Hospitalia Consultaire Ltd

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

NNEWICHI GULLY EROSION SITE, NNEWI NORTH LGA, ANAMBRA STATE

Anambra State Nigeria Erosion and Watershed Management Project

November 2017

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LIST OF ACRONYMS

AIRBDA	Anambra-Imo River Basin Development Authority
AN-NEWMAP	Anambra Nigeria Erosion and Watershed Management Project
ASWAMA	Anambra State Environmental Protection Agency
ARAP	Abbreviated Resettlement Action Plan
CDAs	Community Development Associations
CSOs	Civil Society Organisations
EAs	Environmental Assessments
EIA	Environmental Impact Assessment
ESIAs	Environmental and Social impact Assessments
ESMP	Environmental and Social Management Plan
FEMA	Federal Road Maintenance Agency
FEPA	Federal Environmental Protection Agency
FMEnv	Federal Ministry of Environment
FRSC	Federal Road Safety Corps
GDP	Gross Domestic Product
HEC-RAS	Hydrologic Engineering Centre – River Analysis System
LGAs	Local Government Areas
MDAs	Ministries, Departments and Agencies
NGOs	Non-Governmental Organizations
NEWMAP	Nigeria Erosion and Watershed Management Project
PAPs	Project Affected Persons
PAHs	Project Affected Households
PMU	Project Management Unit
PPE	Personal Protective Equipment
RCBC	Reinforced Concrete Box Culvert
SMEnv	State Ministry of Environment
SMW	State Ministry of Works
SPMU	State Project Management Unit

EXECUTIVE SUMMARY

ES 1: Background

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

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

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

ES 2: Description of Project Activities

The principal components of the design works for the Nnewichi gully Erosion site are:

- The main gully named as Nnewichi Main gully (NNMG) involves the design of box culvert, concrete channel, cascade drops, chute and stilling basin, gabion retaining wall, check dam and outlet structures.
- The Finger gully named as Right and Left Finger gully (RFG and LFG) followed by their respective sequential number on both right and left side of the main gully involves the design of concrete canal, cascade drops, chute and stilling basin, Junction structure with the gabion retaining wall and outlet structures.
- The other main part of the design is the design of gully bank treatment works. The gully bank is largely provided with Bio-remediation and in some cases stone pitching works. This section of the design covers the design of bank treatment works, interceptor and collector drains on the gully.

ES 3: Existing Safeguards Instruments and Rationale for ESMP

The Nigerian EIA Act and the World Bank safeguard policies are similar; designed to help ensure that projects proposed for Bank financing are environmentally and socially sustainable, and thus improve decision-making. The Bank has twelve safeguards policies, however, this section focuses on the World Bank Environmental and Social Safeguard Policies applicable for to this sub-project. These include Environmental Assessment (EA) (OP/BP 4.01), Involuntary Resettlement (OP/BP 4.12) and Physical Cultural Heritage OP 4.11. An Environmental and Social Management Framework as well as Resettlement Policy Frameworks have been developed for NEWMAP.

The ESMP provides a set of procedures through which NEWMAP will develop and implement environmental, social, health, and safety management systems, programs, processes and procedures that will establish a foundation for sound mitigation of adverse impacts, enhancement

of positive impacts, institutional responsibilities, indicative costs for mitigation and eventual monitoring of the ESMP.

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

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

ES 4: Policy, Legal and Administrative Framework

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

The Rehabilitation Project is rated a World Bank Category B (equivalent to Category II in the Nigeria EIA Act) project in accordance with the Environmental Assessment Policy of the World Bank, which will focus on mitigation and Environmental planning measures.

ES 5: Biophysical Environment

Nnewi is the second largest city in Anambra State in southeastern Nigeria. Nnewi as a metropolitan city in Nnewi North LGA and comprises four autonomous villages: Otolo, Uruagu, Umudim, and Nnewichi. Nnewichi is the smallest of the four villages.

Four communities makeup Nnewichi namely; Okpuno Nnewichi, Oduda Nnewichi, Obiofia Nnewichi, and Abubor

Nnewichi is bounded on the east by Otolo, on the west by Uruagu, on the north by Ojoto and Nnobi, both of Idemili South Local Government Area, and on the South by Uruagu and Umudim.

The Nnewichi gully erosion site (located between long 261897.698E .and lat680564.525N) is about 3km long and covers an area of about 30ha. A section of the main gully is about 0.75km long and is progressing. The remaining 1.7km has a relatively mild slope and wider bed width. The gully is advancing laterally in this section. The gully has shallow depths at its tail and is deeper in the middle and head section, up to 30m depth. The width of the gully varies from 60m at shallower areas to 160m at the deeper sections. The shape of the gully is generally V-shape gully at the head with a side slope ranging from 30^{o} to 50^{o} and U-shape gully at the middle. In some areas, the level of gully erosion is so advanced that it destroyed the whole road and is encroaching into private properties.

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

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

ES 6: Social Economic Characteristics

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

A random sampling survey was carried out within the community. Questionnaires were administered to a total of 115 respondents.

It was gathered from the field survey that majority of the Respondents (about 89%) are males while females are 11%. The study shows that those between ages 51-60 years and those above 61 years constitute the dominant population of Respondents with a combined proportion of about 50%. Respondents are predominantly married people (about 87%). Most people or Respondents have some form of education (97%). The highest number of Respondents (57%) Indicated that their highest level of academic qualification is FSLC. About 2% of the Respondents don't have any form of formal education. 27% of respondents get domestic water from privately owned boreholes while 43% make use of water from commercial boreholes. About 30% of respondents use water from other sources which include a combination of water vendors (25%), River (2%) etc. A small amount of respondents use water from water collected in very few occasions. About 14% of the people in the area dispose their household waste in the bush. 5% dispose their refuse by open dump which includes into the gully. About 67% of the respondents make use of firewood for cooking while the rest use either kerosene Charcoal or Gas. shows that majority (90%) of the Respondents in this community are self-employed with 49% engaged in trading, while 13% of the respondents are farmers. 5% of the Respondents are public servant, then the remaining (7%) are artisans and engage in such businesses as welding, mason, mechanic etc.

Field survey shows that dominant income groups amongst Respondents fall within ₦31,000 and above per Month. The survey also shows that about 9% fall within the income of ₦0- ₦5000 per month while about 12% of Respondents earn ₦21,000 to ₦30,000 per month.

All the respondents showed high level of acceptance of the project stating that the gully erosion site poses high risk for the members of the community.

ES 7: Potential Environmental and Socio-economic Impacts and Analysis of Alternatives

Impacts identified were based on the proposed works for the rehabilitation. They include adverse and positive impacts. These are summarized in the table below.

S/N	Positive Impacts	Adverse Impacts
1	Rehabilitation of the erosion menace in the community	Increase in fugitive dust emission during preconstruction and construction phases of the rehabilitation.
2	Repair of the watershed gullies	Waste generation especially construction wastes.

3	Connection and restoration of access to houses and villages already cut off by the erosion	Possibility of seepage and leak of fuel from machineries and effluent discharge into the watershed, thus impacting on the water quality.
4	Provision of employment opportunities for both skilled and unskilled workers.	Site clearing will lead to loss of species diversity and abundance, including soil organisms, fungi, invertebrates, and bacteria.
5	Improved agricultural productivity within the community and Anambra state at large.	Noise and vibration from heavy-duty project vehicles and equipment resulting in nuisance.
6	Community development programs.	The frequency and incidence of occupational hazards may rise with during construction activities.
7	Reintegration of community and diversification of sources of livelihood.	Loss of employment for labourers after the completion of the rehabilitation works,
8	Reduction of mortality rate.	
9	Promotion of afforestation programs (with all its benefits)	
10	Minimization of flooding and control of overflow.	
11	Reduced fear perception of loss of property, inhabitation and ancestral origins of the communities.	
12	Control and Reduction of water body sedimentation rates due to erosion.	
13	Reduction in mortality/morbidity from landslides.	
14	Initiation/ kick-off of rapid production systems and agricultural practices.	
15	Increase in social interactions	
16	Improved livelihood enhancing activities	

17	Gender Issues: Construction activities will encourage economic activities, especially for women. Since there would be a large workforce, petty traders and food-spots owners will benefit immensely from the demand on site.	
18	Promotion of goodwill and community appreciation of the NEWMAP intervention in Anambra State and Nigeria at large.	

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

Various alternatives to the planned rehabilitation of the Nnewichi Gully Erosion Site were evaluated. These include:

- Do nothing approach
- Delayed alternative
- Do it alternative

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

ES 8: Environmental and Social Mitigation Measure

The purpose of mitigation measures is to avoid, reduce or minimize unwanted impacts and enhance beneficial impacts. Selection of alternatives is also a form of mitigation in terms of impact, cost and technology. Different methods were employed for the project. These include prevention and control measures, Compensatory measures as well as Remediation/Corrective measures. Mitigation measures presented, including measures recommending, dust reduction techniques, and modification/adjustment of construction equipment to reduce NOx and other emissions. Others include reduction of trips to site, awareness creation on the part of the construction workers so as to reduce social vices, reduction of soil impaction as well as spill from construction equipment.

ES 9: Rational and Objective of 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. 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. The social, economic losses and the threats posed by gullies in high-density areas is source of great apprehension, needing timely intervention.

The Objective for the study is to develop procedures and plans to ensure that the mitigation measures will be implemented throughout the phases for the Rehabilitation of the Nnewichi, Nnewi Gully Erosion site. It has also been prepared to ensure the effective long-term protection of the area and other biotic and abiotic components of the environment.

ES 10: Environmental and Social Management Plan and Monitoring Plan Budget

The ESMP included the various impacts discussed according to the respective phases during project implementation. The impacts have been described, as they will impact on the different environmental and social sensitivities. The mitigation measures, mitigation costs and institutional responsibilities were also highlighted in the ESMP matrix table.

The total cost for Implementing the ESMP and Monitoring Plan for the Nnewichi Gully Erosion Site Rehabilitation Works is estimated at **Sixty Million Forteen Thousand Two hundred and Forty Naira Only (₦60, 014, 240); that correspond to One Hundred and Fifty Thousand Thirty Five US Dollars and Sixty Cents[USD150, 035.60].** The ESMP matrix for the implementation of the Rehabilitation works for the Nnewichi Gully Erosion Site is highlighted from Table 17-19. NB: $1 = ₦400.

Table 1: Cost and Cost Analysis for ESMP Implementation

Item	Responsibility for implementation and Monitoring	Cost Breakdown	Cost Estimate in Nigerian Naira (₦)	Cost Estimate in Us Dollars (US$)
Enhancement of +ve impacts and Mitigation of –ve impacts	Contractor, PMU, SMEnvr, ASWAMA, FRSC		41,968,000.00	104, 920.00
Management of ESMP Implementation	PMU, SMEnvr, ASWAMA	5% of Mitigation Cost	2,098,400	5,246.00
Monitoring, Evaluation & Audit	SMEnvr, ASWAMA, FERMA, SMW, SPMU, FPMU	25%of Mitigation Cost	10,496,000.00	26,230.00
SUB- TOTAL				136,396.00
Contingency		10% of Sub-Total	5,455,840.00	13,639.60
TOTAL	—	—	60,014,240.00	150,035.60

ES 11: ESMP Implementation and Management

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

Overall sub-project coordination will be housed in Project Management Unit (PMU), of Anambra State NEWMAP Office. They will oversee the day-day project management and ensure that environmental and socio-economic concerns and management as elucidated in the ESMP are

integrated into all aspects of project implementation. The Anambra State Ministry of Environment; herein referred to as State Ministry of Environment (SMEnv); National Environmental Standards Regulatory Enforcement Agency (NESREA), and Anambra State Environmental Protection Agency (ASWAMA) will monitor and evaluate the implementation of the ESMP to ensure that the rehabilitation works and project operations meet "best environmental practices" while an external independent consultant will carry out the environmental audit of the ESMP implementation.

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

ES 12: Disclosure and Public Consultation Plan

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

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

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

The advocacy visit meeting was held on 13th February 2017 at the community. In attendance were the Obi and traditional leaders of the villages, Association Executives, Youth executives and women group executives.

The Town hall meeting was carried out in two (2) stages. The first was a general meeting where all the stakeholders and community members were given a general overview of the project, the component and information regarding the ESMP and other relevant information in the TOR. The second stage meeting provided feedbacks, clarifications and responses.

At the conclusion of the study, the ESMP will be disclosed in World Bank website as well as project community, LGA and State for interested stakeholders to view and make further comments and remarks.

ES 13: Grievance Redress Mechanism

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

More complicated matters like RAP (developed in a separate document) and implementation issues that may involve private sector entities and third party agencies are likely to require the attention of the PMU.

For the GRM to be effective as an all-inclusive engagement instrument that effectively handle the grievances of women, there has to be a deliberate structuring to include Women in Grievance

Redress Committee, who will easily be approached by women for the purpose of presenting their grievances.

1 CHAPTER ONE: INTRODUCTION

1.1 Background

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

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

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

NEWMAP Components are divided into 4 viz;

Component 1: Erosion and Catchment Management investment

Sub-component 1A Gully Rapid Action and Slope Stabilization

Sub-component 1B Integrated Catchment Management

Sub-component 1C Adaptive Livelihoods

Component 2: Erosion and Catchment Management Institutions and Information Services

Sub-component 2A Federal MDA Effectiveness and Services

Sub-component 2B State MDA Effectiveness and Services

Sub-component 2C Local Government Capacity

Sub-component 2D Private Sector Capacity

Component 3: Climate Change Agenda Support

Sub-component 3A Policy and Institutional Framework

Sub-component 3B Low Carbon Development

Component 4: Project Management

This program is financed through an 8-year Strategic Investment Loan (SIL) of $508.59M, consisting of a $500M IDA concessional loan blended with GEF and SCCF grants totalling $8.59M. The Government of Nigeria's contribution will amount to approximately $150M. This contribution

only reflects the costs currently directly attributable to Project activities but will also include the cost of liaison officers from each MDA which is yet to be reflected. The calculated amount comprises (i) a federal contribution both cash and in-kind of $83.34 for duties, taxes, staff and office costs and (ii) a cash and in-kind contribution by each state of approximately $6M (for each of 11 states totalling approximately $67M) for resettlement, staff and office costs and pre-feasibility designs of intervention sites. State contributions to project financing are an agreed criterion for project participation (PAD, 2012).

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

This report focuses on the Environmental and Social Management Plan (ESMP) prepared for the Rehabilitation of the Nnewichi, Nnewi Gully Erosion, Nnewi North LGA in Anambra State, Nigeria.

The project area cuts across Obuofia, Okpuno and Abubor communities all in Nnewichi of Nnewi Local Government Area. Nnewichi is bounded on the east by Otolo, on the west by Uruagu, on the north by Ojoto and Nnobi, both of Idemili South Local Government Area, and on the South by Uruagu and Umudim.

The Nnewichi gully erosion site is nearly 2.5km long.In the layout the following designations have been used to represent each of the gully channels systematically. The left and right fingers are designated as Left Finger Gully (LFG) and Right Finger Gully (RFG), followed by their respective sequential number on both right and left side of the main gully as specified in the engineering design. The Main gully channel is designated as Nnewichi Main Gully (NNMG).

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

The Nnewichi gully erosion site (located between long 261897.698E .and lat680564.525N) is about 3km long and covers an area of about 30ha. A section of the main gully is about 0.75km long and is progressing. The remaining 1.7 km has a relatively mild slope and wider bed width. The gully is advancing laterally in this section. The gully has shallow depths at its tail and is deeper in the middle and head section, up to 30m depth. The width of the gully varies from 60m at shallower areas to 160 m at the deeper sections. The shape of the gully is generally V-shape gully at the head with a side slope ranging from 30^{o} to 50^{o} and U-shape gully at the middle. In some areas, the level of gully erosion is so advanced that it destroyed the whole road and is encroaching into private properties.

1.2 Hydrology

The gully site is located in Anambra-Imo Hydrological Area. The watershed is subdivided into sub-watersheds which formed the outlets of natural and artificial drains redirecting flood to the gully. The sub-watersheds are named using the convention whereby the first one or two letters of the name of the watershed followed by a hyphen and then a number. “NN-1” means Nnewichi sub-watershed number 1,”NN-2” means Nnewichi sub-watershed number 2, etc. The Nnewichi watershed with an area of 2,893ha and a slope of 3.96% was divided into 21 sub-watersheds ranging from NN-1 to NN-21. The watershed finally drains to a fan or delta before joining Idemili River. The upper boundaries of the watersheds are modified by roads discharging into the watersheds. Hence, the real watershed areas are larger than the area subtended by the topographic divide (SMEC, 2015).

