



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

FINAL REPORT

FOR:

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

IRE, OBOSI GULLY EROSION SITE

IDEMILI NORTH LGA, ANAMBRA STATE. NIGERIA



NOVEMBER, 2017

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LIST OF ABBREVIATIONS

ANS-NEWMAP	Anambra State Nigeria Erosion and Watershed Management Project
ANSG	Anambra State Government of Nigeria
ARAP	Abbreviated Resettlement Action Plan
CAI	Community Administrative Institutions
CBO	Community Based Organization
CIP	Community Involvement Program
CRMCI	Community Resource Management and Conservation Initiative
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 _{env}	Federal Ministry of Environment
GEF	Global Environmental Fund
GIS	Geographic Information System
GRASS	Gully Rapid Action and Slope Stabilization
GPS	Global Positioning System
GRM	Grievance Redress Mechanism
LGA	Local Government Area
NEWMAP	Nigeria Erosion and Watershed Management Program
NGO	Non-Governmental Organization
OP	Operational Procedure of the World Bank
OTG	OTG Enviroengineering Nigeria Limited

PAH	Project-Affected Household
PAP	Project-Affected Person
PC	Project Coordinator
PG	President General
PRS	Government's Poverty Reduction Strategy (PRS)
RAP	Resettlement Action Plan
SCCF	Special Climate Change Fund
SMEC	SMEC International (Pty) Ltd, West African Region
SMEnv	State Ministry of Environment
SMLS	State Ministry of Land and Survey
SPMU	State Project Management Unit
ToR	Terms of Reference
WB	World Bank

EXECUTIVE SUMMARY

Introduction and Background

The Nigeria Erosion and Watershed Management Project (NEWMAP), initiated by the Federal Government of Nigeria (FGN) and funded by the World Bank (WB) and International Development Fund (IDF), is being implemented in Anambra State, Nigeria and other participating states to help reduce soil erosion vulnerability in the States and to develop the States' watersheds. Obosi is one of the towns in Anambra State being acutely degraded and destroyed by active gully erosion and perennially suffer huge losses resulting from the impacts of the gully erosion. With each passing year, uncontrolled storm water flow threatens lives and properties as the existing gullies become widened and more menacing. Anambra State is located in the Southeast geopolitical zone of Nigeria. Obosi is located within the co-ordinates: Latitude 6.096869⁰N Longitude 6.811811⁰E and Latitude 6.132058⁰N Longitude 6.834079⁰E and situated in Idemili North LGA in the central part of the Anambra State. The Anambra State NEWMAP is targeting to remedy and rehabilitate the existing gully and reduce the impacts through the NEWMAP opportunity. This Environmental and Social Management Plan (ESMP) has been prepared in support of the proposed Ire Obosi Gully Erosion sub-project in Anambra State.

Description of Project Activities

The Ire Obosi gully erosion sub-project consists of remedial structural and non-structural developments that include civil works and vegetative development along the gully corridor. The proposed ground interventions will address, prevent and reverse land degradation for the long-term and will involve rehabilitation and reconstruction of the existing gully corridor. The rehabilitation and reconstruction activities will involve civil works as well as bio-restoration along the gully corridor and will cause involuntary resettlement thereby triggering the World Bank's OP 4.12 - the World Bank Resettlement Policy.

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

Existing Safeguard Instruments and Rationale for ESMP

The implementation of projects under the NEWMAP is guided by two safeguard documents - the Environmental and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF) prepared for NEWMAP. The Environmental and Social Management Framework (ESMF) indicates that NEWMAP is categorized by the WB as a Category A project whose impacts are sensitive, diverse, unprecedented, felt beyond the immediate project environment and are potentially irreversible over the long term. For Ire Obosi erosion control sub-project, the scale of the construction and development works will involve a significant disturbance of the environmental conditions, with both localized and regional impacts.

The reconstruction of the existing critical infrastructures that serve as inter- and intra-community linkages (rural roads and drainage channels), providing access to the project location will result in social disruptions and in long detours for community members who go

to trade/market their goods and children who attend schools in neighboring communities. Large areas of farmlands will also be majorly impacted with many homes and families losing their primary means of livelihoods. It is envisaged that about 57084m² of land will be required for the stabilization of the gully walls with the attendant loss of economic trees/crops and the permanent loss of use of that portion of land. Consequently, this ESMP as a site-specific safeguard instrument is required to provide necessary procedures and criteria that will guide the proposed Ire gully erosion control intervention.

Policy, Legal and Administrative Framework

This ESMP is guided by the requirements of the World Bank safeguard policies and the relevant and applicable Nigerian and international regulation, guidelines, conventions, industrial best management practices that are triggered by the NEWMAP. Based on the environmental and social effects of the project the potentially triggered WB safeguard operational policies (OPs) include:

- Environmental Assessment (OP 4.01)
- Cultural Physical Property (OP4.11)
- Involuntary Resettlement (OP 4.12)

The basic legal framework for the regulation of the environment in Nigeria is braced in the Environmental Impact Assessment (EIA) Act No. 86 of 1992; the National Guidelines and Standards for Environmental Pollution Control in Nigeria (March 1991); the National Environmental Standards and Regulations Enforcement Agency (establishment) Act 2007 (NESREA), as well as the Land Use Act 1978 (modified in 1990). The power to regulate all environmental matters in Nigeria is vested in the Federal Ministry of Environment (FMEEnv).

Biophysical Environment

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 rainy season begins in March and ends in October of each year while the dry season runs through the months of October to March. 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. Pressure on land mainly in form of commerce has largely reduced the vegetation to mixed savanna. The vegetation cover is highly heterogeneous due to intense disturbance arising from human activities. A listing of plant species with frequent or abundant distribution in the various categories are shown in Chapter 3. The cultivated species on farmlands include *Dioscorea spp* (yam) and *Manihot esculenta* (cassava). There was indication by the people that other species of interest such as *Zea mays* (maize), *Telfairia occidentalis* (ugu), *Musa paradisiaca* (plantain), *Abelmoscus esculenta* (okro), *Ipomea batata* (potato), and *Citrullus vulgaris* (melon/egusi) are also cultivated.

Socio-Economic Characteristics

Based on a 2017 population projections using the 2006 national population census records and the 2.8% annual population growth factor recommended by the national population commission (NPC), Idemili North LGA has a projected population of 583,992 for 2017 while Obosi town has a projected population of 86,410. Ire Obosi has about 10% difference in the male-female population ratio at the household level. The people of Ire Obosi consist of one major Nigerian ethnic group – the Igbos. The people generally speak and write mainly the Igbo and English languages. 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 through marriages. The members of Ire Obosi community are predominantly of the Christian faith, mostly Catholics and Anglicans with some traditionalists and negligible Muslim community.

Three major types of customary land tenure system exist in the village, viz: – (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 50% of land is committed to agricultural production of food crops mainly, maize (*Zea mays*), cassava (*Manihot esculenta*), yams (*Dioscorea spp*), plantain (*Musa paradisiaca*), vegetables, etc.

About 35% of the households in the community are below the age of 21 years while about 39% are between the youthful ages of 22 and 46 years. The percentage of household members above the age of 60 years is about 12%. Household size distribution in the project area ranges from 1-9 persons with an average household size of 5 persons. About 37% of household members in Ire Obosi community are married while about 57% are single; About 6% of the households are widowed and one percent (1%) is divorced or separated. There is a relatively high literacy level within Ire Obosi community with 96% of the surveyed population having attained the FSLC level of education and higher. The educational support system in Ire community is well served by several primary and secondary schools within and around the community. One tertiary institution (School of Health and Environmental Technology) also exists near Ire community at Ugamuma. Only about 4% of respondents have not attained the basic primary education. The occupational distribution data shows a moderately high rate of unemployment (21%) in the community. This situation could pose some serious social risk when not properly managed. The community however, in recent times, has witnessed an influx of persons from other parts of the state/country who have settled in the area mainly for trading purposes. It will be helpful for the community to come together to address the prevailing unemployment social risk. Consideration should be given to formation of cooperative ventures with community and government support.

Market facilities are fairly developed complimented by numerous home-based commercial shops located throughout the community. Household wastes are indiscriminately dumped at illegal points or dumpsites adjacent to the gully corridor. The poor solid waste management system in the community remains a considerable hazard to health and the effective functioning of the storm water drainage systems. Dumped wastes/refuse in the area causes regular obstructions to storm water flow and health records show that common diseases in area include diarrhea, malaria, typhoid, pneumonia, cough, skin diseases, deficiency diseases, eye diseases, ear diseases, and waterborne diseases. These result from malnutrition and lack of hygiene. Although there are several health infrastructural support within and around Ire (mainly private clinics and hospitals), the quality of public health services in the area is generally poor. Most people go to quacks and medicine shops for medical treatment. The road networks within and around Ire Village are severely degraded and perennially suffer from inundation of stormwater surface flows. These roads have no drainages resulting in continuous sheet erosion and gulying along the vulnerable land corridors. A significant portion of Ire village roads are severely potholed. The utilities infrastructure (water, electricity and telecommunications) in the project area are mostly in disuse and lack necessary maintenance.

Potential Environmental and Socio-Economic Impacts and Analysis of Alternatives

There are both positive and negative impacts associated with this project. On the positive side, this project will effectively control the gully erosion and perennial flooding within Ire community and provide safety of lives and properties as well as improve the flow of traffic in and out of the community. Other positive impacts include rehabilitation of affected land and vegetation as well as reduced costs of transportation and delays on travel time; improved

livelihoods for the area residents due to reduced cost of transportation; improved landscape vista; and employment opportunities for both skilled and un-skilled labors.

The potential adverse impacts for which appropriate mitigation and monitoring measures have been provided include: Loss of physical assets, Loss of means of livelihood, loss of vegetation, dust generation and air quality, surface and groundwater quality, noise and vibration impacts, earth movements, occupational health and safety and HIV/AIDS and STIs risks, waste generation as well as impacts of road diversion and landscape change impacts. About 57084m² of land will be required as setback for the stabilization of the gully wall particularly at the deep sections with the attendant loss of land and economic trees/crops.

The project does not envisage any permanent involuntary displacements. However, there will be potentially an economic displacement of residents' livelihood. No buildings or structures will be adversely impacted by the remedial construction works. No identified sensitive sites or resources such as forest reserve, cemetery, shrine or other places of historical and cultural interests will be impacted by the project. However, potential discovery of cultural artifact could be possible during excavation works. The construction/development works will not affect any utility lines such as water, electricity or telecommunication lines.

The selection of the proposed project implementation alternative was premised on several considerations, including the desirability/acceptability of the project, the government's position or inclinations to the project, the potential environmental and social impacts of the project, the economic viability of the project, etc. Three alternatives were considered including *a do-nothing alternative; delayed project alternative; and the planned project alternative*. The advantages associated with the selected project alternative compared with the other two alternatives far outweighed the identified disadvantages. Although initial costs would be high; the accrued socioeconomic and cultural benefits far outweigh those of no-project and delayed project alternatives.

Environmental and Social Impact Mitigation Measures:

The designed 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 programmes for the various ESMP responsible and 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; erection of danger caution board and fencing of project area or with yellow warning tape; provision and use of PPE; provision of first aid kits as well as erection of warning signs; sensitization and awareness on transmission and prevention of HIV/AIDS and STIs; segregation and composting of waste and maintaining high hygienic standards.

Rationale and Objective of the ESMP

The project activities will result in several environmental and social impacts which must be considered and properly addressed to ensure that the environment is not unreasonably further degraded and the socioeconomic life of the people is not adversely disrupted. Consequent upon these, this ESMP Study is required to provide necessary procedures and criteria that will guide the proposed gully erosion intervention in accordance with the World Bank Safeguard Policies and the Nigerian national environmental policies, guidelines and assessment procedures as well as those of Anambra State and the local agencies.

The objective of this study is to prepare an environmental and social management plan (ESMP) for the Ire Obosi Gully Erosion Project that specifically identifies, evaluates and documents the set of mitigation, monitoring and institutional actions to be taken before and

during site construction and rehabilitation to eliminate adverse environmental and social impacts, offset the impacts or reduce the impacts to acceptable levels. The potential impacts associated with the phases of the designed site interventions consisting of pre-construction, construction, and operation and maintenance (O&M) are developed and appropriate mitigation measures established for the impacts.

ESMP Budget and Schedule of Work

The budget estimate for the E&S safeguards as determined under this ESMP, including cost for administration, monitoring and evaluation is **N9,660,000.00** (Nine million six hundred and sixty thousand 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 the Ire Obosi gully erosion intervention 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 magnitude of the flood control problem;
2. The type of technology to be employed;
3. The volume of the project affected households and persons; and,
4. The area of coverage of the proposed project.

ESMP Implementation and Management

The primary responsibility for the project execution and ESMP implementation is on the SPMU. The SPMU, through its various officers (and may also employ the services of consultants) will 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;
- FMEEnv/FPMU - to ensure compliance with the ESMP and other relevant approval conditions;
- SMEEnv - to oversee the effective implementation of the flood control project and related E&S safeguards
- PCC - to address complaints of any aggrieved parties on E&S safeguards
- SMLS – to ensure appropriate disposition of land matters in accordance with the statutory requirements.

Disclosures and Public Consultation Plan

This ESMP is expected to be subjected to public review and it should be disclosed in-the state to the general public for review and comment at designated locations in Anambra State and in World Bank Info Shop. Display centers will include Anambra NEWMAP SPMU office, NEWMAP FPMU office, EA Department of FMEEnv., Office of State Commissioner for Environment, LGA NEWMAP Liaison office, Project Community, and Office of the State Commissioner for Local Government matters.

The public consultation methodology adopted in this ESMP includes a qualitative and quantitative mixed method that offers an effective means to interact widely with the project area general public as well as stakeholder groups. Individual stakeholders and project affected persons (PAPs) were also engaged during the ESMP preparation. To ensure that the rights and interests of PAPs are considered seriously local level consultative forums

serve as community voices and become part of the entire project process. Particularly, the community members welcomed the project and expressed anxiety that remedial work should commence expeditiously to prevent occurrence of further gullying and flood damages from the rainfalls. Ire Obosi community consultations shall remain an ongoing exercise throughout the duration of the project.

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 system of customary avenue that exist in the community to deal with dispute resolution and this 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. The SPMU has also opened toll free lines and a public complaints/suggestion box for the community to bring up their complaints. This ensures that the community can forward their grievances at absolutely no cost. The SPMU toll-free and office phone numbers are 081830034431 and 08183034336, respectively. 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.

CHAPTER 1: INTRODUCTION

1.1 General Description and Background

This Environmental and Social Management Plan (ESMP) for Ire, Obosi gully erosion project 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 some erosion-prone States of Nigeria. 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.

In Anambra State, NEWMAP activities involve medium-sized civil works such as construction of infrastructure and/or stabilization or rehabilitation in and around erosion gullies and flood plains as well as small works in the small watershed where gullies develop and expand. The lead agency at the FGN level is the Federal Ministry of Environment (FMEEnv.), Department of Erosion, Flood and Coastal Zone Management. The Anambra State Government (ANSG) is responsible for the implementation of NEWMAP activities at the State level with the State Ministry of Environment serving as the lead agency. Anambra State is located in the Southeast geopolitical zone of Nigeria. Obosi is located within the co-ordinates: Latitude 6.096869⁰N Longitude 6.811811⁰E and Latitude 6.132058⁰N Longitude 6.834079⁰E and situated in Idemili North LGA in the central part of the Anambra State.

Obosi is one of the many towns in Anambra State whose communities are perennially devastated by erosion gullies resulting from uncontrolled stormwater flow. The gully erosion in Ire village, Obosi have caused major loss of properties to residents and remain a serious threat to lives in the community. Several cases of loss of lives, particularly children were mentioned during this study. Although not documented, the occurrence of such events was corroborated by different community members including the leadership. With each passing year, uncontrolled storm water flow creates new gullies that threaten lives and properties while existing gullies are deepened and widened. Urgent intervention is therefore needed at the site to salvage the environment, save lives, properties and infrastructure and to restore the people's confidence in Government. In an effort to reduce the impacts of erosion on Obosi town, the Anambra State Government (ANSG) has proposed to rehabilitate and remedy the Ire, Obosi gully corridor through the NEWMAP opportunity.

1.2 Description of the Proposed Intervention

1.2.1 Gully Terrain Features and Properties at Risks:

Obosi gully erosion site is located within the co-ordinates: latitude 6^o 7'N and 6^o 50'E, and situated in Idemili North Local Government Area (LGA) in the central part of the Anambra State. The main access to the gully head is from Obosi Road. The gully system comprises of existing cascading lined canals with vertical impact wall drop structures and junctions made of reinforced concrete. The head of the gully receives flow from Obosi Road side drain through 2m wide and 1.5m high concrete lined canal and then flows downstream for about 230m through the road to discharge into the village side and then flows through a natural gully to finally discharge into Idemili River. Based on the engineering design documents for Ire Obosi gully erosion project, the Obosi Main Gully (OMG) starts from the gully head and it is about 3.6km long, the width ranging from about 16m to 100m wide with the deep sections of the main gully having a depth of up to 12m. The flow meanders within the gully system until it discharges into the Idemili River downstream at the southern area. The Idemili River drains into the River Niger which empties into the Atlantic Ocean. The Ire gully corridor runs through the southeastern section of Obosi town and in addition to the main gully, there are eleven other finger gullies that join the main gully.

1.2.2 Activity Description:

The proposed project consists of remedial structural and non-structural developments that include civil works (drop structures, drainage channels, check dams, etc) and vegetative works (gabion protection, tree planting, etc) to prevent erosion and provide aesthetic view along the channel as well as prevent further encroachments of the floodplain. The SMEC remedial engineering design for the gully corridor includes the main structures for the gully bed system and the bank stabilization measures. The designed gully bed system comprises of the following structures:

- Drain Inlet Structure;
- Lined canal for a total length of 3.6km;
- Chute structure with stilling basins;
- Drop structures; and,
- Exit system/outlet structure

The designed bank stabilization measures include:

- Gabion retaining wall;
- Slope cutting with geo-textile and Vetiver grass; and,
- Bio-remediation using Vetiver grass and bamboo planting.

The principal features of the remedial measures for the Ire Obosi gully erosion include:

- 1) The construction of concrete and Reno-mattress drainage canals, gully bank protection works using stone pitching and Vetiver grass, provision of toe protection, provision of box culverts, chutes alignment, energy dissipaters, stilling basin and drop structures for the Main Gully and the Finger Gully. The general location map showing the location of the main and finger gullies is shown in Annex 2.
- 2) Stabilization of the existing components of the Main Gully using reinforced concrete canals, bio-remediation using Vetiver grass; Stabilization of the Finger Gully using reinforced concrete canals, stone pitching and bio-remediation using Vetiver grass;
- 3) Cutting of the slopes in 1:1.5 on both sides with 3m berms in some areas and bio-remediation measures will be used to stabilize and protect the gully bank walls and prevent erosion. The interlocking bedding, gabion, concrete lined canals and Vetiver grass protection all help to provide important resistance to erosion forces and will be more aesthetic and environmentally friendly than other structures.

Civil Construction Works:

- The key activities in putting up the civil works include:
 - cutting and filling for percentage recovery;
 - concrete casting;
 - assembling of structures; and,
 - slope stabilization.
- The foundations of the lattice structures and concrete casting may be dug mechanically with the depth being consistent with the project geotechnical study and engineering designs.
- Vegetation clearing will be done manually.
- A number of transport vehicles shall be employed in the project but there will be no on-site maintenance of vehicles.
- Powered equipment is expected to be used in the construction (as required) as well as earth moving equipment such as excavators, compactors, bulldozers and pay loaders;
- Skilled and unskilled labour shall be employed in the project.

1.3. Rationale for ESMP:

The World Bank safeguard policies are designed to help ensure that projects proposed for financing by the Bank or its affiliate Agencies are environmentally and socially sustainable, and thus improve the decision-making process associated with the project. The NEWMAP project is being funded by the World Bank and other affiliate agencies. The ground interventions along the gully corridor within Ire Obosi community will address, prevent and expectedly reverse land degradation within the project area, and will involve construction of civil works and rehabilitation of the existing flood plain. These activities, according to the Integrated Safeguard Data Sheet (ISDS) of the World Bank, trigger the WB Safeguard Policies that include environmental assessment (OP 4.01), cultural property (OP 11.03), involuntary resettlement (OP 4.12). In fulfillment of the World Bank safeguard policy requirements, the ESMP serves as a safeguard instrument that documents the necessary mitigation, monitoring and institutional actions to be carried out with the implementation of the Ire Obosi gully erosion subproject to eliminate adverse environmental and social impacts or reduce them to an acceptable level.

1.4. Rationale for the Study:

For Ire Obosi gully erosion project, the Obosi Main Gully (OMG) starts from the gully head, the flow meanders within the gully system until it discharges into the Idemili River downstream at the southern area. The project includes the reconstruction of existing degraded infrastructures (access roads and drainage channels) located in areas through which access is gained to the project corridor. These infrastructures are critical inter- and intra-community linkages and their disruption will result in detours for community members who travel to neighboring communities to trade/market their goods and children who attend schools in neighboring communities. Large areas of land are majorly eroded with many homes and families losing their primary means of livelihoods. The proposed gully intervention along the gully corridor will rehabilitate/construct the degraded erosion corridor, redress the impacts of erosion and flood on the affected corridor as well as residents along the corridors and reverse land degradation within the watershed for the long-term.

The project consists of remedial structural and non-structural developments that include civil works and earth works, and vegetative protection to prevent further erosion and land degradation as well as provide aesthetic view along the corridor. These activities will result in several environmental and social impacts which must be considered and properly addressed to ensure that the environment is not unreasonably further degraded and the socioeconomic life of the people is not adversely disrupted. Consequent upon these, this ESMP Study is required to provide necessary procedures and criteria that will guide the proposed gully erosion intervention in accordance with the World Bank Safeguard Policies and the Nigerian national environmental policies, guidelines and assessment procedures as well as those of Anambra State and the local agencies.

The ESMP specifically identifies, evaluates and documents the set of environmental and social impacts of the project and their associated mitigation measures, as well as the monitoring and institutional actions to be taken before, during and after the remedial construction and rehabilitation works. The evaluations have taken into account the proposed civil engineering designs, vegetative land management measures and other activities aimed at reducing or managing gulying and soil erosion within the 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 project affected persons (PAPs).

1.5 Scope of Work and Objectives of the Study:

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

1. Pre-construction phase;

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

1.5 1 Pre-construction Phase

As part of the pre-construction stage, SMEnv/ANS-NEWMAP commissioned Messrs SMEC International (Pty) Limited West African Region to develop the detailed engineering design for the remedial intervention and development of the Ire Obosi gully corridor. The preparation of this ESMP and a separate Abbreviated Resettlement Action Plan (ARAP) 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 ARAP processes.

1.5 2 Construction Phase

The construction of the gully erosion control infrastructure and the site development activities, as designed, will require the use of existing access roadways to reach sections of the project location. The project can be accessed from multiple point but the main access roadway to the upper and middle sections of the project is the Obosi Road. This road is currently degraded and will need to be reworked to sustain the heavy-duty equipment that will ply the road during construction. Civil works associated with the degraded access roadway include re-grading and rehabilitation of the road 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 will require some localized vegetation clearance along the gully corridor and the removal of incipient solid waste materials. Materials arising from the excavation for the gully corridor, foundations, stabilization walls (soil, rock etc.) and installation of gabions would be used to fill appropriate areas. The foundations will be in-filled with cement supplied via ready-mix-cement trucks or alternatively mixed on site. Vegetation clearing may be done manually or mechanically. A number of transport vehicles will be employed in the project but there will be no on-site maintenance of vehicles. The power equipment is expected to be used in the construction including power saws and compressor to break hard ground (if required). Earth moving equipment 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.

1.5 3 Post-Construction (Maintenance) Phase

Routine visual inspection and maintenance of the rehabilitated gully corridor are expected. Access rights may need to be retained through the community watershed association to allow for maintenance works in the future. The erosion and flood control corridor will require routine periodic maintenance of the site infrastructure (culverts, gabions, drainage channels, roadways etc) as well as necessary oversight of the economic trees.

CHAPTER 2: INSTITUTIONAL AND LEGAL FRAMEWORK

2.1 World Bank Environmental and Social Safeguard Policies

The World Bank safeguard policies are designed to help ensure that projects proposed for Bank financing are environmentally and socially sustainable, and thus improve decision-making. The Bank has ten safeguards policies and these are:

- i. OP 4.01 Environmental Assessment;
- ii. OP 4.04 Natural Habitats;
- iii. OP 4.09 Pest Management;
- iv. OP 4.11 Physical Cultural Heritage;
- v. OP 4.12 Involuntary Resettlement;
- vi. OP 4.10 Indigenous People;
- vii. OP 4.36 Forests;
- viii. OP 4.37 Safety of Dams;
- ix. OP 7.50 Projects on International Waterways;
- x. OP 7.60 Projects in Disputed Areas

2.1.1 Triggered WB Safeguard Policies

Based on the scope of construction and rehabilitation works required in the Ire Obosi gully erosion intervention as well as the specific intervention activities proposed, the WB Integrated Safeguard Data Sheet (ISDS) indicates that only three of the WB Safeguard Policies may be triggered by NEWMAP and are applicable to this sub-project. Table 2.1 (Triggered Safeguard Policies) shows the World Bank Safeguard Policies determined to be triggered by NEWMAP. These include: Environmental Assessment (OP 4.01), Cultural Property (OP 4.11), and Involuntary Resettlement (OP/BP 4.12) as shown in the Table 2.1.

Table 2.1: Triggered Safeguard Policies

WB Safeguard Policy	Triggered by NEWMAP?		Triggered by Ire Obosi Gully Project?		Applicable To Project Due To	How Project Addresses Policy Requirements
	YES	NO	YES	NO		
Environmental Assessment (OP/BP4.01)	[x]	[]	[x]	[]	Civil works with site-specific impacts	ESMF prepared for NEWMAP & site specific mitigation measures developed in this ESMP
Natural Habitats (OP/BP4.04)	[]	[x]	[]	[x]	NA*	NA
Pest Management (OP 4.09)	[]	[x]	[]	[x]	NA	NA
Physical Cultural Resources (OP/BP 4.11)	[x]	[]	[x]	[]	Existence of shrines & other cultural relics along project corridor	This ESMP spells out appropriate site specific mitigation measures
Involuntary Resettlement (OP/BP4.12)	[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/BP4.10)	[]	[x]	[]	[x]	NA	NA
Forests (OP/BP4.36)	[]	[x]	[]	[x]	NA	NA
Safety of Dams (OP/BP4.37)	[]	[x]	[]	[x]	NA	NA
Projects in Disputed Areas (OP/BP7.60)*	[]	[x]	[]	[x]	NA	NA
Projects on International Waterways (OP/BP7.50)	[x]	[]	[]	[x]	NA	NA

NA* = Not Applicable

The applicable World Bank safeguard policies identified for NEWMAP include: OP 4.01 Environmental Assessment; OP 4.11 Physical Cultural Resources; and, OP 4.12 Involuntary Resettlements. These World Bank safeguard policies are summarized as follows:

2.1.2 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.

2.1.3 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.

2.1.4 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.

2.2 Federal Policy, Legal, Regulatory and Administrative Frameworks

Pursuant to Section 20 of the Nigerian 1999 Constitution, the state is empowered to protect and improve the environment and safeguard the water, air, and land, forest, and wildlife of Nigeria. The power to regulate all environmental matters in Nigeria is vested in the Federal Ministry of Environment (FMEEnv) – a mandate that previously rested with the now defunct Federal Environmental Protection Agency (FEPA) set up by Federal Act 88, of 1988.

The applicable environmental laws include the Environmental Impact Assessment Act No. 86 of 1992; the National Guidelines and Standards for Environmental Pollution Control in Nigeria (March 1991); the National Environmental Standards and Regulations Enforcement Agency (establishment) Act 2007 (NESREA), the Land Use Act 1978 (as amended in 2004); the Forestry Act 1958; and the National Agricultural Policy 1988.

2.2.1 National Policy on Environment

The national policy on environment, 1989 (revised 1999), provides for “a viable national mechanism for cooperation, coordination and regular consultation, as well as harmonious management of the policy formulation and implementation process which required the establishment of effective institutions and linkages within and among the various tiers of government – federal, state and local government”. The defined guideline and strategies provide for the effective management of the environment in the following 14 major areas:

Human population; Land use and soil conservation; Water resource management; Forestry; Wildlife and protected areas; Marine and coastal area resources; Toxic and hazardous substances; Energy production and use; Air pollution; Noise pollution; Toxic and hazardous substances; Recreational space; Greenbelts movements; and, Cultural property.

