mechanism	97% of survey respondents prefer that their conflicts be resolved through informal traditional modes of conflict resolution. Less than 3% favour resolution through the court system.

Environmental and Social Impacts

There are both positive and negative impacts associated with this project. Overall, this project is aimed at halting or minimizing the environmental and social damages being caused by the incidence of gullying in the project area and beyond. There is an overwhelming emotional relief for community members over fears of losing their ancestral assets to gully erosion with the non-implementation of this project. This is, in the overall a positive impact. Other positive impacts include improved flow of traffic in and out of the project area neighborhood; reduce costs of transportation and delays on travel time and also CO₂ emissions; improve livelihoods for the area residents due to reduced cost of transportation; improve the landscape vista; and provide temporary job opportunities for both skilled and un-skilled labors.

The adverse impacts for which appropriate mitigation measures have been provided include:

Social:

- Loss of physical assets
- Loss of means of livelihood

Environmental:

- Dust and air quality
- Surface and ground water quality
- Noise and vibration
- Vegetation loss
- Public/Occupational Health and Safety
- Earth movement
- Traffic and Transport
- Solid and liquid waste
- Climate change

The project does not envisage any permanent involuntary displacements. No buildings or structures will be impacted by the remedial construction works. No sensitive sites or resources such as forest reserve, cemetery, shrine or other places of historical and cultural interests will also be impacted by the project. Additionally, the rehabilitation works will not affect any utility lines such as water, electricity or telecommunication lines.

Impact Mitigation Measures:

The developed measures to mitigate the identified adverse impacts include: creating of

sustained community awareness and sensitivity to the project activities as well as capacity building and training programs for the various ESMP implementing agents. Other measures include water dousing and heaped soil covering; regular maintenance of plant and machineries; erection of embankments around fueling and servicing areas; protection of water bodies from deposition of wastes and construction materials; exposure control of workers and the public to noise and vibrations; selective vegetative clearing and quick regeneration of vegetation; erection of road warning signs, imposition of speed limits and road diversions; provision and use of PPE; proper and appropriate record keeping; and, proper and regular interface with the community stakeholders. The specific mitigation actions associated with the various impact categories are shown in Chapter 5.

ESMP Monitoring Plan:

The ESMP implementation monitoring will check the effectiveness of mitigation and erosion prevention measures. Such monitoring will also pay close attention to air pollution issues and contamination of water bodies; records of machinery maintenance schedules; noise and vibration exposure levels and duration; water dousing and vehicle speed control; fulfillment of the terms of agreements; records of injury and clinic attendance cases, use and state of PPEs; HIV/ AIDS awareness programs effectiveness; state of toilets and segregation of waste; and mounted road signs and traffic direction. The specific monitoring indicators and the frequencies of monitoring for the various impact categories are shown in Chapter 5.

Public Participation and Consultations

Several formal and informal consultation and town hall meetings were held with members of the Abagana public and residents of the four villages (Umudunu, Uruokpala, Uru and Adagbe) affected by the project. Two town hall meetings were held on January 21, 2014 at the Uruokpala Community Hall and the other on February 6, 2014 at the Palace of the Traditional Ruler, HRH Igwe Mbamalu Okeke. Particularly, the community members welcomed the project and expressed anxiety that remedial work should commence expeditiously to prevent occurrence of further erosion damages from the rainfalls.

The most frequently raised comments, concerns, questions and suggestions raised by stakeholders during the project community consultations and meetings are summarized in Table ES-2 below.

Table ES-2: Summary of Frequently Raised Comments, Concerns, Questions at Community Meetings and Consultations

Comments/Concerns/Questions Raised	Consultant’s Responses to Issues Raised
Residents welcomed the proposed project and are very positive about the measures being taken to address the problems of flooding and erosion which are currently affecting their lives significantly.	The widespread support for the proposed project is appreciated and encouraged to be sustained throughout the project cycle and beyond
Erosion and flooding have caused damages to the people’s homes and have also caused loss of livestock, personal possessions in the past. Will project compensate those that were affected in these losses?	No. The project will compensate only damages resulting from the implementation of project activities
Many of the stakeholders reported that there have been numerous efforts in the past to effectively manage the existing gullies but these have failed largely due to a lack of funding resources. Will funds be made available to tackle future gullies beyond the current project?	One of the NEWMAP components is to help communities build capacity to check erosion and effectively manage their watersheds on a sustainable basis
Flooding and gully erosion are serious problems bestriding Abagana. Several gullies exist in the community. What can the community do to achieve a	Stakeholders seemed unaware that the gullies are attributable to the intermittent channelization of storm water by various

Comments/Concerns/Questions Raised	Consultant's Responses to Issues Raised
sustained check on the incidence of gullies?	property owners in a bid to check water inflows into their respective properties. There is need for awareness creation in the community on how to prevent and control erosion.
The majority of stakeholders commented that awareness creation was essential for the long-term success of the erosion and watershed management program; and that manpower development should be included in the program.;	This view was endorsed by the Consultant.
The construction activities may result in loss of their properties, lands or damage to their economic trees and crops. In such cases, will there be compensations for such damages?	Yes there will be compensations for property damages or loss of assets as a result of project implementation. The purpose of the RAP is to methodically identify such properties and assets that may be impacted and establish level of compensations that may be made
Community safety concerns regarding the next cycle of rainy season were keenly expressed. The community is very apprehensive of the advancement of the gully when the rains come pounding;	The concerns here are noted. It is important that the community provide the necessary support to help speed up conclusion of all due diligent aspects of the project. It is hoped that the project will proceed expeditiously enough as to not cause further damages to the community.
Abagana has lost its only portable water supply source (Oshoku spring water) to massive siltation from erosion. Will the project help restore this water supply source?	No.
Will there be compensation for impacts associated with resettlement and for economic losses and physical displacement?	Yes. Any losses resulting from the project implementation will be compensated.
Will there be compensation for loss of crop lands and pasture. ?	Yes. Any losses resulting from the project implementation will be compensated.

ESMP Coordination and Implementation

The primary responsibility for the project execution and ESMP implementation is on the SPMU. The SPMU through its various officers and also using the available tool of consultancy appointments, shall provide the necessary awareness, mobilization and facilitation, project appraisal, approval & disbursement, capacity building, monitoring & evaluation of all project activities and reporting to the FPMU and the World Bank.

The key actors in the implementation of this ESMP include:

- The contractor - to be awarded the rehabilitation contract and be required to implement the environmental and social safeguard measures;
- SPMU - to ensure that environmental and social (E&S) safeguards and other mitigation measures are duly implemented;
- FME - to ensure compliance with the ESMP and other relevant approval conditions;
- MOE - to oversee the effective implementation of the gully erosion project and related E&S safeguards
- PCC - to address complaints of any aggrieved parties on E&S safeguards
- MOLS – to ensure appropriate compensation for land matters at the prevailing market rate.

Institutional Capacity and Training Needs

Several training programmes will be required to enhance the effectiveness of the key implementing actors of this ESMP. A summary of the institutional capacity and trainings that will be provided to the various groups is presented in Table ES-3.

Table ES-3: Summary of Institutional Capacity and Training Needs with Costs

Programme Description	Participants	Form of Training	Duration	Training Agency	Estimated Cost In (N)
<u>Understanding the Environment:</u> Concepts, Regulations & Statutory Requirements; Environmental Management; Erosion Prevention & Control; Stakeholder & Community Participation (Nigeria and World Bank)	Officials of MOE, MOW, MOLS, SPMU, Contractor, Community Leaders, NGOs, CBOs & Other Relevant Groups	Workshop	One Day	External Agency Engaged for Capacity Building/Environmental & Social Specialists	300,000.00
<u>Scope of Abagana Intervention Project:</u> Environmental & Social Impacts; Engineering Design and Associated ESMP; Coordination with Other MDAs and the Community	Contractor, Safeguard Officers, Engineers, MOE & relevant MDAs, Community Leaders, CDOs, & NGOs	Workshop	One Day	External Agency Engaged for Capacity Building/Environmental & Social Specialists	250,000.00
<u>Project Implementation:</u> Civil Works with Use of Vegetation for Gully Stabilization; Roles and Responsibilities of Key Actors; Environmental Monitoring & Mechanism	SPMU Engineer, Safeguard Officers, Contractors, MOE	Lecture and Site Visit	One Day	External Agency Engaged for Capacity Building/Environmental & Social Specialists	200,000.00
<u>Monitoring and Evaluation:</u> ESMP Monitoring and Reporting Strategy; Stakeholder and Community Participation	Contractor, Safeguard Officers, Engineers, MOE & relevant MDAs, Community Leaders, CDOs, & NGOs	Workshop	Half Day	Environmental & Social Specialists; External Agency engaged for capacity building	150,000.00
<u>Watershed Protection and Management:</u> Alternative Income Generation Programme for Stakeholders and Skills Requirements; Promotion of Agricultural Methods and Technologies for Improving Farm Production and Erosion Prevention;	Watershed Committee, Community Leaders, LGA Staff, Support Professionals	Workshop	One Day	World Bank/External Agency Engaged for Capacity Building/Environmental & Social Specialists	300,000.00
TOTALS					N1,200,000.00

Grievance Redress Mechanism

A mechanism through which complaints and disagreements can be smoothly resolved has been devised for this project. As part of the grievance redress mechanism, formation of a project complaints committee (PCC) is recommended to receive and document all public complaints relating to the project. Currently, there is a series of customary avenues that exist to deal with dispute resolution in the community and they will be employed as the “court of first appeal”, where relevant. It is anticipated that this will allow unencumbered platform for people to express their dissatisfaction over any environmental and social (E&S) issues arising from the project. All grievances or complaints must be registered and compiled regularly for project management. The devised mechanisms are fundamental to achieving transparency in the ESMP process.

ESMP Implementation Budget

The budget estimate for the E&S safeguards as specified under this ESMP, including cost for administration, monitoring and evaluation is **N5,552,500.00** (five million five hundred and fifty two thousand, five hundred Naira) only. The proposed budget will facilitate the implementation of the various measures, monitoring plan and capacity building of the ESMP and should be made an integral part of financing for Umudunu-Uruokpala gully erosion intervention and rehabilitation project. The specific E&S safeguards obligations for the contractor should be incorporated into the contract specifications along with other contract provisions.

The estimated mitigation cost for the environmental and social management has been developed with due consideration to the following factors:

1. The size of the erosion gully;
2. The type of technology to be employed;
3. The volume of the project affected households and persons;
4. The degree of stabilization of the gully; and ,
5. The area of coverage of the proposed project.

A summary of the budget estimate is presented in Table ES-4

Table ES-4: Breakdown of Cost Estimates

S/No	ITEM	RESPONSIBILITY	COST BREAKDOWN IN (N)			COST ESTIMATE IN NAIRA (N)	COST ESTIMATE IN (US\$)
			Pre-Construct ion Phase	Constructi on Phase	Post-Construct ion Phase		
1	MITIGATION	SPMU/Contractor	To be built into Contractor costs			-	-
2	MANAGEMENT	SPMU/ MOE	350,000	750,000	350,000	N1,450,000.00	US\$9,062.50
3	MONITORING	SPMU/ FPMU/ FME/ MOE/ Environmental Consultants/ Contractor	550,000	1,700,000	400,000	2,650,000.00	16,562.50
4	CAPACITY BUILDING & TRAININGS	SPMU/ MOH/ Consultants/ Contractor	900,000	300,000	0	1,200,000.00	7,500.00
Sub-total						N5,300,000.00	33,125.00
5	CONTINGENCY (5%)					N252,500.00	1,578.13
GRAND TOTAL						N5,552,500.00	US\$34,703.13

Review and Disclosure

This ESMP is expected to be subjected to public review and comments, and it should be disclosed in-country in one national paper and a local paper and in World Bank InfoShop.

CHAPTER 1: INTRODUCTION

1.1 GENERAL

This Environmental and Social Management Plan (ESMP) has been prepared in support of the Nigeria Erosion and Watershed Management Project (NEWMAP) being implemented in Anambra State of Nigeria. NEWMAP was initiated by the Federal Government of Nigeria (FGN) to help reduce soil erosion vulnerability and to develop watersheds in seven southern States of Nigeria (Abia, **Anambra**, Cross River, Ebonyi, Edo, Enugu and Imo States). Anambra State is located in the Southeast geopolitical zone of Nigeria and is known to be under severe flood and erosion problems. The state has been identified as the epicenter of gully erosion in Nigeria. Figure 1-1 shows the location of Anambra State within the Southeast of Nigeria.



Figure 1-1: Map of Nigeria Showing Location of Anambra State

Abagana is situated within latitude $6^{\circ} 09^1$ and $6^{\circ} 11^1$, and longitude $6^{\circ} 56^1$ and $6^{\circ} 59^1$ outside the State Capital Territory in Njikoka Local Government Area (LGA) in the central part of the State. The town is one of the many towns in Anambra State whose communities are perennially devastated by erosion gullies resulting from storm water flow. With each passing year, uncontrolled storm

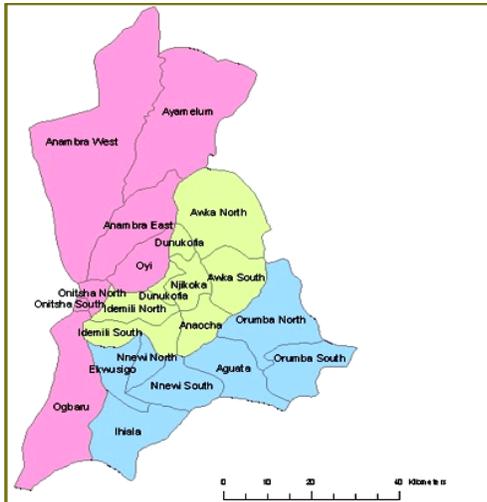


Figure 1-2: Map of Anambra State Showing Location of Njikoka LGA



Figure 1-3: Map of Abagana

water flow creates new gullies that threaten lives and properties while existing gullies are deepened and widened. In an effort to reduce the impacts of erosion on the Abagana communities, the Anambra State Government (ANSG) has proposed to rehabilitate and remedy one of the existing gullies - Umudunu-Uruokpala erosion corridor through the NEWMAP opportunity. Figure 1-2 shows the location of Njikoka LGA in Anambra State. Figure 1-3 shows the map of Abagana and its component villages.

1.1.1 Responsible Lead Agencies

The lead Agencies for NEWMAP at the various tiers of government are as follows:

Federal Lead Agency:

The Federal Ministry of Environment
Department of Erosion, Flood Coastal Zone Management
Abuja. Nigeria

State Lead Agency:

Anambra State Ministry of Environment
State Secretariat Complex
Awka. Anambra State

1.2 Description of Proposed Intervention

1.2.1 Site Location

The Abagana project site is situated at latitude 6° 10' 24" N and longitude 6° 58' 20" E. The gully trends approximately northeast-southwest direction. It is about 2.4 kilometers long, the width varies from 2m - 35m and depth ranges from 3 m to 25 m. The project site is located about two kilometers off the Old Onitsha-Enugu Road on the east highland side in front of the Njikoka LGA headquarters. The landscape slopes gently from Enugwu Ukwu to the Oshoku stream towards Eziowelle and Umunachi. The Oshoku stream which was the only source of portable water for Abagana communities has completely silted up forcing the communities to now depend on water borehole most times provided in motorized water tankers.

Finger 1 Gully

The gully head for this finger gully is located by Uruokpala Community Town Hall. The

finger gully takes its origin from Umudunu and runs into the concrete culvert close to the Community Hall with location coordinates latitude 6 10.381, longitude 6 58.257. The gully is about 780meters long with average width of 45 meters. The depth varied from 18 meters at the gully head to 2 meters at the confluence point. The side slopes are V-shaped with average inclination of 1v:0.5h.

Finger 2 Gully

The gully head for this finger gully is located approximately 400 meters away from gully finger 1 near Uruokpala Community Town Hall as shown in Figure 1-4. This finger gully begins in Umudunu village as the first contributory finger with GIS location coordinates of latitude 6 10.648, longitude 6

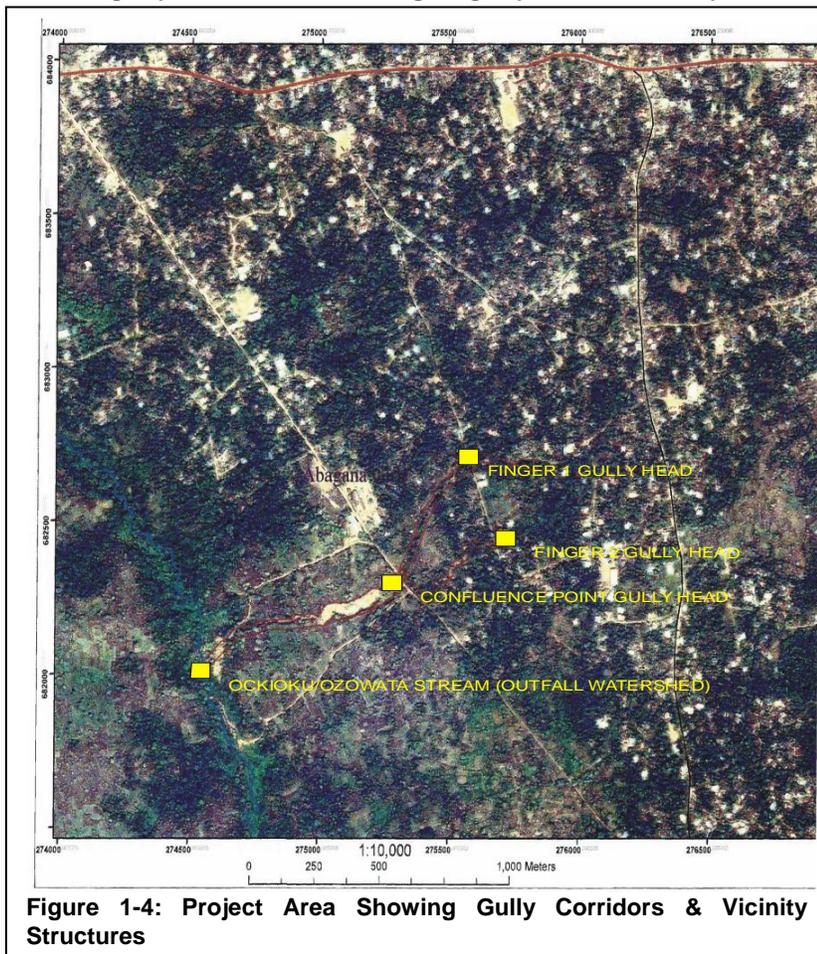


Figure 1-4: Project Area Showing Gully Corridors & Vicinity Structures

58.513, and progressively develops into bigger gully at Uruokpala village, with several other contributory fingers. The gully is about 510 meters long with average width of 30 meters. The depth varied from 3 meters at the gully head to 15 meters at midway and 2 meters the confluence point. The side slopes are V-shaped with average inclination of 1v:0.5h. Flood flow towards this gully head is via abruptly terminated drainage channel. The channel is highly under sized, resulting in over flows, which further induces localized erosion around the gully head. The flow corridor for this finger gully is as shown in Figure 1-4.



Figure 1-5a: Uruokpala Town Hall Road Showing the Gully Culvert in 2011



Figure 1-5b: Culvert Outlet Revealing Town Hall Road Gully Head

Confluence Point of Finger 1 and Finger 2 Gullies

This confluence finger gully is located near Abagana Girls Secondary School (AGSS) in

Adagbe village as shown in Figure 1-7. The Gully Finger 1 and Gully Finger 2 confluence into a constricted inlet of a culvert along Oyeagu-Nimo local road (this culvert is now completely collapsed). The downstream side of the culvert forms the gully head for this stretch of gully as seen in Figure 1-6a & 1-6b. The gully head is located at coordinates latitude 6 10.209, longitude 6 58.144 at an elevation of 471 feet (157 m) just behind the Abagana Girls Secondary School. Access to this gully is through the Abagana Girls School Road (now badly damaged by erosion rills). The gully depth ranges from 25 meters



Figure 1-6a: Abagana Girls School Road Culvert Linking Abagana with Nimo

at the gully head to 2 meters at the confluence point. This gully runs through Uru village to terminate at the Ozowata/Oshoku stream. There are incidences of water seepage at about 1120 meters downstream of the gully head. The side slopes are V- shaped with average inclination of 1v:0.5h. The flow corridor for this finger gully is as shown in Figure 1-4.

The Oyeagu-Nimo local road or AGSS Road (Access Road No.1) is a vital commerce link road between Abagana and Nimo communities. Figures 1-4a & 1-4b show the concrete culvert along this road on the brink of



Figure 1-6b: Culvert Outlet Revealing Abagana Girls School Road Gully Head

collapse in 2011. The culvert has now collapsed. With the collapse of this culvert, a major commerce and communication route and inter-community link between the two neighbouring towns of Abagana and Nimo have been cut off.

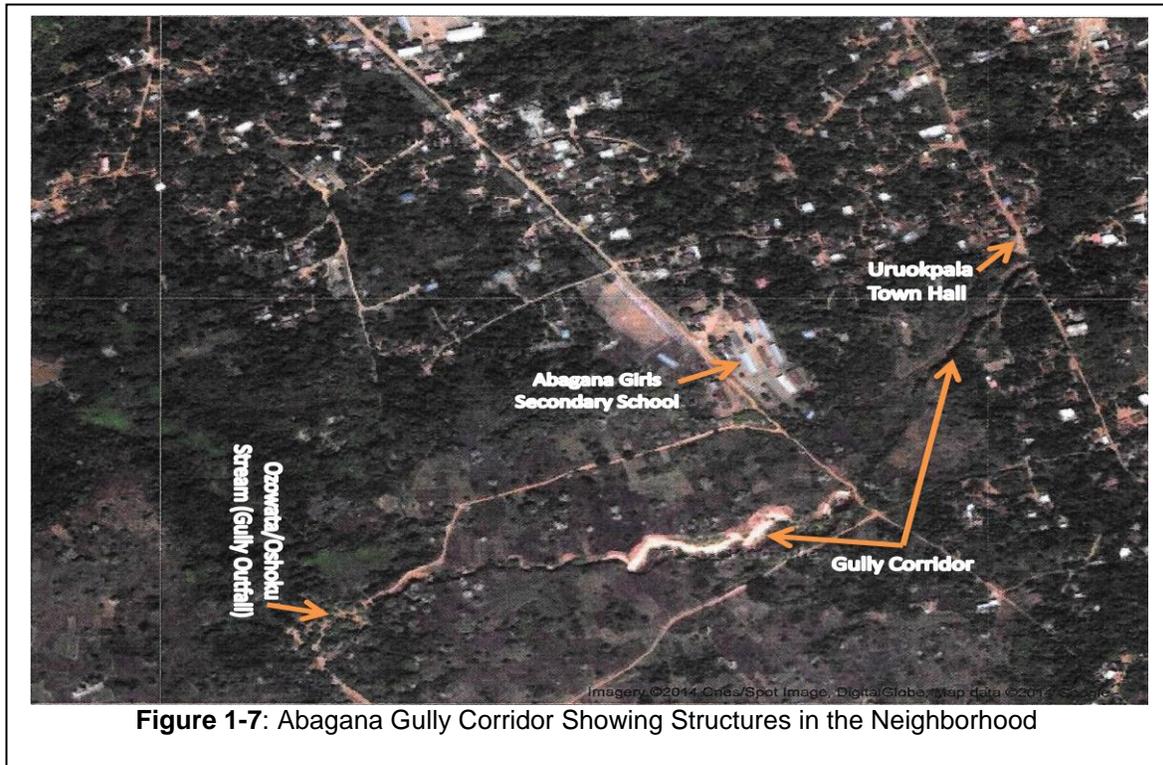


Figure 1-7: Abagana Gully Corridor Showing Structures in the Neighborhood

1.2.2 Project Activities:

The stabilization and reclamation activities will involve civil works as well as bio-restoration at various sections of the gully corridor. Specifically, these activities will include:

The key activities for the Civil Construction Works involve:

- cutting and filling for percentage recovery;
- compaction of soils;
- concrete casting;
- assembling of structures, and,
- slope stabilization.