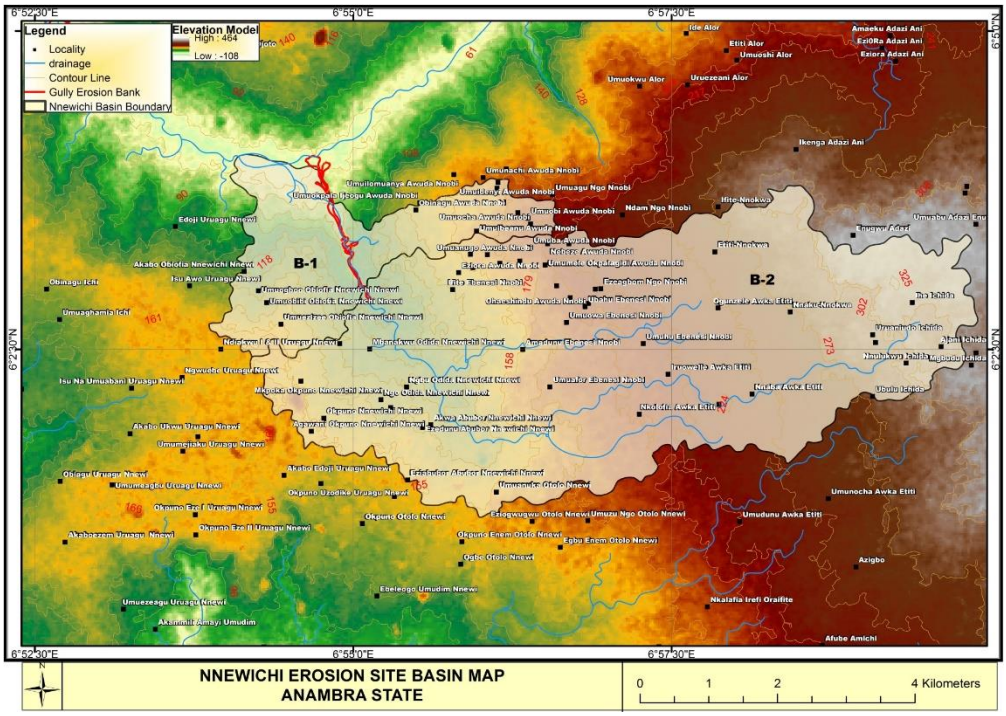


Plate 1 Nnewichi Erosion site Basin map

1.3 Hydrography

Anambra State falls into two main landform regions: a highland region of moderate elevation that covers much of the state south of the Anambra River, and low plains to the west, north, and east of the highlands. The highland region is a low asymmetrical ridge or cuesta in the northern portion of the AwkaOrlu Uplands, which trend roughly southeast to North West, in line with the geological formations that underlie it.

It is highest in the southeast, about 410m above mean sealevel, and gradually decreases in height to only 33m in the northwest on the banks of the Anambra River and the Niger. At Onitsha and Otuocha, the cuesta provides well drained low land, very close to the river, thereby enabling settlements to extend to the banks of the river.

The cuesta has confined the wide and braided channel of the Niger to a comparatively narro' valley bed at the southern part of Onitsha, making an appropriate location for the construction of bridge across the river. The highlands consist two cuestas, a lower and a higher one, each with a eastfacing escarpment. The two cuestas merg south of Nanka.

The lower cuesta, formed by the more resistar sandstone rocks of the Imo Shale, rises to onl 150m above mean sealevel at Umuawulu an decreases in height northwestward to only 100m < Achalla. Its escarpment faces the Mamu Rive plain and has a local relief of between 80 and 30n West of it, is the higher cuesta, formed by the sane stones of the Ameke Formation. Its height is abov 400m in the south-east at Igbolkwu and Isuofii decreasing north-westward to less than 300m ; Agbana, and to only 100m at Aguleri.

There are only of moderate height, they provide elevated, welldrained and attractive settlernei sites, hence, they are closely settled even up I their crests. Agulu, Agbana, Awkuzu, Nteje an Aguleri are some of the settlements on the crest the higher cuesta, and IfiteAwka, Mgbakwi Amanuke and Achalla are some of those on th crest of the lower cuesta. The dip slope of the h er cuesta extends westwards for over 30km and is heavily settled.

The plains lie west and north of the highland; it The River Niger plain, south of Onitsha, about 9km wide, and the NigerAnambra River plain north of Onitsha, which stretches for over 36km east of th an Niger, are really low plains, well below 30m abov ge mean sealevel, and are liable to flood. They ar underlain by recent alluvium; and, east of the Anambra River, by the Imo Shale formation.

The plains are almost featureless, except for sporad broad undulations, rising above the flood plaini at forming sites for the farming and fishing settlement 'er in the area. Such settlements include Nzan m. Nmiata, and Anam in Anambra West LGA, an id Atani, Odekpe, and Oshita in Ogbaru LGA. East ve the Anambra River, a narrow and elongated san ia, stone ridge, projecting about 30m above the level at the plain, formed settlement sites for Anaki Igbakwu, Ifute, and Umueje inAyamelum LGA.

The Mamu River plain, east of the cuesta landscape, is a little higher than the other two plains. It lie between 30 and 70m above sea level in the area and underlain by the Imo Shale, rising higher south wards. East of the Mamu River are found the more resistant sandstone ridge, at some 50m above the level of the plains.

The Anambra River rises on the Gala Plateau near Ankpa in Kogi State and, for its over 85km course in Anambra State, flows through the northern low plain where it, as well as its right bank tributaries, meander heavily, developing oxbow lakes and abandoned meander channels. Its largest left bank tributary is the Mamu River, which drains the east ern low plain on the Imo Shale Formation.

The higher cuesta forms the watershed separating the numerous east flowing tributaries of the Mamu River from the west flowing rivers, the Idemili, the Nkisi, and the Oyis, which drain the dip slope of the cuesta. All but one of the main rivers in Anambra state empty into the River Niger, which forms the western boundary of the state and constitutes the local base level for the rivers.

The exception is the Ulasi River, which rises near Dikenafai in Imo State, flows northward to Ozubulu in Anambra State and then turns round in a wide loop and heads for the Atlantic ocean. The dip slope of the higher cuesta between Nsugbe, Onitsha, Ogbunike and Urnunya is dissected by the numerous tributary streams of the Mamu into a rolling landscape.

1.4 Hydrogeology

Anambra State is directly underlain by four different geological formations including, Alluvial Plain Sands, Ogwashi-Asaba Formation, Ameki/Nanka Sands and Imo Shale, with varying water storage and yielding capacities. Borehole depths within the Alluvial Plain Sands are shallow (5-30m) yet the sands are excellent aquifers with high yields (3-5 litres/sec) especially along the Anambra West – Onitsha -Ogbaru L.G.A. axis. Elsewhere the yield is low (about 0.5litres/sec) and may dry up at peak dry season periods.

The Ogwashi-Asaba Formation occurs in a north-southerly trend and underlies Ekwusigo, Nnewi North and South and Ihiala Local Government Areas. This formation consists of multiple aquifers and a depth to water table ranging from 50 to 110m. Within it, transmissivity values of 37.54 to 95.5m^2/day and a yield of up to 5litres/sec were recorded. The Ameki/Nanka Sands is a prolific water producer and underlies Aguata, Anaocha, Njikoka, Dunukofia, Oyi and Anambra East Local Government Areas. Four aquifer horizons were identified within this formation, designated; shallow, upper, middle and deep aquifers. The most exploited are the upper and middle aquifers, while the least, but most prolific is the deep aquifer with an average yield of 5litres/sec. Imo Shale, because of its sedimentological nature is a poor aquifer. The gravelly intercalations within this formation are usually too thin to sustain continuous water pumping. This study indicates that the extent and distribution of groundwater within the study area is controlled predominantly by lithology and other secondary factors including topography and nearness to source of recharge

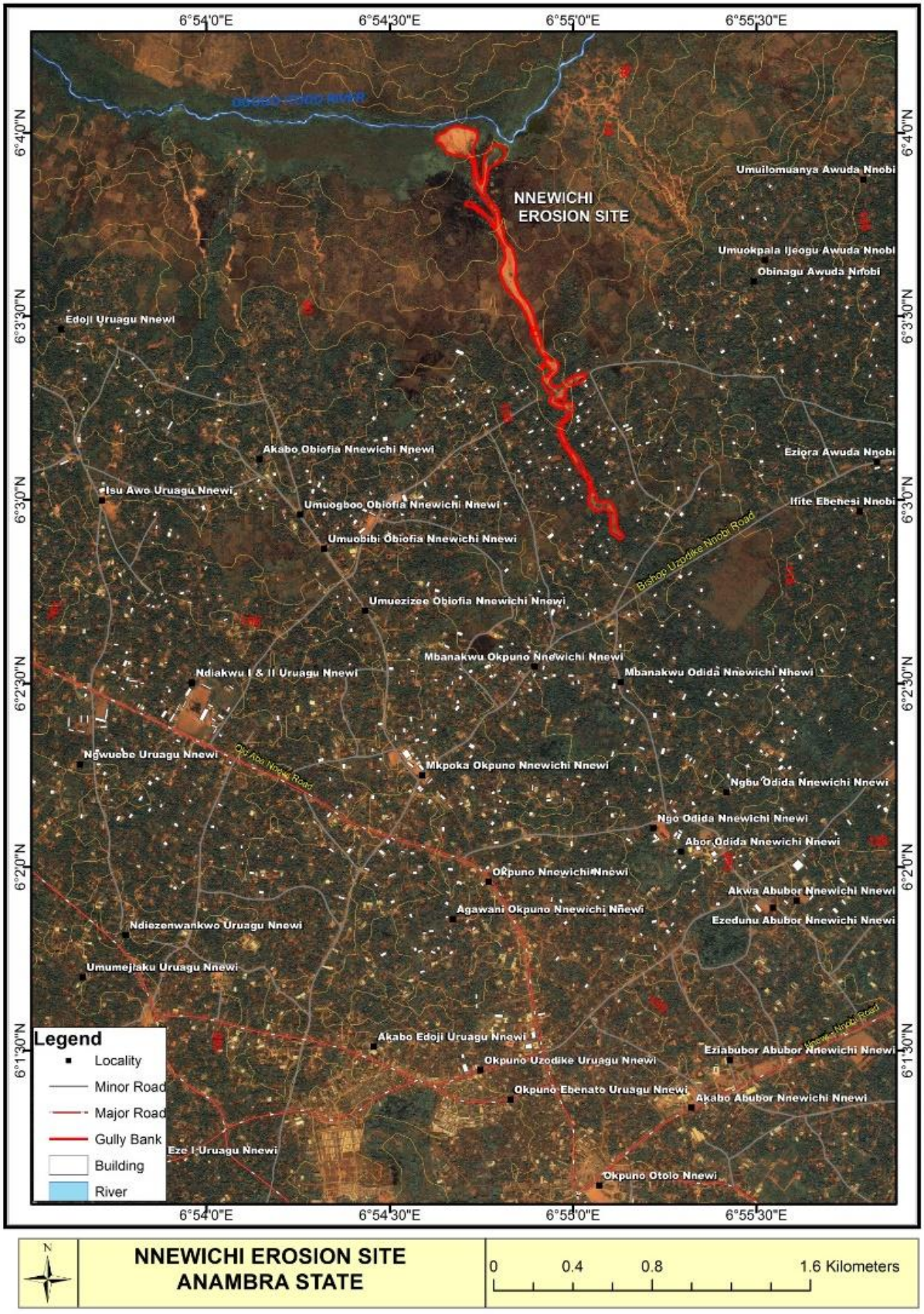


Plate 2 Satellite Imagery showing the Gully and Watershed Catchment of the site

The Nnewichi erosion site has developed partly due to the erosion from culvert outlet and improper connection with the main drainage trunk and termination of drainages around surrounding areas. The drainage from upper catchment comes through a lined drainage and finishes in the gully. The poor drainage system encourages flooding of surrounding areas leading to erosion and gully formation and subsequently destroying road sections and threatening surrounding properties.

The feasibility report prepared by SMEC shows that the existing canal structures were not properly built and not well connected at the outlet. This resulted to bed erosion which propagated upstream by collapsing the structure. These deficiencies in the existing canals also contributed towards the failure of the drainage system.

Plate 3 Collapsed Concrete Canal

Plate 4 A section of the Main Gully

Members of the community have carried out some palliative measures by the use of concrete structures to mitigate the impact of the gully at different sections.

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

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

Plate 5 Catch Pits dug by community to control the erosion

Plate 6 Concrete canal constructed by the community to control further erosion.

1.5 Baseline Information

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

1.5.1 Physical Environment

Climate

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

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

Temperature

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

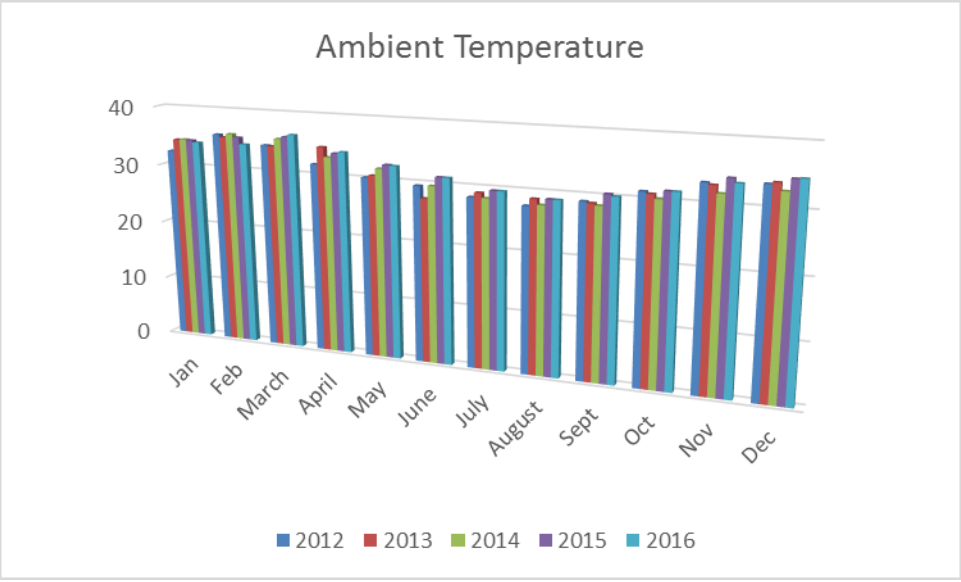


Plate 7: Ambient Temperature of the project area

Rainfall

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

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

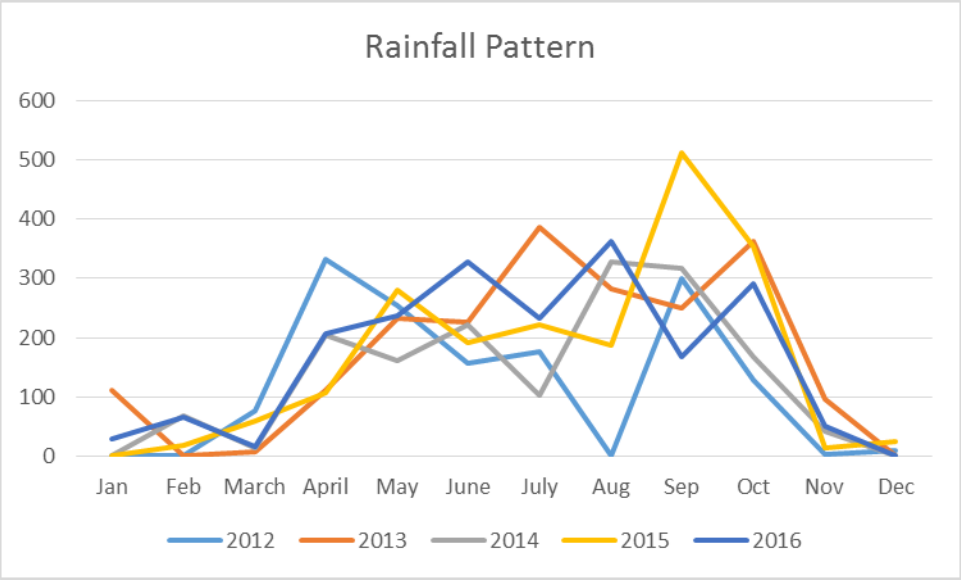


Plate 8: Rainfall pattern of the project area

Relative humidity

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

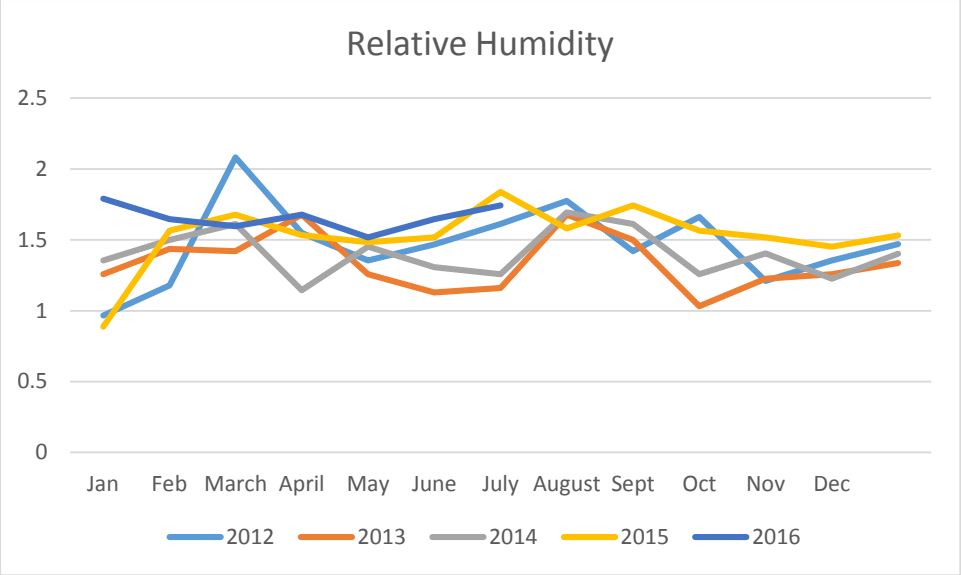


Plate 9: Relative Humidity of the project area

Wind Speed

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

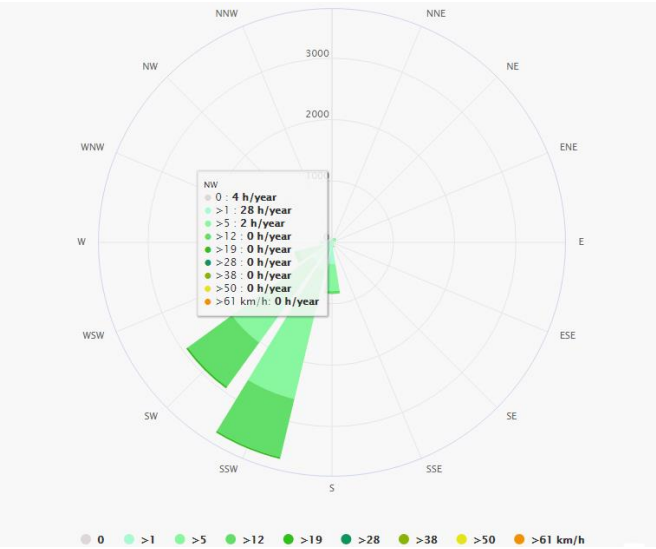


Plate 10: Wind rose chart

Wind Direction

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

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

Geology

Nnewichi erosion site is majorly on the Ogwashi-Asaba Formation and is composed of alternating bands of sandstone and shale. The sandstone unit exhibits colours that range from yellow, whitish, red, to reddish brown. It is also mainly ferruginized and indurated, although sometimes friable. The base of the sandstone consists of poorly sorted pebbly to very coarse- grained sandy particles with mixture of some fine sand.