2.2.2 National Environmental Impact Assessment Act 1992:

National EIA Act 1992, Clause 2 provides that public or private sector of the economy shall not undertake or embark on or authorize projects or activities without prior consideration of the effects on the environment. The act makes an EIA mandatory for any development project, and prescribes the procedures for conducting and reporting EIA studies. As part of the effective utilization of the EIA tool, the ministry has produced sectarian guidelines.

2.2.3 Nigerian Land Use Matters

The basic legal framework for the acquisition of land in Nigeria is the Land Use Act 1978 as amended under the Amended Land Use Act of 2004, Chapter L5 under the laws of the Federation of Nigeria. The Part 1 of the amended Act 2004 vests all land within the urban areas of any Nigerian State in the Executive Governor of that state. Land within the rural areas of the state is vested on the Local Government. The Part VI, Section 29 of law provides for compensation to the holder of any land title when such land is to be acquired for public purposes. For developed land, the Governor (in the case of urban areas) or Local Government (in the case of rural areas) may, in lieu of compensation, offer resettlement in any other place as a reasonable alternative accommodation and in acceptance of resettlement, the holder's right to compensation shall be deemed to have been duly satisfied.

Although the Land Use Act is not strictly an Act for environmental protection, protection of the environment is one of the considerations which a holder of certificate of occupancy has to observe.

2.2.4 National Erosion and Flood Control Policy 2005:

The general soil erosion & flood control guidelines provide necessary instructions for soil and water resources users to develop, implement and monitor plans that are to assure erosion and flood hazard mitigation. The maintenance of levees and other protective structures are also to be developed at areas with potential impacts. In addition to this, all requests for project plan approvals must include soil type and drainage pattern/structures in and around project area and the likely impact of the project on these duly certified.

2.2.5 NESREA Establishment Act, 2007.

The National Environmental Standards and Regulations Enforcement Agency (NESREA) has responsibility for the enforcement of the environment regulations and biodiversity conservation, including coordination and liaison with relevant stakeholders within and outside Nigeria on matters of enforcement of environmental standards, regulations, rules, laws, policies and guidelines.

2.2.6 National Guidelines and Standards for Environmental Pollution (March, 2001):

The National Guidelines and Standards for environmental pollution control in Nigeria (March, 2001) is the basic instrument for monitoring and controlling industrial and urban pollution.

2.2.7 Waste Management Regulations of 1991

This regulation mandates the collection, treatment, and disposal of solid and hazardous waste from municipal and industrial sources.

2.2.8 Approved National Forestry Policy 2006

The extant national forest policy which is included within the document "Agricultural Policy for Nigeria" published by the Federal Ministry of Agriculture in 1988 recognized forestry as

the management and utilization of forests as renewable natural resources. The policy overall objective is to achieve sustainable forest management that would ensure sustainable increases in the economic, social and environmental benefits from forests and trees for the present and future generation including the poor and the vulnerable groups.

The Forest Policy encourages and supports an aggressive establishment of plantations of economic trees of both exotic and indigenous species. It provides for the preservation of forest and the setting up of forest reserves, and also provides goals, targets and implementation strategies for the management, development and use of forests and their resources and products. Nigeria is at present a wood deficit nation. The policy on forest resources management and sustainable use is aimed at achieving self-sufficiency in all aspects of forest product through the use of sound forest management techniques as well as the mobilization of human and material resources. The overall objectives of forest policy are to prevent further deforestation and to recreate forest cover, either for productive or for protective purposes, on already deforested fragile land.

The national biodiversity conservation strategy continues to be based on a system of Protected Areas, including Forest Reserves, National Parks and Game Reserves. In recognition of the fact that the local communities must share from the benefits of these Protected Areas, there must be a meaningful participation of these communities in their management. Efforts to safeguard biodiversity in private forests and to improve agricultural biodiversity through farm forestry initiatives must be supported.

Government has signed a number of international agreement and conservators that are relevant to the forestry development. It is obligatory that Government should honour these agreements and instruments through domestic legislation; and action. Intergovernmental, bilateral and multilateral cooperation will be upheld to promote sustainable development of forest resources.

2.3 Other Relevant Acts and Legislations at Federal Level

Nigeria subscribes to a number of international regulations and conventions relating to Environmental Protection. The assessments and management standards of these international development partners/agencies, such as World Bank and other financial organizations, must be complied with by project proponents before these institutions will invest in the projects. These guidelines/conventions/treaties to which Nigeria is a signatory are summarized below.

2.3.1 The Basel Convention on the Control of Transboundary Movement of Hazardous Waste and Disposal, 1989

The convention focuses attention on the hazards of the generation and disposal of hazardous wastes. The convention defines the wastes to be regulated and controls their trans-boundary movement to protect human and environmental health against their adverse effects.

2.3.2 UN Framework Convention on Climate Change – Kyoto Protocol (1992)

In order to achieve sustainable social and economic development, energy consumption for developing countries needs to grow taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general. This also includes the application of new technologies on terms which make such an application economically and social beneficial, determined to protect the climate system for present and future generations.

2.3.3 Agenda 21 - UN Conference on Environment and Development

At the United Nations Conference on Environment (also the Earth Summit) – held in Rio de Janeiro (1992), with recommendations from the WHO Commission, more than 150 member states adopted Agenda 21 - an action plan to guide future strategies for health and

environment activities on a national and international level. This fact provided the background for FEPA's EIA framework to ensure environmental sustainability of all types of activities in the oil and gas industry (FEPA, 1995).

2.3.4 Public Health Legislations and regulations

Several countries have legislation and regulations that stipulate the administrative and policy framework for conducting health impact assessment for a development project, whether as part of an EIA or a standalone study. In addition, a number of international agencies have endorsed this process, such as the World Banks, Asian Development Commission, and the World Health Organizations. In Nigeria, the Public Health Law (L_N47 of 1955, Cap 103) provides justification for the execution of developmental projects under guidelines that promote health by protecting the environment and safeguarding the health of humans.

2.3.5 WHO Health and Safety Component of EIA, 1987

WHO in its report on health and safety component of environment impact assessment (EIA) to protect human health indicates that:

- i. One of the fundamental considerations in the approval of projects, policies and plans should be the health of communities affected by them; greater consideration should be given to the consequence of development policies/programs for human health;
- ii. Environmental Impact Assessment should provide the best available factual information on the consequence for health of projects, policies and plan; and
- iii. Information on health impact should be available to the public.

2.3.6 Convention on Conservation of Migratory Species of Wild Animals, Bonn, 1979

The Bonn convention concerns the promotion of measures for the conservation (including habitat conservation especial for endangered species and management of migratory species.)

2.3.7 United Nations Guiding Principle on the Human Environmental

The United Nation (UN) published the concept of guiding principles on the Human Environment in 1972. Ten of these Guiding Principles were defined as formal declarations that express the basis on which an environmental policy can be built and which provide a foundation for action.

2.3.8 The Rio Declaration on Environmental and Development

The UN Conference on Environment and development met at Rio de Janeiro in June 1992, at which time it reaffirmed the 1972 declaration on the Human Environment, and sought to build upon it. This was done with the goal of establishing a new and equitable global partnership through the creation of new levels of cooperation among states, key sectors of societies and people. It was also to aid work towards international agreements, which respect the interest of all, protect the integrity of the global environmental development system, and recognize the integral and interdependent nature of the earth.

Other relevant international conventions include:

- Africa Convention on the Conservation of Natural Resources of 1969
- Convention on the Law of the Seas of 1982
- The Ramsar Convention on Wetlands of 1971

2.4 State Legislations

2.4.1 Anambra State Waste Management Act

This Act provides for the effective development and maintenance of sanitation in all areas of the State. The law further provides for proper disposition of excavated silt or earth and other construction materials after any construction project or repair works. Open burning of wastes is prohibited with stipulated penalties.

2.5 Gaps between Nigerian Legislation and World Bank Policies

The gaps between the triggered Nigerian current legislation and WB policies as they relate to this project are summarized in Table 2.2 below:

Table 2.2: Gaps between Nigeria Legislation and WB Policies

Project Triggered Policies	Nigerian Legislation	World Bank Policy	Gaps Between the Policies
OP 4.01 Environmental Assessment	National EIA Act 1992, Clause 2 provides that public or private sector of the economy shall not undertake or embark on or authorize projects or activities without prior consideration of the effects on the environment. The act makes an EIA mandatory for any development project, and prescribes the procedures for conducting and reporting EIA studies. As part of the effective utilization of the EIA tool, the ministry has produced sectorial guidelines. Responsibility for monitoring of EIA activities lies with the NESREA and State ministries of environment but these agencies lack the logistic capability to carry out the tasks assigned to it by the law	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.	Nigeria currently has a comprehensive framework for assessing and managing the environmental impacts of development projects. However, in comparison with the World Bank Safeguard Policies, it would appear that the Nigeria framework lacks the provision of clear requirements or guidance in the assessment of the impact of an activity on public health. In this case the policy of the Bank prevails.
OP 4.11 Physical Cultural Resources	National Commission For Museums and Monuments Act of 1990, Chapter 242 seeks to protect and preserve any objects of archaeological interest wherever they may be found. Any person who discovers an object of archaeological interest in the course of operations permitted under section 19 of this Act shall notify the Commission.	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.	No difference in framework. Responsibility for monitoring of activities and enforcement under this Nigerian Regulations is effectively lacking. In this case the policy of the Bank prevails.
OP 4.12 Involuntary Resettlement	The basic legal framework for the acquisition of land in Nigeria is the Land Use Act 1978 as amended under the Amended Land Use Act of 2004, Chapter L5 under the laws of the Federation of Nigeria. The Part 1 of the amended Act 2004 vests all land within the urban areas of any Nigerian State in the Executive Governor of that state. Land within the rural areas of the state is vested on the Local Government. The Part VI, Section 29 of the law provides for compensation to the holder of any land title when such land is	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	Essentially, there is no difference between the main framework of both policies. Lands that would be acquired for this project shall be fully compensated for in accordance with the World Bank policy and principles. The Nigerian regulations while also lacking clear responsibility for monitoring of activities associated with compensations further

Project Triggered Policies	Nigerian Legislation	World Bank Policy	Gaps Between the Policies
	<p>to be acquired for public purposes. For developed land, the Governor (in the case of urban areas) or Local Government (in the case of rural areas) may, in lieu of compensation, offer resettlement in any other place as a reasonable alternative accommodation and in acceptance of resettlement, the holder's right to compensation shall be deemed to have been duly satisfied.</p> <p>Although the Land Use Act is not strictly an Act for environmental protection, protection of the environment is one of the considerations which a holder of certificate of occupancy has to observe.</p>	<p>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</p>	<p>lack the logistic capability for any agency to carry out the tasks assigned to it by the law.</p> <p>In this case the policy of the Bank prevails.</p>

The summary descriptions of the WB Safeguard Policies are included as Annexure 4.

CHAPTER 3: DESCRIPTION OF AREA OF INFLUENCE AND ENVIRONMENTAL BASELINE CONDITIONS

3.1 Introduction

The geologic and soil characteristics of the project area and the extent to which implementation of the proposed project could be affected by soil characteristics and other natural environmental factors are summarized in this section. The natural environmental factors include climate and vegetation, topography and landforms, hydrogeology and hydrologic patterns. Information sources for this evaluation include published literature, preparation of surface geologic map, geotechnical investigation conducted by Messrs SMEC International (Pty) Limited, West African Region – the engineering design Consultant for this project, and the physical observations made during site inspections in the course of the Consultancy.

3.2 Study Area/Description of Site

Obosi gully erosion site is located within the co-ordinates: latitude 6° 7'N and 6° 50'E, and situated in Idemili North Local Government Area (LGA) in the central part of the Anambra State. The main access to the gully head is from Obosi Road. The gully system comprises of existing cascading lined canals with vertical impact wall drop structures and junctions made of reinforced concrete. The head of the gully receives flow from Obosi Road side drain through 2m wide and 1.5m high concrete lined canal and then flows downstream for about 230m through the road to discharge into the village side and then flows through a natural gully to finally discharge into Idemili River. The gully starts from the gully head and travels about 3.6km long, the width ranging from about 16m to 100m wide with the deep sections of the main gully having a depth of up to 12m. The flow meanders within the gully system until it discharges into the Idemili River downstream at the southern area. The Idemili River drains into the River Niger which empties into the Atlantic Ocean. The Ire gully corridor runs through the southeastern section of Obosi town and in addition to the main gully, there are eleven other finger gullies that join the main gully.

3.3 Physical Environment and Topography

3.3.1 Geology and Hydrology

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 deltaic swamps of the Niger Delta basin and extends northwards beyond the Bende-Ameki formation. The basin is said to have originated contemporaneously with the folding and uplift of the Abakaliki – Benue area during the santonian age. The Anambra basin constitutes a major depocenter of clastic sediments and deltaic sequences and resulting from the second tectonic activities of the lower Benue Trough. Figure 3-1 shows the geologic map of the southern Anambra basin.

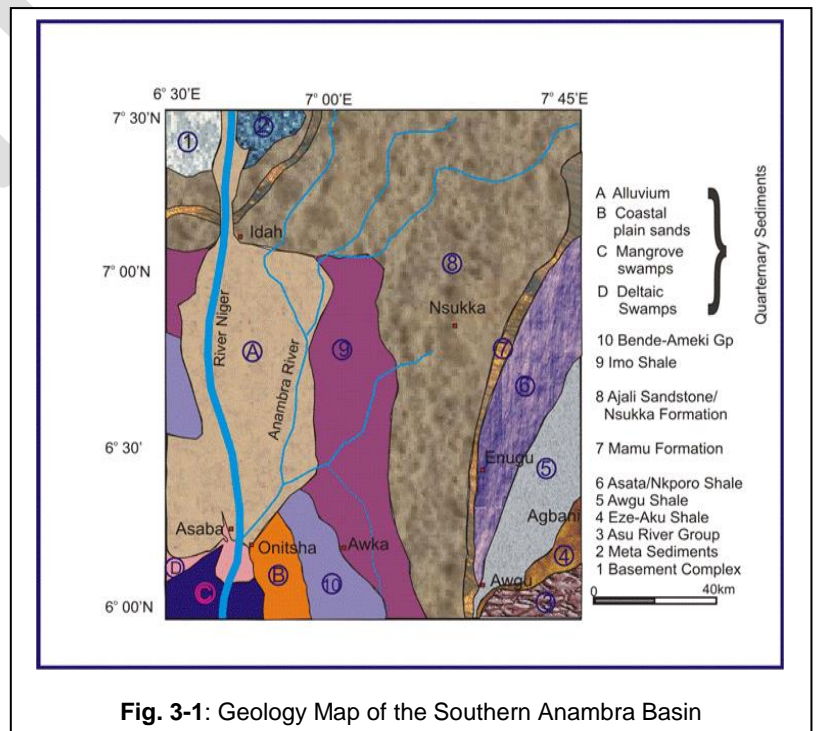


Fig. 3-1: Geology Map of the Southern Anambra Basin

3.3.2 Soil Conditions

The soils of Anambra State particularly have groundwater reservoirs that severely contribute to ecological problems in the region. Obosi soils are typified by the coastal plain sands

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. The litho-stratigraphic units of the Anambra Basin are shown in Table 3-1.

Table 3-1: Litho-stratigraphic 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

Source: Agagu, et al., 1985

3.3.3 Slope Instability

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 is relatively of undulating surfaces.

3.3.4 Land Subsidence

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.

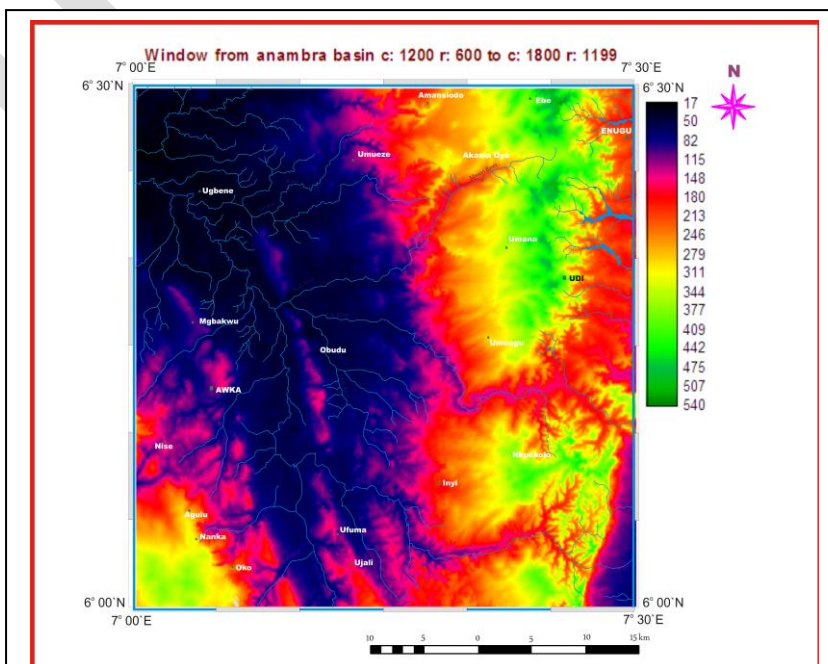


Fig. 3-2: Digital Elevation Map of Southern Anambra Basin Draped With Major Drainages

3.3.5 Natural Drainage Corridors

3.3.5.1 Watershed Drainage Network

Survey maps that included Satellite Imagery and Topographic profiles 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. 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. The Ire Obosi watershed is drained by the Idemili River which empties into the River Niger. Figure 3-2 is the digital elevation model of the study area showing the drainage systems in the area.



Plate 3.3:: Failed Drainage Channel at Ire Obosi

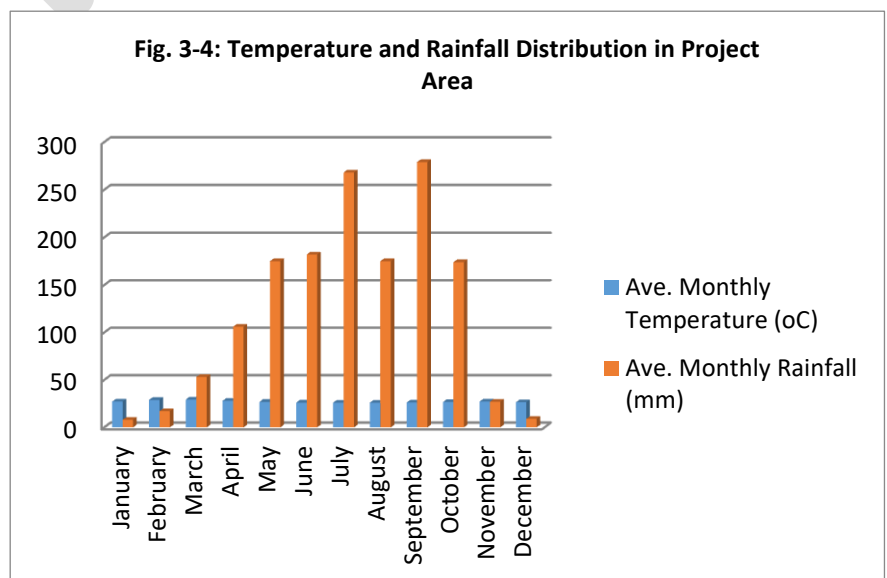
3.3.5.2 Main Agents of Site Gully Erosion

Based on field observations of Ire Obosi landscape, soil erosion at the project site, and indeed all areas of Obosi, is a result of gravity-driven surface water flow enhanced by the topography of the area. Furthermore, development in the area is not in tandem with the natural stormwater flow routes within the catchment and sub-catchment areas thereby creating flow blockades. The major cause of the gully problem at Ire Obosi is the abrupt termination of concrete drainage channels as shown in Figures 3-3.

The Idemili River empties into the River Niger. This means that the material and chemical pollutants carried into Idemili River via the Ire Obosi gully corridor have a wider impact area beyond the local. It is also noted that previous intervention to control or abate the gully erosion scourge at this site has been unsuccessful. These interventions were unsuccessful because of abrupt termination of the drainage channels and/or failing channels (see Figure 3-3).

3.4 Climate and Meteorology

The project area is situated within the sub-equatorial south climatic region characterized by uniformly high temperatures and a seasonal distribution of precipitation and high relative humidity. Figure 3.4 shows the plot of average monthly temperature and rainfall distribution through the year. The climate is of humid tropical climatic condition. Harmattan is felt between December & January. The average annual temperatures range from a minimum of about 24°C to a maximum of about 33°C.



The area experiences distinct wet and dry seasons (eight months of rainfall and four months of dryness) in the year. The rainy season begins in March and ends in October while the dry season runs through the months of November to February of each year as shown in Figure 3.4.

The rainfall shows bimodal peaks which occur in June/July and September with a short break between July and August. The average annual rainfall in the area is about 2500 mm. The rainy season follows the northward advance of maritime air from the Atlantic Ocean. The months of July and September are usually the wettest periods of the rainy season with average monthly rainfall of over 260mm. Relative humidity is high during this period, usually over 90% in the early morning but falls between 60% and 80% in the afternoon.

The weather is highly influenced by the south-western winds and the north-eastern winds. The south-western winds are full of moisture and blusters from the Atlantic Ocean whereas the northern easterlies are dry and dirt-laden winds that primarily blow from the deserts of Sahara. The dry and rainy seasons in Nigeria come into existence due to the movement of the north-east winds and the south-west winds, respectively. The hot and dry Harmattan (north-east) winds from the Sahara sweep across Anambra State and the project area between December and January at wind speeds of between 2.3 mph and 6.15 mph, carrying a reddish dust from the desert. The southwest winds bring cloudy and rainy weather between March and October of each year.

3.5 Environmental Quality Assessment (Baseline Condition)

3.5.1 Soil Assessment

The project area is generally characterized by a semi-urban setting marked by a less dense infrastructural distribution across the entire area. The project area is essentially drained through the failed drainage channel running along the gully corridor. Some major intra-community roads within Ire were severed by fingers of the gully disrupting movement flow between parts of Ire community.

Representative near-surface soil samples for laboratory analysis were collected. The sampling locations are shown in Annex 8. Each near surface soil sample (0 - 6 inches depth) was collected using the Dutch hand auger and put in a properly labeled zip-lock plastic bag for shipment to the FMEnv-certified MGG Resources laboratory at Nsukka for chemical analysis. These results do not show concentration levels that will pose any potential health risks to residents and project construction workers.

3.5.2 Ground Water Assessment

To assess the groundwater condition, water samples were collected in a clean sampling bottle from the Idemili River and one existing household borehole within the project area. The water borehole is located in late Mr. Samuel Okeke's compound near Ire Primary School. The water samples were sealed, labeled and preserved in an ice-filled chest before shipping to the FMEnv-certified MGG Resources laboratory at Nsukka for chemical analyses. The analytical results of the water samples are as shown in Annex 8. These results do not show concentrations that will pose any potential health risks to residents and project construction workers.

3.5.3 Noise and Vibration:

The project area is generally a quiet neighborhood being a village. Noise levels were measured using the Digital Sound Level Meter (BAFX Products), Type BAFX3370. Measurement of minimum noise levels, maximum noise levels as well as noise exposure levels were recorded in-situ at one assessment point (Location NV-1). The assessment location as shown in Annex 8 was chosen because of the high human activity levels within the area.

Noise levels obtained indicate low ambient noise levels. There are generally no significant noise emissions in the project area. The recorded ambient noise levels range from 38.8 dB to 62.4 dB. These levels are well below the FMEnv regulatory standard of 90 dB.

Copies and the laboratory analytical results are included in Annex 8.

3.6 Air Quality Assessment

Ambient air quality assessment for Ire Obosi gully was carried out in three locations; the gully head, gully middle and the gully outfall. The assessment was carried out using the Dragner CMS Gas Analyzer. Ambient air was drawn into the calibrated equipment at the sampling location and the digital readings for the various parameters were subsequently read off the instrument. The analytical results of the baseline air pollution indicators within and around the project corridor show concentrations below the regulatory threshold limits as shown in Annex 8. The location coordinates for each sampling location are also given.

3.7 Vegetation Study

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.

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 vegetative cover of the project area is highly heterogeneous due to severe anthropogenic disturbance.

The vegetative cover presents typical features of the derived savannah ecosystem and shows signs of intense disturbance due to human anthropogenic factors. Known species and others species of interest were identified and classified using standard taxonomic procedures. Some plant species with frequent or abundant distribution identified at the various categories include: Boundary tree (*Newbouldialeavis*), Bermuda grass (*Cynodondactylon*), Bamboo (*Bambusa vulgaris*), Christmas bush (*Alchorneacordifolia*). The complete listing of plant species and their distribution found in the vegetation covers are given in Annexure 7.

The major farm crops cultivated in the project community as observed include cassava (*Manihot esculenta*), plantain (*Musa paradisiaca*), green (*Amaranthus* spp), water leaf (*Triangle triangulare*) and maize (*Zea mays*). Major fruit trees grown in homesteads include avocado (*Persea africana*), paw paw (*Carica papaya*), coconut (*Cocos nucifera*), oil palm (*Elaeis guineensis*), Orange (*Citrus sinensis*), local pear (*Dacryodes edulis*), mango (*Mangifera indica*), bitter leaf (*Vernonia amygdalina*), Africa breadfruit (*Treculia africana*) and guava (*Psidium guajava*). Other trees observed within the homestead include neem (*Azadaracta indica*) and ficus (*Ficus exasperata*). Ornamentals include *Ixora cucinea* and *Alcalypha* spp. and masquerade tree (*Polyathia latiflora*). Other prominent species observed in the home-gardens include Ukwa (*Treculia africana*), Udara (*Gambeya albida*), coconut palm (*Cocos nucifera*), Plantain (*Musa parasidiaca*) and paw-paw (*Carica papyra*).

3.8 Fauna/Wildlife Study

The ecological survey of the immediate project area provides necessary information about the wildlife (vegetation cover and fauna) of the area, which is a vital indicator of its ecological dynamics. It also provides baseline information that can be useful for monitoring and the assessment of project implementation effectiveness.

3.8.1 Animal Inventory of the Watershed

The animal survey was assessed through observations of routes traversed by the animals within the project area and the information received from local people.

Domestic Animals: These include mammal such as goats, sheep, ram and dogs; and aves such as local fowls and agricultural fowls.

Wild Animals: As a result of habitat loss due to urbanization and the flooding menace in the project area, burrowing animals such as grass cutter (*Thryonomys swinderianus*) have seemingly disappeared. None of existing reported animals are listed on the International Union for the Conservation of Nature (IUCN) endangered red list. The terrestrial animals include: *Thryonomys swinderianus* (Cane rat); *Cricetomys gambianus* (bush/giant rat); *Philantomba maxwelli* (antelope). The aquatic animals include: *Tilapia spp*; *terobranchus spp.* (cat fish); *Clarias spp.*; while the reptiles include: *Veranus nilocus* (monitor lizard), *Crocodylus niloticus* (crocodile).

3.9 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.

3.10 Traffic and Transport Infrastructure:

The project area is served by several rural intra-linkage roads which are now destroyed by the gully. One of the two access roads to the gully area currently experiences very low level of traffic flow due to the gully and flooding problems. This is envisaged to gradually increase once the gully erosion control intervention project is completed, and as additional residential areas develop and the road surfacing is improved.

3.11 Waste Management:

Waste management provision in the project area is generally lacking. Solid wastes are generally handled in individual homesteads and are either burnt or disposed in small earth fills to rot. There are no commercial waste collectors in the Ire community so wastes to a large extent are indiscriminately dumped in public places as shown Figure 3-5. There are also no sewerage works in the project area. Many homesteads use septic tanks, while some homes still use the pit latrines.



Plate 3.5: Indiscriminate Waste Dumping Site by Ire Obosi

CHAPTER 4: SOCIOECONOMIC CHARACTERISTICS AND CONSULTATIONS WITH STAKEHOLDERS

4.1 Description of Cultural and Socioeconomic Environment

4.1.1 Introduction:

The cultural/socioeconomic elements and characteristics of Ire Obosi 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.

Qualitative and quantitative mixed method of assessment was adopted in this project. This offered an effective means of interacting widely with the stakeholder groups, the Anambra NEWMAP team, as well as individual stakeholders and affected persons. Participatory community meetings, public discussions as well as discussions with key informants (Community elders, Local leadership, and Anambra NEWMAP Officers, among others) were held in the course of the Consultancy.

4.1.2 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 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.

4.1.3 Public Consultation:

Community consultations began subsequently with separate meetings between the Consultant team and the respective community leaders of Ire village and Obosi Development Association to discuss the best and most effective approach towards mobilizing the community members as it relates to the proposed project. The consultations were 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. Public meetings were held in one location within the project immediate impact area. The meeting location is the Ire Primary School. The several meetings helped to structure effective participation of all other relevant stakeholders and segments of the community including the PAPs in the project process. The community members were actively and enthusiastically engaged in all matters relating to the project and eagerly assisted the Consultant in identifying pertinent socio-cultural issues relevant to the project. Minutes of, and attendance to, these meeting are included in Annex 6.