The key Biological Works will involve:

- Terracing;
- Structured vegetation;
- Specific trees planting with known root strength
- Economic trees planting

1.2.3 Activity Description

The proposed projects' activities can generally be divided into three phases, namely:

1. Pre-construction phase;
2. Construction phase; and,
3. Post-construction (maintenance) phase.

Each phase of the project activities are as described below.

Pre-construction Phase

As part of the pre-construction stage, MOE commissioned Nest Engineering Limited to develop the detailed engineering design for the remedial activities and rehabilitation of the erosion gully corridor. The preparation of this ESMP and the Resettlement Action Plan (RAP) forms part of the pre-construction phase. The commencement of the remedial construction activities is expected to begin after the completion of the ESMP and RAP process.

Construction Phase

The construction of the erosion control infrastructure and the site rehabilitation activities, as designed, will require the use of existing severely eroded/damaged access roadways to reach the project location. The two access roadways are the Oye Abagana-Oye Nimo Road (Access Road No.1) and the Uruokpala-Nimo Road (Access Road No.2). Civil works associated with these access roadways include rehabilitation of the roads and associated drainages, and creation of hard standing areas. The need for the rehabilitation of the access roads is heightened by the level of destruction that will arise from movement of heavy duty vehicles and equipment for project construction activities.

The preparation of the construction staging areas and the gully beds will require some localized vegetation clearance and the removal of incipient solid waste materials, respectively. Materials arising from the excavation for the construction of the gully head drop structures, catchment basins, foundations, gully wall stabilization (soil, rock etc.) and installation of gabions would be spread in appropriate areas as backfill along the gully corridor. The foundations will be in-filled with cement supplied via ready-mix-cement trucks or alternatively mixed on site.

The foundations of the lattice structures will be dug manually. The depth of foundations will be consistent with the geotechnical study. Vegetation clearing will be done manually. A number of transport vehicles will be employed in the project but there will be no on-site maintenance of vehicles. The power equipment expected to be used in the construction including power saws and compressor to break hard ground (if required). Earth moving equipments such as excavators, compactors, bulldozers and pay loaders will also be used at the site; Additionally, skilled and unskilled labor will be employed during the project implementation.

Post-Construction (Maintenance) Phase

Once constructed, the erosion control infrastructure will require routine maintenance. Routine visual inspection and maintenance of the rehabilitated gully corridor are expected. There may be a requirement for occasional visits to prune trees or remove tree branches where these start to grow too wild and at cross purposes. Access rights may need to be retained through the community watershed association to allow for maintenance works in the future. The gully corridor will require routine periodic maintenance of the site infrastructure (drop structures, catch basins, gabions, drainage channels, roadways etc) as well as necessary oversight of the economic trees.

1.3 Project Rationale:

Environmental Impacts:

The proposed ground interventions at the Abagana (Umudunu-Uruokpala) erosion site will rehabilitate and expectedly reverse land degradation at the site. The project consists of remedial structural and non-structural developments that include civil works and vegetative restoration along two active (one main and one finger) gully corridors. The civil works also involves the construction of several check dams along the gully corridors. These activities trigger the WB Safeguard Policies that include, for Abagana project, Environmental Assessment (OP 4.01),

Natural Habitats (OP 4.04), Cultural Property (OP 4.11), and Safety of Dams (OP 4.37) as shown in the Table 1.1 – Triggered Safeguard Policies.

The main gully has a width of about 90 meters at the top of the widest point and average height of 18 meters, while the finger gully has a width of about 70 meters at the top of the widest point and average height of 15 meters. The gully-heads are located at Umudunu village of Abagana while the outfall is located at Adagbe village of the town, meandering a total distance of about 4.46 kilometers through Uruokpala and Uru villages of the town. The main and finger gullies confluence at Uru village of Abagana close to the Abagana Girls Secondary School.

Table 1.1: Triggered Safeguard Policies

Safeguard Policy	Triggered by NEWMAP?		Triggered by Abagana Project?		Applicable To Project Due To	How Project Addresses Policy Requirements
	YES	NO	YES	NO		
Environmental Assessment (OP/BP 4.01)	[x]	[]	[x]	[]	Civil works with site-specific impacts	ESMF prepared for NEWMAP & site specific mitigation measures developed in this ESMP
Natural Habitats (OP/BP 4.04)	[x]	[]	[x]	[]	Vegetation clearing and movement of equipment with impacts on natural habitats	This ESMP spells out appropriate site specific mitigation measures
Pest Management (OP 4.09)	[x]	[]	[]	[x]	NA*	NA
Physical Cultural Resources (OP/BP 4.11)	[x]	[]	[x]	[]	Three local shrines near gully corridor	This ESMP spells out appropriate site specific mitigation measures
Involuntary Resettlement (OP/BP 4.12)	[x]	[]	[x]	[]	Restriction of access to sources of livelihood.	RPF prepared for NEWMAP & a standalone RAP spells out site specific issues to be addressed & how.
Indigenous Peoples (OP/BP 4.10)	[]	[x]	[]	[x]	NA	NA
Forests (OP/BP 4.36)	[x]	[]	[]	[x]	NA	NA
Safety of Dams (OP/BP 4.37)	[x]	[]	[x]	[]	Several check dams with site-specific impacts	Detailed engineering designs provides for safety and maintenance of check dams
Projects in Disputed Areas (OP/BP 7.60)*	[]	[x]	[]	[x]	NA	NA
Projects on International Waterways (OP/BP 7.50)	[x]	[]	[]	[x]	NA	NA

Social Impacts:

The erosion gullies run through Umudunu - the upper watershed of Abagana town which has significant population and critical infrastructures. This result in continued damage to existing infrastructures (roads, drainage channels and private properties) as water flows through the

lower and upper watersheds. Within the lower watershed is the rural area where local people are located including their residential properties and the Palace of the Traditional Ruler (the Igwe) of the community. Other key facilities along the corridor of these gullies are also seriously threatened. These facilities include critical inter-community roadways, residential properties, Abagana Girls Secondary School, and the Health Center. Two major inter-community roadways have been dislodged by the gullies resulting in very long detours for community people who

travel to neighboring communities to trade their goods. Large area of farmlands has been majorly impacted with many homes and families losing their primary means of livelihoods as seen in Figures 1-8a and 1-8b). Many building structures (mainly residential and business properties) are threatened by the ravaging gullies as several are on the verge of imminent collapse if timely intervention is not offered.



Figure 1-8a: Gully Section Downstream of Uruokpala Town Hall Road Culvert

Additionally, field observations of the catchment zone indicate that the main gully gets smaller until it gets to Uru/Adagbe villages, where there is another constricting culvert. This culvert along the Abagana-Nimo local road

(Access Road No.1), has GIS location coordinates latitude 6 10.209, longitude 6 58.144. The resultant massive, deep gully erosion is even more than the preceding upstream gully at the Uruokpala Community Hall area. The nearby AGSS is currently under very serious threat. Other portions of the gully corridor include the erosive water discharge and sediment deposition point at the Ozowata/Oshoku stream (Figure 1-8c). The Ozowata/Oshoku stream is a tributary of the Mamu River which drains into the Idemili River Basin.



Figure 1-8b: Section of the Gully as it Meanders toward the Outfall

This ESMP specifically identifies, evaluates and documents the set of environmental and social impacts of the project and their associated mitigation measures, the monitoring and institutional actions to be taken before, during and after the remedial construction and rehabilitation works. The document has taken into account the proposed civil engineering designs, vegetative land management measures and other activities aimed at reducing or managing storm water runoff within the Abagana watershed. This ESMP Report also addresses the necessity and adequacy of the monitoring and institutional arrangements for the project on a sustainable basis. The report further provides some guides to necessary capacity building and training of stakeholders participating in the mitigation of environmental and social impacts of the project including rehabilitation/resettlement of the PAPs.



Figure 1-8c: A Section of the Outfall - Silted Ozowata/Oshoku Stream

CHAPTER 2: BIOPHYSICAL ENVIRONMENT

2.1 Introduction

This section describes the geologic and soil characteristics of the project area and evaluates the extent to which implementation of the proposed project could be affected by soil characteristics and other natural environmental factors of climate and vegetation, topography and landforms, and hydrologic patterns. The analysis also addresses potential effects of the proposed project on long-term soil erosion and gully development within the watershed. Information sources for this evaluation include published literature, preparation of surface geologic map, geotechnical investigation conducted by NEST Engineering Limited – the engineering design Consultant for this project, and the physical observations made during site inspections in the course of the Consultancy.

Erosion gullies in the project area have been variously attributed to high rainfall intensity, wind action, slope instability, poor engineering and agricultural processes. While human activities tend to accelerate erosion processes, it seems that some endogenic geological factors make some parts of southeastern Nigeria more erosion prone than other areas. Some of these endogenic factors include the existence of some particular geological and geomorphic units and structures in soils of most erosion-affected areas.

2.2 Environmental Setting

2.2.1 General Setting

The project area is located within the hilly slopes and planes of the southeast region of Nigeria and is situated approximately 16 kilometers south of the Anambra State Capital City of Awka. The topography of the project area is of gentle slope within Uruokpala and Uru villages but changes into a rolling hill between the Abagana Girls School Road and the final erosion gully discharge area (the outfall).

The hilly slopes and plains are overlain by acidic sandy and lateritic soils while mud and clays are found in lowlands and valleys. According to literature sources, breakdown of soils in the region is facilitated by its acidic nature which makes the decay and removal of the soil-binding materials easy, causing the soils to be prone to easy wash off. The project area has varied landforms that are associated with several geologic materials.

Figure 2-1 is the regional drainage map of the Orlu–Awka escarpment showing major drainage systems. The Umudunu-Uruokpala erosion gully corridor runs southwestward from Umudunu village of Abagana in the northeastern section of the town at elevation of 790 feet (263m) and terminating at Oshoku/Ozowata stream in the southwestern part at an elevation of 430 feet (143 m). The stream floor is now heavily silted and little or no water currently flows through the stream. This stream which in the past served as a major source of drinking water for a significant portion of

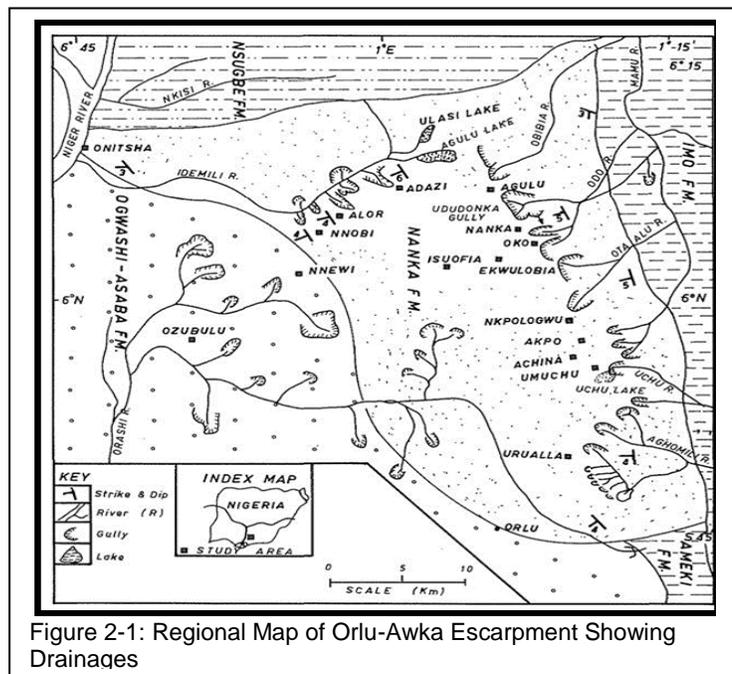


Figure 2-1: Regional Map of Orlu-Awka Escarpment Showing Drainages

Abagana community is now completely silted. The Abagana watershed is drained by the Mamu River together with its main tributary, the Odo River and their numerous smaller tributaries. Figure 2-2 is the digital elevation model of the study area showing the drainage systems in the area.

2.3 Climate

The climatic condition of the project area is characterized by uniformly high temperatures and a seasonal distribution of precipitation. The average annual temperatures range from a minimum of about 24°C to a maximum of about 33°C within the project area. A tropical wet and dry season prevails in the project area. The dry season runs through the months of October to March and the rainy season that begins in March and ends in October. The average annual rainfall in the project area ranges from about 130mm to 175mm. The rainy season follows the northward

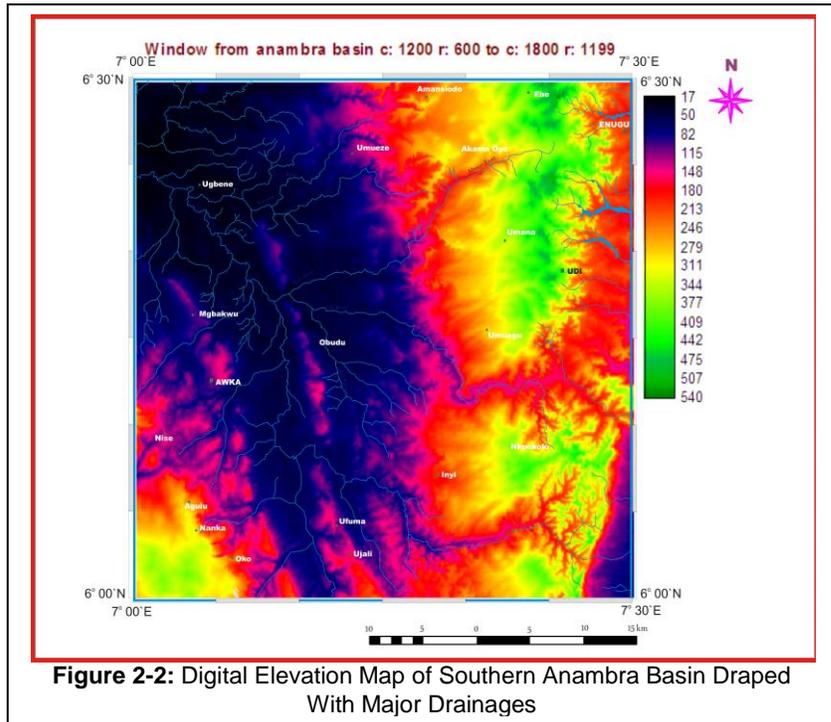


Figure 2-2: Digital Elevation Map of Southern Anambra Basin Draped With Major Drainages

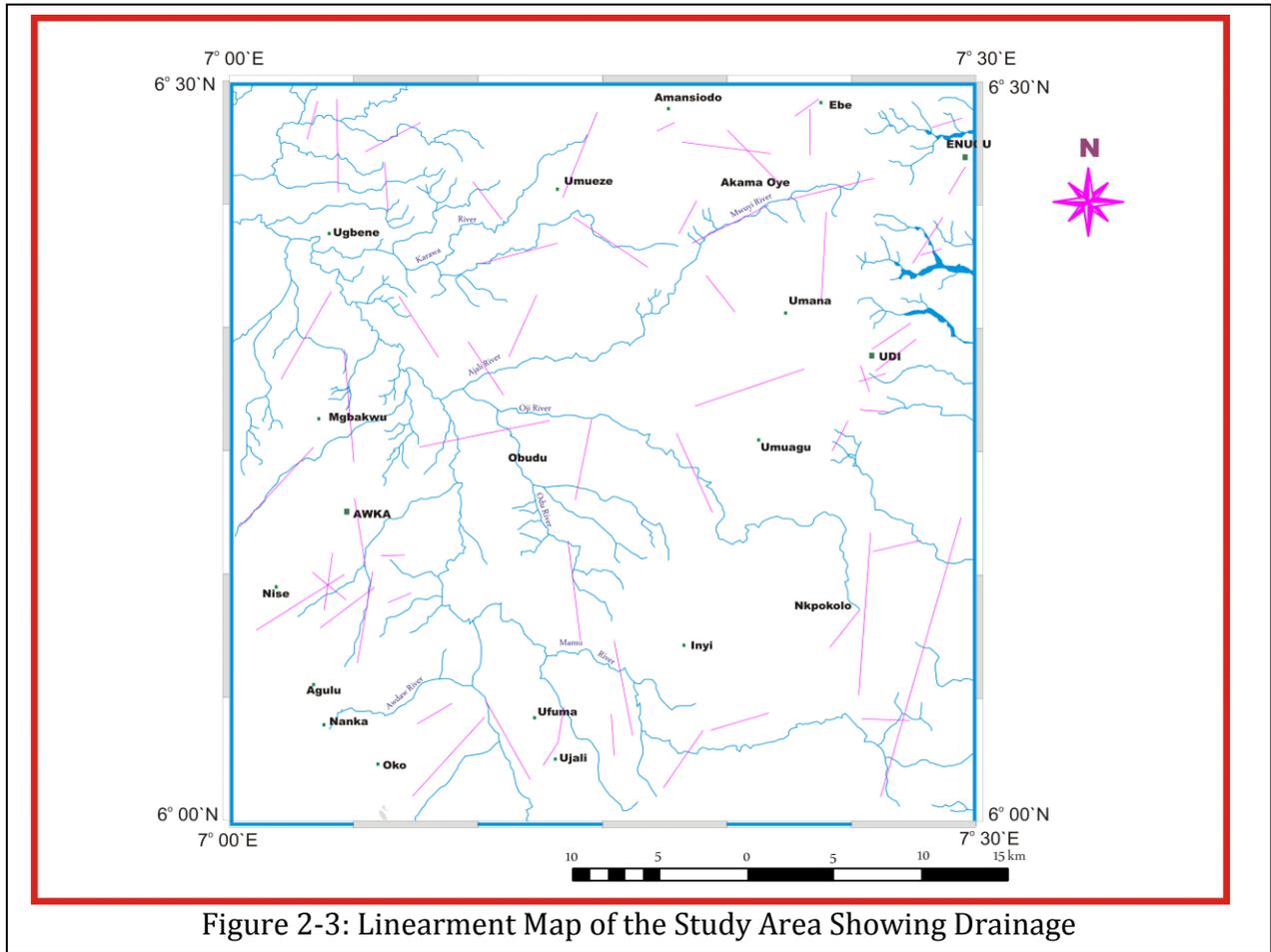
advance of maritime air from the Atlantic Ocean. July and August are usually the wettest periods of the rainy season with average monthly rainfall of over 260mm. The conventional nature of the heavy rainfall results in alternating periods of sunny and rainy conditions. Some of the rainfall occurs as violent downpours accompanied by heavy flooding, soil leaching, extensive sheet wash, groundwater infiltration and percolation.

2.4 Biodiversity

2.4.1 Vegetation

The project area lies within the humid tropical rainforest belt of southeastern Nigeria and evidences savannah type vegetation. But pressure on land in form of agriculture and commerce has largely reduced the vegetation to mixed savanna. Along stream courses and in few preserved areas, some rain forest trees such as Iroko, soft wood, domesticated species like oranges, mangoes etc. exist. Palm trees and coconut trees are quite common in residential areas for their economic value. However, the predominant vegetation here is mixed savanna. The wetter river valleys support dense rainforest of evergreen vegetation along streams.

The vegetative cover of the project area is highly heterogeneous due to severe anthropogenic disturbance. Sampling of flora and fauna in the project area was conducted using quadrates in each of the identified land use categories and 100% enumeration of trees within each quadrate was carried out.



The vegetation cover in the area is classified into six categories based on the land use patterns, namely:

- a) Shrine/Cultural Forest.
- b) Home-gardens/Homestead Farms/Compound Farms.
- c) Secondary Re-growth Forests.
- d) Farmlands.
- e) Fallows/Uncultivated Farmlands.
- f) Silted-up and Low Lying (Fadama) Areas.

A listing of plant species with frequent or abundant distribution identified in the various categories are shown in Table 2.1. The complete listing of plant species and their distribution found in the six categories of vegetation covers are given in Annexure I. Other plants of the watershed include: Cotton tree (Akpu Ogwu), Iroko Tree (orji), Bambo Tree, Tridax, Ufii, Water lily, Bulrush, Reeds, Icheku, Assorted grasses, Shrubs etc.

2.4.2 Animals Inventories of the Watershed

- Soil Arthropods: such as Oprillion, goephiles, Spiders, Scorpions, Centipedes (myriapoda), Milipedes.
- Gastropods: Snails, crabs.
- Snakes - e.g. Viper, Rattle snake, Grass snake, (Ophidia), Lizard, (Monitor, Agama etc), tortoise, Slow Worm (Iacertilian), Rhizolriga Duphcata (Tutuntu), Rove Beetle
- Assorted types of Ants, Napa, Dystiers, Toad, Frogs, Water Scorpions, Butterflies

- Fishes (e.g. Tilapia, Catfish), Aligator, Crocodiles.
- Birds- Owl, Kite, Hawk, Sparrow, Partridge, Wild Dove (Ndo ofia), Vulture, Robin, Obu, Apia, Elo, Ugene-oma etc.
- Other Land Animals include Wild Rabbits, Hare (Ikpikpa), Grass Cutter, Wild Rat (Eyi), Rats, Mouse, Domestic Fowl and Goats, Dogs, Cats, Edi etc.