Nanka Sand is a lateral equivalent of the Bende-Ameki Formation. The lithology consists of fine to coarse sandstone with abundant intercalations of calcareous shale and thin shaley limestone below, and of loose cross-bedded white or yellow sandstone with bands of fine-grained sandstone and sandy clay above. The Ameki Formation is uncomfortably overlain by the Ogwashi Asaba Formation. The contact between these two formations can be discerned by the occurrence of thin layers of lignite.

1.5.2 Biological Environment

Flora

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

Acute population pressure drastically reducing land space for farming and forest cover has caused the decimation of most plant species generally, not least these dominant ones. Taking their places these days are such soil – stabilizing trees as cashew and bamboo plants in gully ravaged parts of Nnewichi.

Table 2: Some common plants found within the community

S/NO	COMMON NAME	BOTANICAL NAME
1.	Maize /corn	*Zeamays*
2.	Cassava	*Manihotesculenta*
3.	Banana	*Musasapientum*
4.	Water leaf	*Talinumtriangulare*
5.	Okro	*Abelmoschusesculentus*

6.	Pineapple	*Ananascomosus*
7.	Guava	*Psidiumguajava*
8.	Cocoyam	*Colocasiaesculenta*
9.	Pumpkin	*Cocurbitapepo*
10.	Melon	*Citrullusvulgaris*
11.	Pepper (small)	*Capsicumannuum*
12.	Mango	*Magniferaindica*
13.	Pawpaw	*Caricapapaya*
14.	Bitter leaf	*Vernoniaamygdalina*
15	Oil Palm	*Elaeisguineensis*
16	Mango	*Mangiferaindica*
17	Avocado Pear	*Perseaamericana*
18	Plantain	*Musaparadisiaca*
19	Coconut	*Cocosnucifera*

Fauna

The fauna (animals) of a typical rain forest environment (which Nnewi is no more) include the antelopes, deer's, monkeys, the rodents like grass cutters, apart from fowls, wild ducks and partridges. All of these have long been chased out by ever-growing human activity on a much limited land space.

Extinct Species

On account of unrelenting population pressure on land space further being reduced by ravaging gully erosion, virtually the entire fauna in this area now belong to the extinct species. In fact, such animals like wild cats, including Leopard and civets, wild pigs, antelopes, monkeys and even grass-cutters are now no more to be found in Nnewichi. As for the rest still around, not up to five percent of what used to exist in this area before the 1960s can still be found.

1.6 Description of The Proposed Intervention

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

The principal components of the design works for the Nnewichi gully Erosion site are:

- The main gully named as Nnewichi Main gully (NNMG) involves the design of box culvert, concrete channel, cascade drops, chute and stilling basin, gabion retaining wall, check dam and outlet structures.
- The Finger gully named as Right and Left Finger gully (RFG and LFG) followed by their respective sequential number on both right and left side of the main gully involves the design of concrete canal,

cascade drops, chute and stilling basin, Junction structure with the gabion retaining wall and outlet structures.

- The other main part of the design is the design of gully bank treatment works. The gully bank is largely provided with Bio-remediation and in some cases stone pitching works. This section of the design covers the design of bank treatment works, interceptor and collector drains on the gully.

During the site inspection visit of Nnewichi gully erosion site, it was observed that the gully developed mainly due to improper culvert and river outlets. The drainage from upper catchment comes through a lined drainage and finishes in the gully. The poor drainage system encourages flooding conditions in surrounding areas leading to erosion and gully formation, thereby destroying the road sections and threatening the surrounding properties. The following sub sections briefly describe the problem observed in Nnewichi erosion site.

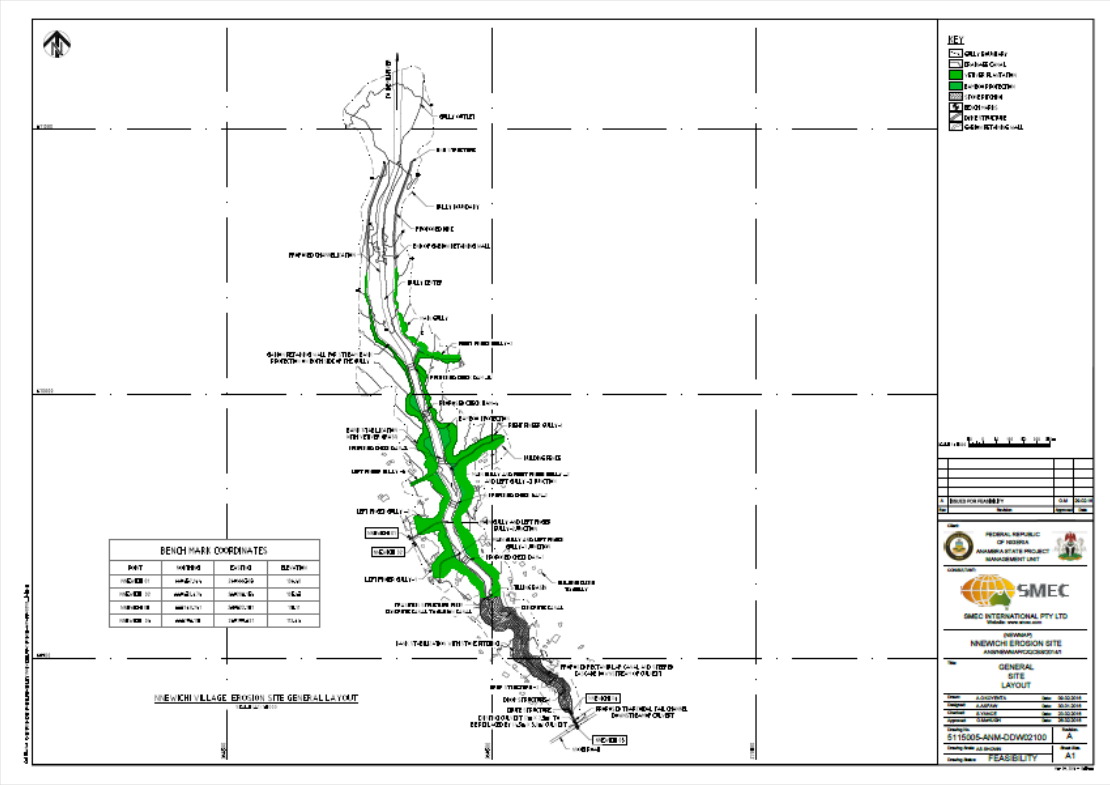


Plate 11 General Design layout of Nnewichi gully, SMEC, 2016

There were previous efforts made to control the erosion. A site inspection of existing canal structures revealed that they were not properly built and not well connected at the outlet. This started with bed erosion which propagated upstream by collapsing the structure. These deficiencies in the existing canals also contributed towards the failure of the drainage system.

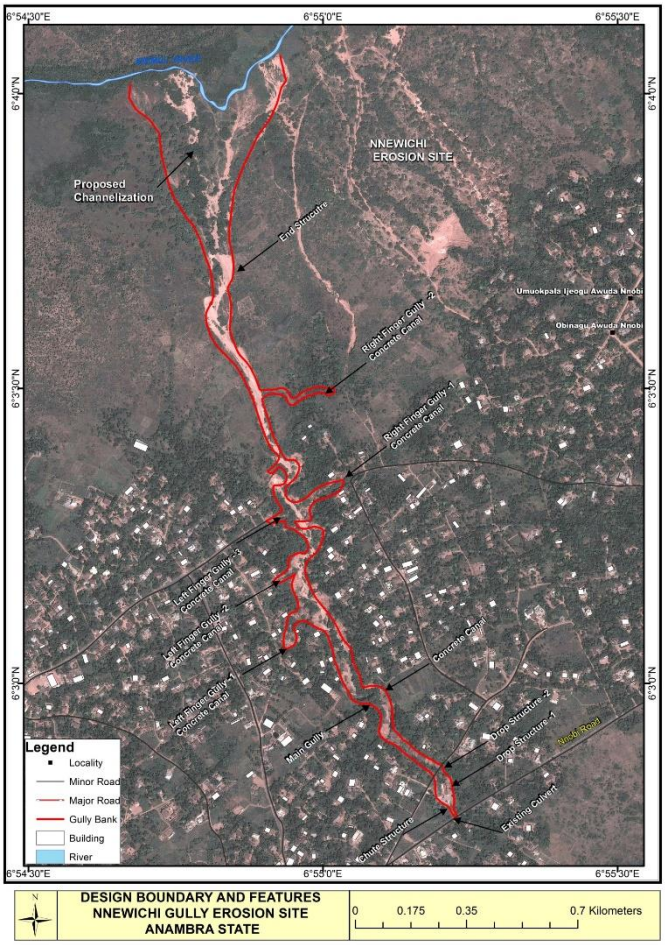


Plate 12 Satellite imageries of Nnewichi gully boundary and features

The Anambra State Nigerian Erosion and Watershed Management Project through the World Bank intervention has Proposed solution to ameliorate the erosion problem in Nnewichi by proper management of prevailing flood flow path to the gully and subsequently controlling the gully using adequate drainage systems such as culverts, drains, chute channels and stilling basins to slow down the flow velocity, re-vegetation etc.

1.6.1 Hydrological data design return period

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

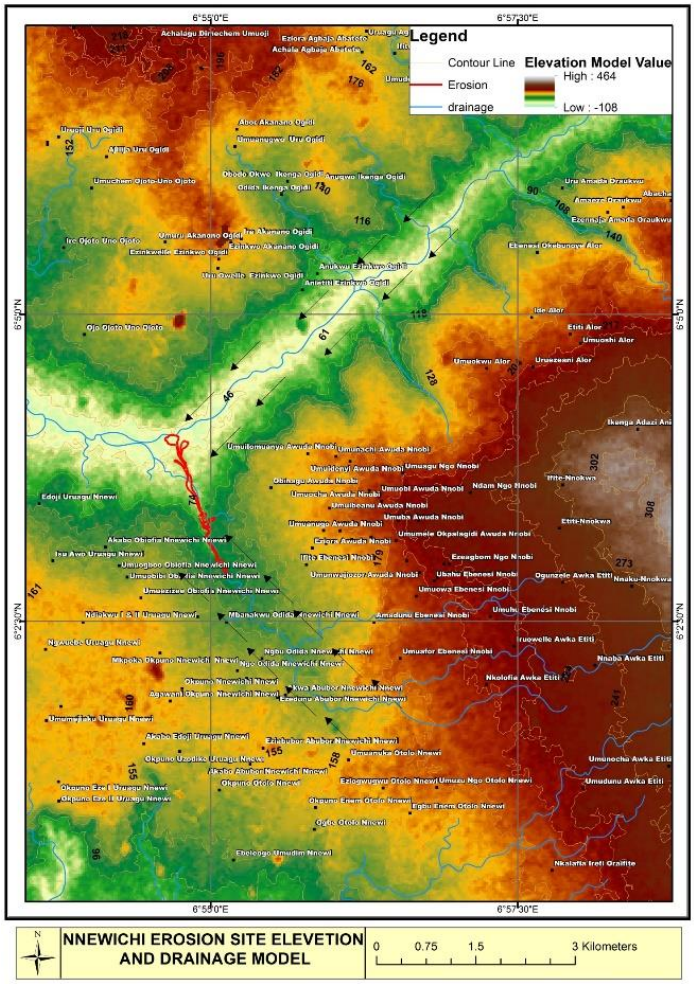


Plate 13 Nnewichi erosion site elevation and drainage model

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

1.7 Geotechnical data and material property

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

1.8 Proposed gully protection concept design

1.8.1 General Layout

The Nnewichi gully erosion site is nearly 2.5km long. A section of the main gully is about 0.75km long. It is worsening upstream and endangering the community and requires urgent intervention. The remaining 1.7km has a relatively mild slope and wider bed width. The gully is advancing laterally in this section. This section also needs an urgent attention to stop the gully from developing laterally and endangering the surrounding community properties. The Nnewichi erosion

site has developed partly due to the erosion from culvert outlet and improper connection of minor drainage from the surrounding areas with the main drainage trunk.

The gully has shallow depths at its tail and is deeper in the middle and head section, up to 30m depth. The width of the gully varies from 60m at shallower areas, mainly along the finger gullies (RFGs and LFGs), to 160m at the deeper sections of the main gully (e.g. 6^0 3'35''N and 60 54' 38''E). The difference in the width of the gully at different sections is as a result of the flow velocity of surface runoff during the rains. This is exacerbated by blockage of waterways by anthropogenic activities such as buildings as well as in lithology and soil strength of the project environment.

The shape of the gully is generally V-shape gully at the head with a side slope ranging from 30$_o$ to 50$_o$ and U-shape gully at the middle. In some areas, the level of gully erosion is so advanced that it destroyed the whole road and is encroaching into private properties.

1.8.2 Hydraulic structure design and analysis

Appropriate hydraulic designs of new drainage and cross drainage structures are required for the site. In addition, gabion retaining walls and check dam structures are provided to avoid further deepening and widening of gullies. Accordingly, drainage canals are proposed in the main stream and finger of the gully.

The drainage canals are designed to safely evacuate the 50 years return period design peak discharge and verified for 100 years return period. A general naming convention was adopted for the purpose of clarity and presentation as earlier explained.

1.8.3 Main gully Hydraulic Modelling and Drainage Canal Design

The existing drainage canal that conveys the flood water from the culvert to Idemili River is damaged entirely by the expansion of the gully. This requires the design of a drainage canal that can safely drain the flows from upper catchment areas in the upper steep slopes and collect runoff from adjacent catchments through finger gullies for the specified design flood event. In addition, the bed profile of the existing gully is very steep and provision of associated structures (concrete canals, chutes and stilling basins, check dams at a certain interval is essential to lower the velocity and dissipate energy of flood flows.

The first option is to control the head of the gully. A chute is proposed at the head of the gully to connect the culvert outlet with the canal. The upstream section has very steep slope and narrow formation with some head cutting to the main road. This section of gully is proposed to be provided with reinforced concrete canal with chute and drop structure. The structures will be designed as U-frame cantilevered walls to serve as a main drain canal and as toe protection for the gully walls.

Drainage systems is provided to control excessive hydrostatic pressures (such as uplift pressure) acting on the concrete structures in case the water table temporarily rises above the channel invert due to local ponding or seasonal groundwater level variations. Water stops will be installed at joints of concrete sections. In addition, cascade drops and chutes are provided along this section where an abrupt bed profile change exists.

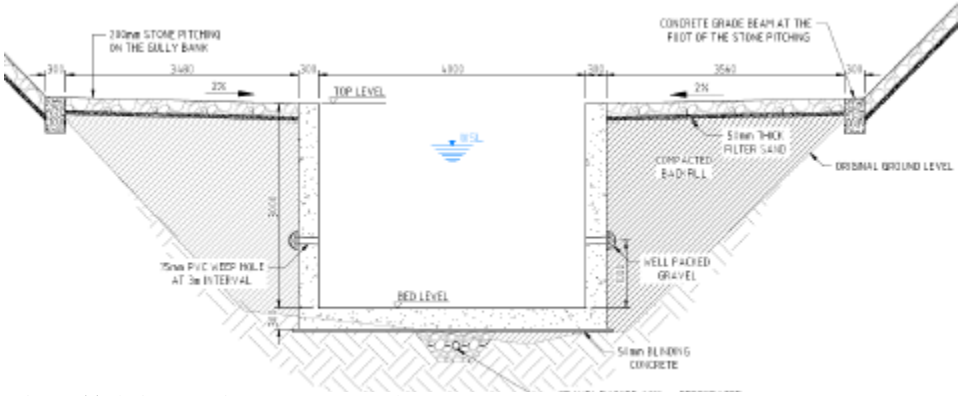


Plate 14 Typical proposed Concrete Cana Section - SMEC, 2016

1.8.4 Stream bank protection and gabion retaining wall section (0+620 to 2+020)

The most important consideration for the installation of gabions is the stability of the stream. A concrete channels along with different hydraulic structures are provided in the upstream section of the gully where a rapid change in down- cutting and extreme lateral movement exists.

The hydraulic modelling and site inspection visit demonstrates that, this section of the gully has relatively mild slope and wider section that lowers the flow velocity in the reach. However, the velocity is still slightly above the allowable non erosive flow velocities. Therefore, a gabion retaining wall and check dams are proposed in this section of the reach so as to avoid bed and bank erosion. The diagram below shows the proposed gabion retaining wall. The rocks used for the gabion boxes and mattresses are normally obtained from local sources near the site and should be durable and of good quality.