4.1.4 Use of Maps and GIS:

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

The qualitative analysis involved an assessment of information obtained during the stakeholders' consultations and public participation forums and 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.

4.2 Cultural Environment

4.2.1 Population

Based on a 2017 population projections using the 2006 national population census records and the 2.8% annual population growth factor recommended by the national population commission (NPC), Idemili North LGA has a projected population of 583,992 for 2017 while Obosi town has a projected population of 86,410.

4.2.2 Ethnic Groups

The people of Obosi consist of one of Nigeria's major ethnic groups – 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 the ethnic groupings. The Igbos have elaborate cultural practices that include strong kinship linkages with organizations spanning from localized social groups to strong clan relations. The cultural associations and social interactions are epitomized during cultural and religious ceremonies and festivities. The people generally speak and write mainly the Ibo and English languages.

Obosi town and its villages are essentially rural communities whose residents are generally agrarians. The local dwellers rear domestic animals such as goats and sheep, and maintain chicken farms most of which are carried out within their residential compounds. The village traces its origin from genealogical ties. Politics in the village are done within the framework of clanism. Clans are the basic point of cultural and political identity for the citizens. Clanism and kinship are the elemental forces in control of political and cultural institutions as well as service points. The village consists of groups of households whose families are inter-related via marriages.

The project area, Ire Obosi is experiencing significant urbanization influence spilling over from the Onitsha Metropolis and resulting from increasing trading activities. As a result of this, the town is now residential host to many persons from other parts of the country, particularly the Igbo-speaking southeast areas.

4.2.3 Religion

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

4.3 Land Use Pattern

There are three major types of customary land tenure system in Igboland – (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.

Ire Obosi can be characterized as a mix of rural and urbanized area with residential and commercial properties occupying a section of the community while the hinterland is predominantly used for agricultural purposes. Over 50% of the community land use is however still committed to agricultural production of food crops. The crops include maize, cassava, yams, cocoa yam, plantain, vegetables, etc.

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

- i) The frontal land areas in the vicinity of, and along the Obosi-Nkpor Road corridor, are predominantly residential and commercial property development areas;

- ii) There are several residential structures very close to the gully edge. The buildings may be considered unsafe in their current conditions. However, these structures are proposed and designed to be appropriately protected by stone pitching during the remedial construction phase of the project.
- iii) The land areas along the gully corridor in the hinterland and towards the Idemili River outfall are essentially dominated by agricultural farmlands and protective bamboo trees.

4.3.1 Cultural Resources

There are no known designated historical, archaeological or cultural resources within the project area.

4.4 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 helps to assess the social economic changes that may occur in the living conditions of the project area population as a result of the project impacts.

4.4.1 Objectives of the Socioeconomic Survey

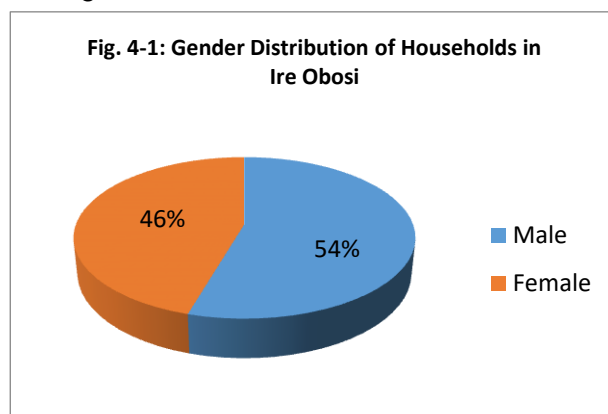
The primary objectives of the socioeconomic survey are as follows:

1. To collect information regarding existing socioeconomic conditions of Ire Obosi population;
2. To use the collected socioeconomic information to develop baseline data for the assessment of the social and economic 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 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 any buildings or structures located within 50 meters from the edges of the gully corridor;
- (2) Owners of any buildings or structures located in areas to be used as construction staging areas during the construction phase of the project;
- (3) Residents/tenants of the buildings or structures identified in items (1) and (2) above whether the structures are permanent or temporary; residential or commercial;
- (4) Land owners along the proposed gully rehabilitation corridor whose lands would be required for the purpose of the project;
- (5) Residents/tenants of any buildings or structures along the access roads which lead to the sections of the project area, irrespective of whether the structures are permanent or temporary, residential or commercial;
- (6) Economic trees/crops owners along the gully banks whose lands would be required as Easement for the purpose of stabilizing the gully walls.

The socioeconomic 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



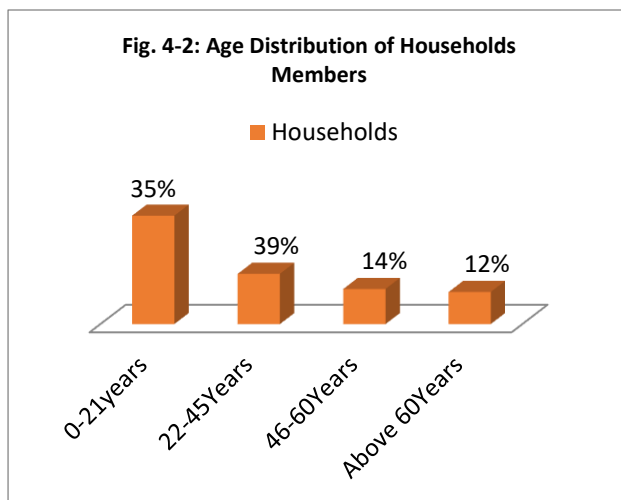
analysis is based on the responses to the questionnaire administered to the group of persons listed above who are most likely to be impacted by the project. On the basis of the responses obtained in the exercise, the following determinations are made.

4.4.2 Respondents to Administered Questionnaire

The residents of the project area (respondents) were requested to respond to the socioeconomic survey questionnaire that was administered to them and members of their households. Each survey questionnaire was completed by the head of the household. A total of 142 questionnaires were administered with a 100% return. The total number of household members for the 142 respondents was 684.

4.4.3 Gender, Age and Household Size Distribution

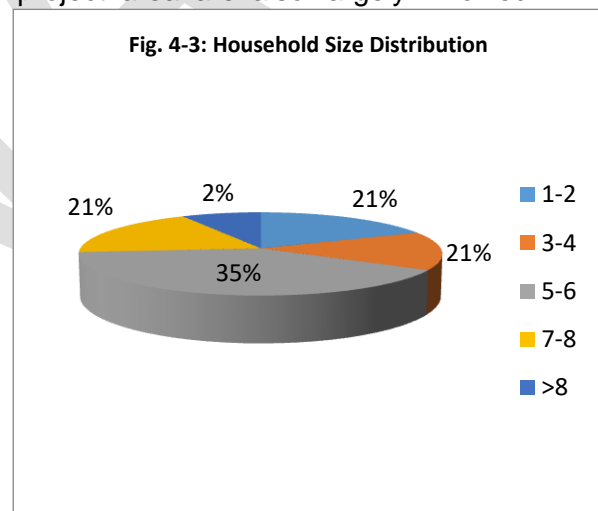
The survey data indicates that 76% of the respondents in the survey are males while 24% are females. The household data however, shows a male/female ratio of 54% to 46% for the project area as shown in the Figure 4-1.



Many of the women in Obosi operate retail stores and are also storekeepers at the many merchandizing outlets in the town. The men however, are generally more mobile than the women as the men are more involved in general pursuits to provide for the family. Women in the project area are also largely involved in

traditional agriculture.

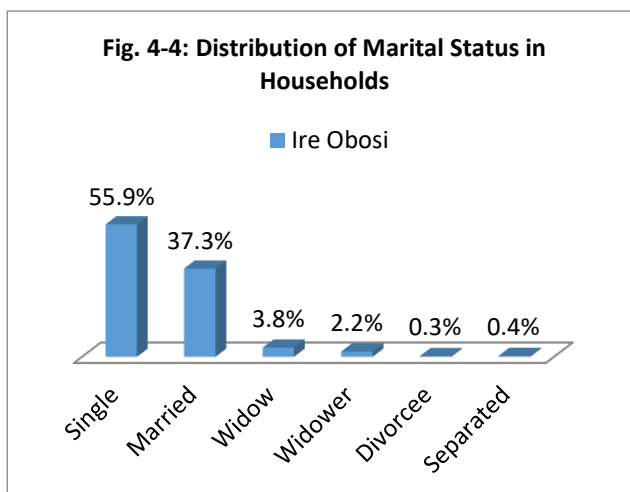
The age distribution data of the household members (Figure 4-2) indicate that 35% of the households are 21 years of age or less while 12% are 60 years or more. The survey further shows that 39% of the households are within the youthful ages of between 22 and 45 years. 14% of the household members are between the ages of 46 and 60 years. The percentage of household members of ages 60 or more is consistent with the population trend in the community and also reflective of urbanization effect in the area.



The household size distribution from the survey ranged from a minimum of one person to a maximum of 8 persons. The average size of households is 6 persons for the respondents. Households with one to two members are 21% while household sizes of more than 8 persons are 2% (Figure 4-3). A majority (35%) of the households have sizes of 5 or 6 persons while 21% has sizes of 7 or 8 persons. The data shows 21% of the households have sizes of between 3 and 4 persons.

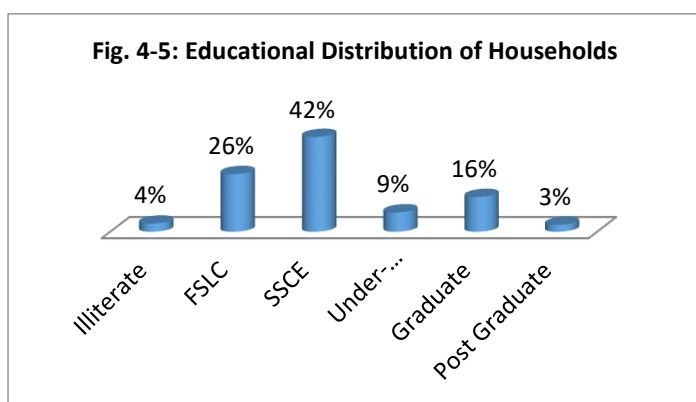
4.4.4 Marital Status of Respondents

Figure 4-4 shows the marital status of respondents in the project area. About thirty-seven percent (37.3%) of the respondents are married while about 56% are single. Approximately six percent (6%) of the respondents are widowed while one percent (0.7%) of the respondents is divorced or separated.



4.4.5 Access to Education

The survey responses indicate that only 4% of the population of schooling age never attended school (Figure 4-5). The level of basic education for the surveyed households is relatively high with 96% of the surveyed population having attained the basic primary (FSLC) level of education and higher.



The data further shows that 68% of the population has attended and/or graduated from the primary and secondary education. This high literacy level within the project affected area is also a reflection of the literacy rate in the Obosi community as a whole. Generally, education in Ire Obosi and indeed the entire LGA seem to be strengthened by the existing educational infrastructure support within the area. There are several

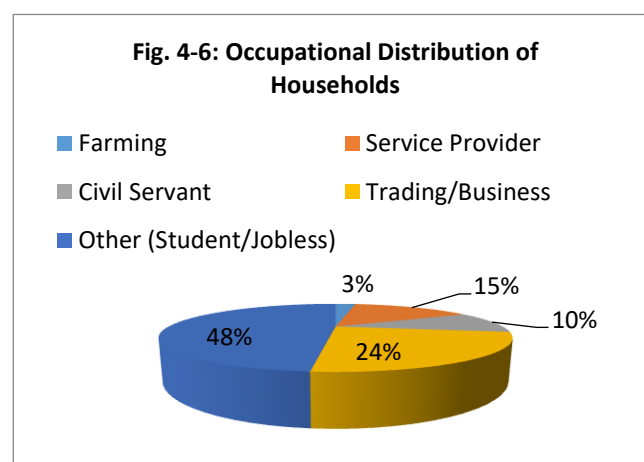
primary and secondary schools located within and around Ire to serve the community. Additionally, one tertiary institution – the School of Health and Environmental Technology is also located in nearby Ugamuma Obosi.

4.4.6 Access to Socioeconomic Infrastructure

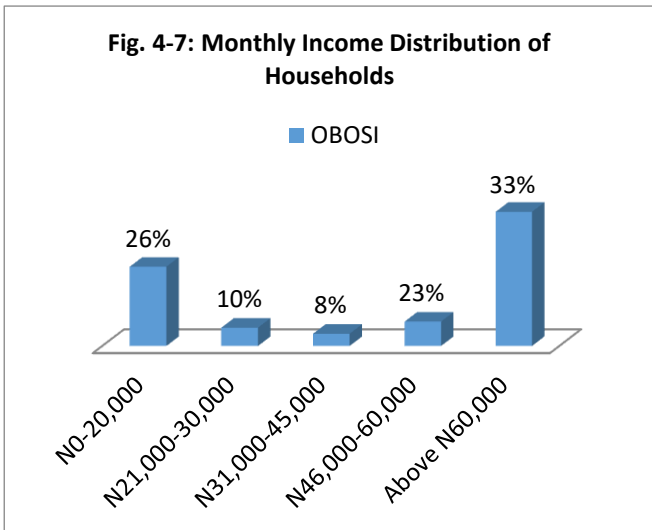
The socioeconomic infrastructures (road network, electricity and water systems) in the area are all generally in very bad state. The road networks within and around Ire Village are severely degraded and perennially suffer from inundation of stormwater surface flows. These roads have no drainages resulting in continuous sheet erosion and gulying along the vulnerable land corridors. Public access to potable water is non-existent and power is generally not steady. The public water piping networks have all broken down and are in total disuse. Several medium market facilities exist in Ire Community and these are fairly developed complimented by numerous home-based commercial shops located throughout the project community.

4.4.7 Occupational and Income Distribution

The occupational distribution data from the survey indicate that 48% of Ire Obosi households are either unemployed or are in school. Approximately, 3% are engaged in farming, 24% are self-employed (trading/business) while 25% are employed in either the private sector or civil service (Figure 4-6).

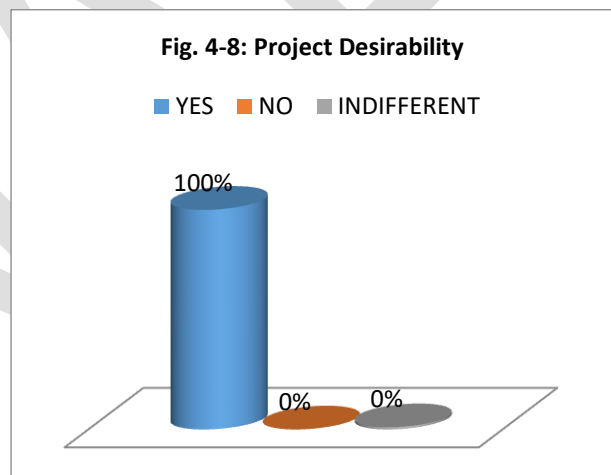


The main financial sources for the households surveyed are income from trading/business across the community. More than 40% of the respondents reported owning a business or being self-employed. A significant number of persons (21%) in the community are unemployed. Based on the income data provided by respondents in the survey, 33% of households in Ire Obosi earn over N60,000 monthly with 41% earning between N21,000 and N60,000 monthly (Figure 4-7). About 74% of the households in the community earn more than N21,000 per month. The margin of error in the information provided on incomes may be significant considering that some of the respondents may have provided grossly inflated data with the intent to receive compensations in accordance with the level of incomes they indicate in the survey. The data provided could not be independently verified.

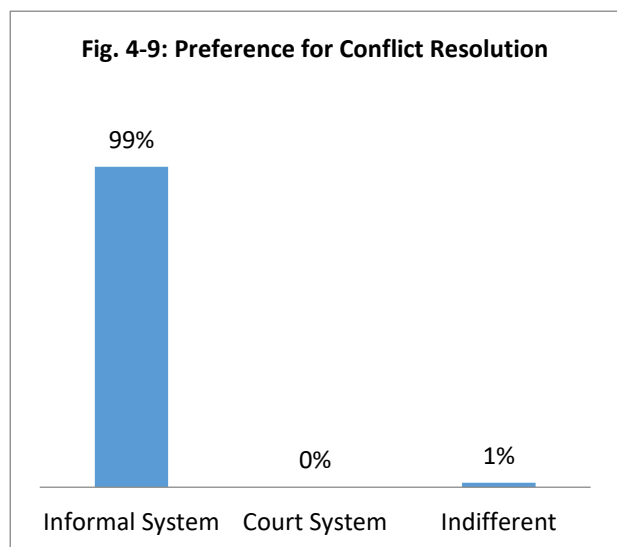


4.4.8 Household Waste Disposal

Most of the respondents indicate that their household wastes are disposed of at convenient locations including natural or man-made crevices. In many areas, the wastes are also indiscriminately dumped inside the drainage channels, gullies or at illegal dumpsites created only as a matter of convenience. Solid waste management in the project area is a considerable health hazard to the residents and also impedes the effective functioning of the storm water drainage systems. The dumped refuse usually causes regular obstruction to storm water flow and the drainage network, resulting in cases of flooding in the affected areas.



Most residents dispose their domestic refuse randomly outside their residential homes and flood-prone areas are also treated as de facto waste disposal sites. The situation in the project area indeed is a reflection of the poor waste management and waste disposal mechanisms in most part of the state. As with other parts of Nigeria, majority of households typically dispose of their domestic refuse inappropriately outside their residences. During the wet season, solid waste is transported by flowing storm water through unplanned drainage paths leaving behind unsightly trails of refuse.



4.4.9 Desirability of the Project

All the respondents in the survey (100%) indicated immense desirability for the project to proceed as proposed (Figure 4-8). Most of them also expressed a desire for the project to proceed before the next round of rainfall.

4.4.10 Conflict Resolution

Most respondents in the survey (99%) prefer and find it most convenient to have conflicts resolved through informal traditional modes of conflict resolution which currently exist within the communities. The court system is seen as an alternative means of resolving issues but no respondent considered it as a first mode of conflict resolution. One percent (1%) of the respondents remained indifferent to the preferred approach as shown in Figure 4.9.

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Table 4.1: Summary of Findings for All Socioeconomic Indicators

S/No	Socioeconomic Indicator	Findings
1	Population	Based on the 2006 national population census records and the 2.3% annual population growth factor recommended by the national population commission (NPC), Idemili North LGA has a projected population of 528,887 for 2016 while Obosi town has a projected population of 86,410. The survey data indicates that Ire Obosi has about 10% difference in the male-female population ratio at the household level. At the respondent level, there is a marked difference of 80% in male and female participation in the survey exercise. While it is not certain why there is such a wide margin, it is however noted that the women appeared to be grossly involved with their petty trading activities.
2	Ethnic Groups and Language Spoken	The people of Ire Obosi consist of one major Nigerian ethnic group – the Igbos. The people generally speak and write mainly the Ibo and English languages. 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 through marriages.
3	Religion	The members of Ire Obosi community are predominantly of the Christian faith, 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 Obosi, viz: – (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 50% 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 the survey, 142 respondents with 684 households were documented in Ire Obosi.
6	Gender, Age and Household Size of Respondents	The survey shows that about 35% of the households in the community are below the age of 21 years while about 39% are between the youthful ages of 22 and 45 years. The percentage of the respondents' household members that are above the age of 60 years is about 12%. Household size distribution in the project area ranges from 1-9 persons with an average household size of 6 persons for the community.
7	Marital Status of Respondents	About 37% of household members in Ire Obosi community are married while about 56% are single and about 6% of the households are widowed. One percent (1%) of the respondents is divorced or separated.
8	Access to Education	There is a relatively high literacy level within Ire Obosi community with 96% of the surveyed population having attained the FSLC level of education and higher. Only about 4% of respondents have not attained the basic primary education
9	Occupational and Income Distribution of Respondents	The occupational distribution data shows a moderately high rate of unemployment (21%) in the community. This situation could pose some serious social risk when not properly managed. The community however, in recent times, has witnessed an influx of persons from other parts of the state/country who have settled in the area mainly for trading purposes.
10	Household Waste Disposal	Household wastes are indiscriminately dumped at illegal points or dumpsites adjacent to the gully corridor. Solid waste management is a considerable hazard to health and the effective functioning of the storm water drainage systems. Dumped wastes/refuse in the project area 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

S/No	Socioeconomic Indicator	Findings
		go to quacks and medicine shops for minor medical treatment.
12	Desirability of Project	100% of survey respondents indicated immense desirability for the project to proceed expeditiously.
13	Conflict Resolution Mechanism	99% of survey respondents prefer that their conflicts be resolved through informal traditional modes of conflict resolution. While no respondent favoured resolution through the court system, 1% of the respondents expressed indifference.

4.5 Consultations With Stakeholders

4.5.1 Community Participation

The direct involvement and active participation of relevant stakeholders and the local Ire residents in the planning and management processes of the project assures that any potential disharmonious issues within the community are resolved speedily. There will also be maximization of resource use, increased benefits and expanded opportunities for the community in the project area.

Community participation improves understanding of the project and communication between the SPMU, the consultants or 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 that have a stake in the project.

4.5.2 Objective of Community Consultation

The aims of the public participation and consultation process are:

1. Solicit inputs, views and concerns from the four affected communities 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 that benefits are maximized;
3. Reduce conflict through the early identification of contentious issues; and increase public confidence in the project.
4. Provide opportunity for the public to influence the project designs and implementation in a positive manner and improve transparency and accountability in decision-making;

4.5.3 Public Consultation Methodology

The methodology adopted in this ESMP for carrying out the consultation process include a qualitative and quantitative mixed method that offers an effective means to interact widely with the project communities and stakeholder groups. Essentially, the approach is based on a participatory approach that included community meetings, public discussions as well as discussions with key informants (Chiefs, Traditional Council members, Local Authorities, and Anambra NEWMAP Officers among others). A brief description of these methods is as follows:

1. Rapid Assessment Technique:
This involved a quick professional assessment of the project impact potential based on nearness of residential/commercial assets to the flood channel edge, anticipated nature and intensity of impacts, and the significance of the impacts along the proposed project corridor. Any affected property owner is directly engaged in discussions to create and gain better understanding between the parties.
2. Socioeconomic Survey:
This involved the administration of structured questionnaire designed to provide socioeconomic profile of households/families 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.

3. Public Meetings:

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. Public meetings were held at different locations within the project immediate impact areas.

4.5.4 Public Participation Process

The potentially project affected individuals and group of persons identified as stakeholders in this project include those who live in close proximity to the gully corridor; 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 the proximity of the project); and, those who infrequently use the land on which the project is located.

Community consultation was driven in a manner that encouraged active and sustained participation of the Obosi community members, particularly Ire village through which the active gully transverses. This was to promote community ownership of the project and to enhance sustainability.

A pre-defined socio-economic questionnaire at the household level was administered for Ire village community. The consultations in this project expectedly will remain an ongoing exercise throughout the duration of the project to give the community the opportunity to make contributions aimed at strengthening the development while avoiding negative impacts as well as reducing possible conflicts. Issues relating to project displacements and compensations, particularly with the project affected persons will continue to be handled to minimize chances of possible conflicts.

4.5.5 Stakeholders' Identification

Generally, five broad categories of stakeholders were identified by the Consultant 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 4-2.

The adopted process consists of:

- i) Identification of any 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;
- ii) Establishment of the stakeholders list and identification of specific stakeholder interests in relation to the project. The issues considered include: (a) the project's benefit(s) to the stakeholders; (b) potential changes to the routine activities of the stakeholders that may occur due to the project; and, (c) the project activities that may cause damage or conflict for the stakeholder;

Table 4-3 gives an initial list of identified stakeholders including their activities and operational areas in the villages traversed by the project. The list includes government functionaries, NGOs, FBOs and CBOs among others.

Table 4-2: 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 are people who either reside within 50m from the gully edge or carry out their daily livelihood activities within the gully corridor.	The identified persons or group of persons in this category may 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 area.	This category of persons serves as mobilization points around which the Consultant will reach 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 are people who either reside or carry out their daily livelihood activities outside the gully corridor but within the communities in which the project is located.	This 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 provide frequent interface with the community members who may be directly or indirectly affected by the project activities.	This group of organizations essentially provides on a continuous basis 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 and developments within the project areas.	This group of individuals is collectively responsible for the political and general socio-economic development of the community, among others within their respective geo-political zones.

Table 4-3: List of Stakeholders and Their Responsibilities

GROUPS	IDENTIFIED STAKEHOLDER	AREA OF INTEREST IN PROJECT
Group-1	Residents of Ire Village	PAPs/PAHs
Group-2	Office of the Ire Village Chairman	Development and welfare of Ire Village
	Office of the President General, Obosi Development Union	Development and welfare of Obosi Town
	Office of the Obosi Traditional Ruler, HRH Eze Iweka III	Development and welfare of Obosi Town
Group-3	Residents of Ire Village	Individualized livelihood issues
Group-4	Community-based Organizations (CBOs)	Watershed protection and management
	Faith-based Organizations in the Village (churches)	Community spiritual and physical welfare
	Non-governmental Organizations (NGOs)	Protection of environmental health of the community
Group-5	Office of the Chairman – Idemili North LGA	Development of the Idemili North LGA
	Office of the Hon. Member – Anambra State House of Assembly	Development of the Idemili North in the state constituency
	Office of the Hon. Member – Idemili North & South Federal Constituency	Development of Idemili North & South federal constituency
	Office of the Distinguished Senator – Anambra Central Senatorial Zone	Development of Anambra Central Senatorial Zone

4.5.6 Summary of Meetings with Stakeholders

The Ire community sensitization activities started February 6, 2017 with a courtesy call on the traditional ruler of Obosi, HRH Igwe Chidubem Iweka III who being unavoidably absent, was ably represented by Chief Shedrack Okenwa—the palace administrative secretary and Mr. Nnamdi Nkemena – the personal assistant to HRH. The community meetings discussed the need for the project and the associated potential impacts to the community members living or farming within the project corridor. The community members' concerns and general thoughts were solicited and noted. The minutes of these meetings are included as Annex 6. The community members particularly welcomed the project and expressed anxiety that remedial work should commence expeditiously to prevent occurrence of further flooding damages from the next rainy season. Additional meetings are expected to be held prior to the commencement of field construction work. Such meetings will include the project-affected persons and households. Issues pertaining to relocations and compensations for losses (means of livelihoods and properties) shall be discussed at such meetings.

4.5.7 Social Issues/Risks

The evaluation of the social environment and existing environmental conditions that impact on human health and safety indicate the following imminent risks that may be associated with the project. The key social issues that emerged through the above processes include:

1. Community safety – Concerns regarding community safety with the next cycle of the rainy season was keenly expressed. The community is quite apprehensive of the advancement of the gullies particularly in relation to safety risks posed to existing homes, human lives and farmlands;
2. Continued gully erosion and flooding in the area would lead to damages and loss of crops and livestock, personal possessions, spread of diseases such as typhoid, cholera, diarrhea, and malaria, and cause pit latrines to overflow;
3. Livelihoods – loss of access to roadways, crop lands and pasture.
4. Resettlement – impacts and compensation measures for economic and physical displacement during project implementation.
5. Awareness creation was necessary for the long-term success of the project; and manpower development should be included in the programme to enhance project sustainability.

The List of participants at the meetings is included in Annex 6.

CHAPTER 5: ASSESSMENT OF POTENTIAL IMPACTS AND ANALYSIS OF ALTERNATIVES

5.1 Introduction

This chapter identifies the methods/techniques used in assessing and analyzing the potential social and environmental impacts of the project.

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 are discussed. The assignment of responsibilities for implementation of the ESMP and the associated costs are presented in Chapter 7.

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 equipment will be used such as excavators, compactors, bulldozers and pay loaders;
 - Skilled and unskilled labour 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 flooding in the project area and beyond. This is, in the overall a positive impact. The envisaged areas of potential impacts (positive and negative) on the socioeconomic, cultural and biophysical environments which could result from the proposed project include:

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 stream.

- 8) Ecological diversity in stream watershed.
- 9) Public Health and safety
- 10) Visual effects.
- 11) Traffic and transportation
- 12) Earth movements
- 13) Solid and liquid wastes
- 14) Soil erosion and flooding vulnerability
- 15) Climate change
- 16) Landscape change

Social Impact Areas:

- 1) Economic Activities:
 - o Sources of livelihoods.
 - o Employment generation
- 2) Damage to Infrastructure:
 - o Residential & commercial buildings
 - o Roads, drainages, utilities, etc.
- 3) Community Effects:
 - o Displacement of persons.
 - o Isolation of settlements.
 - o Migration of communities.
- 4) Gender disparity
- 5) Damage to archaeological and cultural resources
- 6) Land use restrictions

5.2 Analysis of Potential Impacts Triggered by Project

The potential impacts as listed above are organized considering the critical phases of the project from the construction phase to the operation (post-construction) phase and summarized based on whether the envisaged project impact area will result in positive or negative impacts. Impact emphasis is placed particularly on the construction and operation phases of the project. These are summarized as shown in Table 5.5.