Table 2-1: Listing of Plant Species in the Project Areas

S/No	Species	Family	Life Form	Local/ Common Name
1.	<i>Pycnanthus angolense</i>	Myristicaceae	Tree	Akwamiri
2.	<i>Abizia zygia</i>	Fabaceae	Tree	Nkwu
3.	<i>Bosqueia angolense</i>	Moraceae	Tree	Oze
4.	<i>Tetraptera tetrapleura</i>	Fabaceae	Tree	Isikrisi
5.	<i>Canarium schweinfurthii</i>	Buseraceae	Tree	Ube ngba
6.	<i>Pterocarpus osun</i>	Fabaceae	Tree	Ora ohia
7.	<i>Treculia Africana</i>	Moraceae	Tree	Breadfruit (Ukwa)
8.	<i>Dacryodes edulis</i>	Burseraceae	Tree	Ube
9.	<i>Anacardium occidentale</i>	Anacardiaceae	Tree	Cashew
10.	<i>Mangifera indica</i>	Anacardiaceae	Tree	Mango
11.	<i>Pterocarpus mildbraedii</i>	Fabaceae	Tree	Oha
12.	<i>Brachystegia nigerica</i>	Fabaceae	Tree	Achi
13.	<i>Annona muricata</i>	Annonaceae	Tree	Sour sop
14.	<i>Carica papaya</i>	Caricaceae	Tree	Paw-paw
15.	<i>Psidium guajava</i>	Myrtaceae	Tree	Guava
16.	<i>Manihot esculenta</i>	Euphorbiaceae	Shrub	Cassava (Akpu)
17.	<i>Pentaclethra macrophilia</i>	Bignonaceae	Tree	Ogirisi
18.	<i>Bambusa spp</i>	Poaceae	Shrub	Otosi
19.	<i>Dioscorea trifida</i>	Dioscoreaceae	Herb (climber)	Ji Ohia
20.	<i>Milicia excels</i>	Moraceae	Tree	Oji
21.	<i>Anthonotha Macrophylla</i>	Fabaceae	Tree	Ububa
22.	<i>Anthocleista vogelii</i>	Loganiaceae	Tree	
23.	<i>Costus afer</i>	Zingiberaceae	Herb	Okpete

Source: Field Survey, 2014

2.5 Geology and Hydrology

This section addresses the regional and project area geology and illustrates the significance of this factor by carrying out a detailed geological and geophysical characterization of the affected lithostratigraphic unit – the Eocene Bendi- Ameki formation. The characteristics of this unit and its topographic expression are in turn discussed in relation to erosional processes. It is hoped that information gained from such a characterization of this lithostratigraphic unit will prove valuable in the proper design, construction and implementation of appropriate engineering structures. The geotechnical properties of the soil which are integral and important part of evaluation in soil erosion bring into account certain parameters which must be taken into consideration when investigating the causes and remedies of erosion. These two subjects form the foundation on which the control measures are based.

2.5.1 Regional Geology of Southern Anambra Basin

The project area forms a part of the Anambra sedimentary basin of the southeastern Nigeria. The Anambra basin covers about 40,000sq.km. The southern boundary coincides with the northern boundary of the Niger Delta basin. It extends northwards beyond the lower Benue river. The basin is said to have originated contemporaneously with the folding and uplift of the

Abakaliki – Benue area during the santonian stage.

The Anambra basin constitutes a major depocenter of clastic sediments and deltaic sequences. The Basin resulted from the second tectonic activities of the lower Benue Trough to the effect

that the Abakaliki sector was folded and uplifted while the Anambra platform experienced subsistence. Figure 2-4 shows the geologic map of the southern Anambra basin.

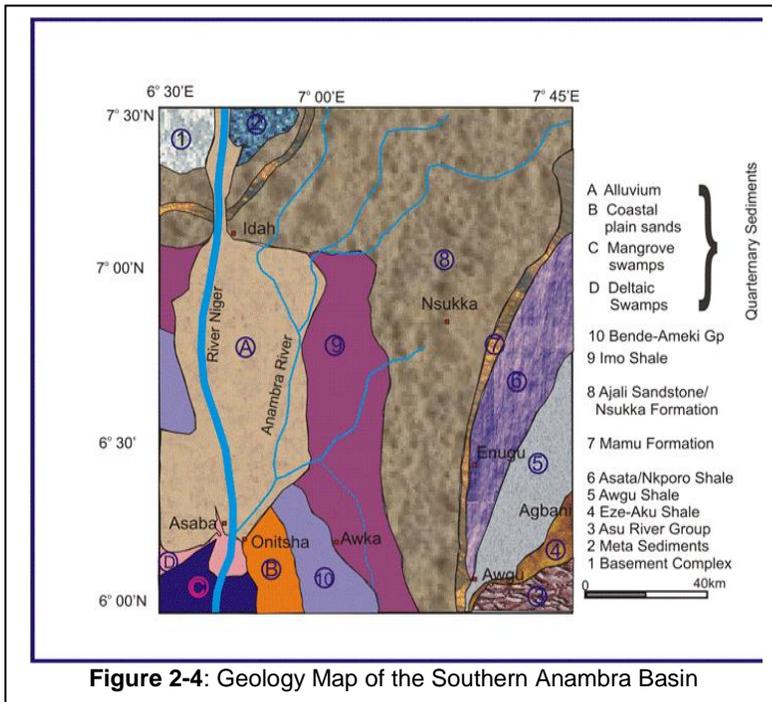


Figure 2-4: Geology Map of the Southern Anambra Basin

2.5.2 Soil Conditions

The soils of Anambra State particularly have groundwater reservoirs that severely contribute to ecological problems in the region. Abagana soils are typified by these general soil characteristics and are highly susceptible to erosion. Beneath the weak lateritic and acidic soils are unstable and poorly consolidated geologic rocks and material. The sandy members of these geologic units contain huge groundwater reservoirs in aquifers with attendant pore water pressures

that become threatening when overlying structures carry uncompromising loads. The lateritic and sandy soils are easily eroded by storm water runoffs.

Table 2-2: Lithostratigraphic section of the Anambra Basin

AGE	LITHOSTRATIGRAPHIC UNITS	
TERTIARY	EOCENE	AMEKI FORMATION / NANKA SAND
	PALEOCENE	IMO SHALE
CRETACEOUS	DANIAN	NSSUKA FORMATION
	MAESTRICHTIAN	AJALI SANDSTONE
		MAMU FORMATION
	CAMPANIAN	ENUGU / NKPORO SHALE

2.5 3 Gully Erosion Characterization in the Study Area

The Umudunu-Uruokpala gully features and characteristics are shown in Table 2-3.

Table 2-3: Gully Features and Characteristics in Umudunu-Uruokpala Erosion Gully, Abagana

S/N	Location	Gully Shape	Gully length (m)	Gully width (m)	Gully depth (m)	Gully Activity	Soil Type	Geological Formation
1	Abagana Main Gully head	V-shaped	500	90	25	Active	Medium to coarse sand	Nanka Formation
2	Abagana Main Gully (Middle)	V-shaped	850	30	20	Active	Medium to coarse sand	Nanka Formation

S/N	Location	Gully Shape	Gully length (m)	Gully width (m)	Gully depth (m)	Gully Activity	Soil Type	Geological Formation
3	Abagana Main Gully (End towards the stream)	U-shaped	1300	50	10	Active	Medium to coarse sand	Nanka Formation
4	Gully Finger Abagana Girls	V-shaped	250	4.2	3.5	Active	Medium to coarse sand	Nanka Formation

2.6 Mineral Resources

The only noteworthy mineral resource in the vicinity of the project area is soil aggregate located within or adjacent to streambeds. At this time, however, numerous active sand mining activities have developed due to the large volume of eroded soil that is deposited along the gully corridor particularly at the Ozowata/Oshoku stream area.

2.7 Slope Instability and Subsidence

The stability or instability of a slope is greatly dependent upon factors such as gradient, available water content, existing vegetation, and stresses (natural and anthropomorphic) affecting the slope. For example, a denuded, saturated slope could be further destabilized and fail if it was to be stressed by considerable earth moving activities. The terrain of the project area varies from relatively level surfaces through steep terrain with slopes up to 30 percent to the ravine outfall. The vast majority of the lands within the project area is farmlands and is not sufficiently vegetated to anchor the area's well drained soils.

Land subsidence is the loss of surface elevation due to removal of subsurface support. Subsidence has many causes, including seismically induced stresses and the extraction of mineral or liquid and gas deposits. Although mineral and gas can and do cause subsidence, it is more common for subsidence to occur as a result of groundwater extraction in excess of groundwater recharge.

There are no known studies on subsidence in the project area or surrounding region. However, subsidence in the region as a whole may be limited because the various geologic and hydrologic conditions associated with subsidence are not known to occur in the area.

2.8 Natural Drainage Corridors

2.8.1 Watershed Drainage Network

Survey maps that included Satellite Imagery and Topographic profiles developed by Cudif Services Limited for the project area were used to guide interpretations of storm water flows throughout the project area. The watershed drainage features were identified through interpretation of 5-meter contour intervals topographic map provided. Drainage features within the scope of this investigation included any topographic feature that could potentially concentrate surface runoff, including convergent topography, swales and existing channels.

2.8.2 Main Agents of Gully Erosion

Abagana lies on the facial slopes of what may be considered the Enugwu Agidi-Abagana-Enugwu Ukwu-Nimo range. Due to its location, the town receives most of the storm water runoff from the higher elevations of the range through both subsurface water creeps and surface runoffs. The subsurface water creep result in Abagana soils being generally over-saturated during extended rainfall periods. A major effect of this phenomenon is the creation of "tunnel" erosion within the subsurface soil body.

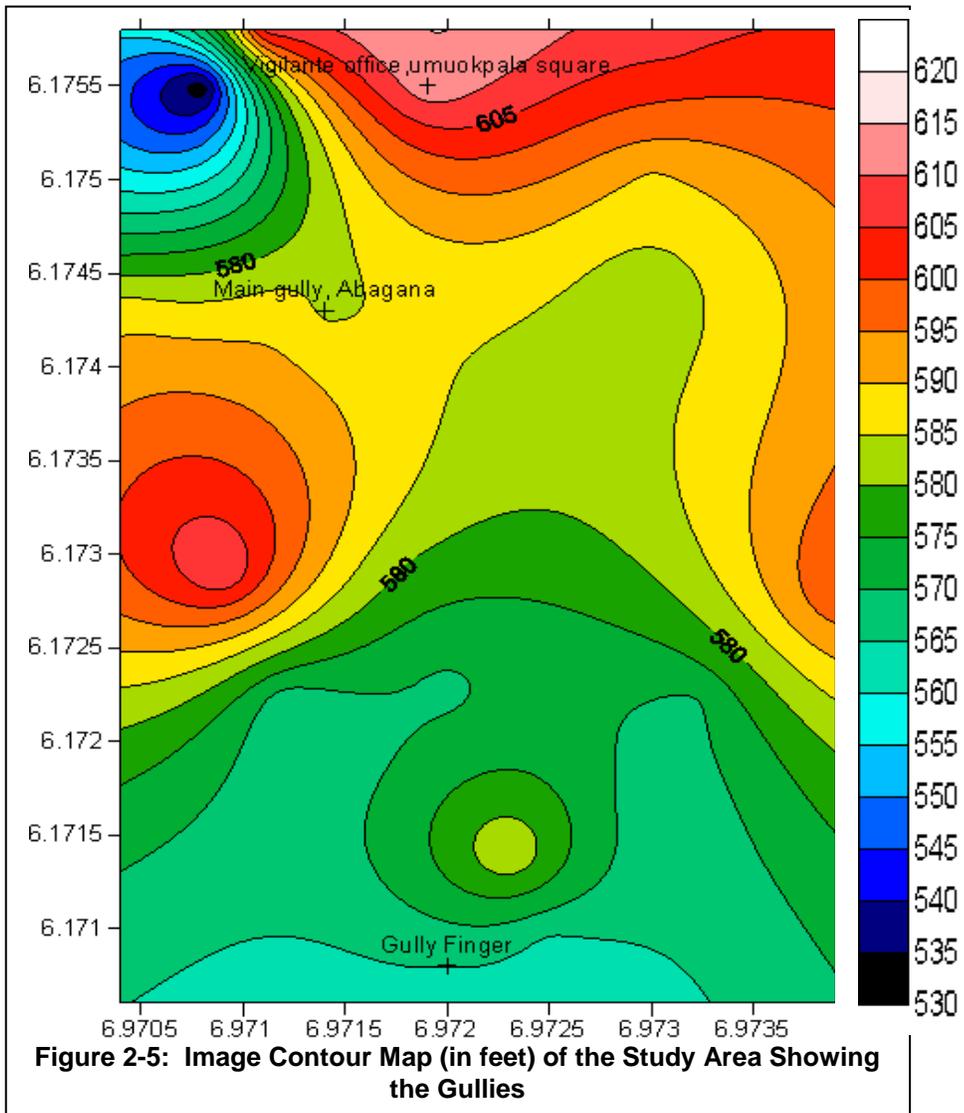
At the time of this study, there are several distinct erosion gullies resulting from the seasonal rainfall events within the Abagana watershed. The Umudunu-Uruokpala erosion site is only one of the gullies within the watershed. The reddish, brownish and sometimes, yellowish lateritic and silty/sandy soils of the Umudunu-Uruokpala gully corridor subsurface are eroded and transported by storm water runoff into the Ozowata/Oshoku stream completely silting up the stream.

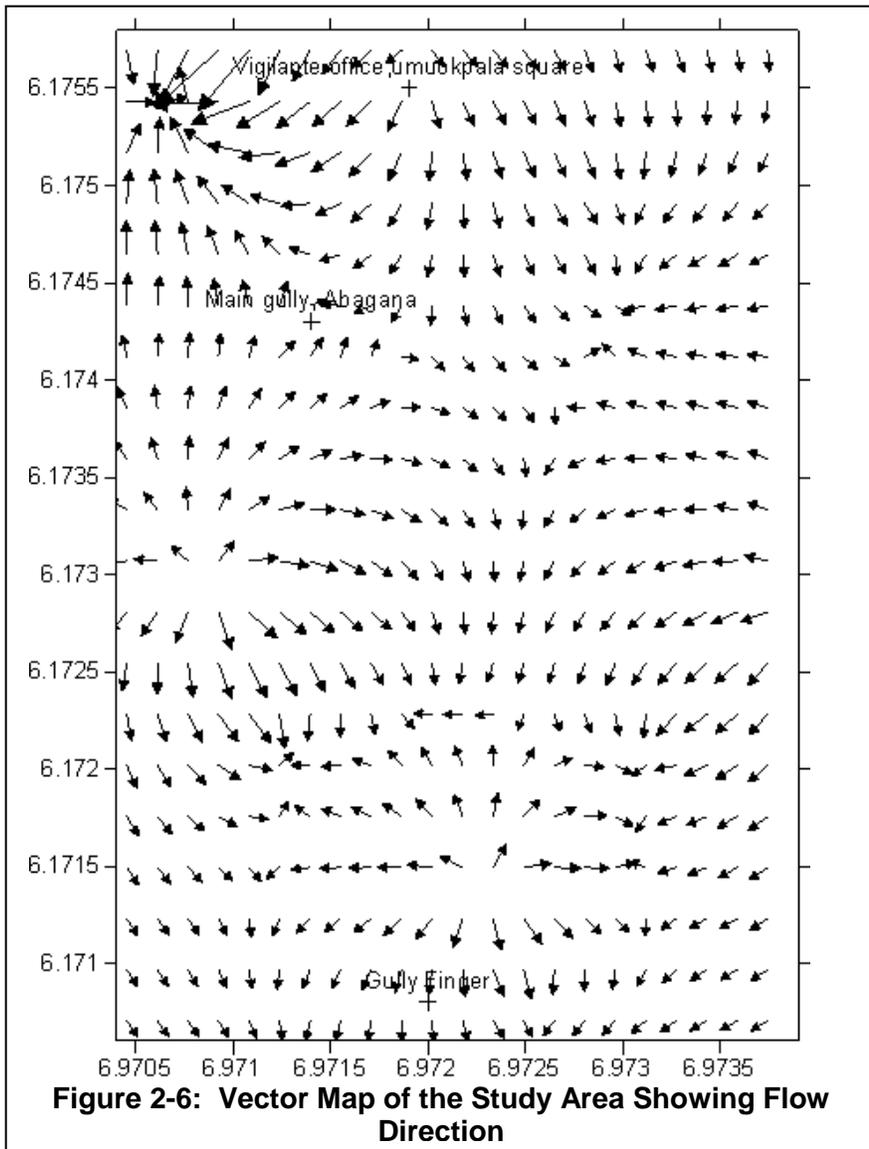
2.9 GPS Mapping of Project Area.

The Germain 78s GPS equipment was used in mapping the study area for the purpose of producing appropriate maps (including the watershed map with all the catchment areas) that may aid in the study. Table 2-4 is the record of appropriate GPS readings within the study area .The data was further used in generating maps using Surfer 10 and Oasis Montaj Software. Figures 2-5 through 2-7 are generated and produced from the GPS reading.

Table 2-4: GPS Readings of the Study Area

S/N	Location	Latitude	Longitude	Elevation (ft)
1	Community Hall Uruokpala Abagana	6.1743	6.9712	589
2		6.1755	6.9708	531.702
3		6.1758	6.9711	607.11
4	Vigilante Office, Uruokpala Square	6.1755	6.9719	613.394
5		6.1729	6.9709	610.252
6		6.1722	6.9712	566.264
7		6.1726	6.9707	594.542
8	Umudunu Uruokpala Gully site	6.1743	6.9714	584
9		6.1743	6.9704	588
10		6.1744	6.973	582
11		6.175	6.973	589
12	Nkwo Igwe Road	6.1757	6.9731	606
13		6.1706	6.9713	562
14		6.1729	6.9718	579
15		6.1723	6.972	569





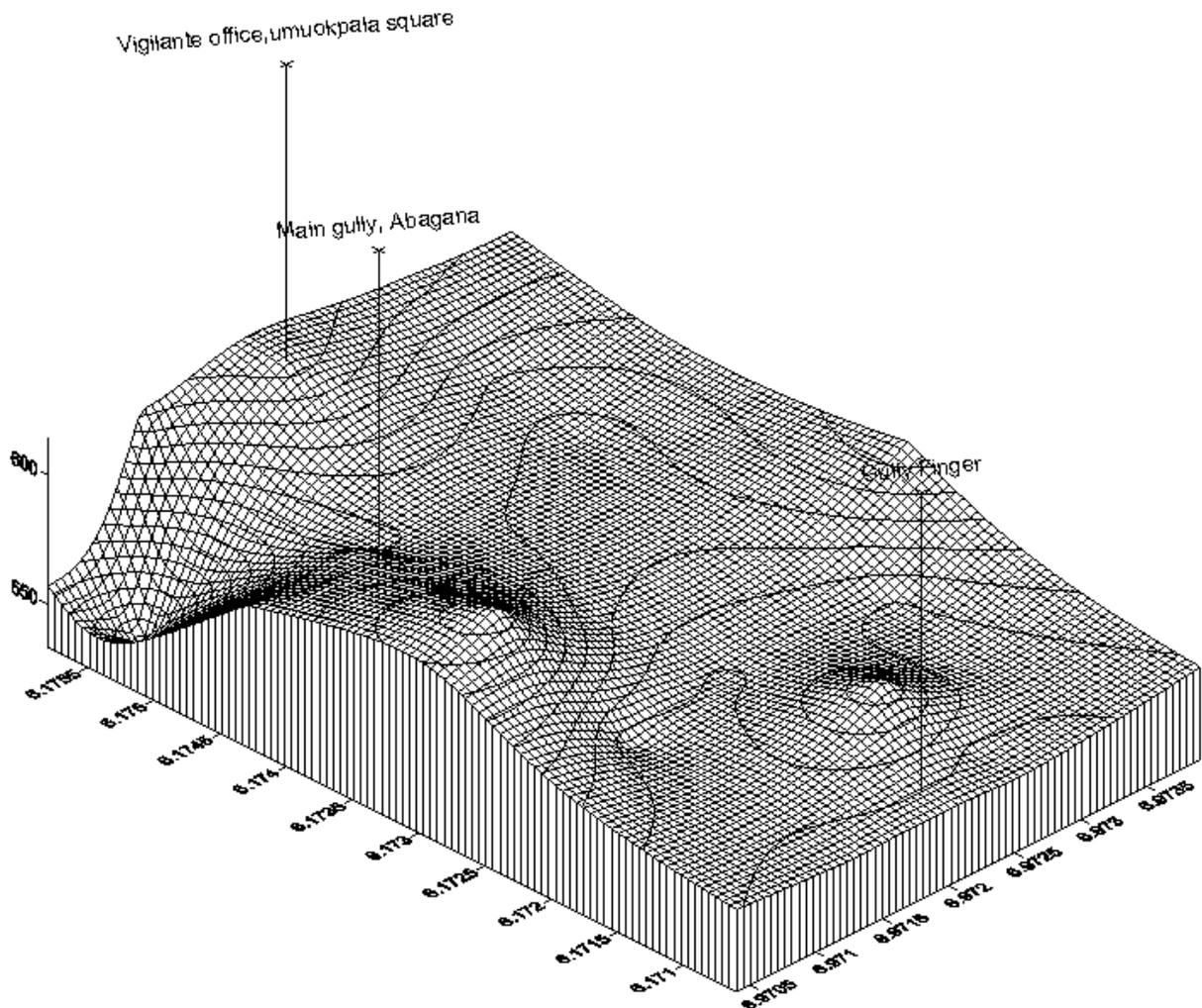


Figure 2-7: Watershed map of the study area showing the erosion gullies

2.10 CHARACTERIZATION OF SURFACE SOIL MATERIALS

(CRUMB TEST & DOUBLE HYDROMETER).

The result of crumb test carried out on the gully area and environs to evaluate field performance of dispersive soils indicates that the soil is dispersive. Details of the result of the crumb test carried out are included in Annex 5.

From the erosion/drainage map of Southeastern Nigeria, the area of high to severe erosion intensities appear to be aligned in two directions NW-SE and NE-SW; the NW-SE direction is the more prominent while that of NE-SW is just perceptible. It is interesting to note that the initial rifting of the Southern Nigeria Continental Margin in the Mesozoic Era produced two principal sets of faults trending NE-SW and NW-SE. While no one could reasonably deny the possible contributions of human activities to the development of gully erosion, we are however of the view that the most important factors to explain gully erosion in the area are not human but interplay of endogenic and exogenic forces within the earth. The main contribution of man to gully initiation and development is essentially one of complicating and accelerating an already inherent problem rather than provoking it.

2.11 Archaeology and Cultural Heritage:

There are no World Heritage Sites or areas of cultural importance that would be impacted by the proposed project, nor are there any archeologically sensitive areas.

2.12 Traffic and Transport Infrastructure:

The project area is served by rural roads which link Abagana town to Nimo and neighboring towns. The Oye Abagana – Oye Nimo Access Road is earmarked for asphaltting. This road currently experiences a low level of traffic flow although this is envisaged to gradually increase as residential areas develop and the road surfacing is improved.

2.13 Waste Management:

Waste management provision in the project area is generally lacking. Solid wastes are generally handled in individual homesteads and burnt or in small earth fills to rot. There are no commercial waste collectors in Abagana so wastes to a large extent are indiscriminately dumped in isolated places. There are no sewerage works in the project area. Many homesteads use septic tanks, while some homes still use the pit latrines.

2.14 Noise and Vibration:

The project area is generally a quiet neighborhood being in rural area of Abagana. Noise observations taken during the field visits indicated that the ambient noise levels were very low as there are generally no significant noise emissions in the project area.



Outfall Area Showing Deposits of Sand/Silt



Sand Excavation Activities at Gully Outfall



Sand Excavation Activities at Gully Outfall



Quarrying Activities in the Project Area.