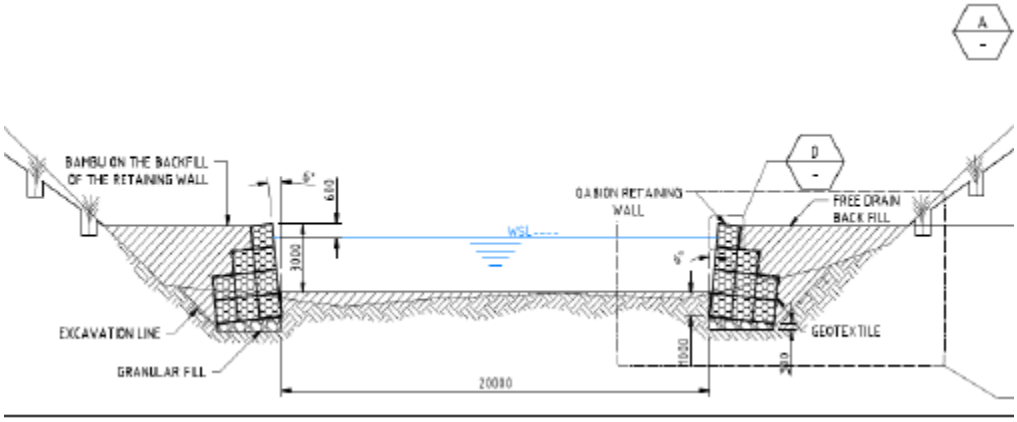


Plate 15 Typical Proposed Gabion retaining wall for stream bank protection- SMEC, 2016

1.8.5 Dike extension and end structure at flood plain (2+020 to 2+400)

The main problem at this section will be sedimentation as the slope is very mild and no defined channel section exists. The section is very wide for small floods and sedimentation will occur. In order to avoid this problem, the section is proposed to be narrowed with provision of dyke so that the velocity will be able to carry the sediment down to the flood plain and river. The dike will be lined by stone riprap so that it can be overtopped during large floods.

1.8.6 Culvert Design

A reinforced concrete box culvert (RCBC) is required at the road crossing to replace the existing undersized culvert. The proposed culvert is a drop inlet culvert and the capacity of the proposed culvert was determined using the HEC-RAS model. The design dimensions of the proposed RCBC to pass the design flood event are shown in Table 2. The RCBC was designed for the 50-year return period flood event and checked for the 100 year flood event. This means the proposed culvert has the capacity to pass the 100 year flood event without overtopping the road surface level.

Table 3 Proposed dimensions of culvert at Main gully

Section	Q-50 (m^3/s)	Width (m)	Height (m)
Reinforced Concrete Box Culvert (RCBC)	129.80	4.50	3.00

1.8.7 External Drain connection and Interceptor drain

External drain connections are provided at 250m average interval along the banks of the gully. These are chute structures located in the left and right banks of the gully with appropriate filter beneath the structure on the sloping banks of the gully. These structures are provided for the community to drain runoff from adjacent properties to the main trunk drainage system. This will avoid further lateral erosion of the gully. In addition, longitudinal flow on the proposed terracing benches will also be intercepted by these structures and diverted to the main concrete lined canal.

1.8.8 Design of Chute and Energy Dissipater Structures

Since the bed profile of the gully is relatively steep at the head, chute structures and energy dissipater structures are proposed along the canal. Chutes are selected because they are used to convey water from a higher elevation to a lower elevation over shorter distances, and large topographic gradient. Chute structures consist of a chute section, a stilling basin, and an outlet transition.

The hydraulic design of chute and stilling basin is sized for 50 years return period design flood and checked for 100 years return period design flood. Accordingly, chute structure is proposed along the canal in order to maintain the flow velocity along the canal within allowable limits. The proposed chute structures are followed by stilling basin structures (for energy dissipation). These basins are composed of chute blocks, baffle blocks, and sills designed to trigger a hydraulic jump to a required tail water condition.

1.8.9 Design of Check dam

Check dams are proposed along the middle reach of the main gully to reduce the bed slope and velocity of flow. These check dams are proposed to be gabion weirs provided across the river. The proposed check dam height is 1.5m with vertical downstream face and steeped upstream face. The weir's upstream side is made stepped in order to facilitate the bonding between gabions and earthfill, which functions so as to make the weir impervious. Moreover, earth fill's weight on the weir steps adds stability to the structure, contributing to prevent sliding and overturning events. Sometimes, natural flow conditions downstream the structure, can provoke a concentration of energy dissipation in a circumscribed zone. Therefore, Weir with counter weir and lined stilling basin located below the natural river bed is selected for this specific condition.

1.8.10 Finger gully Hydraulic Modelling and Drainage Canal Design

In this section, a cascade and chute are represented in the model for the proper connection with the main gully. Water surface levels in the gully are also considered as downstream boundary condition. Also a concrete channel is proposed and provided in the model with cascade structure at the outlet and connection with main gully. A stepped chute structure is also proposed at the finger gully head. The stepped cascade structure is to provide safe energy dissipation and prevent advancement of gully head by scouring the bed and head cutting process.

Table 4 Proposed dimensions of canal section for finger gullies

Description	Q-50 (m3/s)	Width (m)	Height (m)	Main Gully station
RFG-1 (250m)	5.74	2.00	1.50	1+180
RFG-2 (230m)	7.50	2.00	1.50	1+640
LFG-1 (105m)	9.00	2.00	1.50	0+820
LFG-2 (150m)	0.50	1.00	1.00	0+960

LFG-3 (140m)	2.70	1.50	1.00	1+180

1.8.11 Gully bank treatment with rigid structures and Bio-remediation

The gully banks are proposed to be maintained at stable slope. In order to minimise further erosion by uncontrolled surface storm water runoff from the surrounding areas, a slope protection measure is provided. After careful analysis of various types of bank protection measures, two types were considered for this site (Vetiver grasses and stone pitching).

Table 5 Criteria for the proposed bank stabilization measures

Stone pitching	Vetiver Grass combined with bamboo
Proposed inside the steep and narrow gully banks and to avoid terracing and reduce resettlement.	Proposed at gully banks of relatively wider section with provision of 1.5m wide terracing at every 2.5m height.
Near the structure to provide more stability	Interceptor ditch is provided with terracing at 2.5m height to dispose run off to collector chamber chute.
Proposed on slopes of 45^0 and gentler slopes	Proposed on slopes of 45^0 and gentler slopes
This can be locally made and implemented by the local community	Cheaper implementation cost, community involvement and aesthetic value

1.8.12 Bio-remediation (Vetiver grass and bamboo)

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

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

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

1.9 Rationale for the ESMP

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

distance of the gully and its finger. More on the project design is explained in Chapter 3 of this report.

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

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

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

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

1.10 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.

1.11 Scope of Works and Objectives of the Study

The scope of works for this study includes but not limited to;

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.

The Objective for the study is to develop procedures and plans to ensure that the mitigation measures will be implemented throughout the phases for the Rehabilitation of the Nnewichi, Nnewi Gully Erosion site. It has also been prepared to ensure the effective long-term protection of the area and other biotic and abiotic components of the environment.

Specific objectives of this ESMP include the following:

- To examine the project in terms of its major activities and identify the aspects associated with the project construction which generate environmental impacts,
- Identify the environmental issues associated with the major activities,
- Develop mitigation measures for the aspects identified as having adverse environmental impacts,
- Incorporate environmental mitigation measures into activities and develop corrective actions and ensure monitoring.
- Define the specific actions required, roles and responsibilities for these actions, and associated costs and,
- Define a proposed institutional structure to govern the implementation of the ESMP and its monitoring.

2 CHAPTER TWO: INSTITUTIONAL AND LEGAL FRAMEWORK

2.1 Introduction

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

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

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

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

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

2.3 World Bank Safeguard Policies Triggered by the NEWMAP Project

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

Environmental Assessment (EA) (OP/BP 4.01)

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

Involuntary Resettlement (OP/BP 4.12)

This policy can be triggered if the project will involve involuntary taking of land and involuntary restrictions of access to property, protected areas, etc. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic

impacts. It promotes participation of displaced people in resettlement planning and implementation. The main objective of this policy is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

Physical Cultural Heritage OP 4.11

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

2.4 Federal Policy, Legal, Regulatory and Administrative Frameworks

2.4.1 National Policy on Environment

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

- Secure a quality of environment adequate for good health and well-being;
- Conserve and use the environment and natural resources for the benefit of present and future generations;
- Restore, maintain and enhance the ecosystem and ecological processes essential for the functioning of the biosphere to preserve biological diversity, and the principle of optimum sustainable yield in the use of living natural resources and ecosystems;
- Raise public awareness and public understanding between the environment and development and encourage individual and community participation in environmental improvement efforts; and,
- Cooperate in good faith with other countries, international organizations and agencies to achieve optimum use of trans-boundary natural resources and the prevention or abatement of trans-boundary environmental degradation.

2.4.2 The Federal Ministry of Environment

The act establishing the Ministry places on it the responsibility of ensuring that all development and industry activity, operations and emissions are within the limits prescribed in the National Guidelines and Standards, and comply with relevant regulations for environmental pollution management in Nigeria as may be released by the Ministry. To fulfil this mandate a number of

regulations/instruments are available (See section on National Legal Instruments on Environment), however for the main instruments in ensuring that environmental and social issues are mainstreamed into development projects is the Environmental Impact Assessment (EIA) Act No. 86 of 1992 See Annex 1. With this Act, the FMENV prohibits public and private sectors from embarking on major prospects or activities without due consideration, at early stages, of environmental and social impacts. The act makes an EIA mandatory for any development project, and prescribes the procedures for conducting and reporting EIA studies.

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

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

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

2.4.3 National Legal Instruments on the Environment

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

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

According to these guidelines:

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

2.5 Other Relevant Acts and Legislations at Federal Level

- Federal Environmental Protection Agency (Amendment) Act No 59 of 1992
- The National Guidelines and Standards for Environmental Pollution Control in Nigeria
- The National Effluents Limitations. Regulation 1991
- The National Environmental Policy (Pollution Abatement in Industries and
- Facilities Generating Waste) Regulations 1991
- The Management of Solid and Hazardous Wastes. Regulations 1991
- National Guidelines on Environmental Management Systems (1999)
- National Guidelines for Environmental Audit
- National Policy on Flood and Erosion Control 2006 (FMEnv)

- National Air Quality Standard Decree No. 59 of 1991
- National Environmental Standards and Regulations Enforcement Agency Act 2007 (NESREA Act)
- The Land Use Act of 2004, CAP L5.
- Water Resource Management Act, 2009
- The constitution of the Federal Republic of Nigeria 1999

2.6 State Legislations

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

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

Some laws in the state include:

Anambra State Policy on Environment (2010)

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

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

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

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

Anambra Riverine Area Management Policy (2010)

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

Anambra State Watershed Management Policy (2010)

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

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

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

Anambra State Waste Management Agency (Establishment) Act

This law focuses on the protection of the rural and urban environment in the Anambra state. It was made to support the observation of a sanitation day being the last Saturday of the every month. This act gives the agency power to manage solid waste in the state by selection and provision of disposal points as well as bins. They also monitor the observance of sanitation day's thereby punishing defaulters. This agency will play a very important role in sustainability of the project as their involvement will help provide disposal facilities/options to residents in the project area thereby preventing them from disposal of refuse in the gully.

Anambra-Imo River Basin Development Authority

Anambra-Imo River Basin Development Authority is a Federal Government Parastatal under the Ministry of Water resources. It is one of the 12 River Basin Development Authorities established in 1976 by Decree Number 25 and amended by Decree No 35 of 1987. The function of the AIRBDA is towards the development of water resources potentials of the states and to effectively and efficiently manage water resources by harnessing and conserving surface and underground water.

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

3 CHAPTER THREE: DESCRIPTION OF THE AREA OF INFLUENCE AND ENVIRONMENTAL BASELINE CONDITION

3.1 Anambra State

Anambra State is located within the south eastern zone of Nigeria with s land mass of over 4120 sq. km. The state has a population of 4,055,048 (2006 Census). Anambra state is situated on a low elevation on the eastern side of the River Niger and shares boundaries with Kogi, Enugu, Imo, Abia, Delta, Rivers and Edo states.

Local Government Areas

The twenty-one (21) Local Government Areas in Anambra State are: Aguata, Anambra East, Anambra West, Aniocha, Awka North, Awka South, Ayamelum, Dunukofia, Ekwusigo, Idemili North, Idemili South, Ihiala, Njikoka, Nnewi North, Nnewi South, Ogbaru, Onitsha North, Onitsha South, Orumba North, Orumba South, Oyi.

The project area is situated in Nnewichi, which is a large community in Nnewi North Local Government Area of Anambra state.

Geology

Anambra State lies in the Anambra Basin and has about 6,000 m of sedimentary rocks. The sedimentary rocks comprise ancient Cretaceous deltas, somewhat similar to the Niger Delta, with the Nkporo Shale, the Mamu Formation, the Ajali sandstone and the Nsukka Formation as the main deposits. On the surface the dominant sedimentary rocks are the Imo Shale a sequence of grey shales, occasional clay ironstones and Sandstone beds.

The Imo Shale underlies the eastern part of the state, particularly in Ayamelum, Awka North, and Oruma North LGAs. Next in the geological sequence, is the Ameke Formation, which includes Nanka Sands, laid down in the Eocene. Its rock types are sandstone, calcareous shale, and limestone in thin bands. Outcrops of the sandstone occur at various places on the higher cuesta, such as at Abagana and Nsugbe, where they are quarried for construction purposes. Nanka sands out crop mainly at Nanka and Oko in Orumba North LGA.

Lignite was deposited in the Oligocene to Miocene; and it alternates with gritty clays in places. Outcrops of lignite occur in Onitsha and Nnewi. The latest of the tour geological formations is the Benin Formation or the coastal plain sands deposited from Miocene to pleistocene. The Benin Formation consists of yellow and white sands. The formation underlies much of Ihiala LGA. Thick deposits of alluvium were laid down in the western parts of the state, south and north of Onitsha in the Niger and Anambra river floodplains.

Landforms and Drainage

Anambra State falls into two main landform regions: a highland region of moderate elevation that covers much of the state south of the Anambra River, and low plains to the west, north, and east of the highlands. The highland region is a low asymmetrical ridge or cuesta in the northern portion of the Awka Orlu Uplands, which trend roughly southeast to North West, in line with the geological formations that underlie it. It is highest in the southeast, about 410m above mean sea-level, and

gradually decreases in height to only 33m in the northwest on the banks of the Anambra River and the Niger.

The lower cuesta, formed by the more resistar sandstone rocks of the Imo Shale, rises to only 150m above mean sea level at Umuawulu an decreases in height north-westward to only 100m < Achalla. Its escarpment faces the Mamu River plain and has a local relief of between 80 and 30m West of it. This is the higher cuesta, formed by the sane stones of the Ameke Formation. Its height is above 400m in the south-east at Igbo-ukwu and Isuofii decreasing north-westward to less than 300m at Agbana, and to only 100m at Aguleri.

Vegetation and Soils:

The vegetation on the highlands is of semi-tropical rainforest type. It is characteristically green and is complemented by typical grassy vegetation. Fresh water swamp forests occur in the Niger-Anambra Basin.

Three soil types can be recognised in Anambra State. They are: (i) alluvial soils, (ii) hydromorphic soils, and (iii) ferallitic soils. The alluvial soils are pale brown loamy soils. They are found in the tow plain south of Onitsha in Ogbaru and in the Niger Anambra low plain north of Onitsha. They differ from the hydromorphic soils in being relatively immature, having no well-developed horizons.

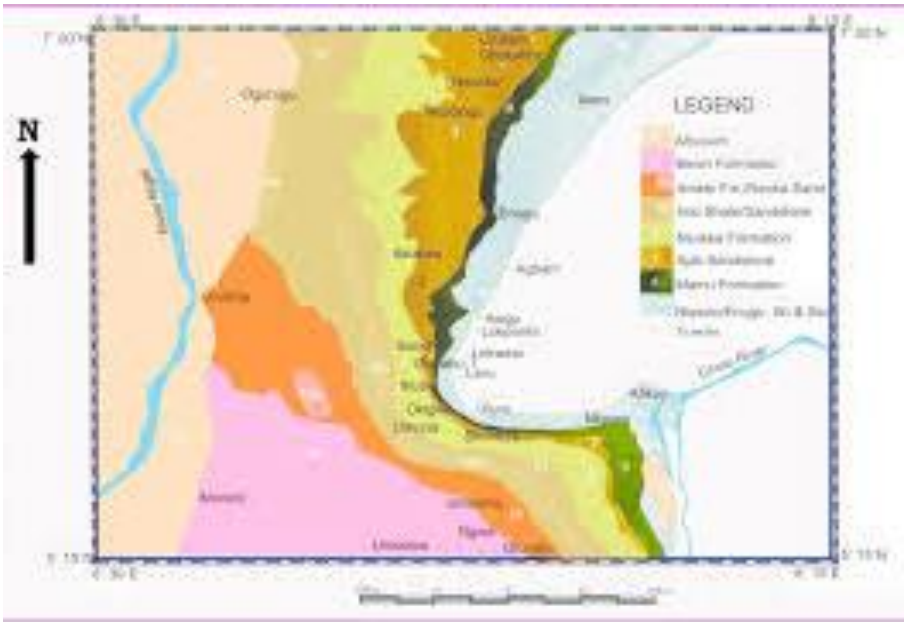


Plate 16: Different Soil types within the project location

Ecological Issue:

Some of the major ecological issues encountered in Anambra mostly includes; flooding and erosion. The erosion issues have exacerbated overtime due to the extensive forest clearing, often by bush burning, and continuous cropping with little or no replenishment of soil nutrients. This further resulted in the disruption of the ecological equilibrium of the natural forest ecosystem. Such a situation in a region of loosely consolidated friable soils is prone to erosion, giving rise to

extensive gully formation typical to the one experienced in Nnewichi and several other communities in Anambra State.