Table 5.5: Summary of Potential Impact Areas Triggered by Project

S/No	Potential Positive Impact		Potential Negative Impact	
	Impact	Aspects of Project that Trigger Impact	Impact	Aspects of Project that Trigger Impact
PROJECT CONSTRUCTION PHASE				
1	Rehabilitation of Affected Lands and Vegetation	The main objective of the project is to rehabilitate the gully eroded lands within the project area. It is envisaged that at end of project the degraded lands will have potentially increased value and usefulness.	Displacement of people.	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.
2	Safety of Lives and Properties	Many properties and assets have been lost to the erosion gullies over time. The gullies also continue to be a major threat to the lives of the people living in the area. The project will promptly provide needed safety to the peoples' lives and properties	Degradation of off-site land	Soils for necessary backfills in the project shall be sourced from identified borrow pits. Owners of the borrow pits will be compensated for soil excavated. Additionally, excavation at the borrow pits may cause land degradation in the vicinity of the borrow pits particularly with respect to erosion and siltation of nearby roads

S/No	Potential Positive Impact		Potential Negative Impact	
	Impact	Aspects of Project that Trigger Impact	Impact	Aspects of Project that Trigger Impact
3	Employment Generation	Project will provide short term, local employment opportunities for community members in the areas of site clearance, excavation, loading and offloading of materials and delivery services; drivers, security services, provision of goods and services to construction workers e.g. food kiosks and other shops.	Loss of means of livelihoods.	There will be loss of some croplands and economic trees along the proposed project corridor. Compensations will be required for the PAPs in accordance with WB policies.
4	Protection to building structures.	The buildings or structural assets within the project corridor are not expected to be damaged during construction but are by project design required to be structurally stabilized. Thus, no permanent resettlement of buildings or owners is anticipated	Loss of vegetation	There will be loss of natural and planted vegetation on staging, temporary office, workers camp and setback lands during site clearance. No impacts however, are anticipated on wildlife habitats and migratory birds.
5	Gender parity	Women as well as men will benefit from the short-term local employment opportunities to be created during construction phase. There will also be income generating activities for women in catering/restaurants for workers on construction site and from sale of local products to construction workers.	Damage to archaeological and cultural resources	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. However, there may be shrines or other cultural relics in the vicinity of the gully corridor which could be impacted during construction activities. Relocation of such shrines/ cultural relics or compensation for these may be expected.
6	PROJECT OPERATIONS PHASE (POST-CONSTRUCTION)		Air quality	Air pollution is 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.
7	Increased community awareness and enhancement of local capacity	The effective implementation of the project will require the active involvement of the project community through awareness campaigns and capacity building. Health, safety and environmental training and awareness will be extended to community members and local residents.	Surface and ground water quality	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.
8	Erosion and flood control capacity	Project will lead to improved community knowledge of causes of erosion and flooding, and capacity to prevent and control flooding and erosion throughout the watershed.	Noise and vibrations	Noise will emanate from moving vehicles, excavators, generators, power tools, 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 where such equipment may be in

S/No	Potential Positive Impact		Potential Negative Impact	
	Impact	Aspects of Project that Trigger Impact	Impact	Aspects of Project that Trigger Impact
				use.
9	Improved and Sustained infrastructure (drainages, electric poles, etc).	Gully erosion control infrastructure as proposed are expected to remain for long time and sustainably maintained for continued effectiveness.	Public and Occupational Health and safety	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	Improved site access roadways	Proposed project will require site access roads to be rehabilitated before and/or after construction to allow for movement of machinery and for the delivery of materials. These roads shall be reinstated to good condition at the conclusion construction works. The improved roads would be of long term benefit to the community since the roads are essential trading links with the neighboring villages and communities.	Visual effects.	Adverse visual impact will arise as construction works 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	Enhanced community leadership	Project will enhance community/local leadership with formation of various committees to facilitate sustainable post-construction monitoring and maintenance. Committee membership nomination is expected to follow existing community structures which rely on opinion of community leaders.	Traffic and transportation	Traffic movements associated with site staff, delivery of materials and the removal of waste during the construction is likely. Occasional movement of abnormal vehicular loads on local roads may result in temporary diversions.
12	Creation of community public recreation areas through land use restrictions	The gully setback land shall be altered through bio-remediation and adapted for a long term use of the community. Structures may never be erected on this portion of land but economic trees could be planted. The community shall be required to sustainably maintain all erosion control structures after the construction of works.	Earth movements	Construction operations can pose earth movement hazards to people working near the construction areas due to unstable soil profiles from site excavations. Additionally check dams that are not properly constructed may suffer damage that could reduce the structural integrity of the erosion control structures during post-construction phase.
13	Restoration of vegetation and other vital trees	There will be loss of natural and planted vegetation during construction due to vegetation clearing. All de-vegetated areas will be replanted after construction and maintained by the community post-construction.	Solid and liquid wastes	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	Maintenance of erosion control structures post construction	Erosion control structures and bio-remediated areas are expected to be continuously maintained for continued effectiveness. Poorly constructed structures including concrete channels and check dams tend to fail after some time and if not properly maintained.	Climate change	Exhaust emissions from construction vehicles, plant and equipment may result in ozone depleting compounds. Emissions occur from poor maintenance of plant and equipment or over revving of engines.

S/No	Potential Positive Impact		Potential Negative Impact	
	Impact	Aspects of Project that Trigger Impact	Impact	Aspects of Project that Trigger Impact
15			Landscape change	Project involves significant cut and fill and soil movement in most areas of the project corridor. This will result in significant landscape changes across the project area.
16			Pressures on Off-site Resources	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

5.3 Potential Impacts Significance Rating

Table 5-6 shows the detailed analysis of the impact significance rating for each of the potential project impact areas.

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	Stream ecological diversity	Very Low	Improbable	Insignificant
7	Safety and health	High	Probable	High
8	Visual Effects	Very Low	Improbable	Insignificant
9	Traffic and transportation	Very High	Definite	Very High
10	Earth movements	Very High	Possible	High
11	Solid wastes	Medium	Definite	Medium
12	Liquid wastes	Medium	Definite	Medium
13	Soil erosion & flood vulnerability	Medium	Improbable	Low
14	Climate change	High	Definite	High
15	Off-site Resources	High	Probable	High
SOCIAL IMPACTS				
1	Loss of means of livelihood	High	Definite	High
2	Loss of physical assets	High	Definite	High
3	Displacement of persons	Low	Definite	Medium
4	Infrastructural displacement	Low	Possible	Very Low

S/No	Potential Impact Area	Consequence Rating	Probability Classification	Impact Significance
5	Damage to roadways	Medium	Possible	Low
6	Gender disparity	Medium	Possible	Low
7	Loss of archaeological and cultural resources	Low	Definite	Medium
8	Economic activities	Medium	Possible	Low
9	Land use restrictions	High	Definite	High

5.4 Identified Social and Environmental Impacts

A combination of the outcome of Table 5.5 and Table 5-6 indicates that the following social and environmental impact categories will suffer medium to very high impact levels during the Construction and Post-construction Phases of the project implementation: The Tables further indicate that the other environmental and social impact categories will suffer low to insignificant impact levels as a result of the project.

Project Construction Phase:

- Loss of means of livelihood
- Loss of physical assets
- Displacement of persons (temporary)
- Vegetation loss
- Dust and air quality
- Surface and ground water quality
- Noise and vibration
- Public/Occupational Health and Safety
- Traffic and Transport
- Earth movement (during construction and post construction phases)
- Solid wastes
- Liquid wastes
- Landscape change
- Off-site Resources

Operation & Maintenance (Post Construction) Phase:

- Land use restriction
- Damage to erosion control structures post construction

5.5 Analysis of Alternatives

Usually there are several alternatives to any project. This section discusses the alternatives to the proposed project and reasons for their rejection. The likely future scenario without the project is also considered. The selection of a particular alternative is premised on several considerations, including the desirability/acceptability of the project, the government's position or inclinations to the project, the potential environmental and social impacts of the project, the economic viability of the project, etc. For the proposed Ire Obosi gully erosion project, a number of alternatives were considered and these include: **a do-nothing alternative; delayed project alternative; and the planned project alternative.** A summary of these alternatives is presented below:

The Do-Nothing (No-Project) Alternative

This alternative assumes that the entire project concept will be cancelled and scrapped. There will be no improvement or changes in the present state of Ire Obosi gully erosion as

well as the access road to and from the gully area. This is an inferior alternative when compared to the option of going ahead with the project. Although if this option is taken, it would mean that the negative environmental and social impacts of the project would be completely avoided; however, not implementing the project will also result in:

- (i) Continued fears and anxiety over potential loss of lives, people's homes, farmlands and ancestral assets, including cultural heritage will persist with each rainy season;
- (ii) Continued lack of rural access and mobility and increased pains in movement within Ire community;
- (iii) Continued lack of economic empowerment, development and transformation in Ire community.
- (iv) Failure to generate employment opportunities as anticipated;

Therefore, the "Do-Nothing" or No-Project Alternative will worsen the present situation and worsen poverty at the same time. In addition, most of the affected Ire community where agricultural activities dominate will still be cut off due to lack of effective road linkages. The "Do-Nothing" or No-Project Alternative is therefore not a viable option.

Delayed Project Alternative

This option means that the project will not be implemented at this time; rather, a delay will be in effect until such a time when certain conditions are met or requirements fulfilled. This kind of option is usually adopted when there are regulatory requirements that need to be met, when the political and economic climate are inclement for project implementation or in a period of war. Presently, the country is not at war neither is Anambra State. Furthermore, the government of Nigeria is vigorously encouraging and courting foreign direct investments and socio-economic development. The planned project can attract foreign investments, in addition to all the added values indicated earlier. Therefore, delaying the project will in turn delay the realization of the positive benefits expected from the project. Given the very high level of inflation in Nigeria's economy, a delay of one year could potentially cause up to a 25% increase in project costs. Therefore, the option of delaying the project is not considered a viable option and this option is rejected as well.

The Ire Obosi Gully Erosion Project (Proposed Project) Alternative

The Ire Obosi gully erosion intervention project Alternative requires the rehabilitation of the existing gully corridor and improving (upgrading, rehabilitation and maintenance) of the existing access roads and drainage channels to an acceptable safety and environment standard. The advantages associated with this alternative far outweigh the disadvantages. Although initial costs would be high; the accrued socioeconomic and cultural benefits far outweigh the no-project and delayed project alternatives. The objective of the intervention project is to eliminate gully erosion in the project area while salvaging the agricultural lands of the affected areas and also boost agricultural production through the provision of access roads for easy transportation of products. Moreover, hitherto post-harvest losses will be reduced and thus creating more benefits to the farmers in particular and Anambra State in general. This remains the viable alternative and its implementation will therefore be undertaken.

This alternative involves a lot of construction work, along with the associated positive and negative impacts. The essence of a project of this nature is to ensure that activities are undertaken in a way that minimizes the negative impacts of the project while enhancing the positive impacts. To this end, there is a need to ensure any activity that can result in negative impacts on the environment (biophysical and socio-economic) are identified and mitigating measures planned for each negative impact. A detailed description of the identified impacts and the mitigating measures for the proposed project is presented in Chapters 5 and 6 of this report.

CHAPTER 6: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

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 6. 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 necessary capacity building 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 construction and maintenance works in the project.

6.1 Mitigation Measures for Implementation

Based on the environmental and social impact categories identified in Chapter 5 (see Section 5.2), the ESMP implementation will address measures that cover the following impacts during the construction and the post construction (operation and maintenance) phases of the project implementation:

Social Impacts:

- Loss of means of livelihood
- Loss of physical assets
- Displacement of persons (temporary)
- Cultural resources
- Land use restriction

These impacts are addressed hereunder as Community and PAP issues management;

Environmental Impacts:

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

These impacts are addressed hereunder as:

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

6.2 Environmental and Social Impact Mitigation Measures

The environmental and social impacts mitigation measures to address the identified impact categories for this project are presented in Table .6-1. These mitigation measures will be implemented by the Contractor who shall be solely responsible through the course of the

project and shall be contractually required to develop all the necessary management plans associated with the mitigation of each impact area. The monitoring aspects of the project implementation shall be carried out by other identified Agencies and organizations including the SPMU-ESO, SMEnv., SMoW, SMLS, Community leaders, Site Committees, NGOs/CBOs, etc in accordance with the provisions and requirements of this ESMP.

Table 6-1: Summary of Impact Mitigation Measures

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
PRE CONSTRUCTION				
1	<p><u>Impacts on Community and PAP Management (Loss of physical assets; Loss of means of livelihood; Displacement of persons (temporary)</u></p> <ul style="list-style-type: none"> • Possible damage to building structures and other structural elements along the gully corridor; • Permanent acquisition of land for gully setback to be used for gully wall stabilization; • Temporary use of land for project staging areas, erection of workers' camp and temporary offices. • Croplands and economic trees along the gully setback may be destroyed during gully wall stabilization. • Construction activities may affect persons with critical health conditions, including old persons, children and other vulnerable persons within project area may be temporarily relocated for construction phase. • Possible disagreement over siting of staging areas and temporary facilities between community and 	<ul style="list-style-type: none"> • Appropriate compensations shall be paid for structural damages; project acquired lands; temporary use of lands; destroyed crops and economic trees. • Compensation to persons (PAPs) within project area who will need to be temporarily relocated prior to beginning of construction activities. • Create awareness among community members and sensitize the people to all project activities • Seek the consent of the landowner to erect the site office for the specified duration of the project; • Identify the landowner through the Assembly member and/or traditional ruler of the community; • 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. • A stand-alone Resettlement Action Plan has been prepared for the project addressing impacts on the community and the PAP management. The Contractor shall be required to implement the RAP in accordance with the provisions therein 	<ul style="list-style-type: none"> • No. of public complaints recorded; • Level of awareness and understanding of community members; • No of community members that attend trainings; • Level of satisfaction among PAPs; • No of women gainfully employed by project; • No of other businesses induced by project • Questionnaires, direct observations and interviews. 	<p>SPMU-ESO; Focal NGO SMEnv.;; SMLS.;; Community Leaders; Site Committee</p>

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
	contractor			
2	<p><u>Community Cultural Heritage</u></p> <ul style="list-style-type: none"> • There may be shrines or other cultural relics in the vicinity of the gully corridor which could be impacted during construction activities. 	<ul style="list-style-type: none"> • Relocation of identified shrines/cultural relics; • Compensation for any damaged cultural relic or for relocation issues. • The Contractor shall be required to prepare and submit a Cultural Heritage Management Plan to the SPMU for approval and adoption for the contractor's implementation 	<ul style="list-style-type: none"> • Protection of all identified treasure finds 	SPMU-ESO; Focal NGO; SMEnv.; SMLS.; Community Leaders; Site Committee
3	<p><u>Public/Stakeholders Participation</u></p> <ul style="list-style-type: none"> • Effective project implementation requires active involvement and cooperation of the project community. 	<ul style="list-style-type: none"> • Build capacities within community • Incorporate community feedback into project implementation process • Disseminate project study findings; • Ensure that period of inaccessibility to land is as short as possible • Awareness campaigns and capacity building. • The Contractor shall be required to prepare and submit a Stakeholders' Engagement Plan to the SPMU for approval and adoption for the contractor's implementation 	<ul style="list-style-type: none"> • No of active participants from the community and other stakeholders 	SPMU-ESO; Focal NGO; SMOW; SMEnv; SMOH; Community Leaders; Site Committee
4	<p><u>Vegetation and Biomass Removal Management</u></p> <ul style="list-style-type: none"> • Damage to the natural and planted vegetation on acquired gully setback lands during site clearance, areas for siting of temporary office and workers camp. • Impact on flora and fauna. • Impact on wild life. 	<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. • The Contractor shall be required to prepare and 	<ul style="list-style-type: none"> • Areas of stressed vegetation; • Size of cleared vegetation areas 	SPMU-ESO; Focal NGO; SMOW; SMEnv; SMOH; Community Leaders; Site Committee

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
		submit a Vegetation and Biomass Management Plan to the SPMU for approval and adoption for the contractor's implementation		
CONSTRUCTION PHASE				
5	<p><u>Dust and Air Quality Management</u></p> <ul style="list-style-type: none"> Air pollution is 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. 	<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; Use of nose masks by all workers at road maintenance/works sites. Surfaces of vegetation along the maintenance road will be monitored to verify the effectiveness of dust suppression method. The Contractor shall be required to prepare and submit an Air Quality Management Plan to the SPMU for approval and adoption for the contractor's implementation. 	<ul style="list-style-type: none"> No. of public complaints; Level of particulates Level of air pollutants Vegetation surfaces free of dusts Ambient air monitoring using standard methods 	SPMU-ESO; Focal NGO SMOH.; Community Leaders; Site Committee
6	<p><u>Water Resources, Erosion and Sedimentation, Run-off Control Management</u></p> <ul style="list-style-type: none"> Increased sedimentation and runoff may result from activities during the construction works. Earthworks release suspended particles into watercourses, which can have temporary detrimental effects on water organisms. 	<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 fueling 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 fueling and other liquid or spill-able storage sites in order to limit or contain such material from escape to potentially pollute water resources; 	<ul style="list-style-type: none"> No of complaints from community members; Absence of sediment build up; Absence of flooding in construction areas; No of spills & repairs made; Use of standard monitoring methods 	SPMU-ESO; Focal NGO; SMOW; Community Leaders; Site Committee

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
	<p>Spillages of fuel and other petroleum products cause contamination of the soil and water resources.</p> <ul style="list-style-type: none"> Excavation at the borrow pits may cause land degradation in the vicinity of the borrow pits; may cause soil erosion and siltation of nearby roads. 	<ul style="list-style-type: none"> 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. The Contractor shall be required to prepare and submit a Water management Plan and an Erosion and Sedimentation Management Plan to the SPMU for approval and adoption for the contractor's implementation. 		
7	<p><u>Noise and Vibration Exposure Management</u></p> <ul style="list-style-type: none"> Noise will emanate from moving vehicles, excavators, generators, power tools (e.g. for vegetation clearing), and compressors during construction. Vibrations may come from soil compaction equipment and other vibroequipment to be used at the gully heads. 	<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 	<ul style="list-style-type: none"> No of complaints from community members; Absence of structural failures; Absence of debris accumulation; No of complaints from community members; Absence of structural failures; Absence of debris 	<p>SPMU-ESO; Local NGO; SMOW; SMOH; Community Leaders; Site Committee</p>

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
		<p>longer than 3 hours a day.</p> <ul style="list-style-type: none"> Sanctions (ranging from a warning to dismissal) will be instituted by the contractor against workers who do not observe the use of appropriate PPEs 	<p>accumulation;</p> <ul style="list-style-type: none"> No of debris removals & repairs made; Sensor measurements around workplace 	
8	<p><u>Occupational/Public Health and Safety Management</u></p> <ul style="list-style-type: none"> Occupational accident during construction. 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. 	<ul style="list-style-type: none"> Health, safety and environmental training and awareness will be extended to community members and local residents; 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. The Contractor shall be required to prepare and submit a Community/Occupational Health Management Plan to the SPMU for approval and adoption for the contractor's implementation 	<ul style="list-style-type: none"> 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 Hazards assessment 	<p>SPMU-ESO; Focal NGO; SMOH; Community Leaders; Site Committee;</p>

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
9	<p><u>HIV/AIDS and STIs Management</u></p> <ul style="list-style-type: none"> Construction workers camp give rise to health risks associated with poor sexual practices and prostitution. 	<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. 	<ul style="list-style-type: none"> No. of HIV/AIDS workshops held; Level of awareness of workers & others; Records of peer educators' training; Records of condoms distributed 	<p>Focal NGO; SPMU-ESO; SMEnv; SMOH; Community Leaders; Site Committee;</p>
10	<p><u>Construction Operation and Slope Stabilization</u></p> <ul style="list-style-type: none"> Construction operations will result in topographic alterations. Construction operations may result in landslides, rock cave-ins, and mudflow/flooding. Construction operations can pose earth movement hazards to people working near the construction areas due to unstable soil profiles from site excavations. 	<ul style="list-style-type: none"> 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 shall be strictly prohibited Monitor and maintain intervention work for continued stability and quality Shortcomings in the control structures including the check dams (retention basins) along the gully corridor should be corrected before they develop into serious problems. The Contractor shall be required to prepare and submit an ESMP and Emergency Response and Incident Plan to the SPMU for approval and adoption for the contractor's implementation 	<ul style="list-style-type: none"> No. of accidents/incidents; No. of visible warning signs; Level of public awareness; Record of safety meetings held; 	<p>SPMU-ESO; Focal NGO; SMOW; SMEnv; Community Leaders; Site Committee</p>
11	<p><u>Traffic and Transportation Hazards</u></p> <p>Traffic movements associated with site</p>	<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 	<ul style="list-style-type: none"> Effective traffic flow with vehicular & worker safety; Appropriate positioning of road signs, reflectors, speed ramps, control limits, traffic wardens; 	<p>SPMU-ESO; Focal NGO; SMOW; SMEnv; Community Leaders; Site Committee</p>

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
	<p>staff transportation, delivery of materials and the removal of waste during the construction is likely. Occasional movement of abnormal vehicular loads on local roads may result in temporary diversions.</p>	<p>posted at positions 100m from the construction points on either side of the road to ensure orderly traffic flow;</p> <ul style="list-style-type: none"> • Actual working areas to be secured with barricades; • Adequate road warning signs to be posted at vantage points to warn and direct traffic; • Traffic and transport associated with project will adhere to existing roads or follow specified routes as established. • All measures shall be effectively monitored by Contractor to ensure their implementation. • The Contractor shall be required to prepare and submit a Traffic and Vehicle Management Plan to the SPMU for approval and adoption for the contractor's implementation 	<ul style="list-style-type: none"> • Records of accidents and near misses 	
12	<p><u>Waste Management (solid and liquid wastes)</u></p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Waste bins to be provided for the disposal of waste generated; • Waste will be segregated into three at source - organic (food residues), recyclables (woods, metals) and non-recyclables (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. • The Contractor shall be required to prepare and 	<ul style="list-style-type: none"> • Waste segregation and littering; • Emptying of bins at waste dump sites; • Waste composting; • Indiscriminate defecation; • Toilets decommissioning 	<p>SPMU-ESO; Focal NGO; SMOW; SMEnv; Community Leaders; Site Committee</p>

S/No.	Environmental and Social Impact Source	Mitigation Measures	Monitoring	Responsibility
		submit a Waste Management Plan to the SPMU for approval and adoption for the contractor's implementation		
OPERATIONS & MAINTENANCE PHASE (POST CONSTRUCTION)				
13	<p><u>Land use restriction</u></p> <ul style="list-style-type: none"> Use of the acquired land associated with gully setback will be altered and restricted to limited community uses. Structures may never be erected on this portion of land but economic trees could be planted. 	<ul style="list-style-type: none"> Create awareness among community members; Build capacities within community; Incorporate community feedback mechanism into process Ensure periodic monitoring of restricted areas Continuous maintenance of erosion control structures including concrete channels and check dams, and bio-remediated areas for continued effectiveness. 	Sustained treated gully healing process	SPMU-ESO; SMEnv; Focal NGO; Community Leaders; Site Committee
14	<p><u>Closure of temporary office, staging areas and decommissioning of project</u></p> <ul style="list-style-type: none"> Damage to land forms and vegetation 	<ul style="list-style-type: none"> Ensure that agreements with the community and landowners on post construction hand-over are kept. Enforce agreed measures to render the site safe and usable post construction to the satisfaction of the community and landowners. 	<p>Agreements entered with community and landowners for use of land;</p> <p>Terms of Agreement fulfilled with community and landowners; Handover of office site as agreed</p>	SPMU-ESO; Focal NGO; Community Leaders; Site Committee
15	<p><u>Erosion control system failure management</u></p> <ul style="list-style-type: none"> Additionally check dams that are not properly constructed may suffer damage that could reduce the structural integrity of the erosion control structures during post-construction phase. 	<ul style="list-style-type: none"> Any treated gullies should be checked regularly and the healing process monitored closely. Structures built in the channelization for stabilization purpose should be observed for damage especially during rainy seasons and after heavy storms. Any damage observed should be repaired immediately to avoid further damage and the eventual collapse. 	<ul style="list-style-type: none"> Sustained gully healing process 	Community Leaders; Site Committee CBOs/CDOs

6.3 Institutional Responsibilities and Accountabilities

The key actors as well as the roles and responsibilities of the various institutions with associated costs in the ESMP implementation are as shown in Table 6.2.

Table 6.2: Institutional Responsibilities

Institutional Category	Project Implementation Phase	Roles & Responsibilities
Anambra State Ministry of Environment (SMENV)	All Phases (Preconstruction, Construction and Post Construction)	<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 • Executing agency with overall responsibility for NEWMAP implementation in the State. • Ensure that sufficient funds are made available to the SPMU • Ensure that SPMU, regardless of financing source, complies with the provisions of the ESMP and WB safeguard policy. • Ensure that SPMU complies with ANSG environmental policies and regulations. • Ensure that the SPMU retain dedicated Technical Support for the project duration including safeguard specialists to oversee ESMP implementation. • Ensure that SPMU monitor environmental protection and mitigation measures in the ESMP and those activities that are embodied in the detailed designs • Ensure that SPMU has secured environmental clearances certification from FMENV and WB prior to award and/or commencement of civil works contracts • Ensure that SPMU establishes and implements an environmental grievance redress mechanism, as described in this ESMP, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the Project's environmental performance • Ensure that the bidding and contract documents include the ESMP. • Ensure that SPMU submits semi-annual monitoring reports on ESMP implementation to WB and FPMU.
SPMU (Safeguard Officers, Project Engineer)	Pre-Construction Phase	<ul style="list-style-type: none"> • Ensure that bidding and contract documents include the ESMP • Review and approve all required management plans necessary for the pre-construction, construction and post construction phases of the project; • Undertake monitoring of the implementation of the ESMP (mitigation and monitoring measures) with support from the appointed Focal NGO, the Site Committee, the Contractor and other stakeholders. • Report to WB and FPMU on all aspects of social and environmental management and monitoring at required frequency • Submit monthly and quarterly or semi-annual monitoring reports on ESMP implementation to FPMU and WB • Participate in grievance redress mechanism, as described in this document, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the sub-project's environmental performance • Based on the results of ESMP monitoring, identify environmental corrective actions and prepare a corrective action plan • Maintain and manage all funds effectively and efficiently for the project; • Coordinate all policies, programmes and actions associated with the intervention construction works; • Ensure the smooth and efficient implementation of the preconstruction phase of project's various programmes; • Have custody of a copy of this ESMP and disseminate information contained therein accordingly.
	Construction Phase	<ul style="list-style-type: none"> • Cooperate with the Steering/Technical Committees to provide guidance to the technical aspects of all project activities; • 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, FPMU and the WB.