CHAPTER 3: SOCIOECONOMIC CHARACTERISTICS AND CONSULTATION WITH STAKEHOLDERS

3.1 DESCRIPTION OF CULTURAL AND SOCIOECONOMIC ENVIRONMENT

The project area encompasses approximately 422 acres, and surface elevations that vary gradually from about 732 feet (244 m) at the northeast corner to 711 feet (237 m) on the northwest corner and 387 feet (129 m) in the southeast area. The cultural/socioeconomic elements and characteristics of the project area considered in this Consultancy include population, land use and tenure system, social setups, economic activities, education, vulnerability profile, gender, religion, settlement and migration patterns and health services system.

The method adopted in this ESMP was a qualitative and quantitative mixed method of assessment. This offered an effective means of interacting widely with the Abagana stakeholder groups, the Anambra NEWMAP team, as well as individual stakeholders and affected persons. Essentially, several participatory community meetings, public discussions as well as discussions with key informants (Chiefs, Traditional Council members, Local Authorities, and Anambra NEWMAP Officers among others) were held in the course of the Consultancy. The means adopted are as briefly described below:

1. Rapid Assessment Technique:

This involved a quick professional assessment of the project impact potential based on nearness of residential/commercial assets to the gully edge, anticipated nature and intensity of impacts, and the significance of the impacts along the proposed project corridor.

2. Socioeconomic Survey:

This involved detailed enumerations/inventories of households/persons resident or doing business within the project area as well as formal and informal discussions with focus groups, including the community traditional and administrative leadership. A comprehensive questionnaire for data collection was developed and used for this purpose.

The questionnaire captured the following information:

- a) Household bio-data (demographic information);
- b) Livelihoods;
- c) Inventory of structural and nonstructural assets including land, common properties, houses, economic trees and cash crops.

Also, census of the PAPs was also conducted to fully characterize the impact on each affected person.

3. Public Consultation:

This was conducted as part of the participatory approach aimed at gaining good knowledge of the social issues/risks associated with the project as perceived by the communities of Abagana. Public meetings were held at three locations within the project immediate impact areas. The locations are Uruokpala Village Hall, Abagana Girls Secondary School and the Igwe's Palace.

4. Use of Maps and GIS:

Survey maps as well as high resolution imagery were used to identify and map out the project area showing locations of various structures relative to the project corridor.

The qualitative analysis involved an assessment of information obtained during the stakeholders' consultations and public participation through public forums, interviews and focus group discussions. The socioeconomic study provided necessary primary quantitative data for the project assessment. This quantitative data included:

- Household census of the people identified as PAPs;
- Establishing the socioeconomic profile of the project area population including health related status of respondents;
- Establishing the structural assets to be affected by project;
- Establishing area of land to be affected;

3.2 Cultural Environment

3.2.1 Population

Based on the 2006 Nigerian National Census, Abagana has a total population of forty six thousand, one hundred and thirty six (46,136) people. A breakdown shows the male population is 22,973 (49.79%) while the female population is 23,163 (50.21%).

3.2.2 Ethnic Groups

The people of Abagana consist of one major Nigerian ethnic group – the Igbos. The ethnic group has its unique culture, social organization and traditions. The social and cultural aspects in the project area are closely intertwined with ethnic groupings. The Igbos have elaborate cultural practices including strong kinship linkages with organizations spanning from localized social groups to strong clan relations and cultural associations as well as social interactions mainly during cultural and religious ceremonies. The people generally speak and write mainly the Ibo and English languages.

Abagana town and its villages are essentially rural centers whose residents are generally agrarians. The local dwellers rear goats and sheep, and maintain chicken farms most of which are carried out within their residential compounds. Abagana town is made up nine villages, each of which traces its origin from genealogical ties. Politics in Abagana are done within the framework of clanism. Clans are the basic point of cultural and political identity for the citizens. Clanism and kinship are strong elements and driving forces in control of political and cultural institutions and service points. The villages consist of groups of households whose families are inter-related.

3.2.3 Religion

The people of Abagana are predominantly of Christian religion mostly Catholics and Anglicans. There are however a few traditionalists in the community.

3.2.4 Land Use Pattern

There are three major types of customary land tenure system in Abagana – (1) individual land ownership; (2) family land ownership; and. (3) communal land ownership. Individual ownership may be for indigenes or for residents of the community. Family lands (as well as individual lands) are inherited from generational relatives. Communities retain family lands which may never be sold. Such family lands are generally retained for communal development and sometimes are rotationally shared among the members of the community for agricultural purposes but are not for sale.

Abagana and all its villages can be characterized as a rural area with agriculture being the predominant land use. An estimated 80% of the land is committed to agricultural production of food crops. The crops include maize, cassava, yams, plantain, vegetables, etc.

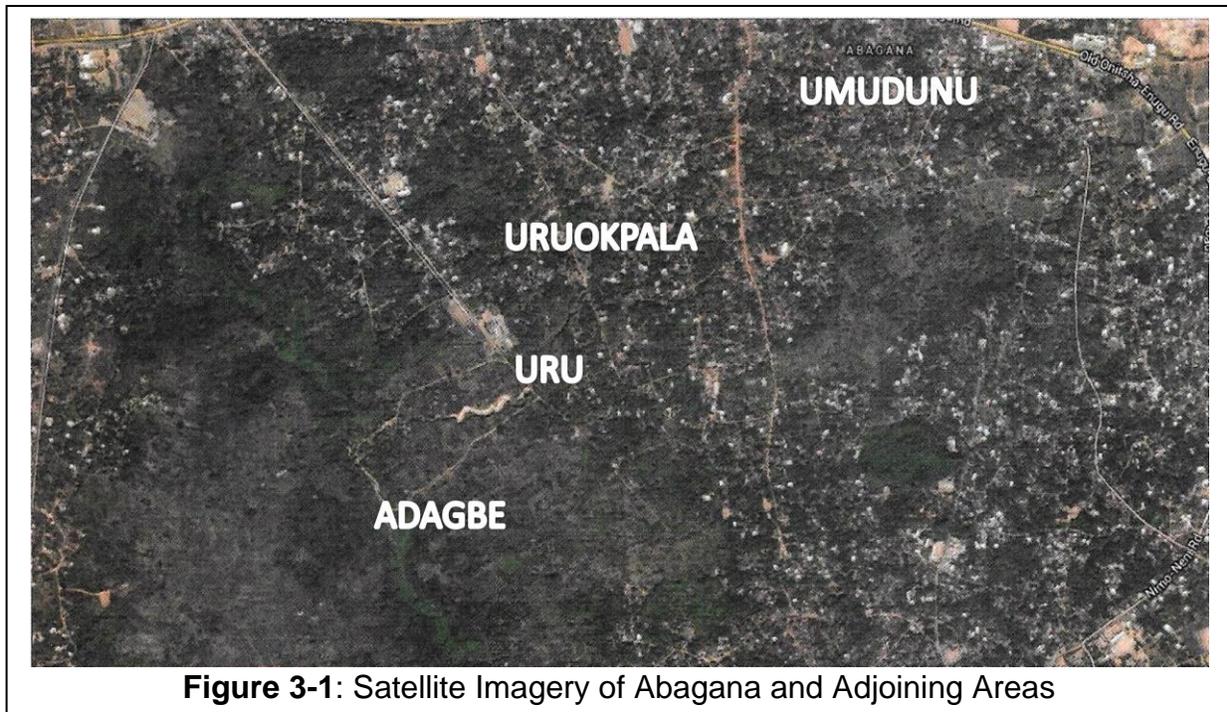
A review of the land use pattern within the project areas reveals the following:

- i) There are more existing developed structures within the Umudunu village portion of the project than there are in Uruokpala, Uru and Adagbe. Uruokpala closely follows

Umudunu in terms of structural development. This is depicted in the satellite imagery shown in Figure 3-1.

- ii) Few structures exist within the Uru village portion of the gully corridor;
- iii) There are no structures within the Adagbe village portion. The entire area is essentially dominated by farmlands.

The Umudunu gully corridor and the structures in the neighborhood as seen from the satellite imagery are shown in Figures 3.2 and 3-3.



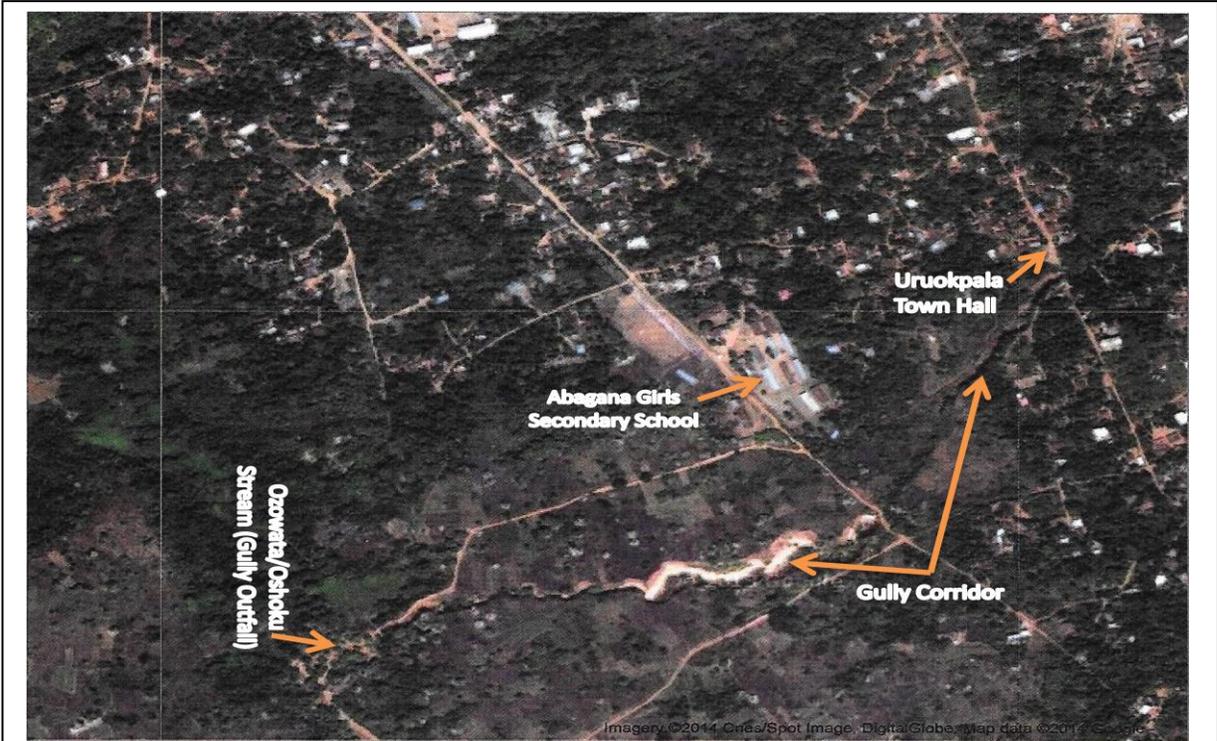


Figure 3.2: Abagana Gully Corridor Showing Structures in the Neighborhood



Figure 3-3: Abagana Gully Showing Structures at the Uruokpala/Uru Villages Area

3.2.5 Cultural Resources

There are no designated historical, archaeological or cultural resources within the project area. However, there are four (4) shrines that exist at locations close to the project area. These shrines namely, Onyeanusi, Ichekuoku, Obichiluzo and Ezimezi/Aro will essentially not be affected by the project as designed except for increased human movements in the vicinity of the shrines during the project construction phase. The no impact situation remains provided the gullies do not escalate further and expand beyond the current dimensions during the next rainy season cycle. In the event that the main gully deteriorates beyond the current limits, it will be necessary for the project implementation team to engage in consultations with the community's cultural/traditional custodians of the affected shrine(s). The consultations will be necessary to establish requirements for mitigating any impacts on the shrine(s).

3.3 Analysis of Socioeconomic Survey

The measurement of precise impacts of the project on persons living or earning their living along the gully corridor cannot be effectively established without appropriate and accurate social and economic baseline data. The socioeconomic study was aimed at assessing the socioeconomic changes that may occur in the living conditions of the project area population as a result of the project impacts.

3.3.1 Objectives of the Socioeconomic Survey

The primary objectives of the socioeconomic survey were as follows:

1. To collect information regarding existing socioeconomic conditions of the project population;
2. To use the collected socioeconomic information to develop baseline data for the assessment of socioeconomic impacts of the project;
3. To analyze the patterns of relationships that exist among various socioeconomic or demographic components of the project area;
4. To obtain perceived views of project area respondents on the effects of project on the environment and their vulnerability to socioeconomic changes due to the project; and,
5. To provide a benchmark for any further information needed to monitor and evaluate improvements in the future.

The respondents to the socioeconomic survey included the following:

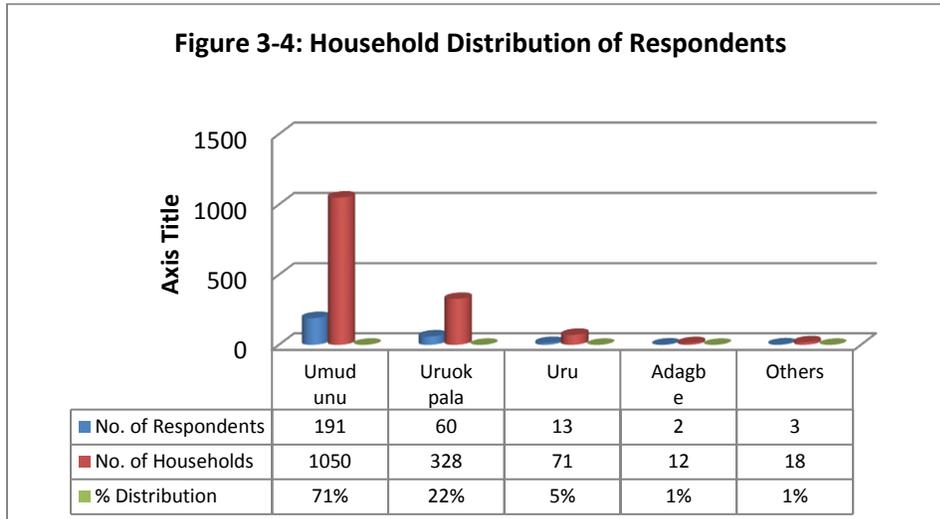
- (1) Owners of building structures located within 50 meters from the edges of the gully along the gully corridor;
- (2) Owners of building structures located in areas to be used as construction staging areas during the construction phase of the project;
- (3) Residents/tenants of the buildings structures identified in items (1) and (2) above whether the structures are permanent or temporary; residential or commercial;
- (4) Land owners along the gully corridor whose lands would be required for the purpose of stabilizing the gully walls;
- (5) Residents/tenants of buildings structures along the two Access Roads Nos. 1 and 2 which lead to the upper and lower sections of the project areas, whether permanent or temporary residential or commercial;
- (6) Economic trees/crops owners along the gully corridor whose lands would be required for the purpose of stabilizing the gully walls.

The survey was conducted in conjunction with the census of the project affected persons to profile the impacted project area and provide baseline data against which mitigations measures and support will be measured. The analysis is based on the 270 respondents to the questionnaire administered to residents of the villages who are most likely to be impacted by the project. A sample of the socio-economic survey questionnaire used is included in the Annexure

III. On the basis of the responses obtained in the exercise, the following determinations were made.

3.3.2 Household Distribution in Project Area

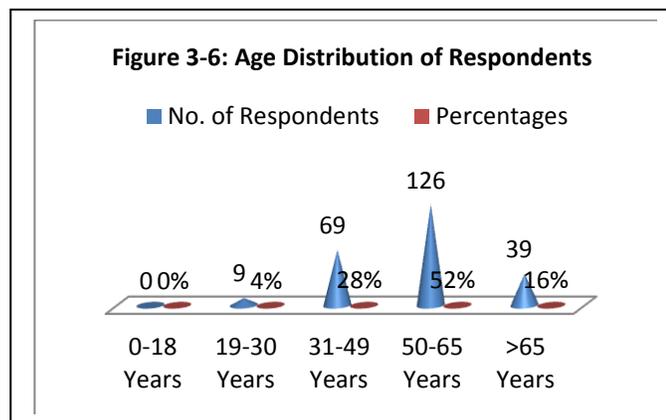
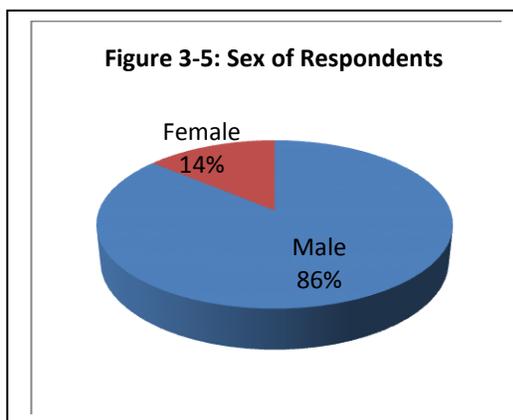
Figure 3-4 shows how the 270 respondents to the socioeconomic survey are distributed across the four villages that are affected by the project. Based on the households surveyed in the project area approximately 71% of the households are in Umudunu village, 22% in Uruokpala village, 5% in Uru village and 1% in Adagbe village.



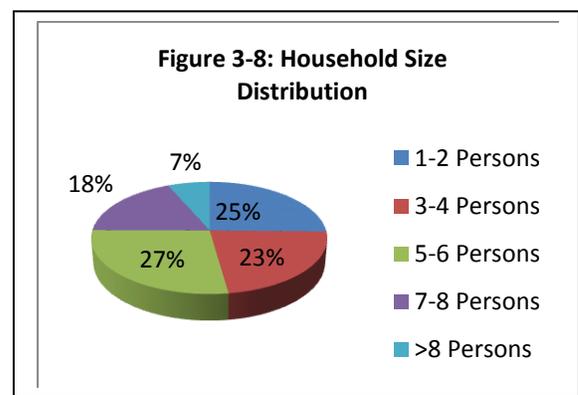
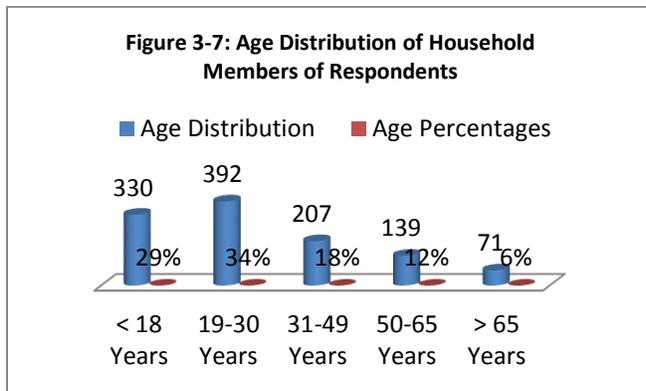
The percentages of respondents to the socioeconomic survey appear to reflect the population and development densities across the affected villages in Abagana. There are a total of 1469 household members associated with the respondents in the survey.

3.3.3 Gender, Age and Household Size of Respondents

The survey data analysis indicates that of the respondents in the survey 86% are males while 14% are females as shown in Figure 3-5.

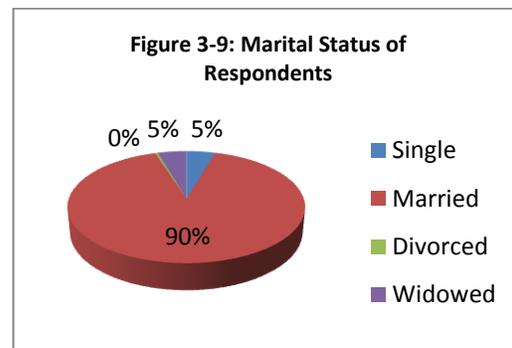


Women in the project area are mainly involved in traditional agriculture and home-keeping. Generally, men are more mobile than the women as the men are more involved in the pursuit to provide for the family.



The age distribution data (Figure 3-6) of the respondents indicate that 32.1% of the people are below the age of 50 while 67.9% are in their 50s and above. The survey also showed that 29% of the household members associated with the respondents are below the age of 18 years (Figure 3-7). 52% of the households are between the ages of 19 to 30 years. 30% of the respondents' household members are between the ages of 31 and 65 years while 6% are over 65 years of age.

The respondents' household distribution from the survey ranged from a minimum of one person to a maximum of 10 persons. The average size of households is 5 persons. 25% of the respondents have household sizes of one or two while another 25% have household members of 7 or more persons (Figure 3-8). 50% of respondents have household sizes of between 3 and 6 persons.

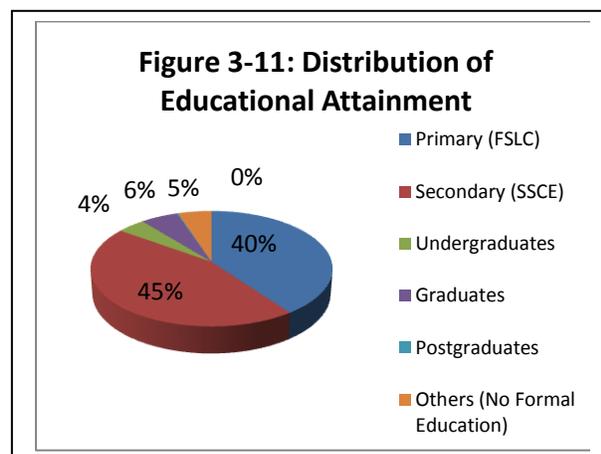
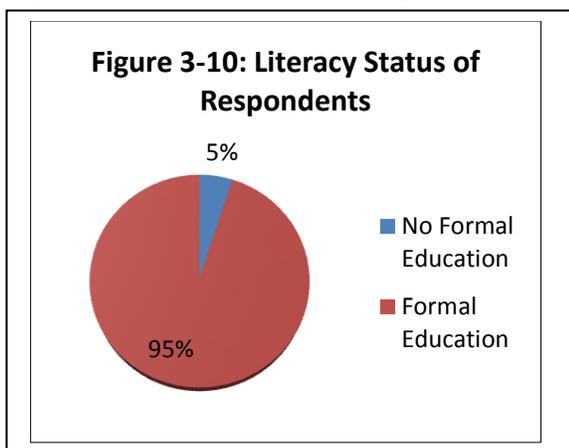


3.3.4 Marital Status of Respondents

About 90% of the respondents are married while 5% are single and about 5% are widowed (Figure 3-9).

3.3.5 Access to Education

The responses from the survey population indicate that only 5% of the population of schooling age never attended school (Figure 3-10).