3.2 Overview of Nnewi

Nnewi is the second largest city in Anambra State in southeastern Nigeria. Nnewi as a metropolitan city encompasses 4 local government areas, Nnewi North, Nnewi South, Ekwusigo and Ihiala Local Government. Nnewi North is commonly referred to as Nnewi central, and comprises four autonomous villages: Otolo, Uruagu, Umudim, and Nnewichi. Nnewichi is the smallest of the four villages.

Four communities makeup Nnewichi namely; Okpuno Nnewichi, Oduda Nnewichi, Obiofia Nnewichi, and Abubor Nnewichi. Each community is divided into family units called 'umunna' and each umunna has a first family known as the 'obi'.

The traditional monarch of Nnewi is called the Igwe. The Igweship in Nnewi kingdom predates the arrival of Europeans, making it a unique monarchy in Igbo land. The Igbos are known for not having kings, hence the popular Igbo saying Igbo é nwĕ Eze, meaning 'the Igbos have no king'. In other Igbo clans, the British colonial administrators created warrant chiefs who then assumed the office and title of Igwe and are elected to this day.

In Nnewi, the Igwe is the *isi obi* (head of the *Obis*) and hence the Igwe, which literally translates as the heavenly one or highness as he is the holder of the *Ofo*, the religious and political symbol. He is born and not made or elected, and the institution of inheritance is the traditional right and privilege. The position is neither transferable nor negotiable. He is also an Obi. Obi is the title held by ruling chiefs; it is the equivalent of a duke in the nobility.

There are *Obis* in the four clans that make up Nnewi. The highest and the most senior obi is the *Obi* of Otolo, who is also the Igwe of Nnewi. Chief Nnamdi Obi, *Obi* Bennett Okafor and *Obi* George Onyekaba are the current obis of Uruagu, Umudim, and Nnewichi respectively. These three *obis* with Igwe Orizu, III as chairman constitute the Igwe-in-Council and they deliberate on the spiritual, traditional, and communal matters, in Nnewi.

Agbo Edo, a forest land which belonged to Edo Nnewi deity, was cleared to make way for a new market called Nkwo Nnewi market. The development of this market propelled the fast development of the local economy.

As a fast developing city and a major industrial and commercial hub in Africa, Nnewi experiences voluminous financial activities, therefore hosts major banks, and other financial institutions. Industries are dotted around the city and adjoining towns. Palm oil, cosmetics, motor, and motorcycle spare parts, books, and stationery, textiles, electric cables, and so on are produced in commercial quantity in the area. Its main trading centers include Nkwo Nnewi market (the largest spare parts market in west Africa) and Nwafor market, Eke Amaobi market, Eke Ochie, Eke Ichi Market, Orie otube Market, etc.

The main occupation of Nnewi people is trading and farming, therefore they depend mainly on agriculture and commerce for their daily livelihood. Most Nnewian have mbubo (home gardens) and ubi (out-station gardens) where they usually cultivate their farm products. These crops when they are harvested are usually taken to the market for sale. Most of the prime cash crops include oil palm, raffia palm, groundnut, melon, cotton, cocoa, rubber, maize, et cetera. Food crops such as yam, cassava, cocoyam, breadfruit, and three-leaf yam are also produced in large quantities.

The location of Nnewi within the tropical rainforest gives it the ecological basis for production of a wide range of tropical agriculture crops with widespread potential for industrial convention.

Geographically, Nnewichi falls within the tropical rain forest region of Nigeria. Though it suffers from soil leaching and erosion which has reduced the soil in some areas to a porous sandy terrain, it remains an area of rich agricultural produce and the epicenter of business trade. It is predominantly occupied by the Igbo ethnic group of Anambra State. Most of its inhabitants are Christians (majorly Roman Catholics).

Major villages that make up the Nnewichi include, Obiofia, Okpuno, Odida and Abubo.

The main ecological hazards in the area are accelerated gully erosion and flooding. Poor drainage and town planning in a region of loosely consolidated and easily eroded soils is prone to serious erosion, giving rise to extensive gully formation. This as well as the topography of the area is the main cause of the erosion menace in Nnewichi.

3.3 Environmental Quality Assessment

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

3.4 Sampling Methodology

Soil and water samples were collected. A total number of six (6) soil-sampling points were collected. Two (2) samples (topsoil and sub-soil) were taken at each point. The list of sampling points and their GPS coordinates are presented in Table 8 below. Ground and Surface water samples were collected from randomly selected locations of boreholes and Mmiri Agu streem respectively within the project area.

3.4.1 Soil Sample Collection

A total of twelve (12) samples were collected randomly using a manual soil auger. six (6) samples were collected within the project corridor and the other six (6) were collected in the project community. Surface soil samples were collected within a soil depth of 0-15cm, while sub-soil samples were collected within a soil depth of 15-30cm. Samples for physico-chemical analysis were collected into coded plastic bags after being wrapped in aluminium foil.

Table 6: Particles size grading of the soils at Nnewichi

LOCATION	COORDINATES	NAME	SAMPLE POINT	DEPTH (cm)	CLAY (%)	SILT (%)	SAND (%)
Nnweichi	N06.04635° E006.92055°	Noble Muodebe	NN 1	0-15	19.30	7.00	73.70
				15-30	12.10	2.90	85.00
	N06.04761° E006.91943	Ozichukwu Nnodu	NN 2	0-15	14.60	3.30	82.10
				15-30	10.30	3.70	86.00
	N06.06050° E006.91328°		NN 3	0-15	6.60	2.00	91.40
				15-30	6.10	3.00	90.90
			NN 4	0-15	15.10	6.10	78.80

	N06.04835° E006.91921°	Osieloka Okafor		15-30	6.70	4.10	89.20
	N06.05504° E006.91663°	Nonso Anajekwu	NN 5	0-15	13.20	2.50	84.30
				15-30	10.00	2.90	87.10
	N06.05449° E006.91535°	Vincent Okafor	NN 6	0-15	17.10	2.90	80.00
				15-30	5.50	1.00	93.50

3.4.2 Water Sample Collection

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

3.4.3 Air Quality Sample Collection

Air samples were collected using a Testo 350 XL. Measurements were taken at different locations around the project area with the same coordinate as stated above.

3.4.4 Noise Level Measurement

Noise levels were measured using a Testo 815 Noise meter. Noise samples were collected at the locations mentioned in the table below.

Table 7: Noise levels at different locations in Nnewichi

S/N	Low	High	GPS
1.	49.7	73.7	N06.04635° E006.92055°
2.	35.0	53.8	N06.04780° E006.91995°
3.	53.1	69.2	N06.05139° E006.91556°
4	50.0	71.2	N06.05449° E006.91535°
5	47.1	56.1	N06.05504° E006.91663°

6	42.0	72.0	N06.05200° E006.91583°

3.4.5 Discussion on Findings from Soil Sample Analysis on Nnewichi

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

Table 8: Physiochemical properties of soils at Nnewich

Sample No	Depth (cm)	pH	OC %	N %	P Mg/kg	Ca Meq/100g	Mg Meq/100g	Na Meq/100g	K Meq/100g	Copper	Iron	Chronium	EC uS/cm
NN 1	0-15	5.3	0.8	0.13	23.80	3.00	0.70	0.15	0.04	0.20	0.09	0.03	19
	15-30	5.6	0.63	0.09	25.70	2.60	0.60	0.16	0.04	0.26	0.07	0.04	23
NN 2	0-15	6.01	1.15	0.14	28.68	5.70	2.80	0.35	0.17	0.47	0.10	0.08	12
	15-30	6.14	0.89	0.11	28.68	2.60	1.86	0.35	0.08	0.54	0.14	0.09	18
NN 3	0-15	5.40	0.69	0.08	19.80	2.40	0.68	0.19	0.05	0.24	0.03	0.04	16
	15-30	5.72	0.70	0.076	24.50	2.00	1.04	0.23	0.04	0.31	0.01	0.05	7
NN 4	0-15	5.5	1.06	0.10	24.50	2.00	1.20	0.22	0.08	0.21	0.09	0.06	13
	15-30	5.8	0.86	0.06	25.73	3.40	0.75	0.21	0.05	0.25	0.06	0.04	10
NN 5	0-15	6.00	0.88	0.07	26.50	6.30	2.20	0.15	0.03	0.62	0.12	0.07	36
	15-30	6.12	0.75	0.08	25.60	5.70	1.85	0.14	0.03	0.62	0.12	0.08	37
NN 6	0-15	4.63	0.89	0.00	20.83	2.80	1.60	0.20	0.06	0.13	0.01	0.02	11
	15-30	4.88	0.80	0.080	20.76	2.55	1.60	0.17	0.05	0.18	0.02	0.01	9
FME Limit		6-9		<1	0.1	100		200	-	1000	-	-	

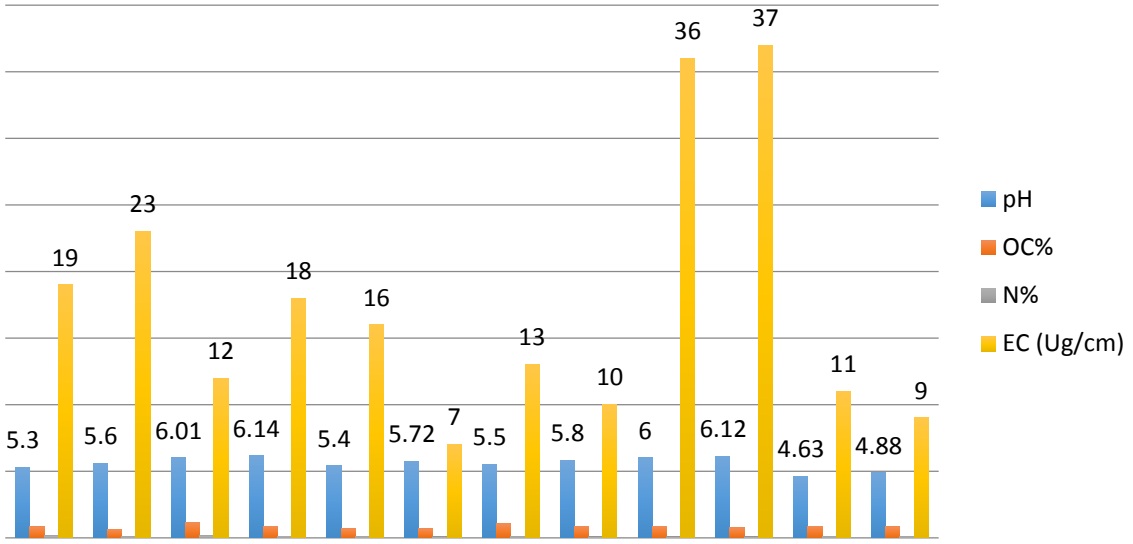


Plate 17 Some Physiochemical analysis for Soil in Nnewichi

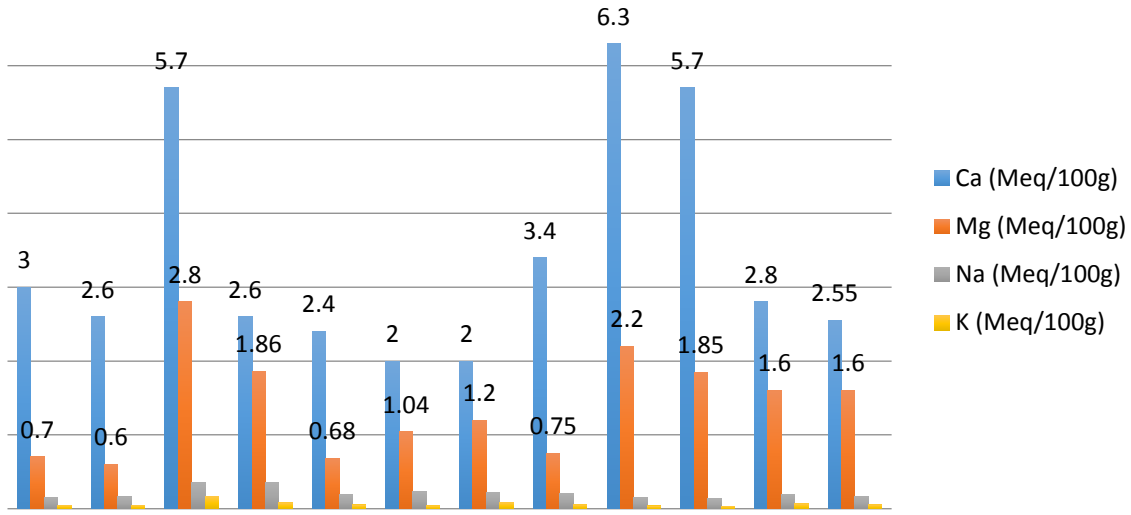


Plate 18 Other Physiochemical analysis for Soil in Nnewichi

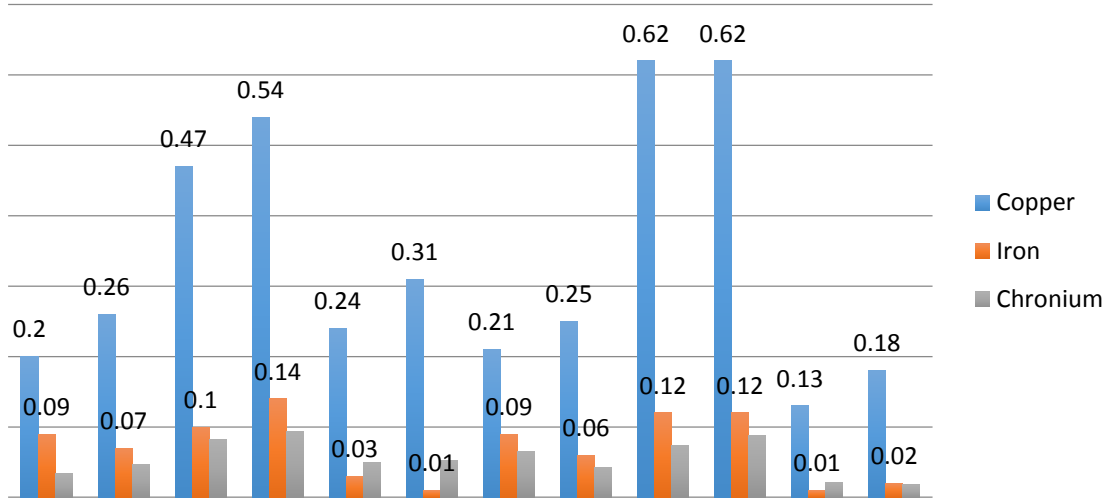


Plate 19 Heavy metal content of soil samples in Nnewichi

pH

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

Color

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

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

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

Heavy Metals

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

Electrical conductivity

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

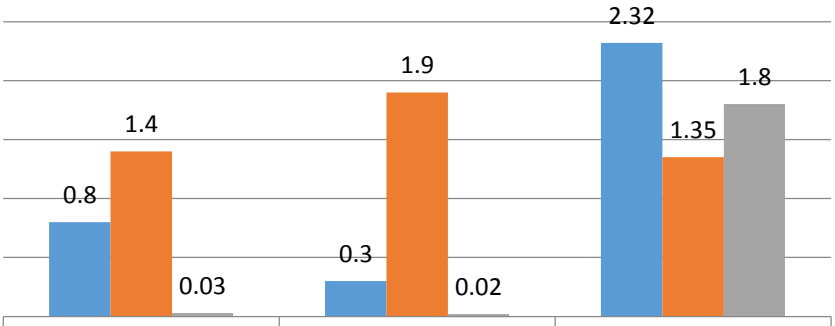
3.4.6 Discussion of Results of Water Quality Analysis in Nnewichi

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

Table 9 Physiochemical properties of water sources at Nnewichi

S/N	PARAMETERS	Mmiri Agu Upstream	Mmiri Agu Downstream	NN3 (Borehole)	FMEnv LIMIT
1	pH	6.30	6.30	6.83	6-9
2	Conductivity (uS/cm)	70	120	179	1000
3	TDS (mg/l)	13.00	35.70	61.60	1000
5	Chlorine (mg/l)	17.6	16.5	357	250
6	Salinity (mg/l)	0.02	0.06	0	0.1
7	Nitrate (mg/l)	0.80	0.30	0.08	20
8	Sulphate (mg/l)	220	183	300	500
9	Calcium (mg/l)	31.30	29.60	51.70	150
10	Magnesium (mg/l)	11.30	11.40	5.19	50
11	Sodium (mg/l)	0.30	0.25	3.2	200
12	Potassium (mg/l)	1.40	1.90	1.35	<1
13	Total Hardness (mg/l)	24.70	18.30	70.0	200
14	Dissolved Oxygen (mg/l)	2.80	4.10	1.70	7.50
15	BOD_5 (mg/l)	7.80	12.80	0.15	30
16	COD (mg/l)	18.70	27.50	1.80	80
17	Phosphate (mg/l)	0.03	0.02	1.80	5
18	Turbidity (NTU)	13.60	18.60	1.60	100
19	Yeast and Mould (cfu/ml)	Nil	Nil	Nil	
20	Coliform (cfu/ml)	226	374	8	

21	Salmonella (cfu/ml)	Nil	Nil	Nil	
22	E.coli (cfu/ml)	142	150	20	
23	Faecal Streptococcus (cfu/ml)	Nil	Nil	Nil	



	Mmiri Agu Upstream	Mmiri Agu Downstream	UM3 (Borehole)
Nitrate (mg/l)	0.8	0.3	2.32
Potassium (mg/l)	1.4	1.9	1.35
Phosphate (mg/l)	0.03	0.02	1.8