Institutional Category	Project Implementation Phase	Roles & Responsibilities
	Post Construction Phase	<ul style="list-style-type: none"> • Ensure proper closures of all contractor's temporary facilities; • Ensure that the terms of Agreement between the Contractor and the community and land owners are fulfilled.
FPMU	All Phases (Pre-construction, Construction and Post Construction)	<ul style="list-style-type: none"> • Project assessment and monitoring of this ESMP implementation and the construction activities. •
World Bank	All Phases (Pre-Construction, Construction and Post Construction)	<ul style="list-style-type: none"> • Assessment of specific and general project implementation; • Recommend additional measures for strengthening the management framework and implementation performance.
State Ministry of Works	Pre-Construction and Construction Phases	<ul style="list-style-type: none"> • Provide necessary preconstruction and construction support to the SPMU • Site assessment and monitoring of construction works and engineering activities;
State Ministry of Lands & Survey (SMLS)	Pre-Construction Phase	<ul style="list-style-type: none"> • Compliance overseer at State Level, on matters of land acquisition, compensation and other resettlement issues
Other MDAs	Pre-Construction and Construction Phases	<ul style="list-style-type: none"> • Intervene in areas under their jurisdiction as and when project demands
Contractor (Site Manager, Site Engineers/ Supervisors)	Pre-Construction Phase	<ul style="list-style-type: none"> • Recruit qualified environmental safeguard specialist to ensure compliance with environmental statutory and contractual obligations and proper implementation of the ESMP • Implement all the provisions of the ESMP in coordination with the SPMU and other relevant authorities • Develop and submit for SPMU and FPMU approvals specific management plans as provided in the ESMP. • Provide sufficient funding and human resources for proper and timely implementation of required mitigation measures in the ESMP • Implement additional environmental mitigation measures for unexpected impacts, as necessary • 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; • Train/create awareness of all personnel/workers on relevant E&S safeguard measures and their obligations; • Ensure land disturbance activities are conducted in accordance with relevant legislation and the ESMP; • Communicate content of ESMP to all employees and contractor agents; • Provide oversight function during mobilization to ensure adherence to good practice and the ESMP
	Construction Phase	<ul style="list-style-type: none"> • Implement all E&S safeguards and other mitigation measures as planned; • Submit monthly and quarterly implementation reports on E&S safeguards to SPMU; • Comply with BEME specification in procurement of material and construction, and adherence to the ESMP and good construction practices; • Ensure land disturbance activities are conducted in accordance with relevant legislation and the ESMP; • Provide adequate onsite waste collection bins, ensure proper disposal, not to litter and not to create environmental nuisance; • Provide oversight function during construction to ensure adherence to good practice and the ESMP
	Post Construction Phase	<ul style="list-style-type: none"> • Provide oversight function during decommissioning to ensure adherence to good practice and the ESMP
Site Committee	All Phases (Preconstruction, Construction and Post Construction)	<ul style="list-style-type: none"> • Monitor and ensure compliance to ESMP provisions as well as contractor implementation quality

Institutional Category	Project Implementation Phase	Roles & Responsibilities
Local government	All Phases (Preconstruction, Construction and Post Construction)	<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
Local Community	All Phases (Preconstruction, Construction and Post Construction)	<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.
CDOs	All Phases (Preconstruction, Construction and Post Construction)	<ul style="list-style-type: none"> • Ensure community participation by mobilizing, sensitizing community members;
Focal NGO	All Phases (Preconstruction, Construction and Post Construction)	<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, & provide wide support in management planning, institutional/governance issues and other livelihood related matter, awareness campaigns
General Public	All Phases (Preconstruction, Construction and Post Construction)	<ul style="list-style-type: none"> • Identify issues that could derail the project • Support project impacts mitigation measures as well as awareness campaigns

6.4 E&S Obligations of the Construction Contractor

It is the responsibility of the construction contractor to ensure compliance with all the Engineering Design provisions associated with this project. The SPMU shall not be responsible for any property (whether community, corporate or individual) damaged as a result of actions or activities undertaken or being undertaken by the contractor in the course of executing its contract. In the event of such damage, the contractor shall be fully liable for the cost of such damage.

As part of the construction approval process for the project, a set of environmental and social management plans is needed to address the specific issues identified in this ESMP which may arise in the course of the project. The management plans will need to be developed by the Contractor to address the specific impacts as identified in this ESMP. These management plans are briefly described in the following sections and shall be implemented as part of the overall environmental and social management and monitoring plan for the gully project.

6.5 Required Environmental and Social Management Plans

The construction Contractor for the project shall be required to meet the specific E&S safeguard obligations as provided in this ESMP which shall be incorporated into the contract specifications for the project as provided in Annex 5. The contractor shall also be required to develop and ESMP for field work to guide and explain how the mitigation measures recommended in this ESMP will be implemented during the project execution. This is in addition to other contractual provisions for the project. The required specific E&S management plans include the following:

6.5.1 Resettlement Action Plan

The WB requires the preparation, in advance of the project implementation, of a Resettlement Action Plan/Abbreviated Resettlement Action Plan (RAP/ARAP) where project impacts are known to displace persons within the project community or affect their social and economic well-being. The RAP/ARAP seeks to specifically identify, evaluate and document

the set of mitigation, monitoring and institutional actions to be undertaken for the project to eliminate identified adverse community or individual social and livelihood impacts before commencing the remedial construction and rehabilitation works.

The Resettlement Action Plan for this project has been prepared as a stand-alone document and is incorporated accordingly into this Environmental and Social Management Plan by reference.

6.5.2 Public/Stakeholder Consultation Plan

A key element of sustaining stakeholders' support in the 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 6.3 provides a summary of the stakeholder consultation activities to be considered in the engagement plan. Public sensitization and consultation will continue throughout the project execution.

The Contractor shall be required to prepare and submit for approval of SPMU and FPMU, a comprehensive Stakeholder Engagement Plan. The Plan will provide the Contractor's specific engagement plan to ensure that all segments of the community and other stakeholders are fully and effectively involved in the project decision process.

Table 6.3: Summary of Stakeholder Consultation Plan

Activity	Stakeholders / Community	Timeline
<i>Pre-Construction / Prior to Project Commencement</i>		
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 flood control and intervention works	Government authorities, Local communities, Key/ relevant stakeholders	Prior to Work Plan approval
<i>Construction and Operations</i>		
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 flood control and intervention works closure plan	Government authorities, Local communities, Key/ relevant stakeholders	Prior to project completion
<i>Prior to Project Closeout/Post-Construction</i>		
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 and feedback from the community

6.5.3 Cultural Heritage Management Plan

The Cultural Heritage Management Plan (CHMP) is required to address the specific impacts that may occur as a result of the planned construction works. It is anticipated that some of the construction activities associated with the project may impact cultural resources such as shrines. The Contractor shall prepare and submit for approval of SPMU and FPMU, the necessary CHMP to be implemented for the project. The CHMP will set out a formal system by which the Contractor will carry out mitigation measures that will reduce any impacts to the Cultural Heritage.

Specifically, the CHMP will provide details regarding the implementation of avoidance, mitigation and management measures for impacts related to the possibility of archaeological

finds or any existing cultural heritage of significance. The scope of the CHMP will cover pre-construction, construction and post construction/closure phases of the Project.

6.5.4 Occupational/Public Health, Safety and Security Management Plan

The Contractor shall be required to develop and implement an occupational and community health and safety plan that contributes to a healthy workforce and local community. The health and safety plan shall be submitted to the SPMU and FPMU for necessary approvals prior to implementation. In developing the Plan, the Contractor shall evaluate possible hazards that may be associated with the project activities such as: (a) imported backfill material; (b) Hazards to the aquatic environment arising from toxic effects of imported material (pH, COD, salinity, dispersed material); (c) Flood hazards due to heavy downpour during the construction period; (d) Physical/mechanical hazards due to the movement of solid material in the event of an accident; (e) Hazards resulting from soil contamination.

The Contractor shall also be required to identify who and what can be affected assuming possible scenarios (such as construction failures). Consideration should be given to issues relating to the environment (water, soil, and biota), humans (life, health and living conditions), and economic losses of the population (damage to infrastructure, property) in the event of the possible scenarios. Cooperation between the Contractor, the SPMU and the local community is recommended for emergency planning.

The Community Health, Safety and Security assessment will identify potential negative risks related to the different phases of the project. Some of the significant risks to be considered include:

- Possible pressure and/or additional demand on community health services associated with the influx of workers from outside the project area;
- Possible pressure and/or additional demand on utility services including water and wastewater system associated with the influx of workers from outside the project area;
- Possible pressure and/or additional demand for social services as a result of an increased family stress and violence;
- Possible change in community wellness as a result of alcohol, and substance abuse associated with the influx of workers from outside the project area;
- Possible Change in Community Health as a result of sudden spread of communicable and non-communicable diseases including sexually transmitted diseases (STDs) associated with the influx of workers from outside the project area;
- Possible pressure on traffic and transportation network associated with construction and operations activities; and
- Possible change in water and air quality associated with construction and operations activities.
- In addition to the potential negative impacts which would require mitigation, the rehabilitation of the erosion gully also has the potential to improve community health safety and security through the following means:
 - Improved access to medical facilities for communities due to the gully rehabilitation and the restoration of connecting roadways;
 - Improved healthcare infrastructure;
 - Improved workforce health awareness;
 - Improved standards of living of direct and indirect employees due to better income in the employees households; and
 - Improved standards of living of vulnerable groups and their households, including support to the elderly within the respective households.

6.5.5 Vegetation Clearing and Biomass Management Plan

The Contractor shall be required to prepare and submit for approval of SPMU and FPMU, a comprehensive Vegetation Clearing and Biomass Management Plan (VCBMP). Together with this ESMP, the VCBMP will provide the specific activities to be carried out to protect the natural biodiversity of the project area as well as maintain appropriate public access.

The specific objectives of the Plan are to:

- Identify appropriate, ecologically sustainable, and spatially-explicit management actions, such as re-vegetation with native plant species, based on biological and hydrological factors, as well as the reasonableness of costs, local community expectations, and other key considerations.
- Develop monitoring methods to evaluate progress toward Plan objectives, to apply adaptive management to enhance the likelihood of achieving those objectives, and to increase understanding of water and ecosystem interactions.
- Prepare for anticipated changes to the system, such as climate change and land-use changes.
- Prepare for implementation of rapid, active ecological restoration and other management strategies for threatened, endangered, and other native wildlife species potentially displaced by construction activities, and to enhance pollinator habitat.
- Provide consideration of proper implementation techniques, implementation costs, short- and long-term maintenance needs, water use/savings, and wildfire control.

The approved Plan shall form part of the construction documents and requirements for Contractor implementation through the project.

6.5.6 Air Quality Management Plan

Air quality plans identify potential control measures and strategies, including rules and regulations that could be implemented to reduce air pollutant emissions from construction equipment, on and off road motor vehicles, and other sources. The Contractor shall be required to prepare and submit for approval of SPMU and FPMU, a comprehensive Air Quality Management Plan (AQMP). The Contractor shall implement these strategies through rules and regulations, public education and outreach, and partnerships with other agencies and stakeholders.

6.5.7 Emergency Response and Incident Plan

The Contractor shall be required to prepare and submit for approval of SPMU and FPMU, a comprehensive Emergency Response and Incident Plan (ERIP). The Plan will describe the set of necessary actions to be taken in response to defined circumstances, across all hazards, and through the phases of mitigation, preparedness, response, and recovery during this project.

The Plan will provide necessary guidance for how to organize assets to respond to an incident (system description) and processes to manage the response through its successive stages (concept of operations). The Plan will document the combination of facilities, equipment, personnel, procedures, and communications existing within the Contractor's organizational structure and designed to help in the management of resources during incident response.

The activities contained in the Plan will address the phases of mitigation, preparedness, response, and recovery and will identify potential hazards, assess their likelihood of occurrence, their potential impact and the organization's vulnerabilities to the impact, and also provide a basis for understanding how the hazard likelihood and organizational vulnerabilities can be addressed.

For the Plan to be effective, the emergency incident must be formally defined so that there is clarity and consistency as to what is being managed. This may be best accomplished by defining the incident response through delineation of response goals and objectives, and by explaining response parameters through the Emergency Response and Incident Plan (ERIP).

6.5.8 Water Management Plan

The Contractor shall be required to prepare and submit for approval of SPMU and FPMU, a Water Management Plan. The Plan will provide information about current water uses and charts a course for water efficiency improvements, conservation activities, and water-reduction goals.

An important step in creating a water management plan is to establish a water balance for the project. It is necessary to ensure that water supply, wastewater, storm water issues, and water efficiency Best Management Practices (BMPs) are taken into account prior to commencement of the construction works. Water emergency and other contingency plans should describe how the construction facility will meet minimum water needs during emergency or other water shortages.

6.5.9 Erosion and Sedimentation Management Plan

The Contractor shall prepare and submit for approval of SPMU and FPMU, a comprehensive Erosion and Sedimentation Management Plan. Together with this ESMP, the Plan will provide the specific activities to be carried out to protect the environment from erosion and sedimentation within the project area. It is important that an erosion and sediment control plan is effective in preventing illicit discharge. Appropriate consideration should be given to identify potential problems posed by the project area slopes, drainage patterns, and soil types in preparing an effective erosion and sediment control plan.

The erosion and sediment control plan shall be overlaid on the project grading plan(s) or site plan if there is no grading plan.

- The plan shall show what Best Management Practices (BMPs) will be used, when, and where, specific to the project scope, along with the total disturbance area and installation details and notes for the proposed BMPs. Measures will include those necessary to delineate areas of work, prevent erosion of unstable or denuded areas, plan for construction staging and storage logistics, construction of stabilized access points, and proper containment measures for construction materials and waste.
- The name and contact information for the person responsible for maintaining erosion and sediment control measures throughout the construction work shall be included as Erosion Control Point of Contact.
- Location, width, direction of flow and approximate location of top and toes of banks of any watercourses.
- Location and types of existing vegetation on the site. Within 10 meter of any cut or fill, the plan shall identify the location, diameter, species and appropriate elevation at the base of all trees over 0.3 m in diameter measured at 1.5m above average ground level.
- Existing drainage patterns and direction of flow.
- Limits of disturbed areas.
- Areas not to be disturbed and off-limits to construction activity.
- Location of proposed vegetative erosion control measures (e.g., seeding, landscaping), including type, quantity, planting schedule, and irrigation.
- Location and details of all proposed drainage systems, walls, cribbing or other erosion protection devices to be constructed in connection with, or as a part of, the project.

6.5.10 Traffic and Vehicle Management Plan

Managing traffic at a construction workplace is an important part of ensuring the workplace is without risks to health and safety. Vehicles including powered mobile plant moving in and around a workplace, reversing, loading and unloading are often linked with death and injuries to workers and members of the public. Traffic includes cars, trucks and powered mobile plant like excavators or graders, and pedestrians like workers and visitors. The most effective way to protect pedestrians is to eliminate traffic hazards.

The Contractor shall be required to prepare and submit for approval of SPMU and FPMU, a comprehensive Traffic and Vehicle Management Plan (TVMP). Together with this ESMP, the TVMP will provide the specific and general guide to vehicular movements throughout the project area in order to protect the community and workforce from accident and safety hazards during construction.

Key issues to consider for managing traffic at the construction workplace include:

- Keeping pedestrians and vehicles apart including on site and when vehicles enter and exit the workplace;
- Minimizing vehicle movements;
- Eliminating reversing vehicles or minimizing the related risks;
- Ensuring vehicles and pedestrians are visible to each other;
- Using traffic signs, and,
- Developing and implementing a traffic management plan.

The Contractor shall be required to provide appropriate information, training, instruction or supervision necessary to protect all persons from risks to their health and safety. The Contractor must also ensure construction induction training is provided to workers who carry out construction work.

- The Anambra State NEWMAP will place speed limits and appropriate road signage along all Project roads;
- The Anambra State NEWMAP will enforce speed limits for safety, air quality, and noise purposes both on the Project site and beyond;
- All Anambra State NEWMAP drivers should be trained by a road safety specialist; and,
- All vehicles should be properly maintained and undergo periodic safety inspections.
- Observance of speed limits by contractor's vehicles / drivers should be part of the contractual agreements

6.5.11 Waste Management Plan

A waste management plan (WMP) is required to achieve the goals set for managing construction waste. The construction Contractor shall prepare and submit for approval of SPMU and FPMU, a comprehensive Waste Management Plan (WMP). The WMP will provide the specific and general guide to the management of solid and liquid wastes throughout the project area and for the duration of the project. The Contractor shall have responsibility for the implementation of the Plan which will include procedures for salvage, reuse and recycling of materials. The implementation of the WMP will protect the community and workforce from the health hazards of indiscriminate waste disposal during construction.

The waste management plan should cover the following:

- i. Specify who is responsible for managing waste on site.
- ii. Establish goals and objectives.
- iii. Estimate the waste types and amounts involved.
- iv. Set targets for reducing the amount of each waste sent to the waste disposal site;
- v. Describe recycling/reuse methods for each material.
- vi. Identify the waste destinations and transport modes, including what materials are being segregated on site for reuse or recycling.
- vii. Track progress.
- viii. Describe special measures for material use and handling.
- ix. Describe communication and training to support and encourage participation from everyone on site.

6.5.12 Chemical Management Plan

The Contractor shall prepare and submit for approval of SPMU and FPMU, a Chemical Management Plan (CMP). The CMP will provide specific and general guidance in the storage, use and disposal of any chemicals or chemical products associated with activities to be carried out as part of the project. Chemicals are an integral part of everyday life, essential to our economy, our communities and our homes. While chemical substances provide benefits, they may also have harmful effects on human health and the environment if not properly managed.

The CMP is aimed at protecting human health and the environment by assessing chemicals used in the project and by taking action on the chemicals found to be harmful. The CMP helps protect the project community and their environment from the harmful effects of chemical substances. The CMP will assess the environmental and human health risks posed by the chemical substances to be used in the project, and also develop measures to be implemented to prevent or manage those risks.

6.6 ESMP Monitoring and Evaluation

For effective implementation of the ESMP, it is essential that an effective monitoring programme be designed and carried out. The objectives of the monitoring and evaluation program are:

- To ensure that the measures suggested herein are being carried out during construction;
- To evaluate the efficiency of the proposed mitigation and enhancement measures;
- To investigate the adequacy of the ESMP as well as suggest improvements to it;
- To generate data that could be incorporated in future ESMPs;
- To evaluate what additional enforcement is required for the effective implementation.

6.6.1 Monitoring and Reporting

Project performance monitoring has the overall objective of achieving the desired outcomes through reporting of as measurable events or parameters or aspects that can be monitored and verified. The following monitoring and reporting sequence is proposed for the ESMP implementation

- The Contractor shall submit to SPMU a monthly monitoring report and the ESMP accomplishments during project implementation,
- The SPMU shall prepare monthly ESMP monitoring and accomplishment reports to be submitted to FPMU and the WB.

This reporting cycle should be repeated as the feedback mechanism scheme to all key players consisting of the affected stakeholders, Site Committee, Focal NGO, CBOs/CDOs, Contractors, SPMU, etc.

6.6.2 Post Construction Monitoring

In the post-construction phase of the project, the Site Committee shall be required to maintain continuous monitoring of the project beyond the decommissioning phase. This will ensure that the Ire Obosi gully rehabilitation/healing process and the associated livelihood programmes are sustained beyond the project closeout. Since the Site Committee will have a big role in sustaining the post construction (operations and maintenance) phase of the project, necessary capacity building trainings will be required to provide its officers/leaders the needed capabilities for formulating necessary policies, systems and procedures. The SPMU and the SMEnv will be required to ensure that the Site Committee and other CBOs/CDOs are institutionally strengthened.

A summary of the impacts mitigation and monitoring plan for the preconstruction, construction, and post-construction phases of the project with the associated monitoring frequencies, responsible parties and projected costs are presented in Table 6-6.

6.7 Capacity of Anambra NEWMAP in Implementing the ESMP

6.7.1 Capacity and Training Needs

In order to achieve effective ESMP implementation, there is a need for the strengthening of relevant competencies on environmental and social management at particularly the State level and secondarily, the LGA and community levels including contractors. This will stimulate the required collaboration among the key actors. Experience shows that strengthening capacity involves more than improving technical skills, developing new systems or establishing quality assurance and improvement standards. While these are important, strengthening capacity is however, essentially about changing behavior.

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 control intervention project need to understand the purpose of the ESMP and their expected roles during its implementation.

The target groups for the training will include:

- SPMU E&S Safeguard Officers and Project Engineers;
- Contractor's personnel;
- Construction workers and site personnel; and,
- Select members from the project communities.

The SPMU E&S safeguard officers and contractors including the supervising firm's E&S officer will require capacity building in the implementation of the projects' environmental and social safeguards and general project planning and management interfaced 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 select members of the project communities will undergo training on public awareness creation/educational techniques (on environmental, social and health issues) and first aid procedures.

6.7.2 Capacity Building Cost

The capacity building plan for the ESMP with the associated cost implications is shown in Table 6.4 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 6.4.

Table 6.4: 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> (Pre-con Phase) <ul style="list-style-type: none"> • Concepts, Regulations & Statutory Requirements; • Environmental Management; • Flood and Erosion Prevention & Control; • Stakeholder & Community Participation 	Officials of MOE, ASWAMA, MOW, MOLS, SPMU, Contractor, Community Leaders, NGOs, CBOs & Other Relevant Groups	Workshop	One Day	External Agency for capacity building or Environmental & Social Specialist	550,000.00
<u>Scope of Ire Obosi Intervention Project:</u> (Pre-con Phase) <ul style="list-style-type: none"> • Environmental & Social Impacts; • Engineering Design and Associated ESMP; • Coordination with Other MDAs and the Community 	Contractor, SPMU Safeguard Officers & Project Engineers, MOE, ASWAMA & relevant MDAs, Community Leaders, CDOs, & NGOs	Workshop	One Day	External Agency for capacity building or Environmental & Social Specialist	550,000.00
<u>Project Implementation:</u> (Pre-con Phase) <ul style="list-style-type: none"> • Civil Works with Use of Vegetation in the project; • Roles and Responsibilities of Key Actors; • Environmental Monitoring 	SPMU Project Engineer & Safeguard Officers, Contractors, MOE, ASWAMA	Lecture and Site Visit	One Day	External Agency for capacity building or Environmental & Social Specialist	550,000.00
<u>Monitoring and Evaluation:</u> (Pre-con Phase) <ul style="list-style-type: none"> • ESMP Monitoring and Reporting Strategy; • Stakeholder and Community Participation 	Contractor, SPMU Safeguard Officers & Project Engineers, MOE, ASWAMA & relevant MDAs, Community Leaders, CDOs, & NGOs	Workshop	Half Day	Environmental & Social Specialists; External Agency engaged for capacity building	300,000.00
<u>Watershed Protection and Management:</u> (Post-con Phase) <ul style="list-style-type: none"> • 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	External independent Agency engaged for Capacity Building/ Environmental & Social Specialists	450,000.00
TOTALS					N2,400,000.00

The capacity building and trainings costs shown in Table 6-4 shall be included as part of the overall project budget to be implemented by the SPMU. The trainings are to be conducted preparatory to the contractor’s mobilization to site. All trainings shall therefore be completed prior to mobilization or latest two weeks after the contractor has mobilized to site.

6.8 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.

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

FINAL

Table 6-5: Proposed ESMP Implementation Schedule

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

6.9. 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. It is recommended that for dispute resolution, the Project Complaints Committee (PCC) be established for the resolution of disputes arising from the implementation of the Ire Obosi gully erosion control project. The PCC shall be responsible for providing support to the entire project and receive/resolve disputes associated with any aspects of the project.

The community traditional leadership structure currently constitutes the nucleus of traditional resolution of disputes among community members. It is therefore wise and advisable that this structure be necessarily retained in the event of any grievance or dispute relating to the ESMP implementation. Inputs from the leadership may also be limited to providing recommendations as to how a specific dispute is to be addressed. Aside from the traditional structure, Figure 6-1 provides a secondary mechanism for grievance resolution using the Project Complaints Committee (PCC). The proposed GRM will also help to achieve the following:

- To serve as the open channel for effective communication together with the identification of emerging environmental and social concerns due to the project;
- 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; and,
- Ensure community acceptance of the project.

The State NEWMAP officer shall serve as the Chairperson of the Committee while the Secretary shall be appointed by the SPMU from among the PAP-members of the committee.

Figure 6-1: Grievance Redress Procedure

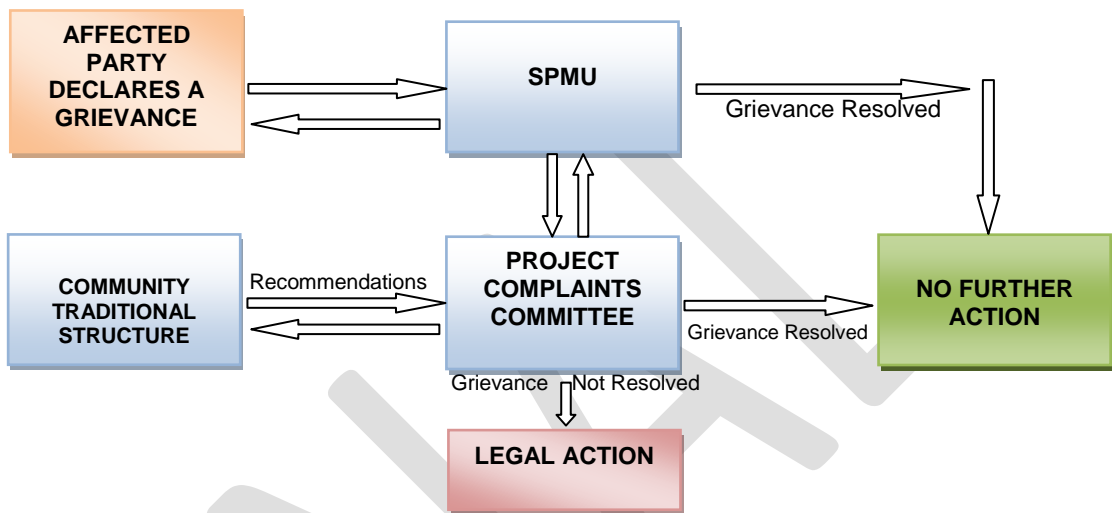


Table 6-6 E&S Impact Mitigation and Monitoring Plan

E&S Impact Category	Source of Impact	Objective	Impact Mitigation Implementation			Performance & Impact Monitoring			
			Proposed Mitigation Measures	Responsible to Implement	Mitigation Cost (N)	Monitoring Indicator	Monitoring Frequency	Responsible to Monitor	Monitoring Cost (N)
PRE-CONSTRUCTION PHASE									
Safeguard Instrument (ESMP)		Ensure that identified E&S impacts are addressed and mitigation measures are executed properly	Environmental and social management measures as spelled out in this document (details are as enumerated below)	SMEEnv & SPMU	To be included in project construction cost	Approval of ESMP Report by FMEEnv & WB; Commencement of construction activities; Availability of completed & approved plans	Monitoring parameters as indicated in this ESMP	FPMU & WB	N/A
Impacts on Community and PAP Management (Loss of physical assets; Loss of means of livelihood; Displacement of persons (temporary))	All impact sources indicated in Table 7.1, Item 1, Column 3	To restore persons adversely affected by the project to a condition equivalent to or better than the pre-project situation	As contained in a stand-alone Resettlement Action Plan (RAP) document prepared for the project; All impact mitigation measures indicated in Table 7.1, Item 1, Column 4	SMEEnv & SPMU	To be included in RAP cost	<ul style="list-style-type: none"> • No. of public complaints recorded; • Level of awareness and understanding of community members; • No of community members that attend trainings; • Level of satisfaction among PAPs; • No of women gainfully employed by project; • No of other businesses induced by project • Performance evaluation questionnaires, direct 	Continuous Quarterly Continuous Quarterly Quarterly; Six months intervals Every two years	SPMU-ESO; Focal NGO SMEEnv.; SMLS.; Community Leaders; Site Committee	Included in RAP Cost 350,000.00

E&S Impact Category	Source of Impact	Objective	Impact Mitigation Implementation			Performance & Impact Monitoring			
			Proposed Mitigation Measures	Responsible to Implement	Mitigation Cost (N)	Monitoring Indicator	Monitoring Frequency	Responsible to Monitor	Monitoring Cost (N)
						observations and interviews.			
Community Cultural Heritage	All impact sources indicated in Table 7.1, Item 2, Column 3	Ensure that community's historical, archeological, and cultural treasures are not destroyed during project execution	All impact mitigation measures indicated in Table 7.1, Item 2, Column 4 Develop and submit for SPMU approval a Cultural Heritage Management Plan; Possible chance archeological findings	SMEEnv & SPMU Contractor	To be included in project construction cost	• Protection of all identified treasure finds	Continuously	Site Engineer; Focal NGO; SPMU; SMEEnv; Community Leaders; Site Committee	Included in construction cost 250,000.00
Public/Stakeholders Participation	All impact sources indicated in Table 7.1, Item 3, Column 3	Ensure effective community and stakeholder involvement in the project decision process	Develop and submit for SPMU approval a Stakeholders Engagement Plan; All impact mitigation measures indicated in Table 7.1, Item 3, Column 4	Contractor Contractor	To be included in project construction cost	• No of active participants from the community and other stakeholders	Continuously	Site Engineer; Focal NGO; SPMU; SMEEnv; Community Leaders; Site Committee	Included in construction cost 300,000.00
Vegetation and Biomass Removal Management	All impact sources indicated in Table 7.1, Item 4, Column 3	Prevent damage to critical ecosystems and habitats and destruction of flora and fauna	Develop and submit for SPMU approval a Vegetation and Biomass Removal Management Plan; All impact mitigation measures indicated in Table 7.1, Item 4, Column 4	Contractor Contractor	To be included in project construction cost	Areas of stressed vegetation; Size of cleared vegetation areas	Monthly Monthly	Site Engineer; SPMU-ESO; Focal NGO; SMOV; SMOH; Community Leaders; Site Committee	Included in construction cost 250,000.00
TOTALS									1,150,000.00