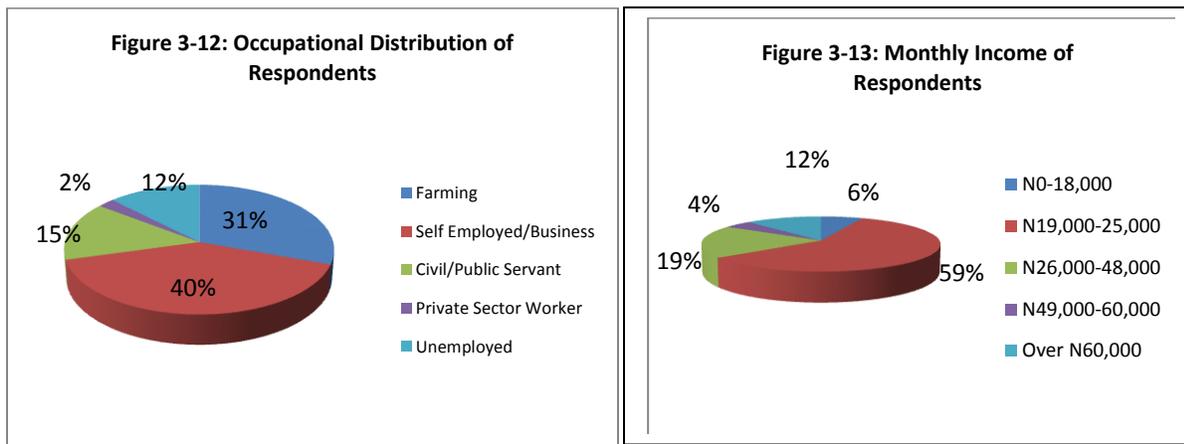


The level of basic education for the surveyed households (Figure 3-11) is relatively high with overall 95% of the surveyed population having attained the FSLC level of education and higher.

Based on respondents' household data, 85.2% of the population has attended/graduated from the primary school and the secondary education. This high literacy level within the project affected villages is also a reflection of the literacy rate in Abagana as a whole. There are several educational facilities readily available in Abagana which appear to have contributed to the net high level of basic and primary education levels in the town with 45% at secondary education level (Figure 3-11).

3.3.6 Occupational and Income Distribution of Respondents

The occupational distribution data from the questionnaire indicates that 40.0% of the respondents in the survey are self-employed or involved in their own businesses while 31.0% are engaged in farming (Figure 3-12). 15.0% of the people are civil/public servants with 2.0% engaged in the private sector work. 12.0% of the respondents are unemployed.



The main source of income for the households surveyed is cash wages (73%). About 23% of the respondents reported owning a business. The project survey showed that 47% of households were self-employed and 17% were engaged in wage-employment. There was ample evidence of small business trading in the project area ranging from small item stores to home-based provisions stores, medicine shops and street hawkers selling fruit, vegetables and other daily domestic consumables.

Based on the income data provided by respondents in the survey, 12% of respondents earn over N60,000 monthly. 78% of respondents earn between N19,000 and N48,000 monthly while 4% of them earn between N49,000 and N60,000. 6% of those surveyed earn below N18,000 and below. The margin of error in the information provided on incomes may be significant considering that some of the respondents may have grossly inflated data provided with the intent to receive compensations in accordance with incomes indicated in the survey. The data provided could not be independently verified.

3.3.7 Household Waste Disposal

Most of the respondents dispose their household wastes into the gully. In many areas, the wastes are also dumped at illegal dumpsites created adjacent to the gully. Solid waste management in the project area is a considerable hazard to the health of the population and the effective functioning of the storm water drainage systems. In the project area, unmanaged refuse disposal causes regular obstruction of the storm water drainage systems. Domestic refuse is disposed randomly outside the residential compounds and the flood-prone areas are also treated as de facto waste disposal areas. The depicted situation in the project area is a clear reflection of the limited management and implementation of waste disposal mechanisms in most part of the state as well as the nation with majority of households disposing of their

domestic refuse outside their compounds. During the wet season waste is washed through the presently unplanned drainage paths leaving a trail of refuse.

3.3.8 Health Services

There are no hospitals in any of the villages involved in this project. However, a part of the Uruokpala Town Hall is being used as a rural health center administered by visiting medical personnel. In the project area, 10% of the respondents reported having malaria and 8% having diarrhea in the month that preceded the survey. While none of the respondents made mention of malaria prevention programmes in their area, one of the root causes for the high prevalence of malaria is the constant presence of water around residences.

Information/data obtained from the local government health information records show that common diseases are diarrhea, malaria, typhoid, pneumonia, cough, skin diseases, deficiency diseases, eye diseases, ear diseases, and waterborne diseases due to malnutrition and lack of hygiene. The quality of the health services in the project area is generally poor. Most people go to quacks and medicine shops for minor medical treatment.

3.4 Desirability of the Project

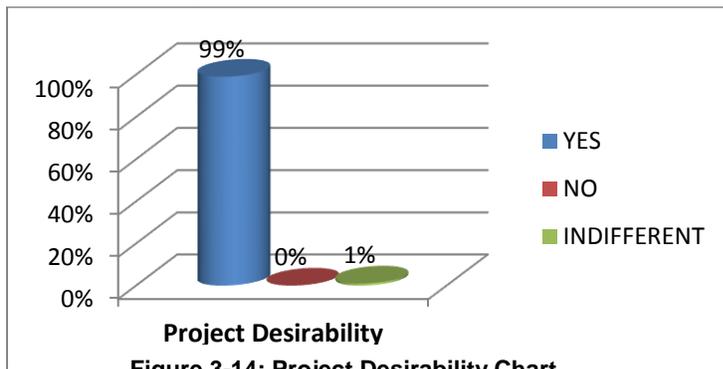


Figure 3-14: Project Desirability Chart

Most of the respondents in the survey indicated immense desirability for the project to proceed. Many of them expressed a clear wish for the project to proceed before the next round of rainfall.

3.5 Conflict Resolution

Most of the respondents in the survey (97%) prefer and actually find it most convenient to have conflicts resolved through informal traditional modes of conflict resolution which currently exists within the communities. While the court system is seen as an alternative means to resolve issues, only 3% of the respondents favour the court approach as shown in Figure 3.15.

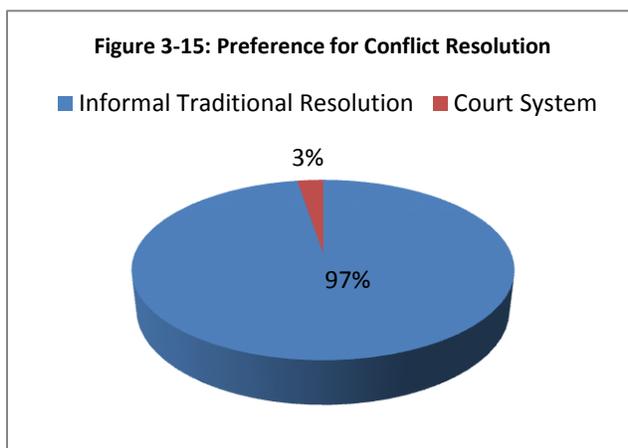


Table 3.1: Summary of Findings for All Socioeconomic Indicators

S/No	Socioeconomic Indicator	Findings
1	Population	Abagana has a total population of 46,136 people. Male population is 22,973 (49.79%) while the female population is 23,163 (50.21%).
2	Ethnic Groups and Language Spoken	The people of Abagana consist of one major Nigerian ethnic group – the Igbos. The people generally speak and write mainly the Ibo and English languages. Abagana town is made up nine villages. Clanism and kinship are strong elements and driving forces in control of political and cultural institutions and service points. The villages consist of groups of households whose families are inter-related.
3	Religion	The people of Abagana people are predominantly of Christians, mostly Catholics and Anglicans with some traditionalists and negligible Muslim community.
4	Land Use System	Three major types of customary land tenure system exist in Abagana – (1) individual land ownership; (2) family land ownership; and. (3) communal land ownership. Individual ownership may be for indigenes or for residents of the community. Family lands (as well as individual lands) are inherited from generational relatives. Communities retain family lands which may never be sold but mostly used for agricultural purposes. About 80% of land is committed to agricultural production of food crops which include maize, cassava, yams, plantain, vegetables, etc.
5	Household Distribution in Project Area	Based on surveyed households in the project area, about 71% of households are from Umudunu village, 22% from Uruokpala village, 5% from Uru village and 1% from Adagbe village. This data appears to reflect development/infrastructural densities of the respective villages within the project corridors.
6	Gender, Age and Household Size of Respondents	86% of respondents are males while 14% are females Age distribution shows 29% of households are below 18 years old; 52% are between the ages of 19 to 30 years; 30% are between the ages of 31 and 65 years while 6% are over 65 years of age. Household distribution in project area range from 1-10 persons with an average household size of 5 persons.
7	Marital Status of Respondents	About 90% of the respondents are married while 5% are single and about 5% are widowed.
8	Access to Education	There is high literacy level within the project area which also reflects the literacy rate in Abagana as a whole. 95% of respondents have attained the minimum of primary education with only 5% of the population of schooling age has never attended school Several educational facilities are readily available in Abagana resulting in the net high level of basic and primary education levels with 45% at secondary education level
9	Occupational and Income Distribution of Respondents	The occupational distribution data from the questionnaire indicates 40.0% of respondents are self-employed or own their businesses; 31.0% are engaged in farming; 15.0% are civil/public servants with 2.0% engaged in private sector work and 12.0% are unemployed. Income data by

S/No	Socioeconomic Indicator	Findings
		respondents shows 12% of respondents earn over N60,000 monthly; 78% earn between N19,000 and N48,000 monthly; 4% earn between N49,000 and N60,000; and 6% earn N18,000 and below.
10	Household Waste Disposal	Household wastes are indiscriminately dumped at illegal dumpsites adjacent to the gully in the project area. Solid waste management is a considerable hazard to health and the effective functioning of the storm water drainage systems. Unmanaged refuse disposal causes regular obstruction of the storm water drainage systems.
11	Health Services	Records show that common diseases in project area include diarrhea, malaria, typhoid, pneumonia, cough, skin diseases, deficiency diseases, eye diseases, ear diseases, and waterborne diseases due to malnutrition and lack of hygiene. The quality of health services in the project area is generally poor. Most people go to quacks and medicine shops for minor medical treatment.
12	Desirability of Project	99% of survey respondents indicated immense desirability for the project to proceed.
13	Conflict Resolution Mechanism	97% of survey respondents prefer that their conflicts be resolved through informal traditional modes of conflict resolution. Less than 3% favour resolution through the court system.

CHAPTER 4: POTENTIAL IMPACTS AND ANALYSIS OF PROJECT ALTERNATIVES

4.1 Introduction

This section identifies the methods/techniques used in assessing and analyzing the potential social and environmental impacts of the project and, also discusses the alternatives to the proposed project and reasons for their rejection. The likely future scenario without the project is also considered.

The beneficial and adverse potential environmental, economic, social and cultural impacts are identified based on professional judgment and the use of unranked pair-wise comparison approach (Canter, L and Sadler, B; 1997). Other factors in predicting the potential impacts include the results of public consultations. The potentially significant environmental and social impacts of the project as well as the suitable mitigation measures have been discussed. The assignment of responsibilities for implementation within the ESMP and the associated costs are presented in Chapter 5.

4.2 Evaluation of Project Alternatives

This section discusses the alternatives to the project which have been considered as part of this ESMP. It also demonstrates how and why the designed erosion remedial option has been chosen such that involuntary resettlement (including involuntary acquisition of land) and impact on livelihood of people living along the gully routes have been avoided or minimized and how environmental impacts have also been minimized. The use of alternative materials, processes and technologies is also discussed.

Specifically, three project alternatives including the proposed project and “do nothing” alternative were evaluated in terms of technical feasibility and effectiveness and cost effectiveness.

4.2.1 “Conventional Channelization Technology” Alternative

World Bank experience has shown that the initiatives (application of conventional technologies) which have been carried out for soil erosion in south-eastern Nigeria from the colonial times to the present were “top down” in design with mixed results. Areas with vegetative solutions have yielded some success while engineered solutions have been mostly and largely unsuccessful, although more expensive to implement. The reasons for the mixed results include:

- i) Focus on engineering solutions without considering the catchment area
- ii) Scale of the problem
- iii) Weak community ownership and participation
- iv) Approach has been ad-hoc in nature
- v) Weak institutional capacity and arrangement
- vi) Inadequate funding

Erosion is caused by excessive energy of flowing water which the natural soil is not able to resist or withstand. Effective erosion control involves the regulation of flow and velocity control of the flowing water so that the natural soil is able to withstand the energy of flowing water. Regulation of water flow is generally achieved by channelization, which is typically applied. However, effective energy dissipation of flowing water is mostly never applied. Channelization therefore, oftentimes creates more problems than they are meant to solve.

Additionally, this alternative cannot be conveniently done during rainy season, does not encourage integration of bio-engineering, incorporates minimal or no energy dissipation structures, does not consider local channel gradient nor reflect local environmental conditions and eroded land never regains its original form. Consequently, a “conventional channelization technology” alternative is not considered to be a viable option.

4.2.2 “Combination of Structural and Non-Structural Technology” Alternative

In proposing this concept, consideration was given to social and environmental impacts of the project. As indicated earlier, the continued application of the conventional channelization technology has so far not been effective at solving the numerous erosion problems across the country and has also in most cases exacerbated the situation.

The project was therefore designed with a view to restore or to protect land and infrastructure through a combination of structural and non-structural (vegetative) approach that include:

- Structural land management and engineering measures (drainage, barriers, terraces, road rehabilitation, etc);
- Vegetative land management measures (grassing, agro-forestry, forest regeneration, vegetation corridors, etc.) on-site and in immediate catchment; and,
- Livelihoods measures and alternatives.

The basic function of a Hydraulic Control Structure is to dissipate the energy of flowing water, and hence the speed of flow. To maintain the same volume of discharge, appropriate sizing of channel is required. By varying the slope (gradient) of channel, the quantum of energy dissipated, and the sizing of channel, erosion is controlled for a given volume of discharge.

The concept as developed and designed largely minimizes the need for land acquisition and resettlement. The combined structural and non-structural technology integrates local channel gradient as part of the solution and customized to reflect local environmental conditions while integrating a sense of community ownership for the project.

4.2.3 Alternative Materials and Processes

The use of environment-friendly, bio-engineered geostructures or gabions enhances recovery of eroded land potentially to its original form and allows immense flexibility in construction. Hydraulic control structures consisting of geostructure mattresses are hydraulically stable during construction hence can be executed during rainy season.

Modular bio-engineered geo-structures may be of any size, but primarily, it must be of size(s), which allows for manual handling and fabrication, self-stabilizing mass (can independently resist hydraulic forces, and hence be easily constructed during rainy season), and appropriate size of linkage/reinforcement synthetic strands.

4.2.4 “Do Nothing” Alternative

Currently, gully erosion is severely ravaging Abagana communities rendering untold hardship to the communities. The effects have and continue to increase exponentially with every year that passes and its associated rainfall. The proposed project as designed will effectively halt these effects and assure the long term objectives of erosion prevention and control within the Abagana watershed. The many erosion gullies in Abagana have had a devastating effect on many peoples’ lives and have destroyed essential infrastructure for economic development and poverty alleviation in the communities. Consequently, a “do nothing” alternative is not considered to be a viable option.

4.3 Discussion of Methods/Techniques Used In Assessing Impacts

4.3.1 Impact Rating Methodology

The assessment of the potential impacts of the project was based on specialists' expertise, Consultant's professional judgment, field observations and desk-top analysis. The significance of potential impacts that may result from the proposed project was determined in order to assist in decision making.

Generally, the envisaged areas of potential impacts which could result from the activities of the project are evaluated for impact significance based on the comparative consequential effects of the potential impact on the social and biophysical environments. The significance of an impact may be defined as a combination of the consequence of the impact occurring and the probability that it will occur. The criteria used to determine impact consequence are shown in the Table 4-1.

Table 4-1: Criteria used to determine the Consequence of the impact

RATING	DESCRIPTION OF RATING	SCORE
A. Extent – the area over which the impact will be experienced		
Localized	Confined to specific project activity area or part thereof	1
Entire Watershed	The entire watershed	2
Regional	Beyond the watershed	3
B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources		
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions and processes are severely altered	3
C. Duration – the timeframe over which the impact will be experienced and its reversibility		
Short-term	Up to 6 months	1
Medium-term	6 months to 1 year	2
Long-term	More than 1 year	3

The numerical scores in Table 4-1 are positive or negative depending on whether the impact is adverse or beneficial. If impact is adverse, the numerical score is positive and if the impact is beneficial, the numerical score is negative. The combined score of the three criteria (extent, intensity and duration) corresponds to a Consequence Rating, as shown in Table 4-2:

Table 4-2: Method used to determine Consequence Score

Combined Score (A+B+C)	3 – 4	5	6	7	8 - 9
Consequence Rating	Very low	Low	Medium	High	Very high

The probability of the impact occurring is determined using the probability classifications presented in the Table 4-3 below:

Table 4-3: Probability Classification

Probability – the likelihood of impact occurring	
Improbable	< 40% chance of occurring

Possible	40% – 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

The overall significance of impacts was determined by considering consequence and probability using the rating system prescribed in the Table 4-4 below:

Table 4-4: Impact Significance Ratings

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	INSIGNIFICANT	INSIGNIFICANT	VERY LOW	VERY LOW
	Low	VERY LOW	VERY LOW	LOW	LOW
	Medium	LOW	LOW	MEDIUM	MEDIUM
	High	MEDIUM	MEDIUM	HIGH	HIGH
	Very High	HIGH	HIGH	VERY HIGH	VERY HIGH

As previously indicated under Chapter 1, the envisaged project activities will include:

1. Civil Construction Works:

- cutting and filling for percentage recovery
- compaction of soils
- concrete casting
- assembling of structures and,
- slope stabilization.
- The foundations of the lattice structures will be dug manually then casting concrete are used. The depth will be determined consistent with the geotechnical study.
- Vegetation clearing will be done manually with safety consciousness.
- A number of transport vehicles will be deployed in the project but there will be no on-site maintenance of vehicles.
- Powered equipment is expected to be used in the construction including power saws and compressor to break hard ground (if required).
- Earth moving equipments will be used such as excavators, compactors, bulldozers and pay loaders;
- Skilled and unskilled labor to be employed in the project.

2. Biological Remedial Construction Works:

- Terracing;
- Structured vegetation;
- Specific trees planting with known root strength
- Economic trees planting

Overall, this project is aimed at halting or minimizing the environmental and social damages being caused by the incidence of gulying in the project area and beyond. This is, in the overall a positive impact.

The envisaged areas of potential positive and negative impacts on the socioeconomic/cultural and biophysical environments which could result from the proposed project include:

Social Impact Areas:

- 1) Sources of livelihoods.

- 2) Damage to building structures.
- 3) Displacement of people.
- 4) Displacement of infrastructure (drainages, electric poles, etc).
- 5) Damage to roadways
- 6) Isolation of settlements.
- 7) Migration of communities.
- 8) Employment generation
- 9) Gender disparity
- 10) Archaeological and cultural resources
- 11) Economic activities
- 12) Land use restrictions

Environmental Impact Areas:

- 1) Air quality
- 2) Surface water quality
- 3) Groundwater quality
- 4) Noise and vibrations
- 5) Degradation of arable land in the project area.
- 6) Biodiversity conservation.
- 7) Siltation of Oshoku/Ozowata stream.
- 8) Ecological diversity in stream watershed.
- 9) Public Health and safety
- 10) Visual effects.
- 11) Traffic and transportation
- 12) Check dam failure and earth movements
- 13) Solid and liquid wastes
- 14) Soil erosion and flooding vulnerability
- 15) Climate change

4.4 Potential Impacts on the Socioeconomic/Cultural and Biophysical Environments

The potential impacts have been organized considering all phases of the project from the pre-construction phase through the construction phase to the post-construction phase and summarized based on whether the envisaged project impact area will result in positive or negative impacts. These are summarized for the socioeconomic/cultural and biophysical environments and shown in Table 4.5.

Table 4.5: Summary of Potential Impact Areas Triggered by Abagana Project

S/No.	Potential Impact Area	Does Project Result in Negative Impact?		Aspects of Project that Trigger Positive or Negative Impact
		YES	NO	
Socioeconomic Environment				
<u>Socioeconomic Impacts</u>				
1.	Erosion Control Capacity in Abagana	[]	[X]	Capacity building in project leads to improved capacity of Abagana communities in the prevention and control of erosion and flooding throughout watershed.
2.	Employment Generation	[]	[X]	Project will provide short term, local employment opportunities for community members in terms of site clearance, excavation, loading and offloading of materials and deliveries services; drivers, security services, provision of goods and services to construction workers e.g. food kiosks and other shops.
3	Sources of livelihoods.	[X]	[]	There will be small, temporary loss of some croplands to be used as easement for stabilizing the

S/No.	Potential Impact Area	Does Project Result in Negative Impact?		Aspects of Project that Trigger Positive or Negative Impact
		YES	NO	
				deep gully wall sections. Compensations will be required for the PAPs in accordance with WB policies.
4	Damage to building structures.	[]	[X]	No buildings or structural assets will be demolished for purposes of executing this project. Project activities will avoid all buildings in the vicinity of gully corridor.
5	Displacement of people.	[X]	[]	There will be no permanent displacements of persons. However, persons with critical health conditions, including old persons and children, within project area may be temporarily relocated during construction phase. PAPs will be compensated for temporary displacement.
6	Displacement of infrastructure (drainages, electric poles, etc).	[]	[X]	Erosion control infrastructure and associated drainage channels as proposed are expected to remain for long time and sustainably maintained for continued effectiveness.
7	Damage to roadways	[]	[X]	Proposed project requires access roads to be rehabilitated to allow for the movement of machinery and for the delivery of materials. The improved roads would also be of long term benefit to the community since the roads are essential trading links with neighboring communities.
8	Isolation of settlements.	[]	[X]	N/A
9	Migration of communities.	[]	[X]	N/A
10	Gender disparity	[]	[X]	Women as well as men will benefit from the short term, local employment opportunities to be created during construction phase. There will be income generating activities for women in catering/restaurants for workers on construction site and from sale of local products to construction workers.
11	Capacity Building	[]	[X]	The effective implementation of the project will require capacity building and awareness campaigns. Health, safety and environmental training and awareness will be extended to both workers and community members and local residents.
12	Archaeological and cultural resources	[..]	[X]	Proposed project will not pass through or be sited close to any known World Heritage or archaeological sites. Project is also not located within any United Nations (UN) Classified Indigenous Peoples Land. There are four (4) shrines that exist at locations close to the project area. These shrines namely, Onyeausi, lchekuoku, Obichiluzo and Ezimezi/Aro will not be affected by the project as designed except for increased human movements in the vicinity of the shrines during the project construction phase.
13	Authority of Community Leadership	[]	[X]	Project will reinforce authority of community elders and local leadership with formation of various committees to facilitate sustainable institutional arrangements for post-construction effectiveness. Committee nomination follows existing community structures which rely on opinion of community leaders.
14	Economic activities	[]	[X]	Short term increase in economic activities and opportunities around the project areas will emerge for local community members can take advantage of. Indirect economic gains from the purchase of

S/No.	Potential Impact Area	Does Project Result in Negative Impact?		Aspects of Project that Trigger Positive or Negative Impact
		YES	NO	
				construction materials such as cement, iron rods and bricks will emerge.
15	Land use restrictions	[X]	[]	Land easement (about six meters from gully edge on both sides of the gully) required for stabilization of the deep gully wall sections may alter long term use of any particular piece of land. For example, structures may not be put on portions of the land although economic trees could be planted.
Bio-Physical Environment				
<u>Bio-Physical Impacts</u>				
1	Air quality	[X]	[]	Air pollution expected from dust and emissions from construction vehicles, plant and equipment. Dust is generated by excavation and earth moving operations and causes nuisance to residents and other sensitive receptors. Exhaust emissions occur from poor maintenance of plant and equipment or over revving of engines.
2	Surface and ground water quality	[X]	[]	Construction works have both short-term and long-term impacts on water resources. Earthworks release suspended particles into watercourses, which can have temporary detrimental effects on water organisms. Spillages of fuel and other petroleum products cause contamination of the soil and water resources.
4	Noise and vibrations	[X]	[]	Noise will emanate from moving vehicles, excavators, generators, power tools (e.g. for vegetation clearing), and compressors during construction. Permissible human noise levels may be temporarily exceeded during construction and may cause hearing impairment and nuisance to local residents and other sensitive receptors such as schools and hospitals. Vibrations from equipment can also be an issue for residences and other sensitive receptors close to the gully heads.
5	Degradation of arable land in the project area.	[]	[X]	N/A
6	Biodiversity conservation.	[X]	[]	There will be loss of natural and planted vegetation during construction by moving plants and machinery as well as siting of temporary office and workers camp. No impacts however are anticipated on wildlife habitats and migratory birds.
7	Siltation of Oshoku/Ozowata stream.	[]	[X]	N/A
8	Ecological diversity in stream watershed.	[]	[X]	N/A
9	Public and Occupational Health and safety	[X]	[]	Construction operations pose hazards to people living or working near construction areas or employed to work on site. Excavations, construction traffic and stockpiled materials pose particular threats to children and livestock. Children may be inadvertently recruited to work on construction sites. Construction workers camp give rise to health risks associated with poor waste disposal practices, sanitation and prostitution.
10	Visual effects.	[X]	[]	Adverse visual impact will arise as construction works

S/No.	Potential Impact Area	Does Project Result in Negative Impact?		Aspects of Project that Trigger Positive or Negative Impact
		YES	NO	
				will be visible to local residents or pastoralists. Construction visual impacts will however be short term in nature and remains an effect at a socio-cultural level in terms of aesthetics.
11	Traffic and transportation	[X]	[]	Traffic movements associated with site staff, delivery of materials and the removal of waste during the construction is likely. Occasional movement of abnormal loads on local roads may result in temporary diversions. Traffic and transport associated with project will adhere to existing roads or follow specified routes as established.
12	Failure of check dams and earth movements	[X]	[]	Poor construction of check dams and other operations can pose a risk of check dam failure and earth movement hazards resulting in impacts to the environment and/or to people working near the construction areas.
13	Solid and liquid wastes	[X]	[]	Proposed project will generate waste during construction including off specification materials such as cement, wood, plastic, paper and domestic waste from construction areas and worker camps. This could result in increased pressure on local waste dump facilities as well as potential for unauthorized disposal and littering if not properly managed.
14	Soil erosion and flooding vulnerability	[]	[X]	N/A
15	Climate change	[X]	[X]	
16	Off-site Resources	[X]	[]	Sourcing construction materials such as sand from river beds or burrow pits may cause adverse environmental impacts if not conducted in a sustainable manner. Project may also lead to increased demand for construction materials and impact on availability of such materials for other projects going on at the same time in the area.