Plate 20 Some physiochemical properties of water samples in Nnewichi

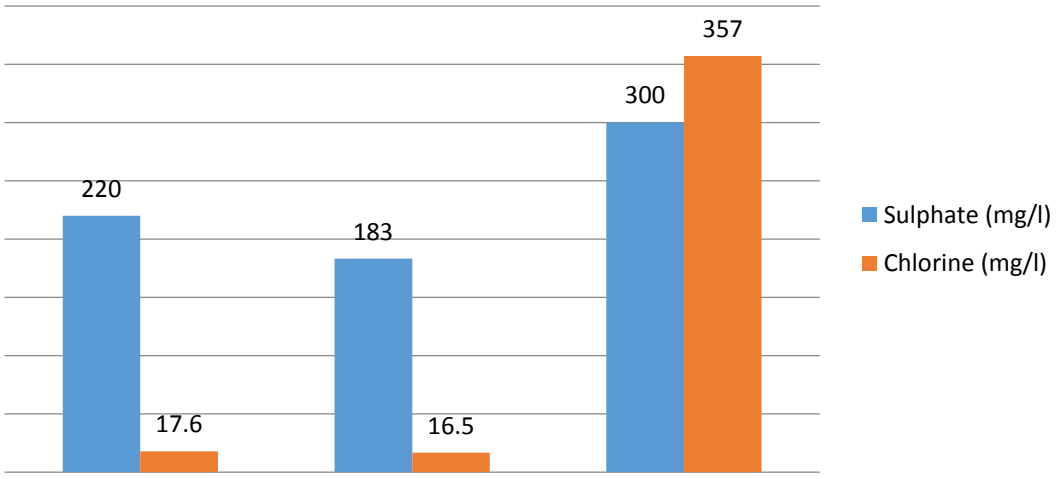


Plate 21 Some Other physiochemical properties of water samples in Nnewichi

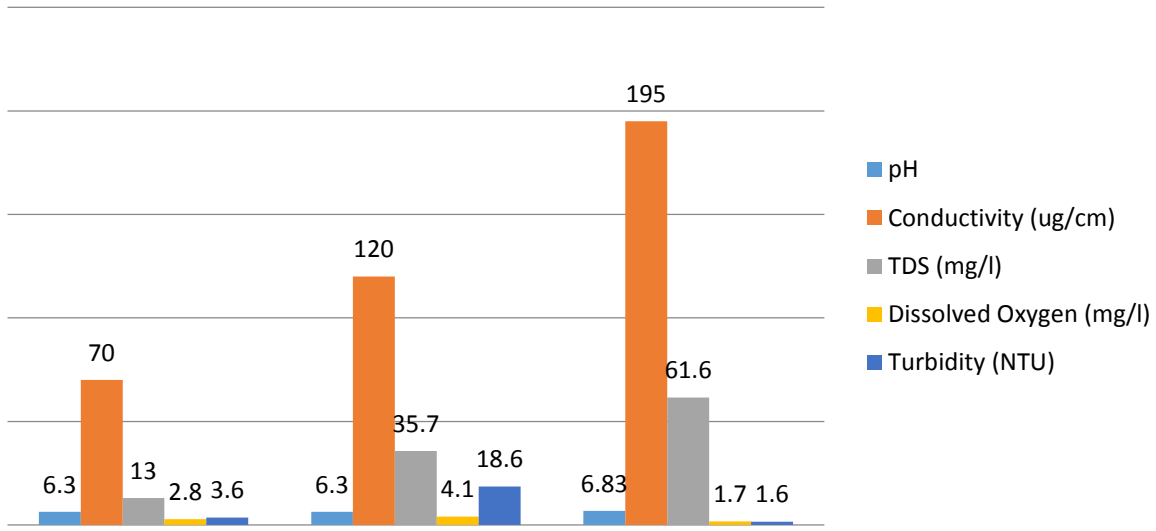


Plate 22 More physiochemical properties of water samples in Nnewichi

Dissolved Oxygen (DO)

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

Turbidity

Turbidity is the measure of relative clarity of a liquid. It is an optical characteristic of water and is an expression of the amount of light that is scattered by material which include clay, silt, and finely divided inorganic and organic matter, algae, soluble colored organic compounds, and plankton and other microscopic organisms in the water when a light is shined through the water sample. The measured turbidity value for the surface water ranged from 3.6 to 15.6NTU and 1.6 NTU for ground water. The turbidities are all within the FMEnv limits, but the downstream surface water is not permissible under WHO limits.

Salinity

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

Calcium and Magnesium

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

Sulphate and Chloride

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

pH

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

Total Dissolved Solids (TDS)

Total Dissolved Solids (TDS) usually refers to the mineral content and dissolved organic material contained in liquid in molecular, ionized or micro-granular suspended form in the water. The TDS concentration of both the surface and groundwater were found to be below the FMEnv limit of 1,000mg/l. A TDS concentration over the recommended limit of 1,000mg/l may cause gastrointestinal problems in humans and animals.

Conductivity

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

Biochemical Oxygen Demand (BOD5)

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

Chemical Oxygen Demand (COD)

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

Microbial Contamination

Bacteriological results for all the water sources presented above may be due to increased anthropogenic and socio-cultural activities. Rapid development of town ships and industries in the surrounding vicinity, nearby lands and or in water bodies as experienced in some sampling points degrades water quality and may also have added strains in the various water bodies to an extent resulting in the degradation of its water quality.

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

Mmiri Agu stream. The above observation indicates that the bacterial contamination varies in sampling points.

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

3.5 Technical Approach and Methodology to the Reconnaissance Exercise

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

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

3.5.1 Preliminary Site Visit/Scoping and Reconnaissance Exercise

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

The methodology used in the conduct of the Reconnaissance exercise for the sub-project is based on guidelines documented under the World Bank Operational Policies OP 4.12.

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

The Community leaders (Obi's, President Generals of the Community Associations, Women and Youth Leaders, some of the PAPs etc.) were engaged in a public forum during the reconnaissance visit. This served as the first point of entry as Stakeholder engagement and consultation is highly critical for the success of the rehabilitation of the erosion. Stakeholder consultation will be a continuous exercise for the successful achievement of the RAP process.

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

During the reconnaissance visit effort was made in highlighting envisaged impacts associated with the sub-project. The perimeter within which people and land will be affected by displacement or land acquisition was identified. Also a date was agreed upon by the community and the consultant to conduct a large stakeholder's consultation where the full details of the project will be discussed with the community especially the PAPs.

3.6 Impact Identification

The proposed Rehabilitation of the Nnewichi Gully will lead to several changes in the environment and socio-economic aspect of the project area. A good number of these changes will be beneficial, especially the impacts of rehabilitating degraded land and reducing longer-term erosion vulnerability in Nnewichi community.

3.6.1 Impact Identification and Assessment Tool

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

During the reconnaissance visit to the Nnewichi gully erosion site, a number of potential and associated impacts were revealed and carefully noted by the use of a Checklist as enumerated in Annex 3. The use of checklist adopted for the evaluation of the potential impacts posed by the project was based on its comprehensiveness, selectivity, mutual exclusivity, objectivity, confidence limit and ability to deduce and predict interactions.

4 CHAPTER FOUR: SOCIO-ECONOMIC CHARACTERISTICS AND STAKEHOLDERS CONSULTATION

4.1 Introduction

The socio-economic assessment studies were aimed at examining the socioeconomic conditions of the people living around the project site in Nnewichi, Nnewi in Nnewi North LGA of Anambra State. This is to ensure that the potential impacts of the proposed rehabilitation of the Nnewichi Gully Erosion site project is captured and described while proffering solutions to possible negative impacts to human habitat, health and livelihoods.

The specific objectives of the study include:

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

Demographics

The study intends to identify and document the demographic data of the project communities such as population, literacy level, occupation, dependency level, housing and social amenities. These data will be useful not only in establishing the importance of the rehabilitation of the Nnewichi gully erosion site but equally in quantifying the environmental and social impacts of the planned works which will help determine the management plans for the said project. It will also be used in the analysis for provision of livelihood alternative during the RAP Implementation.

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

Local Economy

Formerly an agrarian community of small scale farmers up to the 1960s, Nnewichi has since become commercial and industrial. Distributive trade is the most dominant occupation, just as the entire Nnewi town is now known nation-wide, and indeed internationally, as the hub of motor and motorcycle spare parts trade and automobile manufacturing of Nigeria.

However, the vast majority of the adult are petty traders in the lower income group. There is a main market and dozens of neighborhood markets in Nnewi town. In Nnewichi there are; Eke Amuko Market, Orie Agbo Market, and Orie Obiofia Market.

Land Use/Tenure

While majority of the land use is for agricultural purposes others are for residential settlement, market places and public reserve for future development uses. A combination of traditional land ownership system and government ownership of land is observed in the area. However, the Nnewichi community practices the traditional land ownership system.

From time immemorial, land in this area is owned by families. Each indigenous community is made up of families of land-owing kindred's. And within each kindred land and property ownership is by right of primogeniture (the first of the male children having the right to inherit their father's land which they have to share with their junior brothers and half-brothers if their fathers fail to share the property before their demise).

For sale of land to other persons or groups, common family land not yet shared is sold by all adult males enjoying common inheritance of the land. Individual owners are free to sale their own share of family land. However, to be transparent and hitch-free, such sales transactions need to be witnessed by a couple of the vendor's kindred.

Generally, women (daughters or spouses) of a family are by tradition never involved in such property in such property sharing and transfer deals, unfortunately.

Historic and Cultural Resources

Nnewichi, as a historical city, has many cultural events and places adorned with festivities and cultural monuments. It hosts many festivals, notably amongst them is the New yam which all parts of the city and masquerades from all federating towns participates in. The festival attracts all sorts of activities and celebrations which residents hold in the highest esteem.

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

Okwu ogwugwu, Edo Ezennewi, Okwu Udo and Okwu Idemili are the major shrines housed within the community. There are also some smaller shrines owned by families or individuals within the community. However, none of these were within the intervention area.

Traditional Governance

The *obi* of Nnewichi is the overall traditional ruler of Nnewichi and works in close collaboration with the Obis of Abubor, Oduda and Obiofia. Individual and sometimes collectively the obis engage in a great deal of conflict resolution in their respective domains, ensuring inter-family and inter-community peaceful co-existence, and maintaining security for the social and economic progress of Nnewichi.

In matters concerning Nnewi town in general, the Obi of Nnewichi represents the interest of Nnewichi as a whole and strives for good relationship and the fair share of Nnewichi within the Local Government Administration of the day.

Grievance Redress Mechanism

Traditionally, each extended family unit has a body made up of all its male house holders. It is at this forum that conflicts between members of the extended family are resolved. If not, the next level of conflict resolution is at the much taken to the Obi of that community. Tradition generally demands that such stages of conflict resolution must be exhausted before redress is sought at the court of law. An important exception in this regard, however, is where the breach of action causing the conflict is criminal and demands the immediate attention of the law enforcement Agency. A GRM has been developed for the project under the Livelihood component and this shall be used during the implementation of the subcomponent.

Women Participation

In economic, social and religious concerns the women of Nnewichi are very active and adequately represented. It is in the political spheres that women belong almost entirely to the willing followership rather than to the leadership class. This is certainly not a result of any form of gender

discrimination. However with men in the sphere of political leadership, women being in the helm of political leadership still belongs to a distant future.

Health Institution

There are twenty-five private hospitals/clinics, including seven children's hospital in Nnewichi. Also the Nnamdi Azikiwe University Teaching Hospital is in Nnewichi. There are a couple of diagnostic laboratories as well as maternity homes. Five functional government healthcare centers operate in Nnewichi. Apart from about a dozen registered chemist and full-blown drug stores, dozens of road side patent medicine stores are also in business in many parts of Nnewichi.

4.2 Methodology for the Socio-economic survey

The general methodology used for the socio-economic impact assessment employed the collection of primary and secondary source data. The primary sources data gathering comprised of questionnaire administration, group interviews Ground truthing/Reconnaissance survey for identification and Disclosure (awareness creation), discussions and direct observations. Secondary data was obtained from the National Population Commission and desktop literature review. Structured questionnaires designed and uploaded were administered to people living around the project area. Data collected was analysed using Microsoft Excel 2010.

4.3 Primary Data

A random sampling survey was carried out within Nnewichi community. Questionnaires were administered to a total of 115 respondents. This survey was designed to have an understanding of the socio-economic attributes of the people within the community and not specifically for information regarding the gully. However, those living within the gully corridor were part of the population sampled.

4.3.1 Gender Distribution of Respondents

It was gathered from the field survey that majority of the Respondents (about 89%) are males while females are 11% as depicted in plate below. Secondary data of population within the local government shows a different picture. This may be attributed to the willingness of the respondents to fill the questionnaires. Most of the women were eager to attend to family/house chores than to respond to the questionnaires presented. Also the women are found mainly at the market square or their shops which are located outside the sample zone.

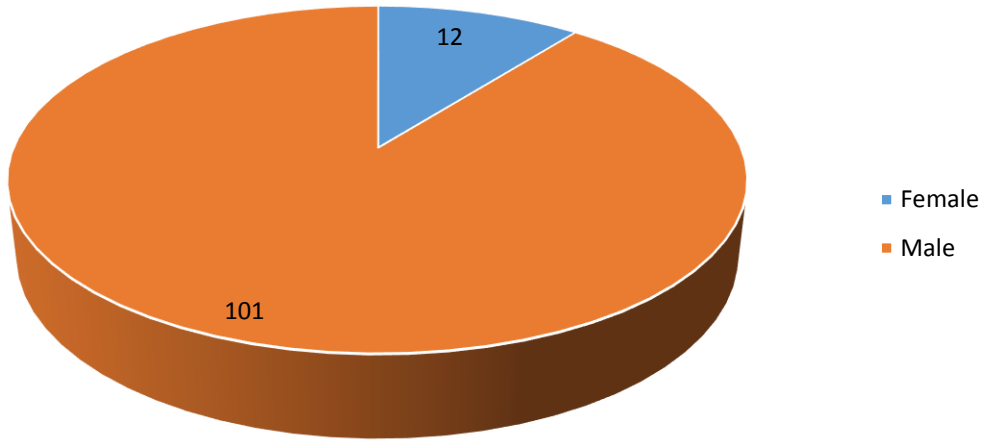


Plate 23 Sex of respondents

4.3.2 Age Distribution of Respondents

As shown in the Plate below, respondents range from 11 to above 61 years. The chart shows that those between ages 51-60 years and those above 61 years constitute the dominant population of Respondents with a combined proportion of about 50%. The least age group among Respondents belongs to those from 11-20 with a population of 2%. The highest population of Respondents (26%) were within 51 to 60years. The younger population are predominant around the residential areas or schools while the more elderly are visible in the around the Market and center of the town.

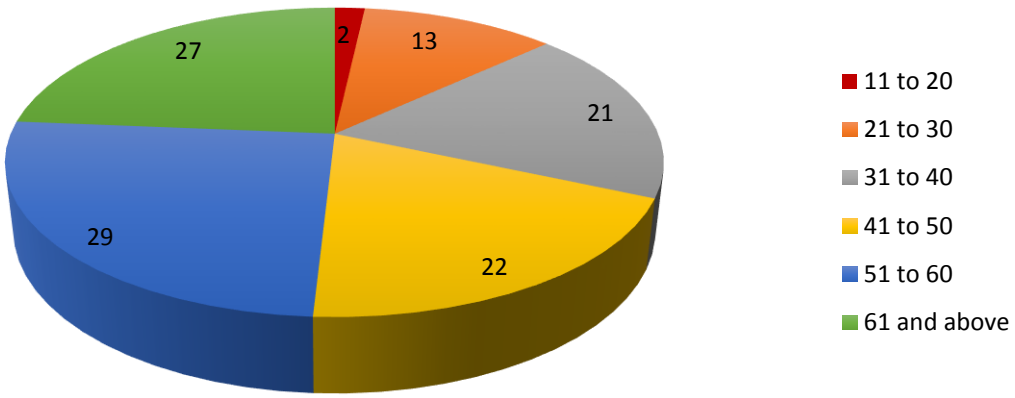


Plate 24 Age Distribution of Respondents

4.3.3 Marital status of Respondents

Respondents are predominantly married people (about 87%) as depicted in the plate below. Singles are the other marital status that featured among the Respondents. The significance of this result is that Respondents are majorly men and women who are the breadwinners and help mates

in their respective households. Sampling was performed within the project environment and not the entire Nnewi. This is due to the fact that the area selected is the area of envisaged impact. Though the data collected and reviewed shows that there is no widow among the respondents, this does not mean that the entire community does not have widows/widowers as observed among the vulnerable groups.

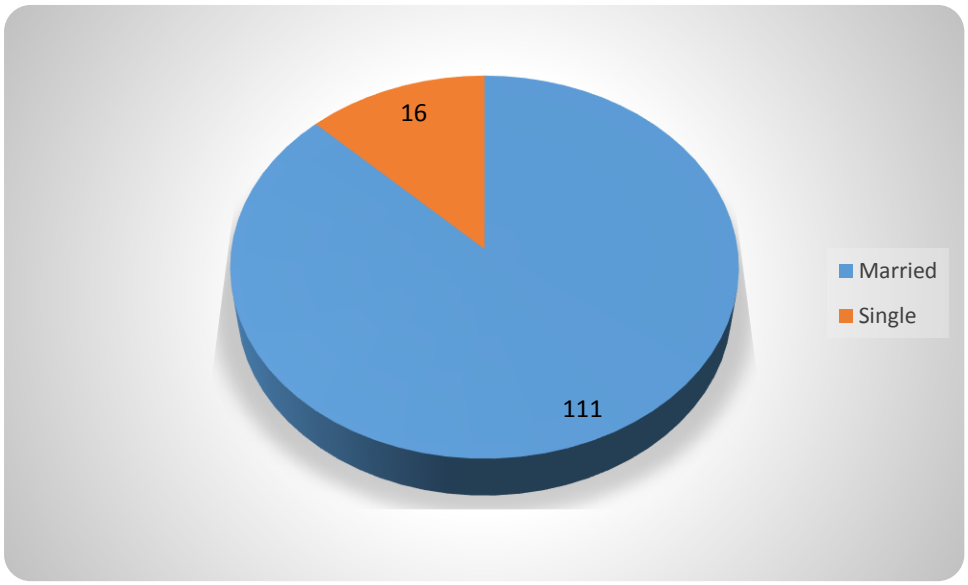


Plate 25 Marital Status of Respondents

4.3.4 Religious practice of Respondents

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

4.3.5 Literacy Level and Educational Infrastructure

Most people or Respondents have some form of education (97%). The highest number of Respondents (57%) Indicated that their highest level of academic qualification is FSLC. About 2% of the Respondents don't have any form of formal education. This shows that majority of Respondents have the minimum level of education that might help them in making informed decision, or participate meaningfully during discussions as it affects the project implementation.