E&S Impact Category	Source of Impact	Objective	Impact Mitigation Implementation			Performance & Impact Monitoring			
			Proposed Mitigation Measures	Responsible to Implement	Mitigation Cost (N)	Monitoring Indicator	Monitoring Frequency	Responsible to Monitor	Monitoring Cost (N)
CONSTRUCTION PHASE									
Dust and Air Quality Management	All impact sources indicated in Table 7.1, Item 5, Column 3	To minimize emission of hydrocarbons and generation of dust at the work site and access roads	Develop and submit for SPMU approval an Air Quality Management Plan; All impact mitigation measures indicated in Table 7.1, Item 5, Column 4	Contractor Contractor	To be included in project construction cost	<ul style="list-style-type: none"> No. of public complaints; Level of particulates Level of air pollutants Vegetation surfaces free of dusts Ambient air monitoring using standard methods 	Twice daily Continuous as necessary Continuous as necessary Two month intervals or as required	Site Engineer; SPMU-ESO; Focal NGO SMOH.; Community Leaders; Site Committee	Included in construction cost 350,000.00
Water Bodies & Water Resources Management	All impact sources indicated in Table 7.1, Item 6, Column 3	Ensure that water bodies and water resources in project area are adequately protected from contamination and other hazards	Develop and submit for SPMU approval a Water Management Plan; All impact mitigation measures indicated in Table 7.1, Item 6, Column 4	Contractor Contractor	To be included in project construction cost	<ul style="list-style-type: none"> No of complaints from community members; Absence of sediment build up; Absence of flooding in construction areas; No of spills & repairs made; Use of standard monitoring methods 	Daily Daily Daily Three month intervals	Site Engineer; SPMU-ESO; Focal NGO; SMOW; Community Leaders; Site Committee;	Included in construction cost 350,000.00
Erosion & Sedimentation Control Management	All impact sources indicated in Table 7.1, Item 7, Column 3	Ensure that project area is adequately protected from development of erosion and sedimentation hazards	Develop and submit for SPMU approval an Erosion and Sedimentation Management Plan; All impact mitigation measures indicated in Table 7.1, Item 7, Column 4	Contractor Contractor	To be included in project construction cost	<ul style="list-style-type: none"> No of complaints from community members; Absence of sediment build up; Absence of flooding in construction 	Daily Daily Daily Daily	Site Engineer; SPMU-ESO; Focal NGO; SMOW; Community Leaders;	Included in construction cost 350,000.00

E&S Impact Category	Source of Impact	Objective	Impact Mitigation Implementation			Performance & Impact Monitoring			
			Proposed Mitigation Measures	Responsible to Implement	Mitigation Cost (N)	Monitoring Indicator	Monitoring Frequency	Responsible to Monitor	Monitoring Cost (N)
						areas; •Use of standard monitoring methods	Three month intervals	Site Committee;	
Noise and Vibration Exposure Management	All impact sources indicated in Table 7.1, Item 8, Column 3	Ensure adequate protection of the workforce and community members from effects of noise and vibrations	All impact mitigation measures indicated in Table 7.1, Item 8, Column 4	Contractor – Site Engineer	To be included in project construction cost	<ul style="list-style-type: none"> •No of complaints from community members; •Absence of structural failures; •Absence of debris accumulation; •No of debris removals & repairs made; •Sensor measurements around workplace 	Daily Daily Daily Daily	Site Engineer; SPMU-ESO; Local NGO; SMOW; SMOH; Community Leaders; Site Committee	Included in construction cost 250,000.00
Occupational & Public Health and Safety Management	All impact sources indicated in Table 7.1, Item 9, Column 3	Ensure that identified occupational & public health, safety and security impacts are addressed and mitigation measures are executed properly	Develop and submit for SPMU approval an Occupational and Public Health, Safety and Security Management Plan; All impact mitigation measures indicated in Table 7.1, Item 9, Column 4	Contractor Contractor	To be included in project construction cost	<ul style="list-style-type: none"> •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 	At start of project; Twice weekly; Weekly; Daily; Monthly; At beginning of project Weekly; Monthly At start of project	Site Engineer; SPMU-ESO; Focal NGO; SMOH; Community Leaders; Site Committee; Site Engineer;	Included in construction cost 350,000.00 Included in construction cost

E&S Impact Category	Source of Impact	Objective	Impact Mitigation Implementation			Performance & Impact Monitoring			
			Proposed Mitigation Measures	Responsible to Implement	Mitigation Cost (N)	Monitoring Indicator	Monitoring Frequency	Responsible to Monitor	Monitoring Cost (N)
						exercises • Hazards assessment			
HIV/AIDS and STIs Management	All impact sources indicated in Table 7.1, Item 10, Column 3	Ensure effective HIV/AIDS and STI awareness among community members	All impact mitigation measures indicated in Table 7.1, Item 10, Column 4	SPMU Safeguard Officers; MOH; NGO; Contractor-Health & Safety Personnel	To be included in project construction cost	• No. of HIV/AIDS workshops held; • Level of awareness of workers & others; • Records of peer educators' training; • Records of condoms distributed	Quarterly Continuous Bi-monthly Monthly	Focal NGO; SPMU-ESO; SMOH; Community Leaders; Site Committee; Site Engineer;	350,000.00 Included in construction cost
Construction Operations & Slope Stabilization	All impact sources indicated in Table 7.1, Item 11, Column 3	To ensure that construction activities are carried out without risks to health and safety of the workforce and the community	Develop and submit for SPMU approval an Emergency Response and Incident Plan; All impact mitigation measures indicated in Table 7.1, Item 11, Column 4	Contractor Contractor	To be included in project construction cost	• No. of accidents/incidents; • No. of visible warning signs; • Level of public awareness; • Record of safety meetings held;	Daily; Daily; Continuous; Weekly.	Site Engineer; SPMU-ESO; Focal NGO; SMOW; Community Leaders; Site Committee	Included in construction cost 250,000.00
Traffic and Transportation Hazards	All impact sources indicated in Table 7.1, Item 12, Column 3	To ensure that traffic within the project area is managed so as to assure the workplace and community are without risks to health and safety	Develop and submit for SPMU approval a Traffic and Vehicle Management Plan; All impact mitigation measures indicated in Table 7.1, Item 12, Column 4	Contractor Contractor	To be included in project construction cost	• 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.	Site Engineer; SPMU-ESO; Focal NGO; SMOW; Community Leaders; Site Committee	Included in construction cost 350,000.00

E&S Impact Category	Source of Impact	Objective	Impact Mitigation Implementation			Performance & Impact Monitoring			
			Proposed Mitigation Measures	Responsible to Implement	Mitigation Cost (N)	Monitoring Indicator	Monitoring Frequency	Responsible to Monitor	Monitoring Cost (N)
Waste Management (Solid and Liquid Wastes)	All impact sources indicated in Table 7.1, Item 13, Column 3	To protect the community and the workforce from health hazards of indiscriminate waste disposal by proper collection and disposal of liquid and solid wastes generated on-site during the project.	Develop and submit for SPMU approval a Waste Management Plan; All impact mitigation measures indicated in Table 7.1, Item 13, Column 4	Contractor Contractor	To be included in project construction cost	<ul style="list-style-type: none"> 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	Site Engineer; SPMU-ESO; Focal NGO; SMOW; SMEnv; Community Leaders; Site Committee	Included in construction cost 300,000.00
TOTAL						•			2,900,000.00
OPERATION AND MAINTENANCE (POST CONSTRUCTION) PHASE									
Land Use Restriction	All impact sources indicated in Table 7.1, Item 14, Column 3	To ensure that required project areas under restricted use remains as designated	All impact mitigation measures indicated in Table 7.1, Item 14, Column 4	SPMU; SMEnv; Community Leaders; Site Committee		Sustained treated gully healing process	Routine monitoring of project corridor (6mos – 12mos)	SPMU-ESO; SMEnv; Focal NGO; Community Leaders; Site Committee	500,000.00
Closure of Temporary Office, Staging Areas and Decommissioning of Project	All impact sources indicated in Table 7.1, Item 15, Column 3	Ensure that agreements with the community and landowners on post construction hand-over are kept.	All impact mitigation measures indicated in Table 7.1, Item 15, Column 4	Contractor Contractor	To be included in project construction cost	<p>Agreements entered with community and landowners for use of land;</p> <p>Agreement fulfilled with community and landowners; Handover of office site as agreed</p>	Prior to start of project; Quarterly; At completion of project	Site Engineer; SPMU-ESO; Focal NGO; Community Leaders; Site Committee	Included in construction cost 250,000.00

E&S Impact Category	Source of Impact	Objective	Impact Mitigation Implementation			Performance & Impact Monitoring			
			Proposed Mitigation Measures	Responsible to Implement	Mitigation Cost (N)	Monitoring Indicator	Monitoring Frequency	Responsible to Monitor	Monitoring Cost (N)
System Control Failures Management	All impact sources indicated in Table 7.1, Item 16, Column 3	Ensure sustainable maintenance of erosion prevention and control structures	All impact mitigation measures indicated in Table 7.1, Item 16, Column 4	SPMU; Community Leaders; Site Committee		Sustained gully healing process	Routine monitoring of project corridor (6mos – 12mos)	Community Leaders; Site Committee CBOs/CDOs	350,000.00
TOTAL									1,100,000.00

6.10 ESMP Management Costs

A summary of the projected ESMP management costs through the preconstruction, construction and post-construction phases of the project are presented in Table 6-7.

Table 6.7: Estimated Institutional Management Costs

Institutional Category	Roles & Responsibilities	Associated Management Costs (N)		
		Pre-Construction Phase	Construction Phase	Post-Construction Phase
Anambra State Ministry of Environment (MOE)	•Overall oversight, assessment and monitoring of specific and general project implementation ;	200,000.00	150,000.00	350,000.00
SPMU (Safeguard Officers, Project Engineer)	•Oversight of all specific activities associated with the ESMP implementation	500,000.00	400,000.00	400,000.00
FPMU	•Project assessment and monitoring of this ESMP implementation and the construction activities.	N/A	N/A	N/A
World Bank	•Overall assessment and monitoring of specific and general project implementation ;	N/A	N/A	N/A
State Ministry of Works	•Provide necessary preconstruction and construction support to the SPMU	100,000.00	100,000.00	N/A
State Ministry of Lands & Survey (SMLS)	•Provide necessary support to the SPMU on matters of land acquisition, compensation and other resettlement issues	100,000.00	N/A	N/A
Other MDAs	•Intervene in areas under their jurisdiction as and when project demands	50,000.00	50,000.00	N/A
Contractor (Manager/ Supervisors)	•Provide oversight function during decommissioning to ensure adherence to good practice and the ESMP	N/A	N/A	N/A
Site Committee	•Monitor and ensure compliance with ESMP, BEME and implementation quality	100,000.00	100,000.00	150,000.00
Local government	•Provide support in monitoring project execution within their domains to ensure compliance with this ESMP and other relevant requirements	N/A	N/A	N/A
Local Community	•Support and promote environmental awareness	100,000.00	N/A	200,000.00
CDOs	•Ensure community participation by mobilizing, sensitizing community members;	N/A	N/A	N/A
NGOs	•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, & provide wide support in management planning, institutional/governance issues and other livelihood related matter,	150,000.00	100,000.00	100,000.00

Institutional Category	Roles & Responsibilities	Associated Management Costs (N)		
		Pre-Construction Phase	Construction Phase	Post-Construction Phase
	awareness campaigns			
General Public	<ul style="list-style-type: none"> Identify issues that could derail the project Support project impacts and mitigation measures as well as awareness campaigns 	N/A	N/A	N/A
TOTALS		N1,300,000.00	N900,000.00	N1,200,000.00

6.11 Budget to Implement ESMP

Cost projections for implementation of the various measures, monitoring plan and capacity building are given in Table 6.8. 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 N9,660,000.00 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 6-8: Breakdown of Cost Estimates

S/No	ITEM	RESPONSIBILITY	COST BREAKDOWN IN (N)			COST ESTIMATE IN NAIRA (N)	COST ESTIMATE IN (US\$)
			Pre-Construction Phase	Construction Phase	Post-Construction Phase		
1	MITIGATION	SPMU/Contractor	To be built into Contractor costs			-	-
2	ESMP MANAGEMENT	SPMU/ SMEEnv	1,300,000.00	900,000.00	1,200,000.00	N3,400,000.00	
3	MONITORING	SPMU/ FPMU/ FME/ MOE/ Environmental Consultants/ Contractor	850,000.00	2,150,000.00	400,000.00	3,400,000.00	
4	CAPACITY BUILDING & TRAININGS	SPMU/ MOH/ Consultants/ Contractor	1,950,000.00	0.00	450,000.00	2,400,000.00	
Sub-total						N9,200,000.00	
5	CONTINGENCY (5%)					460,000.00	
GRAND TOTAL						N9,660,000.00	

CHAPTER 7: SUMMARY CONCLUSION AND RECOMMENDATIONS

7.1 Summary

Overall, this project is aimed at halting or minimizing the environmental and social damages being caused by the incidence of gully erosion at Ire village of Obosi town. There is an overwhelming emotional relief for community members over fears of a continued loss their properties and ancestral lands, and potentially lives to gully erosion. The project will provide long term emotional and economic benefits to the people of Ire community. These residents will no longer live in fear of losing their assets, agricultural lands and cash crops to perennial floods and erosion. Expectedly, this will in turn increase the mental health of the community leading to improved efficiency and productivity. This is, in the overall a positive impact that will bring about emotional relief and comfort to all the community members particularly those living close to the gully corridor.

Additionally, there will be multiplier effects such as employment opportunities, poverty reduction, enhanced national reputation and cultural promotion, among others. Educational establishments, hospitals and agriculture will also benefit from the boost of the reduced community health and safety concerns. There are however, some social and environmental impacts associated with the project that require mitigation to acceptable levels. The social impacts include loss of means of livelihood, loss of physical assets, temporary displacement of persons, and land use restriction. The environmental impacts include dust and air quality issues, surface and ground water quality, noise and vibration effects, vegetation loss, public/occupational health and safety, traffic and transport issues, earth movement and dam safety risks, solid and liquid wastes hazards, and climate change effects.

The set of mitigation measures to be implemented in order to reduce or eliminate the identified environmental and social impacts to acceptable levels have been identified and documented in this ESMP. The monitoring and institutional actions to be taken before, during and after the remedial construction and development works have also been provided.

7.2 Recommendations

The savannah species observed is indicative of the fact that project area falls within the derived savannah zone. Conservation programme which should include the elimination/control of bush burning and cattle grazing in the area should be initiated in order to check the advancing savannah. The area should be re-vegetated after the engineering works in order to stabilize the soil. Species such as *Bambusa spp* and *Gmelina aborea* which have proved to be resilient in the area due to their silvical properties should be given priority considerations. Other species particularly those of economic value should be incorporated based mainly on the peoples' preference. The species already being cultivated in the home-gardens will make a useful guide.

Empowerment programmes should be developed and provided for the community members to reduce their dependence on crop farming and other activities that may impact negatively on the environment thereby pre-disposing the area to soil erosion.

The proposed gully erosion intervention project is designed to improve *erosion and flood management 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 and floods.

- Progressively restore vegetative cover, improve 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.

The construction of the gully erosion control infrastructure and the site rehabilitation activities, as designed, will require the use of the existing degraded/damaged access roadways to reach project locations. These access roadways and associated drainages will need to be rehabilitated. 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.

Generally, the study has indicated that the establishment of the proposed project will immensely impact positively on the existing environmental, social, health and safety conditions of Ire Obosi people. This inference is further made strong by the fact that the community has thrown her full weight behind the project and is anxiously awaiting its implementation.

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ANNEX 1: TERMS OF REFERENCE

FOR THE PREPARATION OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

UNDER THE NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT (NEWMAP), ANAMBRA STATE

BACKGROUND:

The Government of Nigeria is implementing the multi-sectoral Nigeria Erosion and Watershed Management Project (NEWMAP), which is financed by the World Bank, Global Environment Facility, the Special Climate Change Fund, and the Government of Nigeria. NEWMAP finances activities implemented by States and activities implemented by the Federal Government. The Project currently includes 7 States, namely Anambra, Abia, Cross River, Edo, Enugu, Ebonyi and Imo.

The lead agency at the Federal level is the Federal Ministry of Environment (FME), Department of Erosion, Flood and Coastal Zone Management. State and Local Governments, Local Communities and CSOs are or will be involved in the Project, given that the Project is a multi-sector operation involving MDAs concerned with Water Resources Management, Public Works, Agriculture, Regional and Town Planning, Earth and Natural Resources Information and disaster risk Management.

The development objective of NEWMAP is: to rehabilitate degraded lands and reduce longer-term erosion vulnerability in targeted areas. At State level, NEWMAP activities involve medium-sized civil works such as construction of infrastructure and/or stabilization or rehabilitation in and around the gullies themselves, as well as small works in the small watershed where gullies form and expand. These works trigger the World Bank's Safeguard Policies including Environmental Assessment OP 4.01; Natural Habitats OP 4.04; Cultural Property OP 11.03; Involuntary Resettlement OP 4.12 Safety of Dams OP 4.37; Pest Management Safeguard Policy OP 4.09; and Projects on International Waterways OP 7.50. The environmental and social safeguards concerns are being addressed through two national instruments already prepared under the project: an Environmental and Social Management Framework (ESMF) and a Resettlement Policy Framework (RPF). These framework instruments need to be translated into specific costed, measurable and monitorable actions for specific intervention sites through the preparation of site specific management and action plans.

ESMF: In general, the ESMF specifies the procedures to be used for preparing, approving and implementing (i) Environmental/Social Assessments (ESA's or alternately both SA or EA) and/or (ii) Environmental and Social Management Plans (ESMP's or alternately both an EMP and SMP) for individual civil works packages developed for each project. ESMP's are essential for category B projects.

RPF: Resettlement Policy Framework (RPF) applies when land acquisition leads to the temporary or permanent physical displacement of persons and/or loss of shelter and/or loss of livelihoods and/or loss denial or restriction of access to economic resources due to project activities. It sets out the resettlement and compensation principles, organizational arrangements

and design criteria to be applied to meet the needs of project- affected people and specifies the contents of a Resettlement Action Plan (RAP) for each package of investments.

Objective and Scope of the Consultancy

The objective of the consulting services is to prepare an Environmental and Social Management Plan (ESMP) for the following gully erosion sites in Anambra State.

LOT 2: NKPOR FLYOVER & IRE, OBOSI

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

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

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

Tasks of the Consultant include the following:

- a. Describe the existing status of the sub watershed and gullies;
- b. Identify the environmental and social issues/risks associated with the existing conditions;
- c. Select and measure appropriate baseline indicators (for example, m3/sec of runoff collected in the sub watershed during a heavy hour-long rainfall);
- d. Develop a plan for mitigating environmental and social risks associated with construction and operation in the gully in consultation with the relevant public and government agencies; Identify feasible and cost-effective measures that may reduce potentially significant adverse environmental and social impacts to acceptable levels;
- e. Develop a time-bound plan for mitigating environmental and social risks associated with the sub-watershed management in consultation with relevant public and government agencies; Identify feasible and cost effective measures that may reduce potentially significant adverse environmental and social impacts to acceptable levels;

- f. Identify monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed and the mitigation measures described above (as in a-e);
- g. Provide a specific description of institutional arrangements: the agencies responsible for carrying out the mitigation and monitoring measures (e.g. for operation, supervision, enforcement, monitoring of implementation, remedial action, financing reporting, and staff training) and the contractual arrangements for assuring the performance of each implementing agency;
- h. Define technical assistance programs that could strengthen environmental management capability in the agencies responsible for implementation;
- i. Provide an implementation schedule for measures that must be carried out as part of the project showing phasing and coordination with overall project implementation plans; and
- j. Provide the expected capital and recurrent cost estimates and sources of the funds for implementing the ESMP and inform accordingly the design consultants so that these costs are duly taken into consideration in the designs.

RATIONALE FOR THE STUDY

Anambra State is situated in high rainfall area and is prone to high-intensity surface run-offs which lead to the formation of gully erosion. Studies have shown that road construction and poorly-terminated drains/culverts contribute immensely to the acceleration and formation of active gully erosion sites in rural and semi-urban areas. Gully sites can be heavily or lightly populated with critical infrastructure found within the watershed. Storm water run-offs are moderate to heavy, causing major damage to infrastructure along their path with loss of properties and livelihood, with occasional fatalities. Many houses have fallen into the gullies and many more are in the verge of being consumed. The social, economic losses and the threats posed by gullies in high-density areas is source of great apprehension, needing timely intervention. Solving the erosion menace in Anambra will bring social relief, security of lives and properties and overall economic development.

The Following Socio-economic issues shall be addressed in the ESMP

- Summary of the impacted communities for the project location access population number demographic and social characteristics economy employment rate income distribution services types capacity and adequacy and housing concern is the ability to provide workforce service new development and absorb and adjust to growth worker/family)
- Summary of the views of the population including vulnerable groups determined through thoroughly documented discussions with local communities. The meetings and discussions must be documented and should show how issues and problems raised will be resolved. Note that an Abbreviated Resettlement Action Plan (ARAP) could be developed for each site and is covered under a separate Terms of Reference (TOR).
- Cultural summarize the possible effects of the project on historical archaeological sites, heritage artifacts, native religious or harvest sites of the affected communities and identification of development of mechanisms for handling chance findings.

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

Other Tasks:

The consultant shall assist the Anambra State Project Management Unit of NEWMAP to register the ESMP with the environmental assessment departments at Federal and State levels and also disclose the finalized ESMP at National, State and Local Government Area and Community levels.

Qualifications of the Firm

The consulting firm must have qualified expertise in the practices relevant to this assignment. It must demonstrate that at least one of its key personnel possesses an advanced degree in relevant fields including but not limited to civil engineering, environmental engineering, environmental services or the social sciences.

Availability of key staff with requisite qualifications in the field of assignment. Minimum experience should be Eight (8) years with a minimum specific experience of Four (4) years in planning related to infrastructure development or disaster response.

General experience of the firm in consulting services relating to ESMP/ARAP during the last 4 years.

Demonstrate verifiable experience of working in a similar geographical region.

Evidence showing that the firm is a legal entity, field of specialty of the Firm and evidence of firm’s registration with relevant authorities and professional bodies.

The firm must demonstrate requisite experience in design and preparation of an ESMP for social or infrastructure projects. The firm must have competency and documented experience in social and environmental scientific analysis and development of operational action plans.

The firm must have a working knowledge of World Bank’s operational safeguards policies gained through hands-on experience in the preparation and implementation of environmental and social management plans in urban and semi-urban and rural areas.

PROJECT TEAM COMPOSITION FOR ESMP and ARAP

The Consultant(s)/Firm shall appoint the necessary staff including a Team Leader and other required qualified staff. The Consultant will be required to provide the following key staffs as a minimum.

Professional Specialization	Minimum Years of Expertise Experience
Team leader: Environmental Expert - A minimum of Post-graduate qualification in irrelevant field with at least 8 years’ experience in environmental and social management plan, impact assessment plan, resettlement plan, safety and health management plan and disaster and risk management, flood control and management, e.t.c.	10

Monitoring and Evaluation Specialist: A minimum of Post-graduate qualification in irrelevant field with at least 8 years' experience in environmental and social management plan, impact assessment plan, resettlement plan, safety and health management plan and disaster and risk management, flood control and management, e.t.c.	8
Geotechnical Specialist: A graduate civil engineer, geology, GIS or in any relevant field with at least 8 years of professional experience in the field of assignment	8
Social Management Specialist: A graduate of sociology or equivalent with at least 8 years of professional experience in the field of the assignment.	8

Technical and Financial Proposals will be evaluated on Consultant Qualification Selection (CQS) process.

Duration of Assignment

The duration of this assignment is **60 calendar days**.

Deliverables and Timing

- **Week 2:** Inception Report to be delivered Two (2) weeks after mobilization to site.
- **Week 4:** A draft of ESMP Report will be submitted for comments within Four (4) weeks from mobilization to site.
- **Week 6:** Final draft of ESMP report will take into account all comments and will be submitted to the SPMU.
- **Week 8:** Final ESMP report that is acceptable to Anambra NEWMAP and to the World Bank with a comprehensive database of relevant information collected in Microsoft Excel format. Final ESMP report shall be submitted in Five (5) bound hard copies and One (1) copy on CD-ROM.

The drafts and final reports submitted to the client and all relevant data and information contained therein, compiled by the consultant in the course of this assignment shall be deemed the property of the client the client shall be free to make full use of draft and final reports, data and information received pursuant to this contract at its own discretion.

Project-specific Background Documents

- Environmental and Social Management Framework (ESMF)
- Resettlement Policy Framework (RPF)
- NEWMAP Project Appraisal Document (PAD)

- NEWMAP Project Implementation Manual (PIM)
- World Bank Safeguards policies
- Intervention design

Layout of Report

Chapter 1: Background of ESMP Activity

Chapter 2: Institutional and legal framework for environmental management

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

Chapter 3: Biophysical Environment

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

Chapter 4: Socio-economic Characteristics & Consultation with Stakeholders

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

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

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

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

- Discussion of the proposed mitigation measures
- Institutional responsibilities and accountabilities
- Capacity building plan
- Public consultation plan

- Description of “Grievance Redress Mechanism” in alignment with the ESMF, RPF, RAP and project implementation manual to address situations of conflicts or disagreements about some of the project activities.
- Monitoring and Evaluation plan including suitable indicators for the proposed project
- Cost of implementing the ESMP

Chapter 7: Summary, Recommendations and Conclusion

Annex 1: List of Persons Met

Annex 2: Summary of World Bank Safeguard Policies

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

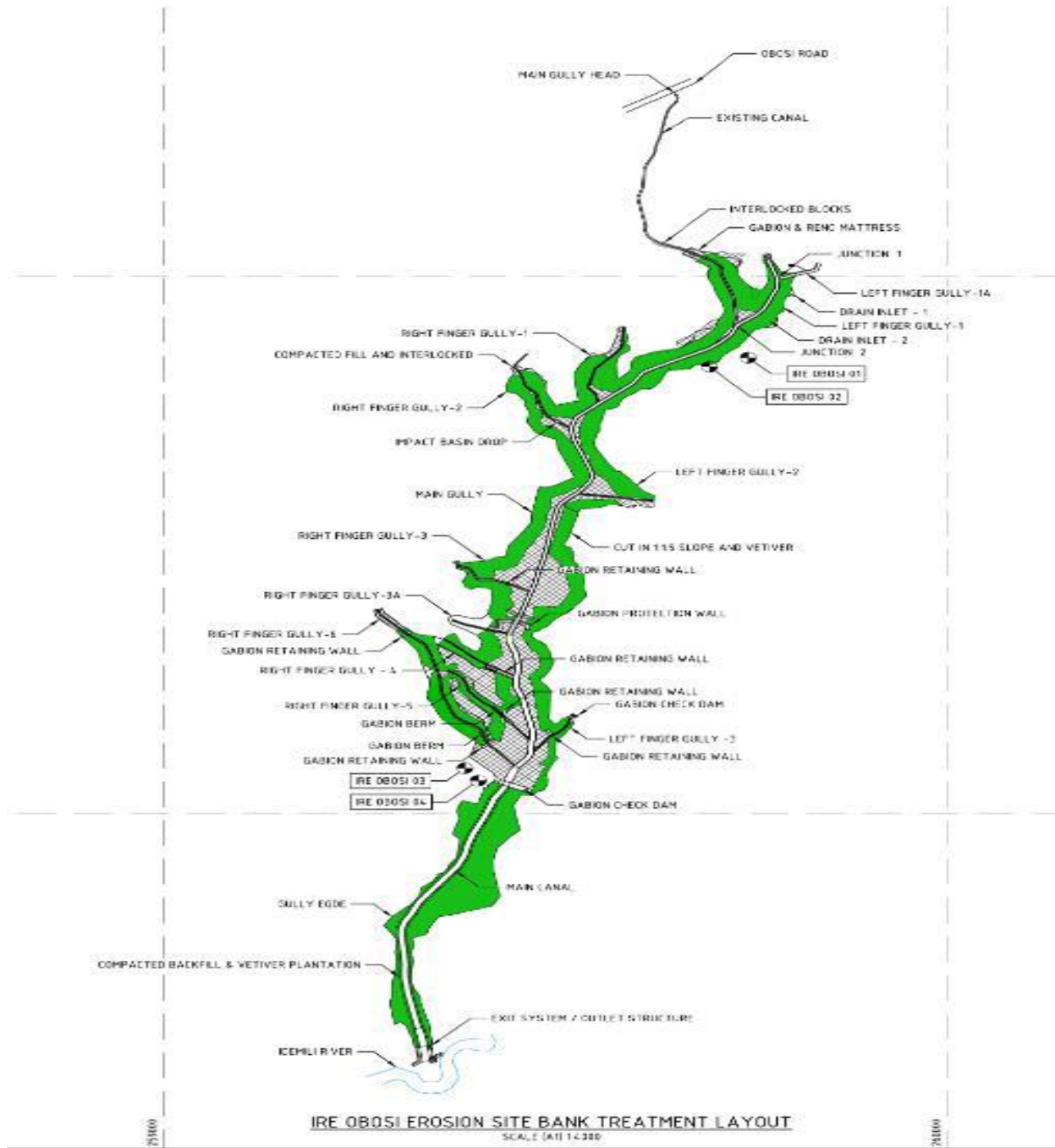
Annex 4: References

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

Annex 6: Maps

Annex 7: Photos/Videos

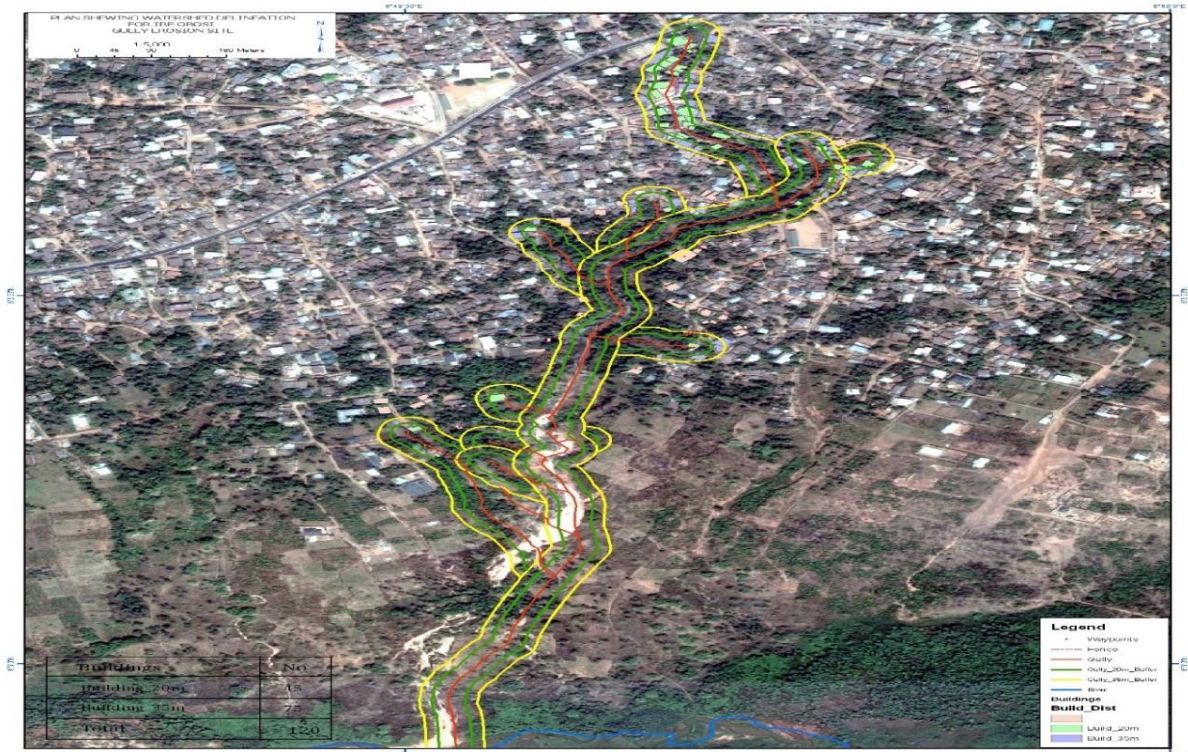
ANNEX 2: PROPOSED PROJECT ENGINEERING DESIGN AND PROJECT AREA SATELLITE IMAGERY



Proposed Engineering Design of Remedial Activities
 (Source: SMEC Feasibility Study Report, 2016)