N/A = Not Applicable

4.5 Potential Impacts Significance Rating

Table 4-6 shows the detailed analysis of the impact significance rating for each of the potential project impact areas.

Table 4-6: Impact Significance Rating

S/No	Potential Impact Area	Consequence Rating	Probability Classification	Impact Significance
ENVIRONMENTAL IMPACTS				
1	Air Quality	Medium	Definite	Medium
2	Surface/ground Water	Medium	Definite	Medium
3	Noise and Vibrations	Medium	Definite	Medium
4	Degradation of land	Medium	Improbable	Insignificant
5	Vegetation loss	Medium	Definite	Medium
6	Siltation of stream	Very Low	Improbable	Insignificant
7	Stream ecological diversity	Very Low	Improbable	Insignificant

S/N o	Potential Impact Area	Consequence Rating	Probability Classification	Impact Significance
8	Safety and health	High	Probable	High
9	Failure of check dams	High	Improbable	Medium
10	Earth movements	Very High	Possible	High
11	Traffic and transportation	Very High	Definite	Very High
12	Solid wastes	Medium	Definite	Medium
13	Liquid wastes	Medium	Definite	Medium
14	Soil erosion & flood vulnerability	Medium	Improbable	Low
15	Climate change	High	Definite	High
SOCIAL IMPACTS				
1	Loss of means of livelihood	High	Definite	High
2	Loss of physical assets	High	Definite	High
3	People displacement	Low	Probable	Low
4	Infrastructural displacement	Low	Possible	Low
5	Settlement isolation	Very Low	Improbable	Insignificant
6	Community migration	Very Low	Improbable	Insignificant
7	Damage to roadways	High	Definite	High
9	Gender disparity	High	Possible	Medium
10	Loss of archaeological and cultural resources	Low	Possible	Very Low

A combination of the outcome of Table 4.5 and Table 4-6 indicates that the following social and environmental impact categories will suffer medium to very high impact levels as a result of the project implementation:

Social:

- Loss of physical assets
- Loss of means of livelihood

Environmental:

- Dust and air quality
- Surface and ground water quality
- Noise and vibration
- Vegetation loss
- Public/Occupational Health and Safety
- Failure of check dams
- Earth movement
- Traffic and Transport
- Solid and liquid waste
- Climate change

Tables 4.5 and 4-6 further indicate that the other environmental and social impact categories will suffer insignificant to low impact levels as a result of the project implementation.

**CHAPTER 5.0: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)
IMPLEMENTATION**

This ESMP is necessary to achieve the health, safety, and environmental regulatory compliance objectives of the project. To this end, the Plan has focused on specific steps to be taken with respect to implementation of the mitigation measures and monitoring activities for the environmental and social impacts identified in Chapter 5. The plan highlights the specific mitigation measures that would be taken and the entities responsible for carrying out the mitigating measures. The ESMP also contains a monitoring plan indicating the responsible parties, the frequency of monitoring, key indicators and the reporting format, and provides for the capacity building necessary to facilitate the ESMP implementation. Cost estimates for implementation of the various measures, monitoring plan and capacity building are also given. The projected implementation budget will enable the ESMP to be an integral part of financing for the rehabilitation/maintenance works in the project.

5.1 Summary of Safeguard Measures for Implementation

Based on the environmental and social impact categories identified in Chapter 4 (see Tables 4-5 and 4-6), the ESMP implementation will address measures that cover the following areas:

Social Impacts

- 1) Community and PAPs issues management;
- 2) HIV/AIDS and health awareness management;

Environmental Impacts

- 3) Dust control and air quality management;
- 4) Water resources, erosion control and flood prevention management;
- 5) Noise and vibration exposure management;
- 6) Flora and fauna removal management;
- 7) Public and occupational health and safety management;
- 8) Construction operation and gully stabilization;
- 9) Road diversion and accident prevention;
- 10) Waste management; and,
- 11) Temporary project office site management.

5.1.1 Environmental and Social Management Measures

The environmental and social management measures to address the identified impact categories are presented in Table 5.1. These measures will be implemented by the Contractor through the course of the project. These measures will also serve as the basis for monitoring.

Table 5.1: Summary of Impact Mitigation Measures

S/No	E&S Impact Categories	Mitigation Measures
<u>Social Impacts</u>		
1	Impacts on Community and PAP Management	<ul style="list-style-type: none"> •Create awareness among community members; •Sensitize the people to all project activities •Pay adequate compensation to PAPs; •Build capacities within community •Incorporate community feedback into implementation process •Disseminate project study findings; •Ensure that period of inaccessibility to land is as short as possible •Maximize local employment (including women) on construction works (this should be a contractual requirement to hire a percentage of local workforce including women) •Provide occupational health and safety awareness training and workshops, •Use of child labor prohibited

S/No	E&S Impact Categories	Mitigation Measures
2	HIV/AIDS and STIs Management	<ul style="list-style-type: none"> • Provide quarterly HIV/AIDS and STIs awareness programmes for workers and nearby communities; • Health and HIV awareness team arranged from the State Health Ministry for the quarterly programmes; • Sponsored educational package put together by the team to be implemented to enlighten both workers and communities; • Training of peer educators within the work force and in communities by the team; and • The contractor to provide free condom supplies and encourage free discussions, counseling and testing.
Environmental Impacts		
3	Dust and Air Quality Management	<ul style="list-style-type: none"> • Dust generation will be controlled mainly by the use of water, especially in the dry season. Use of water tanker for purposes of water dousing to control dust emission. • Erection of speed control signals and ramps mounted in communities; • Covering of hauling trucks carrying sand and other aggregates; • Covering of heaped material e.g. sand will be covered: and • Use of nose masks by all workers at road maintenance/works sites. <p>Surfaces of vegetation along the maintenance road will be monitored to verify the effectiveness of dust suppression method.</p>
4	Water Resources, Erosion Control and Flood Prevention Management	<ul style="list-style-type: none"> • Location for heaping construction material (e.g. sand and other aggregates) not less than 50m from water bodies and drainage channels (i.e. a separation distance of 50m will be observed); • Site for fuelling of machinery and servicing of equipment will be located at a minimum distance of 100m from water bodies, wetlands and drainage channels; • Embankment erection around fuelling and other liquid or spill-able storage sites in order to limit or contain such material from escape to potentially pollute water resources; • Side drains (where appropriate) will be provided with settling basins near water bodies to remove silt and debris from road surface and construction site run-off, before discharge to adjoining streams or rivers; • Adequate side drains provided to carry run-off into drainage channels to prevent erosion; • Culverts of suitable capacity constructed to contain and direct flow, especially at peak flow and run-off; • Road maintenance works to be carried out off peak rainy season; • Provision of toilets and urinal at locations not less than 50m away from water bodies; and • Adequate worker awareness on sanitation and measures to avoid water resource contamination.
5	Noise and Vibration Exposure Management	<ul style="list-style-type: none"> • Equipment servicing plan will be prepared and strictly followed to ensure efficient machinery performance and optimum noise generation. • Stationary equipment shall be sited at safe distances from sensitive areas to minimize noise impacts • Workers operating noisy equipment will not be exposed continuously for more than 3 hours a day. • Workers will be provided with ear plugs. • Workers handling vibrating equipment or parts will be given pads to absorb the vibrations and will not be exposed continuously for longer than 3 hours a day. • Sanctions (ranging from a warning to dismissal) will be instituted by the contractor

S/No	E&S Impact Categories	Mitigation Measures
		against workers who do not observe the use of appropriate PPEs
6	Flora and Fauna Removal Management	<ul style="list-style-type: none"> • Mark out areas for clearance & where possible use manual method of vegetation clearing; • Undertake selective clearance by removing tall woody species leaving saplings for quick regeneration of vegetation; • Prevent colonization by invasive species- • Prevent damage to critical ecosystems and habitats • Prevent destruction of flora and fauna
7	Occupational/Public Health and Safety Management	<ul style="list-style-type: none"> • Erection of warning signals and use of reflective tapes at approaches to excavations, heaped materials, stationary equipment, etc. • Posting of speed limits of 40km/hr at approaches to construction sites; • Safety meetings held twice a week and documented accordingly; • Inductions and awareness programmes held for all employees on occupational health and safety practices; • A First Aid team formed to provide first aid services to workers and where appropriate make referrals to the nearest Health Centre or hospital; • First Aid team to be trained by a medical team from the Health Centre; • Accident records at construction site and neighbourhoods to be maintained both for workers and the public; • Stocks of PPEs to be maintained and supplied to workers regularly as needed; and • Workers required to wear the appropriate PPEs e.g. helmets, ear plugs, nose masks, vibration pads, hand gloves, etc.
8	Construction Operation and Gully Stabilization	<ul style="list-style-type: none"> • Monitor and maintain intervention work for continued stability and quality of check dams and other construction works • Shortcomings in the control structures should be corrected before they develop into serious problems. • Treated gullies should be checked regularly and the healing process monitored closely. Structures built in the gully for stabilization purpose such as check dams 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.
9	Road Diversion and Accident Prevention	<ul style="list-style-type: none"> • A temporary structure to be constructed on one lane to allow for traffic flow while work is on-going on the other lane; • Traffic wardens to be posted at positions 100m from the construction points on either side of the road to ensure orderly traffic flow; • Actual working areas to be secured with barricades; • Adequate road warning signs to be posted at vantage points to warn and direct traffic; • All measures shall be effectively monitored by Contractor to ensure their implementation.
10	Waste Management	<ul style="list-style-type: none"> • Waste bins to be provided for the disposal of waste generated; • Waste will be segregated into two at source - organic and plastic and glass wastes; • Organic waste to be composted near the site office to enrich the soil, while plastics and glass are taken to the district dump-sites; • Topsoil removed from the right of way for maintenance work to be spread on the land to avoid disrupting drainage network; and • Toilets and urinals to be sited at least 100m from any stream or drainage channel and decommissioned at the end of project.
11	Temporary Project Office Site	<ul style="list-style-type: none"> • Identify a potential site, which must not be a farmland with crops or any physical asset;

S/No	E&S Impact Categories	Mitigation Measures
	Management	<ul style="list-style-type: none"> • Identify the landowner through the Assembly member and/or traditional ruler of the community; • Seek the consent of the landowner to erect the proposed site office on the land for the specified duration of the rehabilitation project; • Agree with the landowner to hand over the agreed structure to be erected to the landowner; and • Agree on other measures to render the site safe and usable to the satisfaction of the landowner.

5.2 Summary of Institutional Responsibilities

The key actors, including the roles and responsibilities of the various institutions, in the ESMP implementation are as shown in Table 5.2.

Table 5.2: Institutional Responsibilities

S/No	Category	Roles & Responsibilities
1	State Ministry of Environment (MOE)	<ul style="list-style-type: none"> • Lead role to ensure adherence to this ESMP and applicable standards, environmental and social liability investigations, Monitoring and evaluation process and criteria
2	SPMU (Safeguard Officers, Project Engineer)	<ul style="list-style-type: none"> • Coordinate all policies, programmes and actions associated with the gully rehabilitation project; • Ensure the smooth and efficient implementation of the project's various technical programmes • Cooperate through a Steering/technical Committees that provide guidance to the technical aspects of all project activities; • Maintain and manage all funds effectively and efficiently for the projects • Have custody of a copy of this ESMP; • Provide oversight of contractors work plan and E&S implementation schedule; • Conduct weekly or routine site inspection and monitor implementation of E&S safeguards; • Receive and review reports from the contractor; • Prepare and submit weekly/monthly and subsequent quarterly and annual reports to the SPMU Project Coordinator, FME and the WB.
3	FPMU	<ul style="list-style-type: none"> • Project assessment and monitoring of works and engineering activities
4	World Bank	<ul style="list-style-type: none"> • Assess implementation • Recommend additional measures for strengthening the management framework and implementation performance.
5	State Ministry of Works	<ul style="list-style-type: none"> • Site assessment and monitoring of works and engineering activities
6	State Ministry of Lands & Survey (MOLS)	<ul style="list-style-type: none"> • Compliance overseer at State Level, on matters of Land Acquisition and compensation and other resettlement issues,
	Other MDAs	<ul style="list-style-type: none"> • Intervene in areas under their jurisdiction as and when project demands
7	Contractor (Site Manager, Site Engineers/ Supervisors)	<ul style="list-style-type: none"> • Develop a work plan which incorporates schedule for E&S safeguards implementation; • Submit the work plan and schedule of E&S safeguard implementation to the SPMU; • Implement all E&S safeguards and other mitigation measures as planned; • Train/create awareness of all personnel/workers on relevant E&S safeguard measures and on their obligations; • Submit implementation reports on E&S safeguards to SPMU; • Comply with BOQ specification in procurement of material and construction and adherence to the ESMP and good practice Ensure land disturbance activities are conducted in accordance with relevant legislation; • Communicate content of ESMP to all employees and contractor agents; • Provide adequate onsite waste collection bins, ensure proper disposal, not to litter and not to create environmental nuisance; • Provide oversight function during construction and decommissioning to ensure adherence to good practice and the ESMP
8	Site Committee	<ul style="list-style-type: none"> • Monitor and ensure compliance to BOQ and quality
9	Local government	<ul style="list-style-type: none"> • Provide support in monitoring project execution within their domains to ensure compliance with this ESMP and other relevant requirements

S/No	Category	Roles & Responsibilities
10	Local Community	<ul style="list-style-type: none"> Promote environmental awareness Assist and Liaise with other stakeholders to ensure proper siting and provision of approval for such sites Support with provision of necessary infrastructures and engage/ encourage carrying out comprehensive and practical awareness campaign for the proposed projects, amongst the various relevant grass roots interest groups.
11	CDA/CDOs	<ul style="list-style-type: none"> Ensure community participation by mobilizing, sensitizing community members;
12	NGOs	<ul style="list-style-type: none"> Assist to ensure effective response actions, to evolve and devise sustainable environmental strategies and rehabilitation techniques, organize, coordinate and ensure safe use of volunteers in a response action, & providing wide support in management planning, institutional/governance issues and other livelihood related matter, awareness campaigns
13	General Public	<ul style="list-style-type: none"> Identify issues that could derail the project Support project impacts and mitigation measures, Awareness campaigns

The specific E&S safeguard obligations of the contractor that can be incorporated into the contract specifications are provided in Annex 2. This is in addition to other contractual provisions for the project.

5.3 Capacity Building Plan

5.3.1 Capacity and Training Needs

In order to achieve effective ESMP implementation, there is need for the strengthening of relevant competencies on environmental and social management at State, the LGA and community levels including contractors. This will stimulate the required collaboration among the key actors. The capacity building should include equipping individuals with the understanding, skills and access to information and training that enables them to perform effectively. Personnel of the erosion gully rehabilitation project need to understand the purpose of the ESMP implementation and their expected roles.

The target groups for the training will include:

- SPMU E&S Safeguard Officers and Project Engineers;
- Contractors;
- Construction workers and site personnel; and
- Selected members from the project communities.

The SPMU E&S safeguard officers and contractors will require capacity building in the implementation of the projects' environmental and social safeguards and general project planning and management inter-faced with E&S components. Capacity requirements are also in the areas of E&S monitoring and reporting adherence to the required E&S principles, standards and commitments. The construction workers and selected members of the project communities will undergo training on public awareness creation/educational techniques (on environmental, social and health issues) and first aid procedures.

5.3.2 Capacity Building Cost

The capacity building plan for the ESMP with the associated cost implications is shown in Table 5.3 below. To enhance the respective roles and collaboration of the relevant stakeholders, the broad areas for capacity building and effective ESMP implementation are identified and shown in Table 5.3.

Table 5.3: Summary of Institutional Capacity and Training Needs with Costs

Programme Description	Participants	Form of Training	Duration	Training Agency	Estimated Cost In (N)
<u>Understanding the Environment:</u> Concepts, Regulations & Statutory Requirements; Environmental Management; Erosion Prevention & Control; Stakeholder & Community Participation (Nigeria and World Bank)	Officials of MOE, MOW, MOLS, SPMU, Contractor, Community Leaders, NGOs, CBOs & Other Relevant Groups	Workshop	One Day	External Agency Engaged for Capacity Building/Environmental & Social Specialists	300,000.00
<u>Scope of Abagana Intervention Project:</u> Environmental & Social Impacts; Engineering Design and Associated ESMP; Coordination with Other MDAs and the Community	Contractor, Safeguard Officers, Engineers, MOE & relevant MDAs, Community Leaders, CDOs, & NGOs	Workshop	One Day	External Agency Engaged for Capacity Building/Environmental & Social Specialists	250,000.00
<u>Project Implementation:</u> Civil Works with Use of Vegetation for Gully Stabilization; Roles and Responsibilities of Key Actors; Environmental Monitoring & Mechanism	SPMU Engineer, Safeguard Officers, Contractors, MOE	Lecture and Site Visit	One Day	External Agency Engaged for Capacity Building/Environmental & Social Specialists	200,000.00
<u>Monitoring and Evaluation:</u> ESMP Monitoring and Reporting Strategy; Stakeholder and Community Participation	Contractor, Safeguard Officers, Engineers, MOE & relevant MDAs, Community Leaders, CDOs, & NGOs	Workshop	Half Day	Environmental & Social Specialists; External Agency engaged for capacity building	150,000.00
<u>Watershed Protection and Management:</u> Alternative Income Generation Programme for Stakeholders and Skills Requirements; Promotion of Agricultural Methods and Technologies for Improving Farm Production and Erosion Prevention;	Watershed Committee, Community Leaders, LGA Staff, Support Professionals	Workshop	One Day	World Bank/External Agency Engaged for Capacity Building/Environmental & Social Specialists	300,000.00
TOTALS					N1,200,000.00

5.4 Public Consultation Plan

A key element of sustaining stakeholders' support in this project is to sustain the consultations and communication process that has already been effectively established in the course of the preparation of this ESMP. Stakeholders' engagement needs to be enhanced and managed through a well-defined strategy. Table 5.4 provides a summary of the stakeholder consultation plan. Public sensitization and consultation will continue throughout the project execution.