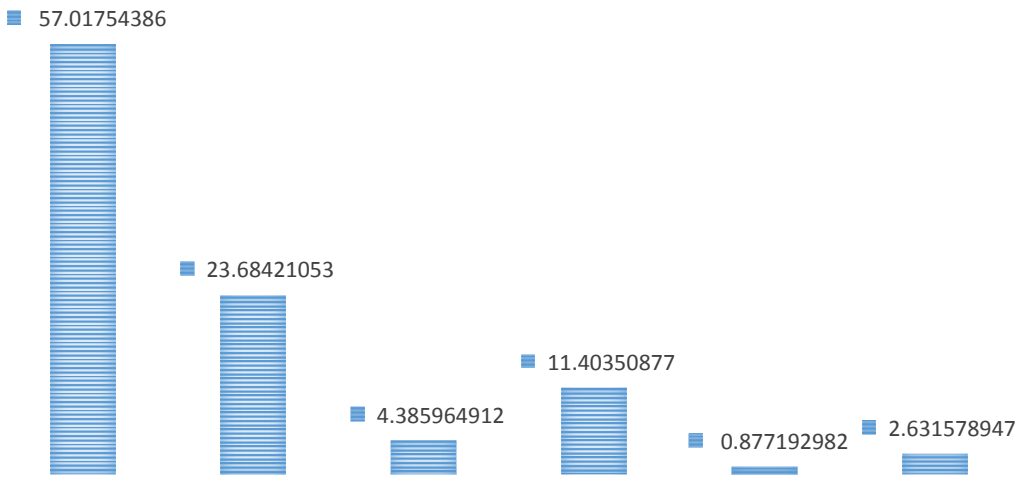


Plate 26 Literacy level of Respondents

4.3.6 Water and Sanitation

27% of respondents get domestic water from privately owned boreholes while 43% make use of water from commercial boreholes. About 30% of respondents use water from other sources which include a combination of water vendors (25%), River (2%) etc. A small amount of respondents use water from water collected in very few occasions.

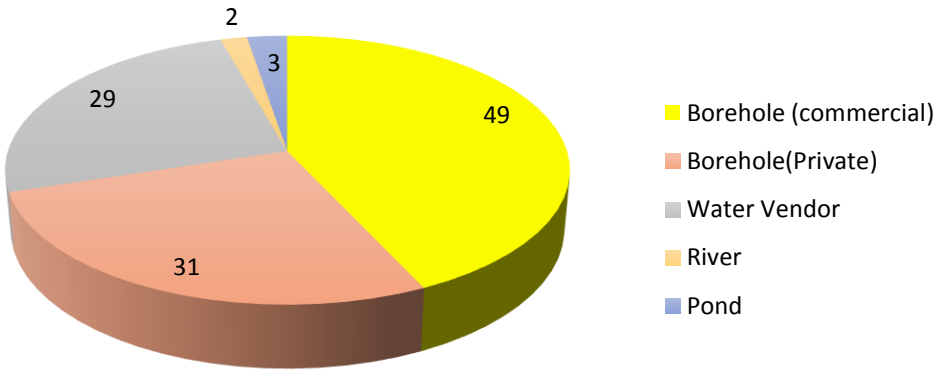


Plate 27 Water Source for domestic use

It was also deduced from the field work that about 49% of the respondents use Pit latrines while 41% make use of water closet as seen in the plate below. 10% of the respondents defecate in the bush and this was evident during the field trip as faeces were seen littered in different sections of farm lands and bush.

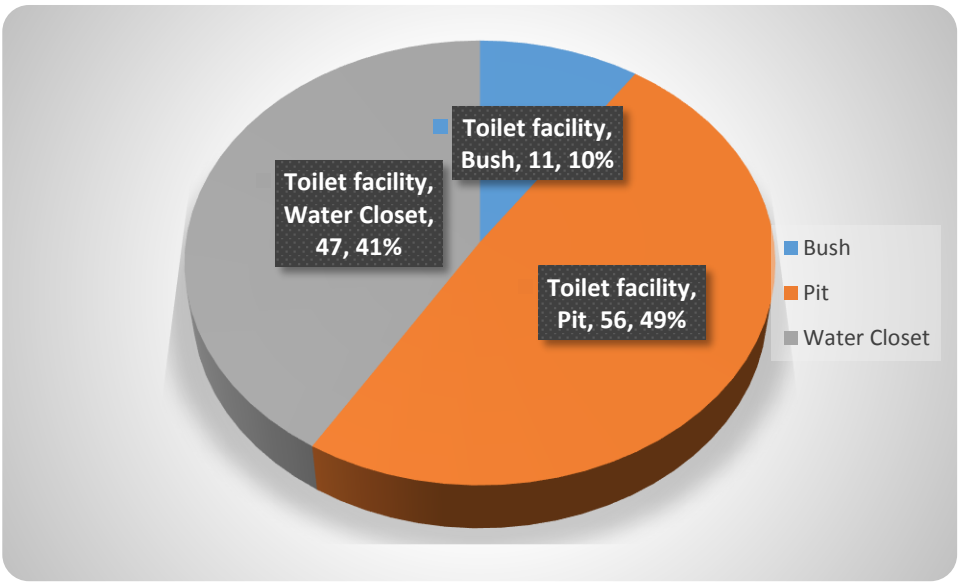


Plate 28 Type of toilet facility

4.3.7 Household Waste Disposal, Cooking Fuel and Electricity

About 14% of the people in the area dispose their household waste in the bush. 5% dispose their refuse by open dump which includes into the gully. About 67% of the respondents make use of firewood for cooking while the rest use either kerosene Charcoal or Gas as shown in plate below. The survey also showed that electricity is obtained from the national grid within the project communities. However, their services are epileptic. As an alternative source of electricity, the people mostly use hurricane lamps (56%) and Generators (44%).

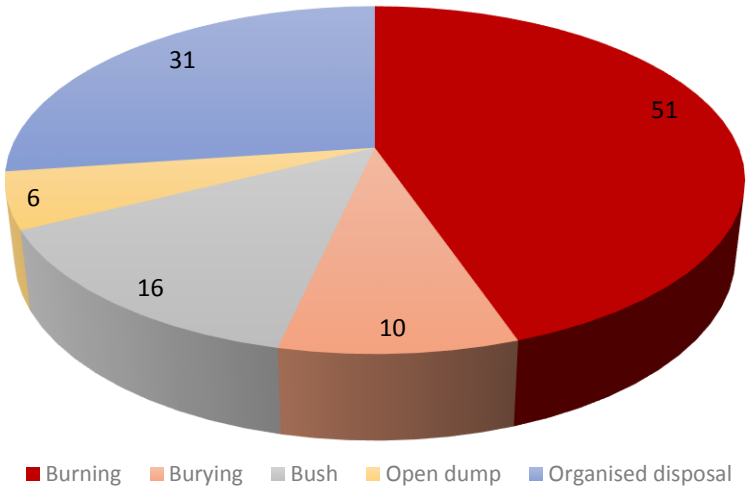


Plate 29 Refuse disposal methods

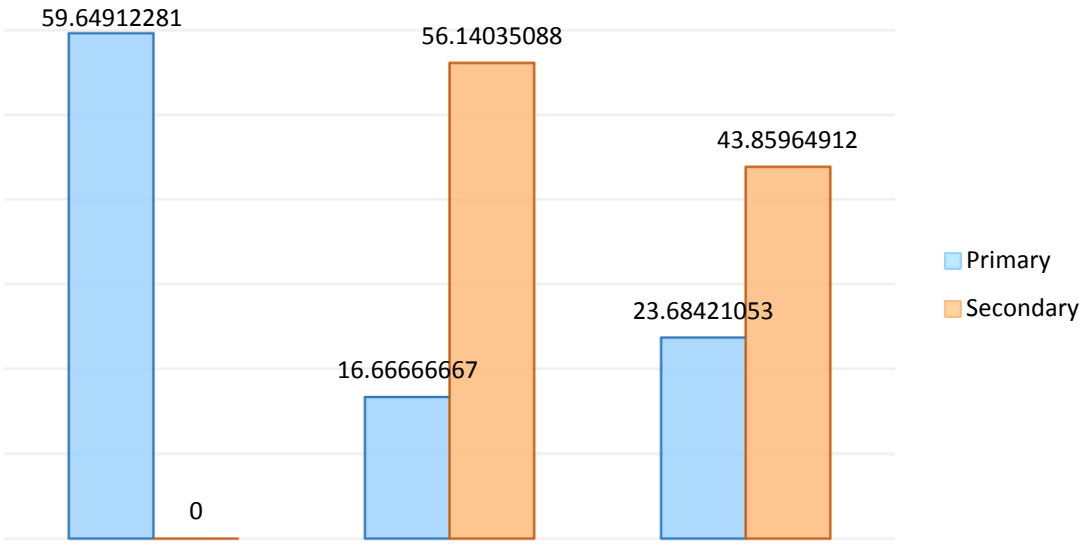


Plate 30 Source of Energy

4.3.8 Average household size of Respondents

The survey shows that most of the Respondents (38%) run medium sized households. 35% of the Respondents have large sized households while 27% have families of 1-2 members. This goes to

show that the level of dependent on the Head of Household will be much and there will be a heavy burden on the family if involuntary displacement occurs.

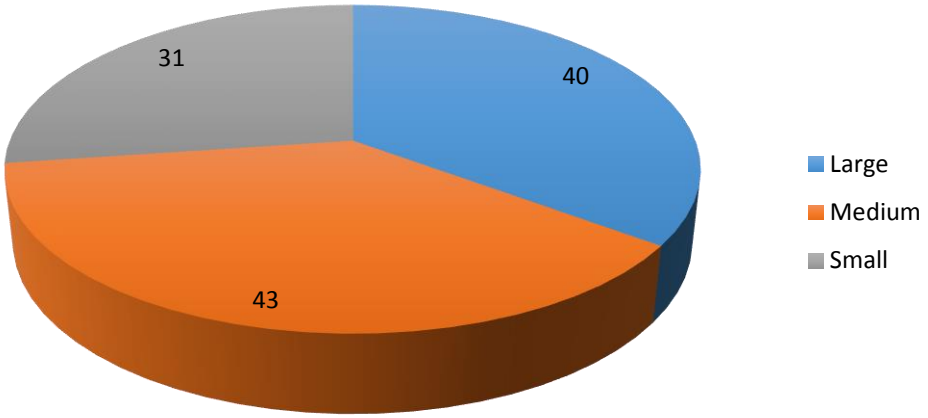
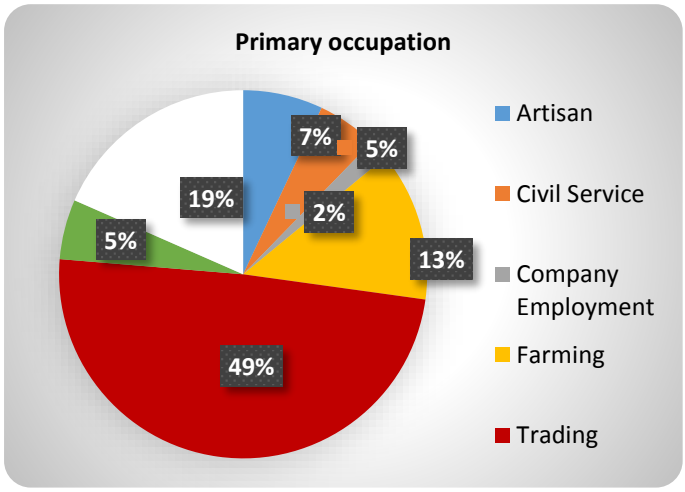


Plate 31 Family size

4.3.9 Occupation

The Plate below shows that majority (90%) of the Respondents in this community are self-employed with 49% engaged in trading, while 13% of the respondents are farmers. 5% of the Respondents are public servant, then the remaining (7%) are artisans and engage in such businesses as welding, mason, mechanic etc.



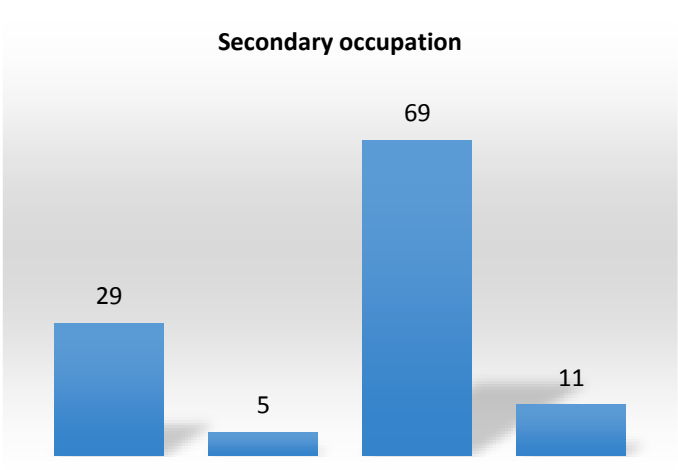


Plate 32 Respondents Household Occupation

4.3.10 Average Income status of Respondents

Field survey shows that dominant income groups amongst Respondents fall within ₦31,000 and above per Month. The survey also shows that about 9% fall within the income of ₦0- ₦5000 per month while about 12% of Respondents earn ₦21,000 to ₦30,000 per month.

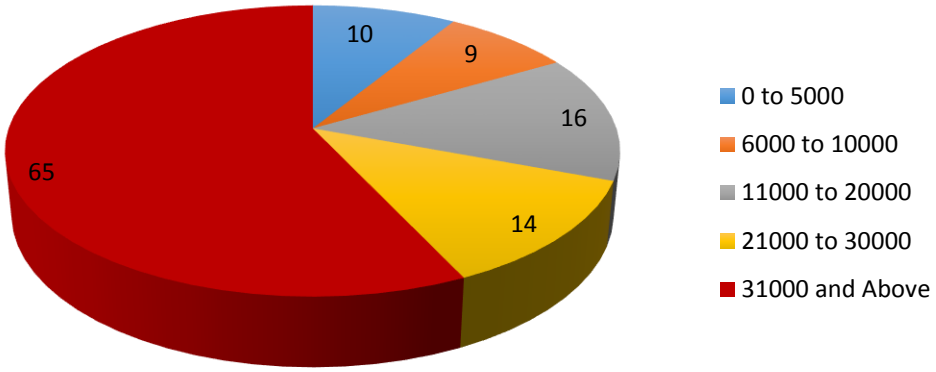


Plate 33 Average Income of Respondents

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

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

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

4.3.11 Infrastructural Development

Most of the roads leading to Nnewichi are tarred through state and LGA efforts. However, some sections of the road within the communities have been washed off by flood. The erosion has also cut off some sections of the road joining both villages within Nnewich thereby affecting travel time. There is GSM telecommunication facilities of various networks available in the area and have considerably good connection. Nnewichi have over many Nursery and Primary Schools. There are also some Secondary within the community. About 12% believe that these institutions are in very good conditions while 49%, 27% and 12% believe that they are Good, Fair and Poor respectively.

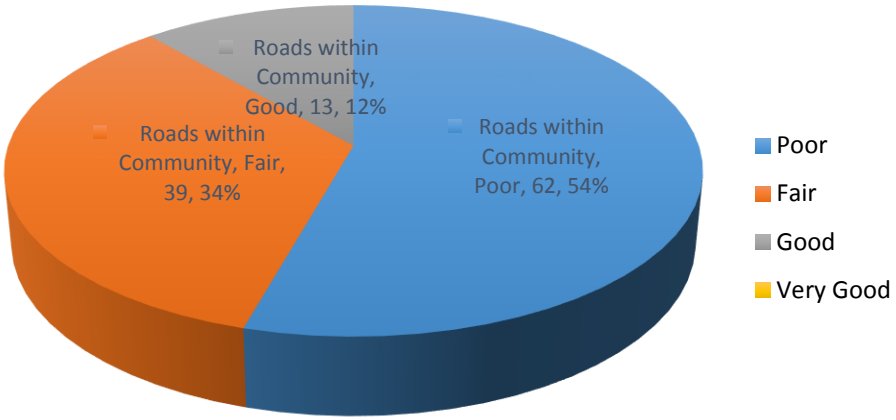


Plate 34 Access road within community

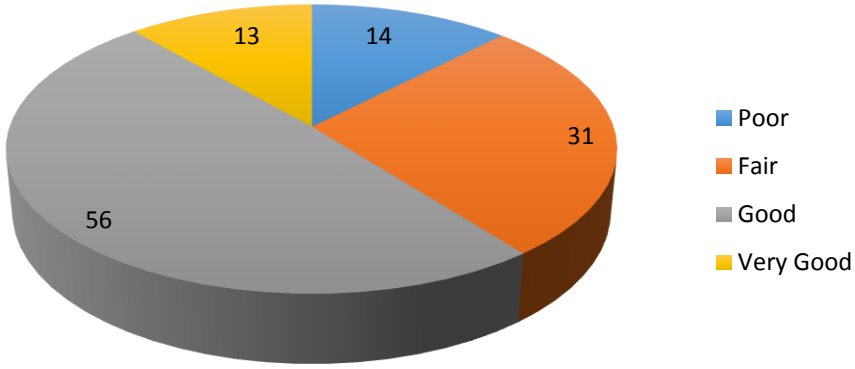


Plate 35 Nature of Schools within the Community

4.3.12 Desirability of the Project

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

4.3.13 Health Status Survey

For the purpose of this ESMP, a Rapid appraisal was adopted as the health impact is envisaged to be minimal. A Rapid Health Impact Assessment checklist designed in consideration of the

environmental and social determinants of health as it affects the sub-project was used for the assessment.