Satellite View of Project Area Showing the Ire Obosi Gully Corridor



ANNEX 3: LIST OF CONTACTED STAKEHOLDERS

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

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>OR</u> whose day-to-day lives/livelihoods may be directly affected by project activities.	General meetings, phones and personal contacts using a facilitator.
Group-2	Office of the Chairman and Diokpa – Ire Village	Phone and personal contacts
	Office of the President General (PG) – Obosi Town	Phone and personal contacts
	Office of the Obosi Traditional Ruler, HRH Igwe Iweka III	Phone and personal contacts
Group-3	Office of the Chairman – Idemili North LGA	Phone contacts
	Office of the Hon. Member – Anambra State House of Assembly	Phone contacts
	Office of the Hon. Member – Idemili North & South Federal Constituency	Phone contacts

ANNEX 4: 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, effective, 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 (OP 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 5: 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 its 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 SMENV, 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 6: MINUTES OF COMMUNITY CONSULTATION MEETINGS

**SENSITIZATION MEETING WITH OBOSI TRADITIONAL RULER, HRH IGWE IWEKA III
HELD AT HIS PALACE ON TUESDAY FEBRUARY 6, 2017**

ITEMS	DESCRIPTION
1. Project	ANAMBRA NEWMAP; ESMP & ARAP
2. Name of Community:	Ire Village, Obosi
3. Date:	February 06, 2017
4. Title:	Report of the courtesy call on the traditional ruler of Obosi Community
5. Language of Communication:	Igbo and English
6. Introduction:	<ul style="list-style-type: none"> • This was a courtesy call at about 11:30am on the traditional ruler of Obosi community, HRH Igwe Chidubem Iweka III who was represented by the palace secretary—Mr. Shedrack Okenwa and Mr Nnamdi Nkemenana – the personal assistant to HRH. • The visiting teams were introduced by Mr. Emeka Achebe, the CO of the SPMU.
7. Remarks of the Principal Consultant:	<ul style="list-style-type: none"> • Dr. Odili Ojukwu, the chief consultant in OTG spoke on behalf of the teams. • He explained that the ESMP & ARAP consultancy is mainly concerned with documenting persons and elements of the physical and social environment that would be affected by the proposed gully erosion control project in Ire-Obosi; and recommend appropriate mitigation and compensation package to the SPMU for necessary action. This intervention is under the auspices of Anambra Newmap. • The assignment has to be completed before the commencement of civil engineering works at the erosion site. He reminded the traditional ruler that similar exercise had earlier been completed successfully in Ugamuma village in the community. • He therefore solicited the blessing and support of the royal father for the exercise.
8. Response of the Traditional Ruler:	<ul style="list-style-type: none"> • The palace secretary, Mr. Shedrack Okenwa, in his response apologized for the absence of the traditional ruler which was due to an emergency official trip to Abuja. He welcomed the delegation and assured the project of the full blessings of the royal father and the support of a grateful community.
9. Attendees:	<ul style="list-style-type: none"> • The delegation was composed of experts and staff from OTG led by Dr. Odili Ojukwu, representatives of the SPMU led by the CO Mr. Emeka Achebe; and representative of CRIMC/ACERDEN, the focal NGO, led by Prof. Peter Nnabude.
10. Closing:	<ul style="list-style-type: none"> • The meeting/ceremony closed at about 12:00pm.

**COMMUNITY SENSITIZATION MEETING HELD AT IRE VILLAGE CENTRE
ON TUESDAY FEBRUARY 6, 2017**

ITEMS	DESCRIPTION
1. Project:	Anambra State NEWMAP: ESMP/ARAP
2. Name of Community:	Ire Village, Obosi
3. Date:	February, 06, 2017
4. Language of Communication:	English and Igbo
5. Protocols and Introductions:	<ul style="list-style-type: none"> • The sensitization activities started with a courtesy call on the traditional ruler of Obosi, HRH Igwe Chidubem Iweka III who being unavoidably absent, was ably represented by Chief Shedrack Okenwa—the palace administrative secretary and Mr. Nnamdi Nkemena – the personal assistant to HRH. The team was welcomed by the palace and was promised all necessary support from the community. • The meeting with Ire village members and started at about 12: noon at the village central square. The meeting was attended by a large delegation of the SPMU led by the communications officer (CO) – Mr. Emeka Achebe. The consultant firm, OTG Enviroengineering Ltd was led by the principal consultant – Dr. Odili Ojukwu. The focal NGO, Crimc/Acerden was led by Prof. Peter Nnabude. • The attendees were welcomed by the Ire Village Head-Diokpa Alex Obi, supported by the Ogbueshis (elders aged 80 years and above). Kolanut ceremonies were observed as per the custom of the community. Thereafter the CO who anchored the meeting introduced OTG the consultant firm for the ESMP/ARAP.
6. Remarks of the SPMU:	<ul style="list-style-type: none"> • Mr Emeka Achebe—the communication officer (CO), Mrs Blessing Okafor– the social and livelihood officer–(SLO), and Mr Ejike Onuchukwu—the environment safeguard officer (ESO) spoke on behalf of the SPMU. • The CO reminded the attendees that the current ESMP and ARAP consultancy is the second in Obosi after the successful completion of the first one in Ugamuma village. The SPMU is expecting the support and cooperation of an appreciative community in the on-going exercise. • The SLO stressed the need for massive turn-out in the census of the PAPs and the need for honesty in completing the census form. He urged vulnerable members of the community who might be affected psychologically to come out and be documented. • The ESO in his own remarks stressed the point that there will be no compensation for erosion related losses suffered before the civil

	<p>works and bio-remediation begin. Also lands ravaged by gullies and lands used for stabilization of drainage walls and bio-remediation will revert to communal ownership. Such lands can no longer be claimed by any individual or group.</p>
<p>7. Remarks of the Principal Consultant:</p>	<ul style="list-style-type: none"> • Dr. Odili Ojukwu, the principal consultant at OTG spoke on behalf of the consultants. He first introduced the team of specialists and other support staff from OTG. • He informed the attendees that it was the challenges of the gully erosion corridor from the flyover on Onitsha-Enugu Express Way to Idemili stream, with its consequent displacements of homesteads, businesses, farmlands and other assets that precipitated the meeting. • The ravaging impacts of the gully erosion will be dealt with by the state government under the NEWMAP, with funding assistance from the World Bank. • The engineering design for the civil works has been completed. The ESMP/RAP consultancy is aimed at finding out and documenting the impacts of the proposed civil engineering works on the elements of the bio-physical and socio-economic environment of the gully corridor, and to recommend appropriate remediation and compensation packages in line with the World Bank social safeguard policies. • The gully control measures will be both structural and non-structural. The structural component would involve concrete drainages or gully walls. The gully walls will require some meters of land along each side of the gully edge as easement for the stabilization of the walls, particularly at the deep sections of the gully corridor. People's land and assets and other elements of the physical environment are therefore most likely to be affected during construction at the sites. • The structural measures will be complemented with land reclamation and bio-remediation which will involve planting trees and grasses along the corridor. This way, the long term sustainability of the control measures is assured. • All lands acquired for the purpose of control measures will revert to community ownership and cannot be claimed by any individual or group. • A seven-day census/documentation of PAPs would start on Tuesday February 7 and end on Monday 13 February. No documentation after the cut-of-date. The census will involve both residents, non-residents and every other person who may be affected by the remedial measures. This also includes those who

	<p>would be affected psychologically and health-wise owing to the effects of noise, fugitive dusts and other pollutants during the construction activities.</p> <ul style="list-style-type: none"> • The community was further advised to take full ownership of their environment and all aspects of the implementation activities. They should participate in all the implementation processes, and avoid unnecessary conflicts and disaffections. • The communities were advised to be honest and truthful in completing the census questionnaire form as all claims will be verified physically and with appropriate technology. • A focus group discussion for elders, women and youths in the community would be held in due course to ascertain their specific perspectives and perceptions about the project. • Those who had suffered losses in the past prior to the project intervention would not be considered for compensation. They may therefore not bother to show up for the census exercise. Only those who are likely to be affected by the proposed civil engineering and bio-remediation works should participate in the exercise.
8. Remarks of the Focal NGO:	<ul style="list-style-type: none"> • Prof Peter Nnabude and Mrs. Jane Okonkwo spoke on behalf of CRIMSSI/ACERDEN – the focal NGO. • The NGO would ensure that the community gets all benefits derivable from the project. • The attendees were advised to stop stuffing the existing drainages with waste materials and desist from all forms of environmental abuse. • With the advice and guidance of the NGO a site committee under the chairmanship of Mr. Dulue Emekekwe was elected by the community members present.
9. Questions/Concerns of the Community:	<ul style="list-style-type: none"> • In response to the remarks above, the attendees asked two questions: • Would the project fix community roads affected by the gully corridor? • What of those not yet affected by the gullies, but who are under the threat of being affected?
10. Responses to the Questions and Concern:	<ul style="list-style-type: none"> • The intervention work will be as per the engineering design already completed. It is expected that the design would take care of connecting culverts affected by the gully. • All these who feel threatened by the gully corridor are advised to avail themselves of the census exercise and be properly documented.
11. Community Perceptions about the Project:	<ul style="list-style-type: none"> • The project intervention is a welcome development. Speaking on behalf of the community, the village head (Diokpa) thanked the delegations for their remarks and explanations and promised that issues of PAPs will not derail or slow down implementation

	activities including civil works.
12. Vote of Thanks/Closing:	<ul style="list-style-type: none">• A formal vote of thanks was moved by Ogbueshi Mbidebe Enweluzo. The meeting closed with prayers at about 1:00pm.
13. Attendees:	<ul style="list-style-type: none">• The meeting was attended by 100 persons including 36 females and 74 males.

FEMINAL

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT (NEWMAP)
 COMMUNITY STAKEHOLDERS' MEETING WITH THE ANAMBRA SPMU AND THE
 ESMP & ARAP CONSULTANTOTG ENVIROENGINEERING NIG. LTD

COMMUNITY Ire Obosi FEBRUARY 06/02, 2017

ATTENDANCE SHEET

NO	NAME	GENDER	COMMUNITY/VILLAGE/ ORGANIZATION	PHONE NUMBER	SIGNATURE
1	Ndubuisi Dnochie	M	Ire Obosi	09035930147	<i>[Signature]</i>
2	Clement Mgbakogu	M	Ire Obosi	08033080498	<i>[Signature]</i>
3	Paul Ofor	M	Ire Obosi	0805923513	P.R.K
4	Nkiri Obi	F	Ire	09030346694	<i>[Signature]</i>
5	Ekwemaka Maduabuchi	F	Ire	0814960935	<i>[Signature]</i>
6	Ikechukwu Ikebuife	M	Ire	NIL	E.K
7	Nwojem Nubem	M	Ire	08067273323	<i>[Signature]</i>
8	Ndubuisi Iheanigbo	M	Ire	08136704692	<i>[Signature]</i>
9	Oforah Afamerefung	M	Ire	08026852197	<i>[Signature]</i>
10	Udoka Nwoosa	M	Ire	08061205275	<i>[Signature]</i>
11	Doli Chukwukelu	F	Ire	NIL	<i>[Signature]</i>
12	Onaka Ikebuife	M	Ire	08063657166	<i>[Signature]</i>
13	Theresa Chukwura	F	Ire	080229165321	T.N.C.
14	Chukwunonye Onwukwe	F	Ire	08108398873	<i>[Signature]</i>
15	Anneke Onwukwe	F	Ire	07017638930	<i>[Signature]</i>
16	Juliana Onwukwe	F	Ire	07060270099	J.O
17	Mary Ikebuiki	F	Ire	09033348215	<i>[Signature]</i>
18	Agnes Ebukasi	F	Ire		<i>[Signature]</i>

NO	NAME	GENDER	COMMUNITY/VILLAGE/ ORGANIZATION	PHONE NUMBER	SIGNATURE
0	Elizabeth Chukwunonye	F	Ire	08165261038	
1	Edwin Edwin	M	Ire	07035011457	
2	Ndubuisi Okafor	M	Ire	08109976781	
3	Nonso Nnebo	M	Ire	0810130104	
4	Chukwadi J. Nkemelu	M	Ire	08036488274	
5	Chukwunonye Ebene	M	Ire	08133982292	
6	Ikeme Chukwuka	M	Ire	07038024886	
7	Samuel Ebuzeme	M	Ire	09066157240	
8	Ifechukwu Ebbokosi	M	Ire	08173441966	
9	Ipeanyi Ofordile	M	Ire	N/A	
10	Orji Enochukwu	M	Ire	08076738370	
11	Ikpendu Anaeimika	M	Ire	08067827037	
12	Chaise Ofor	M	Ire	0803506820	
13	Ifeanyi Nidefo	M	na-	09093623380	
14	Ammanuel Ibeagwu	M	Ire	08063710952	
15	Ikemife A.	M	Ire	08033850038	
16	Obijesiri Anometha	M	Ire	08100634642	
17	Ikemife Chaise	M	Ire	07060170397	
18	Bene Odeh	F	Ire	0806070397	
19	Chukwadi Olesgbur	M	Ire	08062907562	
20	Ifeanyi Okegbo	M	Ire	08062907562	
21	Ikeme Nimeke	M	Ire	0809373623	
22	Chukwadi Inyang	M	Ire	07037080859	
23	Ikeme Anaeimika	M	Ire	08036743411	

no	NAME	GENDER	COMMUNITY/VILLAGE/ ORGANIZATION	PHONE NUMBER	SIGNATURE
4	Uwa Amanghwe	f	Ire	08103664201	
5	Mrs. Odoefor U.	f	Ire	0803349302	
6	Mr. Ebele Okeke	m	Ire	08162191836	
7	Sp4 Sumner Eburaku	m	Ire	08034640326	
8	Jekwu Oshia	m	Ire	07036382388	
9	Onyebuchi Kpasuwa	m	Ire	08030231333	
10	Dulue Inekokwe	m	Ire	08033038949	
11	Chinedu Emadi	m	Ire	08037837726	
12	Onwite Okeke	m	Ire	NIL	
13	Adunni Charles Odi	m	Ire	NIL	
14	Chiesin Anjaneti C.	f	Ire	07069183802	
15	Chibuzor Uzomue	m	Ire	08033924596	
16	Fahimfa Michael	m	Ire	08180484620	
17	Abjanneti Ik Engr.	m	Ire	08037587819	
18	Okwesi Masdu U.	m	Ire		
19	Okwesi Goodwin A.	m	Ire	08034087322	
20	Okwesi Mideke Enzor	m	Ire	08037832246	
1	Keazor Christian	m	Ire	07037202929	
2	Eugene Chi	m	Ire	NIL	
3	Chel Mmegbo	m	Ire	NIL	
4	Nnaso Chigothu	m	Ire	08034792248	
5	Nnaso Nwagwu	m	Ire	07037521447	
6	Nwasiolu Ukeas	m	Ire	08032992937	
7	Dr. Chyele Eburaku	f	Ire	08064420177	

ID	NAME	GENDER	COMMUNITY/VILLAGE/ ORGANIZATION	PHONE NUMBER	SIGNATURE
1	Klghastsony Ibeanji	m	Ire Village	08037588912	
2	Benjamin Okeke	m	Ire Village	08038758853	
3	Flukosia Raphael N.	m	Ire Village	08061336925	
4	DREKE EBEKE	m	Ire Village	08083468889	
5	Okeke Chinye	f	Ire	08134210699	
6	Chi Nwaeze Otuoma Otuoma	f	Ire	08063116011	
7	Amaka Obodasofura	f	Ire	08063116011	
8	Umarah Nwabuisi	w	Ire	07086904833	
9	Isaac Iheagha	m	Ire Village	08063116011	
10	Chimsi Eshue	f	Ire	07082477890	
11	Umarah Kaku	f	Ire	08006666024	
12	Tachibawa Kaku	m	Ire	07062477000	
13	Osinschi Nwashi	m	Ire	09023711300	
14	Benedikte Nwashi	f	Ire	08060097494	
15	Chidinma Ofor	f	Ire		
16	Uche Anirpe	f	Ire Village	08162072771	
17	O'Nwachukwu Nnamdi	f	OTG	08068947894	
18	Nwagwu Stanley C.	m	OTG	07066662090	
19	Chimusa ROSEMARY A	f	OTG Ire Village	07035810359	
20	Umesakafe A. Chudo	f	OTG	08087739675	
21	Chikae Chikwemba	m	OTG	08183830308	
22	Ilesanmi Vincent U	m	OTG	08042006669	
23	Chidi Mojellon	m	OTG	08023302930	

Id	NAME	GENDER	COMMUNITY/VILLAGE/ ORGANIZATION	PHONE NUMBER	SIGNATURE
1	Okonjesike Henry	M	NEW MAP	08063731032	
2	Amanaka Ephraim C.	M	SFGSD	08037303368	
3	Anzodo Humphrey	M	NEW MAP	08074254537	
4	Ndubuisi Isidore J.	M	ANS-FALGO	08086501408	
5	Chief, Chibichael A	F	ANS-NEW MAP	08063726686	
6	Obi, Ojima	F	ANS-NEW MAP	08067756728	
7	Efosa Blessing C.	F	ANS-NEW MAP	08037350764	
8	Okora, Sophia M.	F	ANS-NEW MAP	08086905581	
9	ANUGANI, CHITOMA WILLIAM	F	ANS-NEW MAP	08032524662	
10	CHONWUO JANE	F	ANS-FALGO	08067559257	
11	Shabude Itanyi	M	ANS-FALGO	0703736360	
12	Emeka Achewe	M	ANS-NEW MAP	08034300369	
13	Onu Chukwuebuka A.	M	ANS-NEW MAP	08039533877	
14	Chukwuka ETKEME ROBERT M	M	ANS-NEW MAP	08067594206	
15	Aiboh, Gwanka Felekan	M	ANS-NEW MAP	08033592169	
16	Peter C. Nwabude (Prop)	M	CRM/RESUM/ANS(FALGO)	07053128992	
17	Dr. Chinyelu Chikozie	F	NEW MAP / FALGO	08064490177	

REPORTS OF THE FOCUS GROUP DISCUSSIONS (FGD)

ITEMS	DESCRIPTION
1. Project:	Anambra NEWMAP: ESMP/RAP
2. Title	Women Focus Group Discussion (FGD)
3. Community:	Ire - Obosi
4. Date:	February 21, 2017.
5. Language of Communication:	English and Igbo
6. Introductions:	<ul style="list-style-type: none"> The meeting started at about 11:am. The venue was the open space at No. 3 Chief Emeka Anyaoku Street. The meeting was a follow-up to the general community sensitization exercise held at the central village square on February 6, 2017.
7. Remarks of the Consultant:	<ul style="list-style-type: none"> The consultant firm-OTG Enviroengineering Ltd, was represented by Mr. Chudi Mojekwu- the social development specialist. He explained to the attendees that the proposed remedial works on the gully erosion corridors are likely to have adverse impacts on the elements of the physical environment and socio-economic lives of the community. There is therefore the need to recommend appropriate mitigation and compensatory measures to deal with these impacts; and this is the main purpose of the ESMP/RAP consultancy. Women-specific perspectives to the study and their perception about the project are considered important. Hence the need for the meeting. He mentioned the following likely adverse impacts and the corresponding mitigation measures for the knowledge and benefit of the attendees. <ul style="list-style-type: none"> Dusts: Spray water to limit dusts Lost of topsoil and vegetation: Limit work areas and operation vehicle movement routes. Noise: By retrofitting vehicles with sound-proofing materials. Soil/ground water contamination: By creating limit zones and limiting excavation to desired areas. Traffic disruptions: There will be changes in lanes configuration, and creation/limiting of operational routes. Disruptions to livelihood: Identify and provide best alternatives to prevent disruptions. Pay compensations as the need arises. Sexual risks (HIV/AIDs): Provide sexual awareness campaigns.
8. Remarks of the Women:	<ul style="list-style-type: none"> The remarks of the women centred on four issues, namely, assets they have along the gully corridors, the impacts of the gully erosion on their lives, the expected benefits on completion of the remedial works and the roles they intend to play during the remedial works. <p>Assets along the gully corridor: The distribution of the attendees by ownership of assets along the gully corridor is as follows: Built –up structures -6, farm crops and economics trees -3 and land -3.</p> <p>Impacts of the erosion: The women mentioned the following among the impacts of erosion on their lives.</p> <ul style="list-style-type: none"> - Flooding and displacements of homesteads. - Destruction/loss of farmlands

	<p>Expected benefits from remedial works: These include:</p> <ul style="list-style-type: none"> - Peace of minds; - Restoration of homesteads and farmlands; - Increased life expectancy. <p>Expected roles: During the remedial works, the women would:</p> <ul style="list-style-type: none"> - Monitor implementation progress and give feed-back; - Explore income opportunities through sales of food and sundry items; - Supply their labour (skilled and unskilled); - Help to ensure peace and security.
9. Perceptions of the Project and Questions:	<ul style="list-style-type: none"> • The women are well pleased with the prospect of the project being implemented soon. They pledged their support, prayers and cooperation. They posed two questions: <ul style="list-style-type: none"> - Will there be compensation for destroyed livelihoods? - What happens to these suffered losses in the past?
10. Response of the Consultant:	<ul style="list-style-type: none"> • Yes, there will be reasonable compensation for those whose lives, assets and livelihoods would be affected adversely by the remedial works; provided they were documented during the census exercise. The World Bank social safeguard policies will apply. • Those who had suffered losses in the past owing to the erosion are not scheduled for compensation. Only those that would be affected by the proposed remedial works as per the engineering design would be compensated.
11. Attendees:	<ul style="list-style-type: none"> • The meeting was attended by 23 women including the elderly, traders, public servants and artisans.
12. Closing:	<ul style="list-style-type: none"> • The meeting rose at about 12:30pm.

ITEMS	DESCRIPTION
1. Project:	Anambra Newmap: ESMP/RAP
2. Title	Elders Focus Group Discussion (FGD)
3. Community:	Ire – Obosi
4. Date:	February 21, 2017.
5. Language of Communication:	Igbo and English
6. Introductions:	<ul style="list-style-type: none"> • The meeting is a follow-up to the general community sensitization held on February 6, 2017. This venue was the open space at No. 3 Chief Emeka Anyaoku Street Ire – Obosi.
7. Remarks of the Consultant:	<ul style="list-style-type: none"> • The consultant firm-OTG Enviroengineering Ltd, was represented by Mr. Chudi Mojekwu- the social development specialist. • He explained to the attendees that the proposed remedial works on the gully erosion corridors are likely to have adverse impacts on the elements of the physical environment and socio-economic lives of the community. There is therefore the need to recommend appropriate mitigation and compensatory measures to deal with these impacts; and this is the main purpose of the ESMP/RAP consultancy. • Elders-specific perspectives to the study and their perception about the project are considered important. Hence the need for the meeting. • He mentioned the following likely adverse impacts and the corresponding mitigation measures for the knowledge and benefit of the attendees. <ul style="list-style-type: none"> • Dusts: Spray water to limit dusts • Lost of topsoil and vegetation: Limit work areas and operation vehicle movement routes. • Noise: By retrofitting vehicles with sound-proofing materials. • Soil/ground water contamination: By creating limit zones and limiting excavation to desired areas. • Traffic disruptions: There will be changes in lanes configuration, and creation/limiting of operational routes. • Disruptions to livelihood: Identify and provide best alternatives to prevent disruptions. Pay compensations as the need arises. • Sexual risks (HIV/AIDs): Provide sexual awareness campaigns.
8. Remarks of the Elders:	<ul style="list-style-type: none"> • The remarks of the elders are summarized as follows: <p>Ownership of assets along the gully corridor: The distribution of the elders by the assets they have along the gully corridor is as follows: built- up structures – 5, land – 8 and farm crops and economic trees – 6.</p> <p>Impacts of the erosion: The following are the key impacts of the erosion on their lives and livelihoods.</p> <ul style="list-style-type: none"> - Restricted commuting and interaction; - Destruction and displacements of ancestral shrines; - Destruction and displacements of homesteads; - Forced relocation from ancestral homes; - Emotional distress; - Disruption of school attendance by children; - Restriction of housing developments; <p>Expected benefits from remedial works: These include:</p>

	<ul style="list-style-type: none"> - Emotional distress; - Displacement of homesteads and businesses; - Mosquito infestation/illnesses; - Traffic disruptions and restricted commuting. <p>Expected benefits: On completion of the remedial works, the elders expect:</p> <ul style="list-style-type: none"> - Peace of mind and improved quality of life; - Increased life expectancy; - Increased interaction and relationships among indigenes and residents; - Restoration of the sacredness of the village shrines; - Increased pace of development. <p>Roles during remedial works:</p> <ul style="list-style-type: none"> - Ensuring peace and security of lives and property; - Monitor and evaluating implementation progress; - Ensure implementation of sound environmental laws and practices.
9. Perceptions of the Project and Questions:	<ul style="list-style-type: none"> • The elders are anxious to see remedial works start soon. They pledged on behalf of the community to make start necessary sacrifices so that work will start without further delay. They promised that the issue of compensation will not be stumbling- block on the part of the community. They posed two questions. - When will remedial work start? - Is there any special expectation from the community?
10. Response of the Consultants:	<ul style="list-style-type: none"> • Work will start as soon as the ESMP/RAP report is completed, approved and implemented. And this will not take long going by the current pace of implementation. Undue delay is not expected. • There is no special expectation from the community. All the community need to do is to support and cooperate with the implementation actors including the SPMU, consultants and other service providers. More importantly, the community should take ownership of their environment and the project and participate actively and constructively in the implementation activities.
11. Attendees:	<ul style="list-style-type: none"> • The meeting was attended by 30 elders – mainly the Ogbuehis (80 years and above) led by the village head (Diokpa) Ogbueshi Alex Obi.
12. Vote of Thanks and Closing:	<ul style="list-style-type: none"> • Vote of thanks was moved by Ogbueshi Goddy Ichu – Omenife Obosi. The meeting rose at about 2:00om.