Table 5.4: Summary of Stakeholder Consultation Plan

Activity	Stakeholders / Community	Timeline
Pre-Construction / Prior to Project Commencement		
Project briefings, site tours, personal meetings, community sessions, consultation meetings	State Government , Local Government, Site committee, Residents of affected areas/ Community and interest groups	As required, subject to project updates and feedback from the community
Development/dissemination of feedback and complaints mechanism and communications procedures	State Government , Local Government, Site committee, Residents of affected areas/ Community and interest groups	As required, subject to any updates on the Project

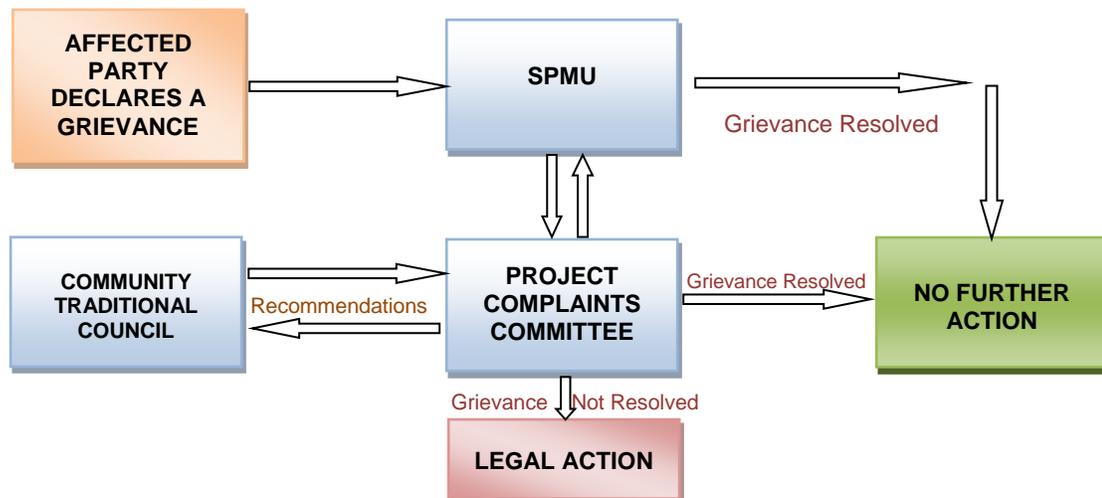
Briefings, Site Tours and Community Sessions - for gully development and rehabilitation	Government authorities, Local communities, Key/ relevant stakeholders	Prior to Work Plan approval
Construction and Operations		
Responding to issues and inquiries as per feedback and complaints mechanism	All stakeholders	Ongoing / as required
Monthly/Quarterly reporting on status of project	All stakeholders	Monthly/quarterly/as required.
Briefings, site tours and community sessions for gully development and rehabilitation closure plan	Govt authorities, Local communities, Key/ relevant stakeholders	Prior to project completion
Prior to Project Closeout/Post-Construction		
Project briefings, site tours, personal meetings, community sessions, consultation meetings with stakeholders	All stakeholders, State Govt , Local Govt, Site committee, Affected residents/ Community/ interest groups	As required, subject to approvals route and feedback from the community
Briefings, Site Tours and Community Sessions - for development of the Rehabilitation and Closure Plan	Government authorities, Local communities, • Additional relevant stakeholders	Prior to Work Plan approval

5.5. Grievance Redress Mechanism (GRM)

A Grievance Redress Mechanism (GRM) is necessary in order to prevent and address community issues, reduce exposure to risks and also provide the platform for the optimization of environmental and social benefits of the project. The community Traditional Leadership Council currently constitutes the nucleus of traditional resolution of disputes among community members. It is therefore wise and advisable that this Council be necessarily consulted in the event of any grievance or dispute relating to the ESMP implementation. Inputs from the Council may also be limited to providing recommendations as to how a specific dispute is to be addressed. Aside from the traditional council, Figure 5-1 provides a secondary mechanism for grievance resolution using the Project Complaints Committee (PCC). The proposed GRM will also help to achieve the following:

- serves as the open channel for effective communication together with the identification of emerging environmental and social concerns due to the project
- the GRM demonstrate concerns about members of the community including their environmental and social welfare
- to prevent and mitigate any adverse environmental and social impacts as a result of any phase of the project
- promote harmonious relationship and respect among stakeholders
- ensure community acceptance of the project.

Figure 5-1: Grievance Redress Procedure



5.6 ESMP Implementation Schedule

The implementation and management of the ESMP schedule is designed to facilitate any necessary resettlement issues associated with the RAP. The ESMP activities also need to be implemented within an agreed timeframe and budget. Appropriate timing should be adhered to in order to avoid project delays especially if the situation arises where site clearing is to begin before the resettlement end date.

The ESMP activities will be executed in accordance with the schedule shown in Table 5-6. The period of the first week will be used to develop and set up all structures necessary to support all aspects of the programs.

Table 5-6: Proposed ESMP Implementation Schedule

DESCRIPTION OF ACTIVITY	DURATION			
	1 st Week	2 nd Week	3 rd Week	4 th Week & Up
Disclosure of ESMP Report				
Formation of Project Complaint Committee (PCC) and PAP Committee (PC)				
Review and Approval of Contractor's ESMP and Health, & Safety Plan				
Hold Stakeholders Meetings and Consultations				
Execute Capacity Building Programmes				
Implementation of Mitigation Measures				
Supervising ESMP Implementation				
Monitoring & Reporting on ESMP Implementation				
Conduct Monitoring and Evaluation				
Program Administration				

5.7 ESMP Monitoring Plan

A summary of the impacts mitigation and monitoring plan with the associated monitoring frequencies, responsible parties and projected costs are presented in Table 5-7.

S/No.	Impact Category	Mitigation Action & Requirements	Monitoring Indicator	Frequency	Responsibility	Projected Cost
			sampled locations for the baseline data			
5	Noise and Vibration Exposure Management	Control exposure of workers to noisy and vibrating equipment; Regulate distance of stationary noisy equipment from public places; Equipment service plan to be strictly followed; Provide ear plugs to workers; Provide hand pads to workers to absorb vibrations; Noise & vibration exposure not more than 3hrs/day.	No of complaints from community members; Absence of structural failures; Absence of debris accumulation; No of debris removals & repairs made; Sensor measurement around the premises at established sampled locations for the baseline data	Daily Daily	Contractor/ SPMU Safeguard Officers/MOW/MOE/MOH/Community Leaders/Site Committee	150,000.00
6	Flora and Fauna Removal Management	Mark out areas for clearance & where possible use manual method of vegetation clearing; Undertake selective clearance by removing tall woody species leaving saplings for quick regeneration of vegetation; Prevent colonization by invasive species-	Areas of stressed vegetation; Size of cleared vegetation areas	Monthly Monthly	Contractor/ SPMU Safeguard Officers/MOW/MOE/MOH/Community Leaders/Site Committee	150,000.00
7	Occupational/Public Health and Safety Management	<ul style="list-style-type: none"> Erection of warning signals and use of reflective tapes at unsafe areas; Posting of speed limits of 40km/hr at approaches to construction sites; Road diversions & erection of speed control signs and ramps Post traffic wardens to direct traffic flow Protective barricades Awareness creation Training of first aid team Maintenance of accident book Provision and use of PPE Safety meetings will be held twice a week and documented accordingly 	No. of sanitary facilities provided at start of project; Adherence to stipulated speed limit Record of incidents; Use of PPEs by workers; Records of appropriate workers' training; Record of reinstatement plan for burrow pits; Record of health and safety meetings Record of first aid exercises Hazard assessment	At start of project; Twice weekly; Weekly; Daily; Monthly; At beginning of project Weekly; Monthly At start and at end of project	Contractor/ SPMU Safeguard Officers/MOW/MOE/MOH/Community Leaders/Site Committee	350,000.00

S/No.	Impact Category	Mitigation Action & Requirements	Monitoring Indicator	Frequency	Responsibility	Projected Cost
8	Construction Operation and Gully Stabilization	<ul style="list-style-type: none"> • Only suitably trained personnel to dispense and work with hazardous material; • -Immediately clean up spillages • Avoid filling gullies with rubbish, logs, rocks, car bodies and other unsuitable foreign materials; • Use earthen banks that divert runoff away from the gully head; • Design structures to collect maximum sediments & reduce flow in gully to non-scouring velocity; • Plant vegetation between the structures; 	No. of accidents/incidents; No. of visible warning signs; Level of public awareness; Record of safety meetings held;	Weekly; Daily; Continuous; Bi-weekly.	Contractor/ SPMU Safeguard Officers/MOW/MOE/MOH/Community Leaders/Site Committee	250,000.00
9	Road Diversion and Accident Prevention	<ul style="list-style-type: none"> • Road diversions & erection of speed control signs and ramps • Post traffic wardens to direct traffic flow • Protective barricades • Awareness creation • Training of first aid team • Maintenance of accident book • Provision and use of PPE • Safety meetings will be held twice a week 	Effective traffic flow with vehicular & worker safety; Appropriate positioning of road signs, reflectors, speed ramps, control limits, traffic wardens; Records of accidents and near misses	Daily; Daily; Daily.	Contractor/ SPMU Safeguard Officers/MOW/MOE/MOH/Community Leaders/Site Committee	350,000.00
10	Waste Management	<ul style="list-style-type: none"> • Segregation of waste & composting of organic waste; • Disposal of wastes in bins at approved waste dump sites; • Decommissioning of toilets at completion of project • Suitably trained personnel only to dispense and work with hazardous material; • Provision of suitable PPE; • Immediately clean up spillages • Keep health and safety data sheets on hand 	Waste segregation and littering; Emptying of bins at waste dump sites; Waste composting; Indiscriminate defecation; Toilets decommissioning	Daily; Weekly; Weekly; Daily; At end of project	Contractor/ SPMU Safeguard Officers/ MOE/ MOH/Community Leaders/Site Committee	300,000.00
11	Temporary Project Office Site Management	<ul style="list-style-type: none"> • Avoiding crops and physical assets in siting office; • Obtain landowner consent • Reinstate site to agreed conditions at completion of project 	Documented agreement with landowner for use of land space; Documented fulfillment of conditions of agreement with landowner; Handover of office site as agreed	Prior to start of project; Quarterly; At completion of project	Contractor/ SPMU Safeguard Officers/ MOE/ Community Leaders/ Site Committee	150,000.00
TOTAL COST					N	2,650,000.00

5.7 Budget to Implement ESMP

Cost projections for implementation of the various measures, monitoring plan and capacity building are given in Table 5.8. The projected implementation budget will enable the ESMP to be an integral part of financing for the rehabilitation/maintenance works in the project.

An indicative budget of US\$ 5,552,500.00 is shown for the implementation of the ESMP bearing in mind the elements that make up the implementation process. The budget covers:

1. Routine E & S duties of the SPMU;
2. Capacity Building for the SPMU and other stakeholders;
3. Engagement of Environmental and Social Specialists
4. Environmental and Social Due Diligence investigations and or Audits;
5. Monitoring and evaluation activities of the SPMU

Table 5-8: Breakdown of Cost Estimates

S/No	ITEM	RESPONSIBILITY	COST BREAKDOWN IN (N)			COST ESTIMATE IN NAIRA (N)	COST ESTIMATE IN (US\$)
			Pre-Construct ion Phase	Constructi on Phase	Post-Construct ion Phase		
1	MITIGATION	SPMU/Contractor	To be built into Contractor costs			-	-
2	MANAGEMENT	SPMU/ MOE	350,000	750,000	350,000	N1,450,000.00	US\$9,062.50
3	MONITORING	SPMU/ FPMU/ FME/ MOE/ Environmental Consultants/ Contractor	550,000	1,700,000	400,000	2,650,000.00	16,562.50
4	CAPACITY BUILDING & TRAININGS	SPMU/ MOH/ Consultants/ Contractor	900,000	300,000	0	1,200,000.00	7,500.00
Sub-total						N5,050,000.00	N33,125.00
5	CONTINGENCY (5%)					N252,500.00	N1,578.13
GRAND TOTAL						N5,552,500.00	US\$34,703.13

Assumed N160.00 = US\$1.00

CHAPTER 6.0 PUBLIC PARTICIPATION AND CONSULTATIONS WITH STAKEHOLDERS

6.1 Public Participation Process

The public participation process adopted in this Consultancy involved identifying and working with all Abagana stakeholders and the project affected persons (PAPs) or group of persons. These individuals and group of persons include those who live in close proximity to the erosion gully; those who will hear, smell or see the development; those who may be forced to temporarily relocate because of the project; those who have interest either traditionally or administratively, over developmental activities or policy changes in the project area (they may or may not necessarily live in proximity of the project); and, those who infrequently use the land on which the project is located.

The consultation process with the people of Abagana was driven to encourage active and



Figure 6-1: Community/Stakeholders' Meeting

sustained participation of the community members, particularly the four villages (Umudunu, Uruokpala, Uru and Adagbe) through which the active gully transverse. This was to promote community ownership of the project and to enhance sustainability. The process also involved the administration of pre-defined socio-economic questionnaires at the household level for the population living within the four affected villages particularly 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. The consultations will also remain open as an ongoing exercise throughout the duration of the entire project. Issues relating to project displacements and compensations to project affected persons and any vulnerable groups will be handled to minimize chances of possible conflicts.

6.2 Identification of Stakeholders

Generally, five 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 6-1. The identification followed the following considerations:

- i) Any persons or parties whose line of duties whether officially, socially, economically or culturally have 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 remedial 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.

Table 6-1: Identified Stakeholder Groups

GROUP	DESCRIPTION	ROLE(S) IN COMMUNITY PROCESS
Group-1	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 50meters of the erosion gully edge.	The identified persons or group of persons in this category will ultimately represent the project potentially-affected persons (PAPs) or households (PAHs)
Group-2	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-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.
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.

Table 6-2 gives the list of identified stakeholders in the villages traversed by the project including their areas of responsibilities or what they represent in the project. The list includes government functionaries, NGOs, FBOs and CBOs among others.

Table 6-2: List of Stakeholders and Their Responsibilities

GROUPS	IDENTIFIED STAKEHOLDER	AREA OF INTEREST IN PROJECT
Group-1	Residents of Umudunu Village	PAPs/PAHs
	Residents of Uruokpala Village	PAPs/PAHs
	Residents of Uru Village	PAPs/PAHs
	Residents of Adagbe Village	PAPs/PAHs
Group-2	Office of the Traditional Ruler – His Royal Highness, Igwe of Abagana	Welfare of the entire community
	Office of the President General – Abagana Welfare Association	Development of the entire community
	Office of Chairman – Umudunu Union	Development and welfare of Umudunu community
	Office of the Chairman – Uruokpala Union	Development and welfare of Uruokpala community
	Office of the Chairman – Uru Union	Development and welfare of Uru community
	Office of the Chairman – Adagbe Union	Development and welfare of Adagbe community
Group-3	Residents of Umudunu Village	Individualized livelihood issues
	Residents of Uruokpala Village	Individualized livelihood issues
	Residents of Uru Village	Individualized livelihood issues

GROUPS	IDENTIFIED STAKEHOLDER	AREA OF INTEREST IN PROJECT
	Residents of Adagbe Village	Individualized livelihood issues
Group-4	Community-based Organizations (ABEWAMA, etc)	Watershed protection and management
	Faith-based Organizations in the Villages (churches)	Community spiritual and physical welfare
	Non-governmental Organizations (WIEF, etc.,)	Protection of environmental health of communities
Group-5	Office of the Chairman – Njikoka LGA	Development of the LGA including Abagana town
	Office of the Hon. Member – Anambra State House of Assembly	Development of Njikoka/Anaocha state constituency
	Office of the Hon. Member – Anaocha/Njikoka Federal Constituency	Development of Njikoka/Anaocha federal constituency
	Office of the Distinguished Senator – Anambra Central Senatorial Zone	Development of Anambra Central Senatorial Zone

6.3 Community Consultations

The consultations in the course of this Consultancy dovetailed into the ones already initiated previously by the Consultant team and established by SPMU. The direct involvement and active participation of relevant stakeholders and the local level people in the planning and management processes of the project assures that any potential disharmonious community issues will be resolved speedily. There will also be maximization of resource use and increased benefits and expanded opportunities for the communities in the project area.

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

6.3.1 Objective of Community Consultation

The aims of the community consultation process are:

1. Solicit inputs, views and concerns within Abagana community as they relate to the project and obtain local and traditional knowledge that may be useful for decision-making;
2. Facilitate consideration of alternatives, mitigation measures and trade-offs and ensure that important impacts are not overlooked and benefits maximized;
3. Reduce conflict through the early identification of contentious issues; and increase public confidence in the project.
4. Provide an opportunity for the public to influence the designs and implementation in a positive manner and improve transparency and accountability in decision-making;

6.3.2 The Stakeholders Consulted and their Concerns

The consultations involved separate meetings between the Consultant team and the Traditional and Administrative leaderships of Abagana including the village Chairmen. The key stakeholders identified and consulted in the area include the traditional ruler of Abagana, the President General of Abagana Welfare Association, and, the Chairmen of the four villages that are affected by the project - Umudunu, Uruokpala, Uru, and Adagbe communities. Other stakeholders include individuals who own properties that will be directly or indirectly affected by the project, community associations and business owners, etc. A list of the stakeholders contacted is shown in Annex 1.

During consultation meetings, an overview of the proposed project and appreciation of ESMP 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.

6.3.3 Summary of Meetings with Stakeholders

The stakeholders' meetings focused on and discussed the need for the project and the associated potential impacts to the community members living within the project area. The community's concerns and general thoughts were solicited and noted. Details of the proceedings at the meetings held are included as Annexure IV.

Consultation Meeting with Igwe Abagana:

The Consultancy team met with HRH Mbamalu Okeke, Igwe Abagana on January 20, 2014 to apprise him of the project development and consult with him on how to achieve maximum involvement of Abagana stakeholders on the project. The Igwe welcomed the consultant team and expressed delight that the World Bank is coming to the community's aid in bringing lasting solution to the ravaging impacts of the erosion gullies.



Figure 6.2: Consultation Meetings with Igwe Abagana

Meeting with Residents of Umudunu, Uruokpala, Uru and Adagbe Villages

Meetings were held on January 21, 2014 and February 6, 2014 with members of the four communities affected by the project. The two meetings were held one at the Uruokpala Community Hall and the other at the Palace of the Traditional Ruler, HRH Igwe Mbamalu Okeke. Particularly, the community members welcomed the project and expressed anxiety that remedial work should commence expeditiously to prevent occurrence of further erosion damages from the rainfalls. Summaries of the proceedings at the meetings are shown in Tables 6.3 and Table 6.4, respectively.

Table 6.3 Summary of Stakeholders' Meeting Held on January 21, 2014

ITEMS	DESCRIPTION
Project	NEWMAP ESMP
Name of community	Abagana, Njikoka LGA
Date	January 21, 2014
Language of communication	Igbo and English
Introductions and opening remarks	The meeting started at 11:40am with an opening prayer by Deacon Francis Eze and the breaking of kolanut by Chief Okuagba Ezechukwu after which members of the State NEWMAP and the Consultant for the ESMP & ARAP took turns to introduce themselves.

ITEMS	DESCRIPTION
Overview of the meeting	<p>Mrs Ubaka from the state PMU noted the low turnout of women in the meeting and the consultant immediately called on the women outside to join in the meeting which they did. The consultant then informed the community that he has visited the whole erosion corridors and was there to explain to them the procedures involved in determining those that may be affected by the project. He explained that the socio-economic survey will help to determine the extent to which the project will affect the community and that it is important that everybody utilizes the opportunity to be captured in the survey. The cutoff date for the survey was set for Friday January 24, 2014. He assured the community that all those with genuine cases that satisfy the World Bank guidelines for compensation will be adequately compensated.</p> <p>Mr. Emmanuel Ifesinachi a member of the state NEWMAP commended the consultant and assured that the state government is determined to ensure that the erosion problem in the community is effectively tackled. In his contribution, Mr. Ibuzo also of the state NEWMAP harped on the need for the community to own the project since they are the ones directly involved.</p>
Questions and concerns	<p>The community asked to know:</p> <ul style="list-style-type: none"> i) if the people earlier captured in the earlier organized socio economic survey should be recaptured again; ii) the criteria for determining those that will be affected by the project; iii) if the youth should be part of the project.
Responses to the concerns	<p>The consultant informed the community that those that have earlier been captured need not do so again unless in the case where there have been major changes in the information earlier provided.</p> <p>On the issue of criteria, the consultant informed the people that those within 6meters from the edge of the gully on both sides at the deep gully sections will be affected.</p> <p>On the issue of youth involvement, the consultant encouraged them to mobilize and become part of the project.</p>
Perceptions about the Project	<p>The community expressed willingness to forfeit any form of compensation to avoid any delays in the immediate commencement of the project.</p>
Closing Comments & Remarks	<p>Chief Godfrey Chukwumah thanked the team for the visit and enlightenment, and assured them of the community's co-operation towards the project. The meeting ended at 02:15pm with a closing prayer from Mrs Peace Beluolisa.</p>

Table 6.4 Summary of the Stakeholders' Meeting Held on February 6, 2014

ITEMS	DESCRIPTION
Project	NEWMAP ESMP
Name of community	Umudunu-Uruokpala, Abagana community of Njikoka LGA
Date	February 6, 2014
Language of communication	Igbo and English
Introductions and opening remarks	<p>The meeting started around 11:20am with an opening prayer said by Deacon Francis Nnezianya and the breaking of kolanut by the Traditional Ruler of Abagana Igwe Mbamalu Okeke Thereafter the consultant Dr. Odili Ojukwu expressed his appreciation to the community for their co-operation since the inception of the project. He told the community that the various meetings held has been to ensure that everybody is carried along with the step by step process of the NEWMAP project as it affects the community</p>
Overview of the proposed project	<p>He then informed the community on the stages recommended for the remedial construction activities in the project to include civil works at the gully head, roads and culverts construction, stabilization of gully walls, check dams, installation of gabions and planting of trees. The Consultant informed them that some areas where the culvert were taken by the gully will be reconstructed especially the Uruokpala Hall and the Abagana girls school axis of the gully. He told them that retention basins will be constructed to ensure that the rain water will not have enough speed to cause erosions anymore adding that economic trees will be planted to help in checking erosions too. He further informed that the sustained maintenance part of the project will be handled by the community themselves at the completion of the whole project.</p> <p>Dr. Ojukwu informed the community that according to the engineering designs for the project, 6meters of land on both sides of the gully edge will be used for reducing the slopes to help stabilize the gully walls at the deep sections along gully corridor. He told them that the World Bank policies on land settlement will be applied to ensure that nobody is short changed.</p>

ITEMS	DESCRIPTION
	<p>Dr. Ojukwu further informed the people that heavy equipments will be required during the project, particularly at the two gully heads and other areas where the gully has eaten deep. Because of the expected activities, there will be increase in vehicular traffic, increase in noise, increase in fugitive dusts, water ponding and solid waste management and all these will create some impacts on the people along the gully corridor.</p> <p>He explained that the World Bank has a set of guidelines to determine who is affected by a project and that the socio economic survey earlier conducted will help in ascertaining the number of people that may be affected and the level impacts. He specifically mentioned that the Zelibor family houses will not be affected because the work to be carried out there will be inside the gully, so also is the Ichekeoku shrine where the fence will be stabilized and therefore the work will not affect the shrine. He urged the community to monitor the project through their local erosion and watershed association and assured that the project works is qualitatively executed.</p>
Questions and concerns	<p>Participants sought to know:</p> <ul style="list-style-type: none"> i) If the 6meters will be applicable to all areas along the gully corridor; ii) If compensation will be paid to those whose land has gone with the gully; <p>The participants further raised the need to:</p> <ul style="list-style-type: none"> • Ensure that the roads leading to the gully site are reconstructed as this will grant them access to other towns in the locality.
Responses to the concerns	<p>In response, the Consultant informed the community that the 6meters is only applicable in the deep sections of the gully corridor and that some areas might not require up to 6meters.</p> <p>On the issue of compensation for the land that has been taken by the gully, the consultant informed them that any land that has been taken by the gully is gone and therefore will not be compensated for.</p>
Perceptions about the Project	<p>Generally, the participants commended the Government and World Bank for the intervention project and are excited on the participatory nature of the project.</p>
Closing comments & Remarks	<p>Chief Ibegunam Nwefo thanked the Consultant for the consultative meeting and expressed hope that the work will commence soonest to avoid getting into the rainy season. Mrs Bridget Onwuka said the closing prayer at about 1:08pm</p>

Figure 6.3: Photos of Participants at Various Stakeholders Meetings



Several additional informal consultation meetings between the Consultant team and various community leadership groups/stakeholders were held to help structure effective participation of all segments of the community including the PAPs in the project process. The community members are now actively and enthusiastically engaged in all matters relating to the project and are eagerly awaiting commencement of project construction phase.

The most frequently raised comments, concerns, questions and suggestions raised by stakeholders during the project community meetings are summarized below.