ITEMS	DESCRIPTION
1. Project:	Anambra Newmap: ESMP/RAP
2. Title:	Youths Focus Group Discussion (FGD)
3. Community:	Ire – Obosi
4. Date:	February 21, 2017
5. Language of Communication:	English and Igbo
6. Introductions:	<ul style="list-style-type: none"> The meeting started at about 2.00pm at the open space of No. 3 Chief Emeka Anyaoku Street Ire- Obosi. Like the other FGDs, it was a follow-up to the general community sensitization held on February 06, 2017.
7. Remarks of the Consultants:	<ul style="list-style-type: none"> The consultant firm-OTG Enviroengineering Ltd, was represented by Mr. Chudi Mojekwu- the social development specialist. He explained to the attendees that the proposed remedial works on the gully erosion corridors are likely to have adverse impacts on the elements of the physical environment and socio-economic lives of the community. There is therefore the need to recommend appropriate mitigation and compensatory measures to deal with these impacts; and this is the main purpose of the ESMP/RAP consultancy. Youths-specific perspectives to the study and their perception about the project are considered important. Hence the need for the meeting. He mentioned the following likely adverse impacts and the corresponding mitigation measures for the knowledge and benefit of the attendees. <ul style="list-style-type: none"> Dusts: Spray water to limit dusts Lost of topsoil and vegetation: Limit work areas and operation vehicle movement routes. Noise: By retrofitting vehicles with sound-proofing materials. Soil/ground water contamination: By creating limit zones and limiting excavation to desired areas. Traffic disruptions: There will be changes in lanes configuration, and creation/limiting of operational routes. Disruptions to livelihood: Identify and provide best alternatives to prevent disruptions. Pay compensations as the need arises. Sexual risks (HIV/AIDs): Provide sexual awareness campaigns.
8. Remarks of the Youths:	<ul style="list-style-type: none"> The remarks of the attendees are summarized below: Ownership of assets along the gully corridor: the distribution of the youths by the types of assets they have along the gully corridor is as follows: Built-up structures -10, land – 8 and farm crop and economic trees -3. Impacts of the erosion: The following impacts were mentioned by the youths. <ul style="list-style-type: none"> - Emotional distress; - Displacement of homesteads and ancestral graves; - Restricted commuting and interactions in the community; - Crashes into the gully leading to incidents of death. Examples is late Mrs Josephine Molokwu. Expected benefits on completion of remedial works: On completion of

	<p>remedial works, the following benefits are expected.</p> <ul style="list-style-type: none"> - Improved quality of life; - Increased community and interactions in the commuting; - Increased life expectancy. - Sanctity of ancestral graves and artefacts. <p>Roles during remedial works:</p> <ul style="list-style-type: none"> - Supply of both skilled and unskilled labour; - Supply of construction materials; - Protection of lives and property; - Implementation monitoring and feedback.
9. Perception about the Project and Questions:	<ul style="list-style-type: none"> • The youths are well disposed to the project. They are looking forward to a beneficial project, the implementation of which will get their full support and active participation. They had one question only. When would remedial work commence?
10. Response of the Consultant:	<ul style="list-style-type: none"> • The consultant while appreciating their pledge of support for the project explained to them that remedial works would commence as soon ESMP/RAP report is completed, approved and delivered. Undue delay is not expected.
11. Attendees:	<ul style="list-style-type: none"> • 33 youths attended the meeting. Some of the key attendees were Nwabu Oguejiofor – Chair of Nwobodo Ire –Youths, Mr. A.C. Ikebuife – Chair of Ogbeozara Ire – Youths and Mr. Dulue Emekekwe- the site committee chairman.
12. Closing:	<ul style="list-style-type: none"> • The meeting closed at about 3:00pm.



Fig.4-1: ANS-NEWMAP & Consultant Teams' Visit to HRH Igwe Iweka, Igwe of Obosi (Palace Secretary Addressing the Group)



Fig. 4-2: Visit to HRH Igwelweka, Igwe of Obosi at the Igwe's Palace Palace Secretary Addressing the Group)



Fig. 4-3: Consultation Meeting at Igwe Iweka' Palace



Fig. 4-4: Consultation Meeting at Ire Square February 6, 2017





WOMEN FOCUSED GROUP DISCUSSIONS IN PHOTOS



ELDERS FOCUSED GROUP DISCUSSIONS IN PHOTOS



YOUTH FOCUSED GROUP DISCUSSIONS IN PHOTOS

ANNEX 7: COMPLETE LISTING OF DOMINANT PLANT SPECIES OBSERVED AT THE PROJECT AREAS

Listing of Plant Species in the Project Area

S/No	Species	Family	Life Form	Local/ Common Name
1	<i>Sidastipulate</i>	Malvaceae	Herb	Eshioku
2	<i>Acacia ataxacantha</i>	Fabaceae	Herb	Flame thorn
3	<i>Ficusexasperate</i>	Moraceae	Tree	Ogbu/fig tree
4	<i>Newbouldialeavis</i>	Bignoniaceae	Tree	Ogrisi/ boundary tree
5	<i>Alchorneacordifolia</i>	Euphorbiaceae	Shrub	Christmas bush -/osokpo
6	<i>Brachiariadeflexa</i>	Poaceae	Herb	Signal grass
7	<i>Cynodondactylon</i>	Poaceae	Herb	Bermuda grass
8	<i>Sporoboluspyramidalis</i>	Poaceae	Herb	Cat's tail grass
9	<i>Ficuscapensis</i>	Moraceae	Tree	Ugbor
10	<i>Canariumschweinfurthii</i>	Burseraceae	Tree	Ubengba
11	<i>Albizziazygia</i>	Fabaceae	Tree	Ngwu
12	<i>Bombaxbuonopozense</i>	Bombacaceae	Tree	Silk cotton tree
13	<i>Gmelinaarborea</i>	Verbenaceae	Tree	Gmelina
14	<i>Rauvolfiavomitoria</i>	Apocynaceae	Shrub	Osisicatapult/akanta
15	<i>Centrosemaspp</i>	Fabaceae	Herb	EfiaObubu /Butterfly pea
16	<i>Spigeliaanthelmia</i>	Loganiaceae	Herb	Worm grass
17	<i>Chromoleanaodorata</i>	Asteraceae	Herb	Awolowo/ siam weed
18	<i>Setariabarbatia</i>	Poaceae	Herb	Bristle grass
19	<i>Persea Americana</i>	Lauvaceae	Tree	Avocado

S/No	Species	Family	Life Form	Local/ Common Name
20	<i>Pterocarpusmilbraedii</i>	Fabaceae	Tree	Oha
21	<i>Amaranthusspinosus</i>	Amaranthaceae	Herb	Prickly green/ ininendimuo
22	<i>Zorniaaglochidiata</i>	Fabaceae	Herb	Kitra
23	<i>Phyllanthusamarus</i>	Euphorbiaceae	Herb	Obukoieyeke
24	<i>Cyperusesculentus</i>	Cyperaceae	Herb	Tiger nutsedge
25	<i>Elusineindica</i>	Poaceae	Herb	Goose grass
26	<i>Morindalucida</i>	Rubiaceae	Herb	Eze-ogu/njisi
27	<i>Moringaoleifera</i>	Moringaceae	Shrub	Moringa
28	<i>Ipomeaeriocarpa</i>	Convulvulaceae	Herb	Morning glory
29	<i>Maytenussenegalensis</i>	Celastraceae	Tree	Spike thorn
30	<i>Dacryodesedulis</i>	Burseraceae	Tree	Pear/Ube Igbo
31	<i>Azadiracthaindica</i>	Meliaceae	Tree	Neem/ dogoyaro
32	<i>Mangiferaindica</i>	Anacardiaceae	Tree	Mango
33	<i>Euphorbia hirta</i>	Euphorbiaceae	Herb	Asthma weed
34	<i>Aspiliabussei</i>	Asteraceae	Herb	Hemorrhage plant
35	<i>Irvingiawombulu</i>	Irvingiaceae	Tree	Ogbono/ ugiri
36	<i>Berliniagrandiflora</i>	Fabaceae	Tree	Ebiara
37	<i>Anthocleistadjalonensis</i>	Loganiaceae	Tree	Forest fever/okpokolo
38	<i>Pseudospondiasmicrocarpa</i>	Anacardiaceae	Tree	African grape
39	<i>Euphorbia leucodendron</i>	Euphorbiaceae	Tree	Cat tail plant
40	<i>Picralimanitida</i>	Apocynaceae	Tree	Osiigwe

S/No	Species	Family	Life Form	Local/ Common Name
41.	<i>Spondiamombin</i>	Anacardiaceae	Tree	Hog plum/ngulungwu
42.	<i>Napoleonavogelii</i>	Lecythidaceae	Shrub	Nkpoda/NnekeleOchenwayi
43.	<i>Dioscoreaspp</i>	Dioscoreaceae	Herb	Yam
44.	<i>Costusafer</i>	Zingiberaceae	Herb	Ginger lily
45	<i>Cassia obtusifolia</i>	Fabaceae	Herb	Sickle pod
46	<i>Klaninedoxagabonensis</i>	Irvingiaceae	Tree	NIL
47	<i>Voacanga Africana</i>	Apocynaceae	Tree	Vocanga
48	<i>Ricinodendronheudelotii</i>	Euphorbiaceae	Tree	African wood oil nut
49	<i>Vitexdoniana</i>	Verbenaceae	Tree	Black plum
50	<i>Ocimumgratissimum</i>	Lamiaceae	Herb	Scent leaf/nchianwu
51	<i>Bambusa vulgaris</i>	Poaceae	Shrub	Bamboo

Source: OTG Field Survey

**ANNEX 8: LABORATORY ANALYTICAL RESULTS OF SOIL, WATER AND AIR SAMPLES
IRE OBOSI SAMPLES ANALYSIS**

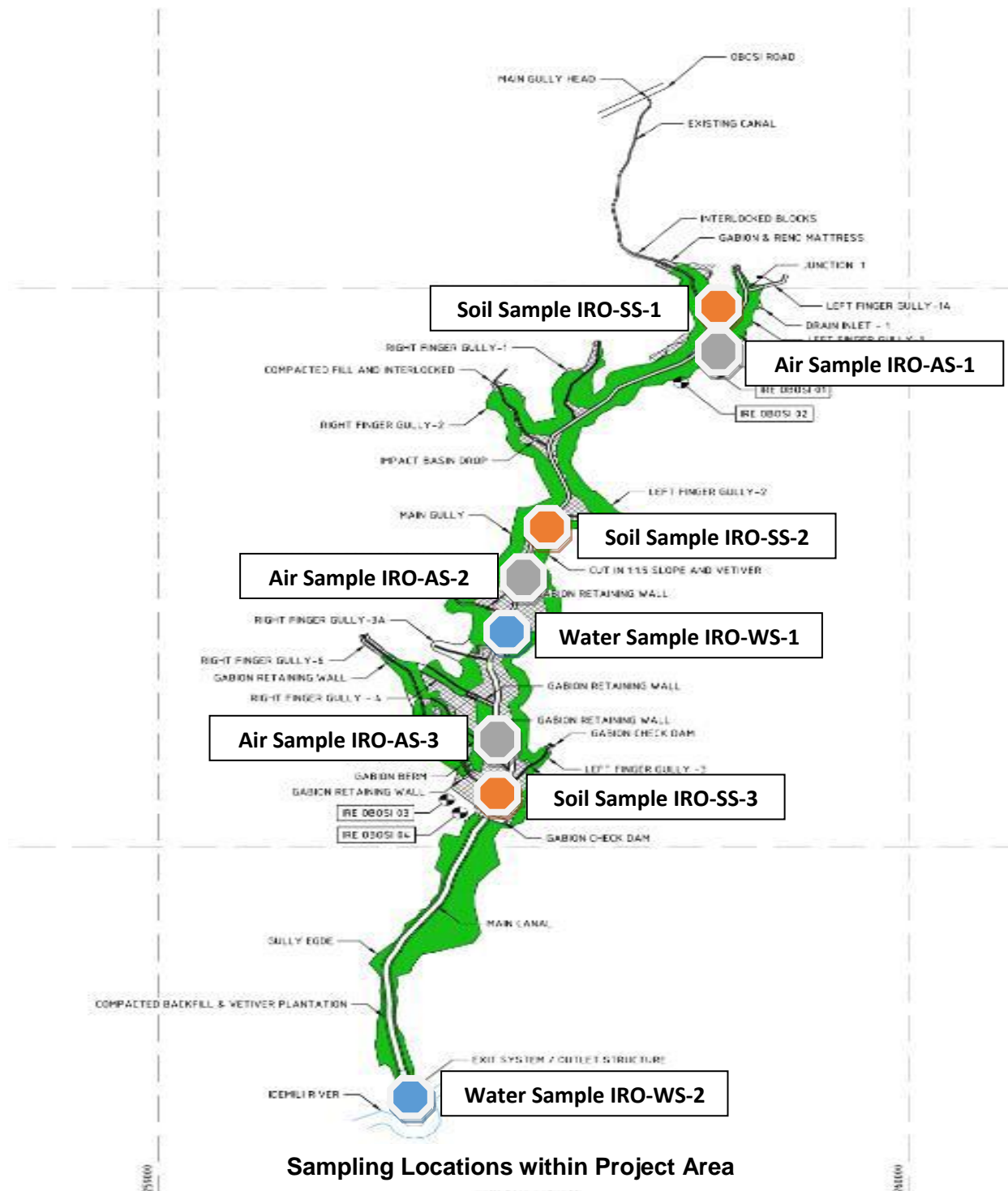


Table 3.4: Analytical Results of Soil Samples Collected at Location IRO – GHS 1 : N06⁰ 06'42.7" and E006⁰49'47.2" Elevation 285.6fts.

S/N	Parameters	Units	Sample Results	FMENV/ NESREA	METHOD
1	pH (KCl)	-	4.5		pH meter
2	pH (10% solution @ 25°C	-	5.6	6.5-9	pH meter
3	Nitrate	mg/kg	0.342	-	ASTM
4	Moisture	%	0.860	-	ASTM
5	Electrical conductivity	µS/Cm	4.00	-	Conductivity meter
6	Soil Colour	-	Brownish Soil	-	Visual Inspection
7	Potassium (K ⁺)	Meq/100g	0.101	-	ASTM
8	Magnesium(Mg ²⁺)	Meq/100g	0.264	-	ASTM
9	Calcium (Ca ²⁺)	Meq/100g	0.328	-	ASTM
10	Sodium (Na ⁺)	Meq/100g	0.133	-	ASTM
11	Available Phosphorus	mg/l	13.86	5	ASTM
12	Organic Matter	%	1.276	-	ASTM
13	Total Nitrogen	%	0.098	-	ASTM
14	Organic Carbon	%	0.740	-	ASTM
15	Iron (Fe ²⁺)	mg/kg	2.770	0.03	ASTM
16	Lead (Pb ²⁺)	mg/kg	0.196	164	ASTM
17	Copper (Cu ²⁺)	mg/kg	0.420	100	ASTM
18	Zinc(Zn ²⁺)	mg/kg	1.406		ASTM
19	Grain Size Distribution (Coarse Sand)	%	52.00		ASTM
20	Grain Size Distribution (Clay)	%	14.00		ASTM
21	Grain Size Distribution (Silt)	%	5.00		ASTM
22	Grain Size Distribution (Fine Sand)	%	29.00		ASTM
23	Textural Class		Sandy Loam		Visual Inspection

µS/Cm = MicroSiemens per centimeter; NS = Not Specified.; mMol/L = millimole per litre
meq/100g= milliequivalent per 100g.

Table 3.5: Analytical Results of Soil Samples Collected at Location IRO- MDS: N06⁰ 06'20.2'' and E006⁰49'41.7'' Elevation 208.4fts

S/N	Parameters	Units	Sample Results	FMENV/ NESREA	METHOD
1	pH (KCl)	Units	4.1		pH meter
2	pH (10% solution @ 25°C)	-	4.9	6.5-9	pH meter
3	Nitrate	mg/kg	0.309	-	ASTM
4	Moisture	%	2.80	-	ASTM
5	Electrical conductivity	µS/Cm	2.0	-	Conductivity meter
6	Soil Colour	-	Brownish Soil	-	Visual Inspection
7	Potassium (K ⁺)	Meq/100g	0.093	-	AST
8	Magnesium(Mg ²⁺)	Meq/100g	0.324	-	ASTM
9	Calcium (Ca ²⁺)	Meq/100g	0.429	-	ASTM
10	Sodium (Na ⁺)	Meq/100g	0.138	-	ASTM
11	Available Phosphorus	mg/l	14.27	5	ASTM
12	Organic Matter	%	1.965	-	ASTM
13	Total Nitrogen	%	0.077	-	ASTM
14	Organic Carbon	%	1.140	-	ASTM
15	Iron (Fe ²⁺)	mg/kg	3.387	0.03	ASTM
16	Lead (Pb ²⁺)	mg/kg	0.138	164	ASTM
17	Copper (Cu ²⁺)	mg/kg	0.443	100	ASTM
18	Zinc(Zn ²⁺)	mg/kg	1.276		ASTM
19	Grain Size Distribution (Coarse Sand)	%	61.00		ASTM
20	Grain Size Distribution (Clay)	%	8.00		ASTM
21	Grain Size Distribution (Silt)	%	5.00		ASTM
22	Grain Size Distribution (Fine Sand)	%	26.00		ASTM
23	Textural Class		Loamy Sand		Visual Inspection

Table 3.6: Analytical Results of Soil Samples Collected at Location IRO-FOS N06⁰ 05'59.7'' and E006⁰49'44.0'' Elevation 112.7fts

S/N	Parameters	Units	Sample Results	FMENV/ NESREA	METHOD
1	pH (KCl)		4.3		pH meter
2	pH (10% solution @ 25°C)		6.8	6.5-9	pH meter
3	Nitrate	mg/kg	0.316	-	ASTM
4	Moisture	%	6.06	-	ASTM
5	Electrical conductivity	µS/Cm	2.00	-	Conductivity meter
6	Soil Colour	-	Whitish Soil	-	Visual Inspection
7	Potassium (K ⁺)	Meq/100g	0.086	-	AST
8	Magnesium(Mg ²⁺)	Meq/100g	0.318	-	ASTM
9	Calcium (Ca ²⁺)	Meq/100g	0.429	-	ASTM
10	Sodium (Na ⁺)	Meq/100g	0.139	-	ASTM
11	Available Phosphorus	mg/l	13.64	5	ASTM
12	Organic Matter	%	1.429	-	ASTM
13	Nitrogen	%	0.063	-	ASTM
14	Organic Carbon	%	0.829	-	ASTM
15	Iron (Fe ²⁺)	mg/kg	3.710	0.03	ASTM
16	Lead (Pb ²⁺)	mg/kg	0.116	164	ASTM
17	Copper (Cu ²⁺)	mg/kg	0.370	100	ASTM
18	Zinc(Zn ²⁺)	mg/kg	1.547		ASTM
19	Grain Size Distribution (Coarse Sand)	%	65.00		ASTM
20	Grain Size Distribution (Clay)	%	8.00		ASTM
21	Grain Size Distribution (Silt)	%	5.00		ASTM
22	Grain Size Distribution (Fine Sand)	%	22.00		ASTM
23	Textural Class		Loamy Sand		Visual Inspection

µS/Cm = MicroSiemens per centimeter

NS = Not Specified.

mMol/L = millimole per litre

meq/100g= milliequivalent per 100g.

**Table 3-7: Analytical Result of Water Sample Collected at Location IRO – WS 1 : N06⁰
06'42.7'' and E006⁰49'47.2'' Elevation 285.6fts**

S/N	PARAMETERS TESTED	UNITS	Average Value/Results	NESREA/FMENV LIMITS/WHO/NAFDAC	METHOD
1	Temperature	⁰ C	20.8	Ambient	ASTM
2	Ph	-	5.3	7.0-8.5	ASTM
3	Taste	-	Slight Taste	Unobjectionable	Organoleptic
4	Appearance	-	Slight colour	5 NTU ²	Organoleptic
5	Odour	-	Slight Odour	Unobjectionable	Organoleptic
6	Total Dissolved Solids	mg/l	135	500	ASTM
	Conductivity	uS/Cm	297	1000	Conductivity Meter
8	Total hardness	mg/l	56.00	100	ASTM
9	Chloride	mg/l	14.20	200	ASTM
10	Fluoride	mg/l	0.223	1.5	ASTM
11	Sodium	mg/l	21.628	-	ASTM
12	Potassium	mg/l	11.620	1-2	ASTM
13	Sulphate	mg/l	0.610	200	ASTM
14	Sulphide	mg/l	0.012	54.00	ASTM
15	Ammonia	mg/l	0.014	-	ASTM
16	Nitrate	mg/l	0.125	50	ASTM
17	Phosphate	mg/l	0.025	-	ASTM
18	BOD	mg/l	4.6	6.0	ASTM
19	COD	mg/l	22.896	-	ASTM
20	Chromium	mg/l	0.667	0.05	AAS
21	Copper	mg/l	Bdl	2.0	AAS
22	Iron	mg/l	0.1223	0.05-0.3	AAS

S/N	PARAMETERS TESTED	UNITS	Average Value/Results	NESREA/FMENV LIMITS/WHO/NAFDAC	METHOD
23	Zinc	mg/l	0.0173	5.0	AAS
24	Lead	mg/l	Bdl	0.01	AAS
25	Nickel	mg/l	Bdl	-	ASTM
26	Manganese	mg/l	0.1944	0.5	AAS
27	Silver (Ag ⁺)	mg/l	Bdl	-	AAS
28	Calcium	mg/l	9.60	50.00	ASTM
29	Magnesium	mg/l	46.40	50.00	ASTM
30	Total Alkalinity	mg/l	22.00	100.00	ASTM
31	Hydroxide	mg/l	Nil	-	ASTM
32	Bicarbonate	mg/l	14.00	-	ASTM
33	Carbonate	mg/l	20.00	-	ASTM
	Microbial Analysis				
34	E-Coli	cfu/ml	1.0x10 ¹	0	ASTM
35	Total viable count(cfu/ml) N.agar	cfu/ml	1x10 ³	1x10 ²	ASTM
36	Total Choliform (cfu/ml) M.agar	cfu/ml	5.0x10 ¹	1	ASTM

µS/Cm = MicroSiemens per centimeter

NS = Not Specified

mg/l = milligram per litre

cfu = Coliform forming units.

**Table 3-8: Analytical Result of Water Sample Collected at Location IRO – WS 2: N06⁰
05'59.7'' and E006⁰49'44.0'' Elevation 112.7fts**

S/N	PARAMETERS TESTED	UNITS	Average Value/Results	NESREA/FMENV LIMITS/WHO/NAFDAC	METHOD
1	Temperature	⁰ C	20.9	Ambient	ASTM
2	pH	-	5.9	7.0-8.5	ASTM
3	Taste	-	Has taste	Unobjectionable	Organoleptic
4	Appearance	-	Unobjectionable	5 NTU ²	Organoleptic
5	Odour	-	Has Odour	Unobjectionable	Organoleptic
6	Total Dissolved Solids	mg/l	013	500	ASTM
	Conductivity	uS/Cm	28.6	1000	Conductivity Meter
8	Total hardness	mg/l	24.00	100	ASTM
9	Chloride	mg/l	5.68	200	ASTM
10	Fluoride	mg/l	0.206	1.5	ASTM
11	Sodium	mg/l	20.412	-	ASTM
12	Potassium	mg/l	14.013	1-2	ASTM
13	Sulphate	mg/l	0.542	200	ASTM
14	Sulphide	mg/l	0.015	-	ASTM
15	Ammonia	mg/l	0.017	-	ASTM
16	Nitrate	mg/l	0.113	50	ASTM
17	Phosphate	mg/l	0.029	-	ASTM
18	BOD	mg/l	3.6	6.0	ASTM
19	COD	mg/l	24.647	-	ASTM
20	Chromium	mg/l	Bdl	0.05	AAS
21	Copper	mg/l	Bdl	2.0	AAS
22	Iron	mg/l	0.1223	0.05-0.3	AAS

S/N	PARAMETERS TESTED	UNITS	Average Value/Results	NESREA/FMENV LIMITS/WHO/NAFDAC	METHOD
23	Zinc	mg/l	0.0173	5.0	AAS
24	Lead	mg/l	Bdl	0.01	AAS
25	Nickel	mg/l	0.2051	-	ASTM
26	Manganese	mg/l	Bdl	0.5	AAS
27	Silver (Ag ⁺)	mg/l	Bdl	-	AAS
28	Calcium	mg/l	6.40	50.00	ASTM
29	Magnesium	mg/l	17.60	50.00	ASTM
30	Total Alkalinity	mg/l	60.00	100.00	ASTM
31	Hydroxide	mg/l	Nil	-	ASTM
32	Bicarbonate	mg/l	52.00	-	ASTM
33	Carbonate	mg/l	58.00	-	ASTM
	Microbial Analysis				
34	E-Coli	cfu/ml	1.0x10 ¹	0	ASTM
35	Total viable count(cfu/ml) N.agar	cfu/ml	1.5x10 ²	1x10 ²	ASTM
36	Total Choliform (cfu/ml) M.agar	cfu/ml	1x10 ²	1	ASTM

µS/Cm = MicroSiemens per centimeter

NS = Not Specified

mg/l = milligram per litre

cfu = Coliform forming units.

Table 3-9: IRO – AS 1 : N06⁰ 06'42.7'' and E006⁰49'47.2'' Elevation 285.6fts

S/N	Parameters	Unit	NESREA	RESULT	METHOD
1	Hydrogen Sulphide(H ₂ S)	Mg/Nm ³	5	5	M40 Gas Analyser (direct reading method) (MGA)
2	Carbon monoxide(CO)	Mg/Nm ³	500	0	
3	Nitric Oxide (NO)	Mg/Nm ³	300	6.25	
4	Nitric dioxide (NO ₂)	Mg/Nm ³	300	1.375	
5	Sulphur dioxide	Mg/Nm ³	500	1.125	
6	Hydrogen Cyanide(HCN)	Mg/Nm ³	NS	3.75	
7	Ammonia (NH ₃)	Mg/Nm ³	NS	3.125	
8	Oxygen	Mg/Nm ³	NS	20.8	

BSL = Below standard limit.

MGA = M40 Gas Analyser

Mg/Nm³. = Milligram per Newton meter cube.

Table 3-10: IRO-AS 2 :N06⁰ 06'20.2'' and E006⁰49'41.7'' Elevation 208.4fts

S/N	Parameters	Unit	NESREA	RESULT	METHOD
1	Hydrogen Sulphide(H ₂ S)	Mg/Nm ³	5	0	M40 Gas Analyser (direct reading method) (MGA)
2	Carbon monoxide(CO)	Mg/Nm ³	500	0	
3	Nitric Oxide (NO)	Mg/Nm ³	300	6.25	
4	Nitric dioxide (NO ₂)	Mg/Nm ³	300	1.275	
5	Sulphur dioxide	Mg/Nm ³	500	1.115	
6	Hydrogen Cyanide(HCN)	Mg/Nm ³	NS	2.99	
7	Ammonia (NH ₃)	Mg/Nm ³	NS	3.125	
8	Oxygen	Mg/Nm ³	NS	20.8	

BSL = Below standard limit.

MGA = M40 Gas Analyser

Mg/Nm³. = Milligram per Newton meter cube.

Table 3-11: IRO-AS3 : N06⁰ 05'59.7'' and E006⁰49'44.0'' Elevation 112.7fts

S/N	Parameters	Unit	NESREA	RESULT	METHOD
1	Hydrogen Sulphide(H ₂ S)	Mg/Nm ³	5	5	M40 Gas Analyser (direct reading method) (MGA)
2	Carbon monoxide(CO)	Mg/Nm ³	500	0	
3	Nitric Oxide (NO)	Mg/Nm ³	300	6.25	
4	Nitric dioxide (NO ₂)	Mg/Nm ³	300	1.375	
5	Sulphur dioxide	Mg/Nm ³	500	1.125	
6	Hydrogen Cyanide(HCN)	Mg/Nm ³	NS	3.75	
7	Ammonia (NH ₃)	Mg/Nm ³	NS	3.125	
8	Oxygen	Mg/Nm ³	NS	20.8	

BSL = Below standard limit.

MGA = M40 Gas Analyser

Mg/Nm³. = Milligram per Newton meter cube.

ANNEX 9: DISCUSSION OF METHODS/TECHNIQUES USED IN ASSESSING IMPACTS

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 to assist 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 5-1.

Table 5.1: Criteria for Determining Impact Consequence

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 5-1 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 5-2:

Table 5-2: 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 5-3 below:

Table 5-3: 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 5-4 below:

Table 5-4: 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