Figure 6-4: Stakeholders' Meeting at Igwe's Palace

- Residents welcomed the proposed project and remain positive about the measures being taken to address the problems of flooding and erosion, which are currently affecting their lives significantly. There is widespread support for the Umudunu Erosion Project;

- Erosion and flooding have caused damages to the people's homes and have also caused loss of livestock, personal possessions, spread diseases such as typhoid, cholera, diarrhea, and malaria, and cause pit latrines to overflow;

- Gully erosion management has become a nightmare to the people of Abagana and

requires urgent focused attention;

- Many of the stakeholders reported that there have been numerous efforts in the past to effectively manage the existing gullies but these have failed largely due to a lack of funding resources;
- Flooding and gully erosion are serious problems bestriding Abagana. Stakeholders seemed unaware that the gullies are attributable to the intermittent channelization of storm water by various property owners in a bid to check water inflows into their respective properties;
- The construction activities may result in temporary loss of their lands or damage to their economic trees and crops, and in such cases, provision for compensation would be made;
- The majority of stakeholders commented that awareness creation was essential for the long-term success of the erosion and watershed management program; and that manpower development should be included in the program. This view was also endorsed by the non-government organizations and the community-based organizations as well;

6.4 Social Issues/Risks

The key issues that emerged through the above processes include:

- a) Community safety – Concerns regarding community safety with the next cycle of the rainy season keenly expressed. The community is quite very apprehensive of the advancement of the gully when the rains come pounding;
- b) Water supply- Abagana has lost its only portable water supply source (Oshoku spring water) to massive siltation from erosion. Currently, there is no reliable portable water supply in Abagana communities. The communities have requested that the intervention should help to address this problem.
- c) Livelihoods – loss of access to water points, crop land and pasture.
- d) Resettlement – impacts and compensation measures for economic and physical displacement.

CHAPTER 7.0: SUMMARY AND RECOMMENDATIONS

The proposed Abagana erosion project is designed to improve erosion management and undertake existing gully rehabilitation which will result in:

- Reduced loss of infrastructure including roads, houses, etc.
- Reduced loss of agricultural land and productivity from soil loss caused by surface erosion.
- Reduced siltation in rivers leading to less flooding and the preservation of the water systems for improved access to domestic water supply.
- Reduced risks of floods (due to reduced siltation).
- Progressively restore vegetative cover, improved environmental conditions and more humid local microclimates expected to result in increased vegetation cover for wildlife and carbon sequestration.
- Environmental improvements due to land stabilization measures which preserve the landscape and biodiversity.

Overall, this project is aimed at halting or minimizing the environmental and social damages being caused by the incidence of gully erosion in the project area and beyond. There is an overwhelming emotional relief for community members over fears of losing their ancestral assets to gully erosion with the continued existence of unattended gullies in the area. The project will provide long term emotional and economic benefits to the people of Abagana particularly to the residents of Umudunu, Uruokpala, Uru and Adagbe villages. These residents will no longer live in fear of possibly losing their homes to gully erosion as well as loss of additional agricultural lands. Expectedly, this will in turn increase the mental health of the communities leading to improved efficiency and productivity. This is, in the overall a very positive impact.

There will also be multiplier effects such as employment opportunities, poverty reduction, enhanced national reputation and cultural promotion, among others, will be enhanced. Educational establishments, hospitals and agriculture will also benefit from the boost of the reduced community health and safety concerns. Although several potential negative impacts associated with the project were identified, these impacts are not considered to be of sufficient magnitude that would interrupt the execution of the project and have been adequately addressed through measures for implementation by this ESMP.

The ESMP revealed that one major impact of the project is the damage that will result from use of the existing access roads Abagana Girls School Road and Uruokpala Community Hall Road leading to the project location. These roads, particularly the former, serve as crucial commercial/trading haulage routes between Abagana and Nimo town. It is strongly recommended that the roads be appropriately rehabilitated and asphalted as part of the mitigation measures. Appropriate institutional framework has been developed to implement the mitigation measures and environmental management plan with a monitoring programme to be set in motion as soon as possible. All identified potential impacts are expected to be minimized to acceptable levels with the implementation of the developed construction environmental management plan.

The construction of the erosion control infrastructure and the site rehabilitation activities, as designed, will require the use of existing severely eroded/damaged access roadways to reach the project location. The two access roadways are the Oye Abagana-Oye Nimo Road (Access Road No.1) and the Uruokpala-Nimo Road (Access Road No.2). Civil works associated with these access roadways include rehabilitation of the roads and associated drainages, and creation of hard standing areas. The need for the rehabilitation of the access roads is heightened by the level of destruction that will arise from movement of heavy duty vehicles and equipment for project construction activities.

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ANNEXURES FOR ESMP

Annex 1: List of Contacted Stakeholders

The following persons were contacted during the course of the Consultancy:

Table 3-2: List of Contacted Stakeholders

GROUPS	CONTACTED STAKEHOLDER	MODE OF CONTACT
Group-1	Individuals or group of persons whose daily activities (including farming) bring them in close proximity to the project area <u>QR</u> whose day-to-day lives/livelihoods may be directly affected by project activities.	General meetings, phones and personal contacts.
Group-2	Office of the Traditional Ruler – His Royal Highness, Igwe Mbamalu Okeke	Phone and personal contacts
	Office of the Community Leaders for Abagana; President General of Abagana Welfare Association; Chairmen of Umudunu, Uruokpala, Uru and Adagbe	Phone and personal contacts
	Project Site Committees (ABEWAMA) Members	Phone and personal contacts
Group-3	Office of the Chairman – Njikoka LGA	Phone and personal contacts
	Office of the Hon. Member in the Anambra State House of Assembly	Phone and personal contacts
	Office of the Hon. Member representing Abagana community at the Federal House of Representatives	Phone contacts
	Office of the Distinguished Senators representing Abagana community at the Senate	Phone contacts

Annex 2: Summary of World Bank Safeguard Policies

The environmental and social safeguard policies of World Bank applicable here are summarized as follows:

Environmental Assessment (EA) (OP 4.01):

An EA is conducted to ensure that Bank-financed projects are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. Any World Bank project that is likely to have potential adverse environmental risks and impacts in its area of influence requires an EA indicating the potential risks, mitigation measures and environmental management framework or plan.

Natural Habitats (OP 4.04):

The policy is triggered by any project (including any subproject under a sector investment or financial intermediary loan) with the potential to cause significant conversion (loss), degradation of natural habitats, whether directly (through construction), or indirectly (through human activities induced by the project). The policy has separate requirements for critical (either legally or proposed to be protected or high ecological value) and non-critical natural habitats. The Bank's interpretation of "significant conversion or degradation" is on a case-by-case basis for each project, based on the information obtained through the EA.

Pest Management (OP 4.09):

The policy supports safe, affective, and environmentally sound pest management. It promotes the use of biological and environmental control methods. An assessment is made of the capacity of the country's regulatory framework and institutions to promote and support safe, effective, and environmentally sound pest management.

Indigenous People (OP 4.10):

Major objectives of the indigenous people policy are to (i) ensure that indigenous people affected by World Bank funded projects have a voice in project design and implementation. (ii) ensure that adverse impacts on indigenous people are avoided, minimized, or mitigated and (iii) ensure that benefits intended for indigenous people are culturally appropriate. The policy is triggered when there are indigenous people in the project area and there is likely potential of adverse impacts or they are intended beneficiaries. When this policy is triggered, an Indigenous People Development Plan is required to be prepared to mitigate the potential adverse impacts or maximize the positive benefits of the project interventions.

Physical Cultural Resources (OP 4.11):

The Bank seeks to assist countries to manage their physical cultural resources and avoid or mitigate adverse impact of development projects on these resources. This policy is triggered for any project that requires an EA.

Involuntary Resettlement (OP 4.12):

Key objectives of the World Bank's policy on involuntary land acquisition are to avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; assist displaced persons in improving their former living standards, income earning capacity and production level, or at least in restoring them; encourage community participation in planning and implementing resettlement; and provide assistance to affected people regardless of the legality of land tenure. The policy covers not only physical relocation, but any loss of land or other assets resulting in relocation, or loss of shelter; loss of assets or access to assets; loss of income sources or means of livelihood whether or not the affected people must move to another location. When the policy is triggered, a Resettlement Action Plan (RAP), must be prepared. An abbreviated plan may be developed when less than 200 people are affected by the project. In situations, where all the precise impacts cannot be assessed during project preparation, provisions are made for preparing a

Resettlement Policy Framework (RPF). The RAP/RPF must ensure that all Bank's policy provisions detailed in OP 4.12 are addressed particularly the payment of compensation for affected assets at their replacement cost.

Forestry (OP 4.36):

This policy is triggered by forest sector activities and other Bank sponsored interventions which have the potential to impact significantly upon forested areas. The Bank does not finance commercial logging operations but aims to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty and encourage economic development.

Safety of Dams (OP 4.37).

For the life of any dam, the owner is responsible for ensuring that appropriate measures are taken and sufficient resources provided for the safety to the dam, irrespective of its funding sources or construction status. The Bank distinguishes between small and large dams.

Projects on International Waterways (O 7.50).

The Bank recognizes that the cooperation and good will of riparians is essential for the efficient utilization and protection of international waterways and attaches great importance to riparians making appropriate agreements or arrangement for the entire waterway or any part thereof.

Disputed Areas (OP 7.60).

Project in disputed areas may occur the Bank and its member countries as well as between the borrower and one or more neighbouring countries. Any dispute over an area in which a proposed project is located requires formal procedures at the earliest possible stage.

Disclosure Policy (OP 17.50).

This policy supports decision making by the Borrower and Bank by allowing the public access to information on environmental and social aspects of projects. Mandated by six safeguard policies that has specific requirements for disclosure in country (Before project appraisal in local language and in English) and World Bank INFO-Shop (Before project appraisal in English). Documents can be in draft but must meet WB standards

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

Contract Specifications for Contractor

1.0 General

- a. All Environmental and Social (E&S) safeguards associated with the contract shall be complied with by the contractor. The Contractor shall also update himself about such issue in the ESMP, and prepare his work strategy and plan to fully take into account relevant provisions of the ESMP.
- b. The Contractor shall develop a plan of work indicating all Environmental and Social safeguards at the various stages and indicate the period within which site will be maintained to it's original state after completion of works to ensure that significant E&S safeguards have been addressed appropriately.
- c. The Contractor shall adhere to the proposed plan implementation schedule and the monitoring plan to ensure effective feedback of monitoring information to the SPMU Project Engineer (PE).
- d. The Contractor shall implement all measures to avoid undesirable adverse environmental and social impacts wherever possible, restore site offices to acceptable standards, and abide by all environmental performance requirements specified in the ESMP

2.0 Dust Mitigation Measures

- a. The contractor shall minimize the effect of dust on the surrounding environment resulting from site clearing, vibrating equipment and temporary access roads.
- b. During the rehabilitation project, the contractor shall carry out proper and efficient measures, such as water dousing, whenever necessary to reduce the dust nuisance, and to prevent dust originating from the operations.

3.0 Noise Due to Construction Activities

The contractor shall ensure the noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.

4.0 Waste Management

- a) Construction waste shall not be left in stockpiles along the road, but removed and disposed of/or reused where needed.
- b) All waste shall be segregated into organic waste and plastic and glass. The organic waste will be composted near the site office to enrich the soil while plastics and glass will be taken to the district dump sites
- c) All sanitary facilities (e.g. garbage collection and disposal, drinking water facilities, etc.) shall be provided by the contractor in site offices or project sites.

5.0 Water Resource Management

- a) No construction water containing spoils or site effluent, especially cement, oil and fuel, shall be allowed to flow into natural water drainage courses.
- b) The contractor shall take all possible steps to prevent pollution of streams and other water supplies.
- c) Entry of runoff water to the site shall be restricted by constructing diversion channels or culverts to reduce the potential of soil erosion and water pollution.

- d) Waste water from washing out of equipment shall not be discharged into water courses.

6.0 Material Excavation and Deposit

Vegetation clearing shall be restricted to the area required for safe operation of the rehabilitation work. Vegetation clearing shall not be done more than two weeks in advance of rehabilitation.

7.0 Contractor's Environment and Social Management Plan (ESMP)

- a) Within 6 weeks of signing the Contract, the Contractor shall prepare a work plan to ensure the adequate management of E&S aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an E&S safeguards for the works. The Contractor's work plan will serve two main purposes:
- i. For the Contractor, for internal purposes, to ensure that all measures are in place for adequate E&S management, and as an operational manual for his staff.
 - ii. For the Client, supported where necessary by SE, to ensure that the Contractor is fully prepared for the adequate management of all E&S safeguards issues.
- b) The Contractor's E&S document shall provide at least:
- A description of procedures and methods for complying with these general environmental and social conditions, and any specific conditions specified in the ESMP;
 - A description of specific mitigation measures that will be implemented in order to minimize adverse impacts;
 - A description of all planned monitoring activities and the reporting thereof; and
 - The internal organizational, management and reporting mechanisms put in place.

8.0 Health and Safety

- a) In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of HIV/AIDS.
- b) Adequate road signs to warn pedestrians and motorists of rehabilitation activities, diversions, etc. shall be provided at appropriate points.

9.0 Reporting

The Contractor shall prepare monthly progress reports to the SPMU on E&S monitoring with these general conditions and the project E&S safeguards. It is expected that the Contractor's reports will include information on:

- E&S management actions/measures taken, including approvals sought from MOE, PE and FME
- Problems encountered in relation to E&S aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Lack of compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to E&S aspects; and
- Observations, concerns raised and/or decisions taken with regard to E&S management during site meetings.

10.0 Cost of Compliance

It is expected that compliance with these conditions is already part of standard of good workmanship and state-of-the-art as generally required under this Contract. The item "Compliance with Environmental and Social Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable E&S impact.

Annex 4: Minutes of Community Consultation Meetings

Minutes of Stakeholders' Meeting Held on January 21, 2014 at the Uruokpala Community Hall.

Attendance: See list

ITEMS	DESCRIPTION
1. Project	NEWMAP ESMP & RAP
2. Name of community	Abagana, Njikkoka LGA
3. Date	January 21, 2014
4. Language of communication	Igbo and English
5. Introductions and opening remarks	The meeting started at 11:40am with an opening prayer by Deacon Francis Eze and the breaking of kolanut by Chief Okuagba Ezechukwu after which members of the State NEWMAP and the Consultant for the ESMP & ARAP took turns to introduce themselves.
6. Overview of the meeting	<p>Mrs Ubaka from the state PMU noted the low turnout of women in the meeting and the consultant immediately called the women outside to join in the meeting which they did. The consultant then informed the community that he has visited the whole erosion corridors and was there to explain to them the procedures involved in determining those that may be affected by the project. He explained that the socio-economic survey will help to determine the extent to which the project will affect the community and that it is important that everybody utilizes the opportunity to be captured in the survey. The cutoff date for the survey was set for Friday January 24, 2014. He assured the community that all those with genuine cases that satisfy the World Bank guidelines for compensation will be adequately compensated.</p> <p>Mr. Emmanuel Ifesinachi a member of the state NEWMAP commended the consultant and assured that the state government is determined to ensure that the erosion problem in the community is effectively tackled. In his contribution, Mr. Ibuzo also of the state NEWMAP harped on the need for the community to own the project since they are the ones directly involved.</p>
7. Questions and concerns	The community asked to know: iv) if the people earlier captured in the earlier organized socio economic survey should be recaptured again; v) the criteria for determining those that will be affected by the project; vi) if the youth should be part of the project.
8. Responses to the concerns	The consultant informed the community that those that have earlier been captured need not do so again unless in the case where there have been major changes in the information earlier provided. On the issue of criteria, the consultant informed the people that those within 6meters from the edge of the gully on both sides at the deep gully sections will be affected. On the issue of youth involvement, the consultant encouraged them to mobilize and become part of the project.
9. Perceptions about the Project	The community expressed willingness to forfeit any form of compensation to avoid any delays in the immediate commencement of the project.
10. Closing Comments & Remarks	Chief Godfrey Chukwumah thanked the team for the visit and assured them of the community's co-operation towards the project. The meeting ended at 02:15pm with a closing prayer from Mrs Peace Beluolisa.

Minutes of the Stakeholders' Meeting Held on February 6, 2014 at the Palace of the Traditional Ruler, HRH Igwe Mbamalu Okeke.

Attendance: See list

ITEMS	DESCRIPTION
1. Project	NEWMAP ESMP
2. Name of community	Umudunu-Uruokpala, Abagana community of Njikoka LGA
3. Date	February 6, 2014
4. Language of communication	Igbo and English
5. Introductions and opening remarks	<p>The meeting started around 11:20am with an opening prayer said by Deacon Francis Nnezianya and the breaking of kolanut by the Traditional Ruler of Abagana Igwe Mbamalu Okeke Thereafter the consultant Dr. Odili Ojukwu expressed his appreciation to the community for their co-operation since the inception of the project. He told the community that the various meetings held has been to ensure that everybody is carried along with the step by step process of the NEWMAP project as it affects the community</p>
6. Overview of the proposed project	<p>He then informed the community on the stages recommended for the remedial construction activities in the project to include civil works at the gully head, roads and culverts construction, stabilization of gully walls, check dams, installation of gabions and planting of trees. The Consultant informed them that some areas where the culvert were taken by the gully will be reconstructed especially the Uruokpala hall and the Abagana girls school axis of the gully. He told them that retention basins will be constructed to ensure that the rain water will not have enough speed to cause erosions anymore adding that economic trees will be planted to help in checking erosions too. He further informed that the sustained maintenance part of the project will be handled by the community themselves at the completion of the whole project.</p> <p>Dr. Ojukwu informed the community that according to the engineering designs for the project, 6meters of land on both sides of the gully edge will be used for reducing the slopes to help stabilize the gully walls at the deep sections along gully corridor. He told them that the World Bank policies on land settlement will be applied to ensure that nobody is short changed.</p> <p>Dr. Ojukwu further informed the people that heavy equipments will be required during the project, particularly at the two gully heads and other areas where the gully has eaten deep. Because of the expected activities, there will be increase in vehicular traffic, increase in noise, increase in fugitive dusts, water ponding and solid waste management and all these will create some impacts on the people along the gully corridor.</p> <p>He explained that the World Bank has a set of guidelines to determine who is affected by a project and that the socio economic survey earlier conducted will help in ascertaining the number of people that may be affected and the level impacts. He specifically mentioned that the Zelibor family houses will not be affected because the work to be carried out there will be inside the gully, so also is the Ichekeoku shrine where the</p>

	<p>fence will be stabilized and therefore the work will not affect the shrine. He urged the community to monitor the project through their local erosion and watershed association and assured that the project works is qualitatively executed.</p>
7. Questions and concerns	<p>Participants sought to know:</p> <ul style="list-style-type: none"> iii) If the 6meters will be applicable to all areas along the gully corridor; iv) If compensation will be paid to those whose land has gone with the gully; <p>The participants further raised the need to:</p> <ul style="list-style-type: none"> • Ensure that the roads leading to the gully site are reconstructed as this will grant them access to other towns in the locality.
8. Responses to the concerns	<p>In response, the Consultant informed the community that the 6meters is only applicable in the deep sections of the gully corridor and that some areas might not require up to 6meters.</p> <p>On the issue of compensation for the land that has been taken by the gully, the consultant informed them that any land that has been taken by the gully is gone and therefore will not be compensated for.</p>
9. Perceptions about the Project	<p>Generally, the participants commended the Government and World Bank for the intervention project and are excited on the participatory nature of the project.</p>
10. Closing comments & Remarks	<p>Chief Ibegbunam Nwefo thanked the Consultant for the consultative meeting and expressed hope that the work will commence soonest to avoid getting into the rainy season. Mrs Bridget Onwuka said the closing prayer at about 1:08pm</p>

Annex 5: Summary of the Database of Information Collected for ESMP

Plant Species Identified During Studies

Listing of Plant Species in the Shrine Forest Showing Life Forms and Distribution of Species

S/N	Species	Family	Life Form	Local/ Common Name	Distribution	Remarks
1.	<i>Pycnanthus angolense</i>	Myristicaceae	Tree	Akwanmiri	Occasional	Only saplings seen.
2.	<i>Abizia zygia</i>	Fabaceae	Tree	Nkwu	Occasional	
3.	<i>Bosqueia angolense</i>	Moraceae	Tree	Oze	Occasional	
4.	<i>Tetraptera tetrapleura</i>	Fabaceae	Tree	Isikrisi	Rare	
5.	<i>Canarium schweinfurthii</i>	Buseraceae	Tree	Ube ngba	Rare	
6.	<i>Pterocarpus osun</i>	Fabaceae	Tree	Ora ohia	Occasional	
7.	<i>Combretum</i>	Combretaceae	Shrub		Occasional	
8.	<i>Sterculia tragacantha</i>	Sterculiaceae	Tree		occasional	
9.	<i>Cola gigantean</i>	Sterculiaceae	Tree		Occasional	
10.	<i>Milicia excels</i>	Moraceae	Tree	Oji	Frequent	Only saplings seen.
11.	<i>Hannoa klaineana</i>	Simaroubaceae	Tree		Occasional	
12.	<i>Antiaris Africana</i>	Moraceae	Tree		Occasional	Only saplings seen.
13.	<i>Anthonotha Macrophylla</i>	Fabaceae	Tree	Ububa	Occasional	Only saplings seen.
14.	<i>Pilostigma</i>	Fabaceae	Tree		Rare	
15.	<i>Ricinodendrum heudelotii</i>	Euphorbiaceae	Tree	Okwe	Rare	
16.	<i>Gossweilorodendron balsamiferum</i>	Fabaceae	Tree	Agba	Rare	
17.	<i>Anthocleista vogelii</i>	Loganiaceae	Tree		Occasional	
18.	<i>Costus afer</i>	Zingiberaceae	Herb	Okpete	Occasional	

Source: Field Survey, 2014.

Table 3-7: Listing of Species in Home-gardens/Compound Farms

S/N	Species	Family	Life Form	Local/ Common Name	Distribution	Remarks
1.	<i>Treculia Africana</i>	Moraceae	Tree	Breadfruit (Ukwa)	Frequent	
2.	<i>Dacryodes edulis</i>	Burseraceae	Tree	Ube	Occasional	
3.	<i>Anacardium occidentale</i>	Anacardiaceae	Tree	Cashew	Occasional	
4.	<i>Mangifera indica</i>	Anacardiaceae	Tree	Mango	Occasional	
5.	<i>Pterocarpus mildbraedii</i>	Fabaceae	Tree	Oha	Abundant	
6.	<i>Brachystegia nigerica</i>	Fabaceae	Tree	Achi	Rare	
7.	<i>Annona muricata</i>	Annonaceae	Tree	Sour sop	Occasional	
8.	<i>Carica papaya</i>	Caricaceae	Tree	Paw-paw	Frequent	
9.	<i>Psidium guajava</i>	Myrtaceae	Tree	Guava	Occasional	
10.	<i>Manihot esculenta</i>	Euphorbiaceae	Shrub	Cassava (Akpu)	Frequent	
11.	<i>Ornamentals</i>				Frequent	Various ornamental species were observed around residential areas.

Source: Field Survey, 2014.