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

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

Table 10 Healthcare Assessment

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

The Table above shows that All of the households are aware of the availability of HCFs in their community, although adequate staffing, cost/availability of drugs may be a challenge to many. The high level of awareness and compliance to use of HCFs may be as a result of the Community being within Nnewi Town. Some members of the communities still combine orthodox means (e.g. herbs) of treatment.

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

4.3.14 Replacement Options

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

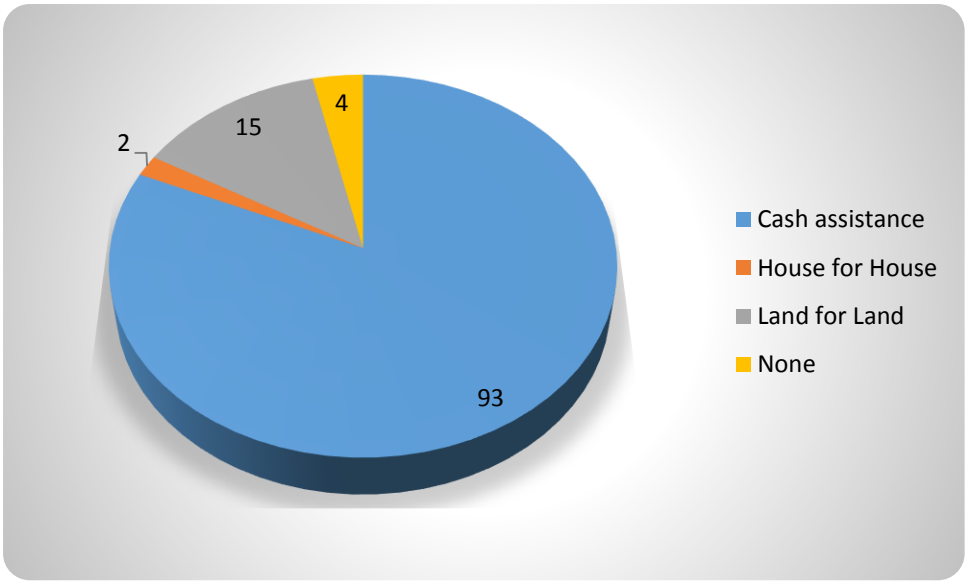


Plate 36 Choice of Replacement option

4.4 Stakeholders Consultation

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

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

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

4.4.1 Identification of Stakeholders

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

These stakeholders are grouped as shown in Table 9.1. The identification followed the following considerations:

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

ii) Any persons or parties whose specific interests in the project results from: (a) the project's benefit(s) to such persons; (b) potential changes that may occur to the routine

activities of the persons due to the project; and, (c) the project activities that may cause damage or conflict for the persons. The identified persons or group of persons in this category will ultimately represent the project Affected Persons (PAPs) or Households (PAHs)

4.4.2 Identified Stakeholder Groups

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

Table 11 Identified Stakeholder Groups

Group	Description	Role(s) In Community Process
Group-1	Individuals or group of persons whose day-to-day traditional or administrative functions include oversight of developmental activities within the project areas.	This category of persons served as mobilization points around which the Consultant reached out to the other members of the community
Group-2	Individuals or group of persons whose day-to-day lives/livelihoods may be directly affected by project activities. These people either reside or carry out their daily livelihood activities within 50m of the erosion gully edge.	The identified persons or group of persons in this category will ultimately represent the Project Affected Persons (PAPs) or Households (PAHs)
Group-3	Individuals or group of persons whose daily activities (including farming) bring them in close proximity to the project area. These people may either reside or carry out their daily livelihood activities outside of the erosion gully but within the communities in which the project is located.	The category of persons may or may not be affected by the project but may be significant contributors to the long-term sustainability of the project.
Group-4	CBOs, FBOs and NGOs who provided frequent interface with the community members who may be directly or indirectly affected by the project activities.	This group of organizations essentially contributes to and/or provide on a regular basis to the spiritual and physical welfare as well as environmental health of the community (Focal NGO engaged PMU was duly consulted).
Group-5	Individuals or group of persons who are political office holders and have significant responsibilities toward community members within the project area.	This group of individuals is collectively responsible for the political and general socio-economic development of the communities among others within their respective political zones.

The identified groups includes:

- Anambra State NEWMAP PMU
- Chiefs/Elders
- President General and Village Chairmen
- Youth group leaders
- Women group Leaders
- Town Associations/ Community Based Organization Leaders etc.
- Focal NGO

4.4.3 Community Consultations

All consultations in the period of the consultancy were initiated by the Consultant and established by the SPMU. The direct involvement and active participation of relevant stakeholders and the local

level people in the planning and management processes of the project, guarantees that any potential disharmonious issues will be resolved swiftly. Also, there will be maximization of resource use, increased benefits and expanded opportunities for the communities in the project area.

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

4.4.4 Objective of Community Consultation

The aims of the community consultation process are:

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

4.4.5 The Stakeholders Consulted and their Concerns

The consultations involved independent and frequent meetings between the Consultant team, Engineering design Consultant and Traditional and Administrative leaderships of Nnnewichi which included the President General and Village Chairmen.

The key stakeholders identified and consulted in the area include:

- The Obi of Nnnewichi.
- President General of Nnewich Development Union and other
- Women Group
- Other Stakeholders are individuals who own properties that will be directly or indirectly affected by the project, Community Associations, Business Owners etc.

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

4.4.6 Summary of Meetings with Stakeholders

The stakeholders' meetings focused and discussed on the project justification and the associated potential impacts to the community members living within the project corridors. The community's concerns and general thoughts were implored and noted. Details of the proceedings at the meetings held are included in Annexes section.

The Consultancy team visited the relevant stakeholders of Nnewichi Development Union among stakeholders present in the meeting includes: Obi of Nnewichi, President General of Nnewichi Development Union, Special Adviser to Anambra State Governor on Economy and Strategic Planning, Women Group Leaders, Youth Group Leaders and other stakeholders. The purpose of the visit was to inform the relevant stakeholders and liaise with them on how to achieve maximum involvement of Nnewichi people on the project. The president General of Nnewichi Development Union , Obi of Nnewich and Special Adviser to Anambra State Governor on Economy and Strategic Planning were on separate notes welcomed the consultancy team and were particularly delighted for the visit. The stakeholders utilized the opportunity to understand the scope of the consultancy and agree on an effective date for the Public Consultation /Town hall Meeting.

The town hall meeting was held at the Nnewichi Community Hall. Generally, the community members welcomed the project whilst expressing their worries that rehabilitation work should commence expeditiously to prevent exacerbation of the erosion damages as the raining season draws near.

Table 12 Frequently Raised Comments, Concerns, Questions at Consultations

Comments/Concerns/Questions Raised	Consultant's Responses to Issues Raised
Resident Stakeholders welcomed the proposed project and were very much delighted and positive with regards to the approach undertaken by the AN-NEWMAP and World Bank to address the current problems of watershed and erosion, which are currently affecting their lives negatively.	The consultant acknowledged the residents widespread support for the proposed project and encouraged them to sustain it throughout the project life cycle
Okeke Samuel sought to know if the proposed project is real or scam	Nnewichi erosion intervention has been approved by the World Bank. However, the proposed project works will trigger some environmental and social sensitivities which ESMP report is expected to address the commencement of remedial works.
Chief Ezikiel Izuchukwu (Obi Umuogbo Nnewichi) expressed happiness and pleaded with stakeholders to effectively participate through the project cycle.	Endorsed.
Felix Udeh observed that the gully has different fingers, some not connected to the major gully; he sought to know if all the sites were captured.	An-NEWMAP engaged SMEC Group, an engineering firm based in Australia to carry-out the engineering and feasibility study of the proposed site. They have carried out an in-depth studies and believed to have captured the affected sites.
Ofokile Josephine (Mrs.) expressed sadness over the mortality incidences the erosion menace has caused. She however expressed hope that the proposed project will bring a lasting solution to the problem.	Endorsed
Ifeoma Okafor lamented over the communities insensitive on waste disposal practices. She stated that those who use gully sites or drainage channels as a dump site are being irrational. She called on the Obi of Nnewichi to take drastic action on the offenders and also set up Monitoring Committee to enforce his decision.	Her views were noted by the consultant.
Ogbuofi advised the members of the community to be sincere and upright with the consultant. He stated that the attitude and commitment of the community would enable the project to actualize its desired result.	View duly endorsed.
Emmanuel stated that he is unsure of the proposed until when contractors and equipment are on ground for the rehabilitation works. He however praised the World Bank, An-NEWMAP, FGN and Anambra State Government for the rescue mission	Noted and endorsed

The Obi of Nnewichi in closing remarks thanked everyone that participated, urging them focused and committed throughout the project implementation phases.

Plate 37 Consultation with stakeholders

Plate 38 The Safeguards Officer addressing the stakeholders

Plate 39 The Consultant addressing the stakeholders

Details and minutes of the consultations are found in Annex Eight.

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

5.1 Introduction

The proposed Rehabilitation of the Nnewichi Gully Erosion will lead to several changes in the environment and socio-economic aspect of the project area. A good number of these changes will be beneficial, especially the impacts of rehabilitating degraded land and reducing longer-term erosion vulnerability in the project community.

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

5.2 Potential Positive and Negative Impacts

The results of the evaluation of the interactions between the proposed activities and their impacts on environmental and social sensitivities are shown in subsequent pages of this chapter. The identified negative impacts were rated as **minor, moderate and major**. Beneficial impacts arising from the project were rated as positive. Hence, no further classifications were made on the beneficial impacts.

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

Some adverse impacts that may be associated with the rehabilitation of the gully site are highlighted in this subsection (Table 18). Notwithstanding, the ESMP will be prepared to ensure that these impacts are reduced to the barest minimum.

Table 13 Summary of Beneficial and Adverse Impacts

S/N	Positive Impacts	Adverse Impacts
1	Community development programs.	The frequency and incidence of occupational hazards may rise with during construction activities.
2	Connection and restoration of access to houses and villages already cut off by the erosion	Possibility of seepage of fuel from machineries and effluent discharge into the watershed, thus impacting on the water quality.
3	Control and Reduction of water body sedimentation rates due to erosion.	Contaminated (with human waste) water run-off into surface water, etc.
4	Gender Issues: Construction activities will encourage economic activities, especially for women. Since there would be a large workforce, petty traders and	Soil destabilization due to vibrations from construction equipment use.

	food-spots owners will benefit immensely from the demand on site.	
5	Improved agricultural productivity within the community and Anambra state at large.	Noise and vibration from heavy-duty project vehicles and equipment resulting in nuisance.
6	Improved livelihood enhancing activities.	Disruptions to resident activities within the project area.
7	Increase in social interactions	Delayed travel time due to movement of construction equipment or vehicles
8	Initiation/ kick-off of rapid production systems and agricultural practices.	Increase in sexual activities leading to possible spread of STIs.
9	Minimization of flooding and control of overflow.	Grievance and resistance from communities
10	Promotion of afforestation programs (with all its benefits)	Green House Gas (GHG) emissions from vehicular and construction equipment would be generated during the pre-construction, construction and subsequently, operational phases of the project
11	Promotion of goodwill and community appreciation of the NEWMAP intervention in Anambra State and Nigeria at large.	Increased generation of solid and liquid wastes.
12	Provision of employment opportunities for both skilled and unskilled workers.	Site clearing will lead to loss of species diversity and abundance, including soil organisms, fungi, invertebrates, and bacteria.
13	Reduced fear perception of loss of property, inhabitation and ancestral origins of the communities.	Injuries, falls, accidents, explosions, fires, leakages, accidents etc.
14	Reduction in mortality/morbidity from landslides.	Occurrence of social vices (e.g. theft, drug use, etc.).
15	Reduction of mortality rate.	Increase in turbidity of river waters from storm water/ runoff during preconstruction and construction phase.
16	Rehabilitation of the erosion menace in the community	Increase in fugitive dust emission during preconstruction and construction phases of the rehabilitation.

17	Reintegration of community and diversification of sources of livelihood.	Loss of employment for labourers after the completion of the rehabilitation works,
18	Repair of the watershed gullies	Waste generation especially construction wastes.

Identified Potential Impacts (by Project Phases)

Pre-Construction Phase

A. Environmental Impacts

Positive

- Prior to the commencement of rehabilitation works, a feasibility study and environmental assessment are required to describe the proposed project needs, aid project design, and ensure environmental and socio-economic sustainability of the project and the project community.
- The project will undertake a stakeholders/public consultation exercise to sensitize the stakeholders in the project command area and beyond on the environmental safeguards components of the project. The public consultation process is seen to be a positive impact, as it will form a basis for project design and implementation of decision-making.

Negative

a. Air Quality

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

b. Soil

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

Surface Water

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

c. Noise and Vibration

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

B. Social Impacts

Positive

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

Negative

a. Land Acquisition

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

b. Noise

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

c. Others

- Possible disruptions of movement of residents within the project area to places of work, and businesses, as a result of movement of equipment and materials along access roads, resulting in loss of man-hours and negative perception of the project amongst road users and residents.
- Properties particularly farmlands may be accidentally damaged or destroyed during the movement of heavy duty vehicles and equipment.
- Accidents involving vehicles or pedestrians may occur during vehicle and equipment movement to site.

C. Occupational Health and Safety

Positive

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

Negative

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

Construction Phase

A. Environmental Impacts

Positive

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

Negative

a. Climate Change

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

b. Air Quality

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

will impact negatively on air quality. Air pollution from machineries will be short term, moderate and localized.

c. Soil

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

d. Water Quality and Hydrology

- Increased pressure on water resources during construction works
- During construction works, seepage of fuel from machineries and effluent discharge into the watershed may occur, thus impacting on the water quality
- During the rehabilitation works, there may be potential for sediment/contaminant laden water runoff to impact on water quality. The contaminants in water runoff may have the potential to enter existing drainage channels and into local watercourses, affecting downstream users and aquatic life.
- Flood draining activities may introduce chemicals into water bodies leading to possible changes in water colour and pH levels, pollution and eutrophication in surface water.

e. Noise and Vibration

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

f. Waste

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

g. Flora and Fauna

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

h. Topography

- Scarification of natural landscape of the project site.

B. Social Impacts

Positive

a. Employment

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

b. Economic Benefits

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

c. Waste Management

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

d. Occupational, Health and Safety

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

Negative

a. Impact on Livelihood/Community Activities/Social Stress

- During the rehabilitation works there are bound to be restriction in movement, which will affect residents and business owners in the project area.

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

b. Social Vices

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

c. Health and Safety

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

d. Noise and Vibrations

- This phase will cause noise and vibration nuisance

e. Waste

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

f. Archaeological and Cultural Loss

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

g. Conflict

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

h. Traffic

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

C. *Occupational Health and Safety*

Negative

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

Operational Phase

A. Environmental Impacts

Positive

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

Negative

a. Water Quality

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

b. Odour

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

c. Blocked Drains

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

B. Social Impacts

Positive

a. Livelihood

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

b. Education

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

c. Traffic

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

d. Control

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

Negative

a. Loss of Employment

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

b. Air Quality

- Increase vehicular emissions from road users

c. Waste

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

d. Conflict

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

e. Health and Safety

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

C. *Occupational Health and Safety*

Positive

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

Negative

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

5.3 Analysis of Alternatives

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

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

5.4 No Project Option

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

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

5.5 Delayed Project Option

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

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

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

5.6 Do project Option

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

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

5.7 Gully Treatment Options

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

1. The do nothing
    a. Applicable when assets are not at risk from erosion.
    b. This option can result in downstream significant sedimentation problems.
    c. Generally the slowest option to achieve a stable gully.
2. Backfilling the gully and forming a stable drainage state
    a. Generally only viable for small gullies.
    b. This option requires only cheap supplies of materials for gully/earth filling

c. Generally the quickest Option to achieve a stable gully.

3. Partially backfilling the gullies using natural sedimentation processes
   a. This is usually the cheapest option in the long run.
   b. This option relies on the on-going supply of sediments from the upstream gully erosion. If the upstream gully is stabilized as part of the overall gully rehabilitation, then there may be insufficient sediments to backfill the weirs.
   c. This option is often adopted, when the gully extends upstream of a given property.
4. Partially backfilling using local or imported materials
   a. This option requires heavy machinery.
   b. High safety risks are often associated with such project and Earth works.
   c. Battering the gully bank to provide a source of fill usually accelerate the rehabilitation of the gully bank.
5. Stabilization of gully without partial backfilling of the beds or battering of the banks
   a. This option can result in a long drawn-out process, requiring planting and replanting.
   b. Significant sediment loss can occur before the gully bank reaches a stable form

5.8 Alternative Technologies/Designs

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

5.8.1 Option One: Rock Lined Chute

The rock-lined chute as seen in Plate 30 is used to lower surface water into the open channel where a gully has developed. The chute is sized according to drainage area and site factors. Proper sizing of the rock to withstand the expected velocity of water in the chute is the key factor. For the installation of this structure a good source of rock must be available in the area. Rock lined chutes as seen in are an essential item in the stabilization of gullies. Wherever practical erosion problems should be stabilized synthetic material should only be used in circumstances where natural based solutions fail to achieve the required stability.

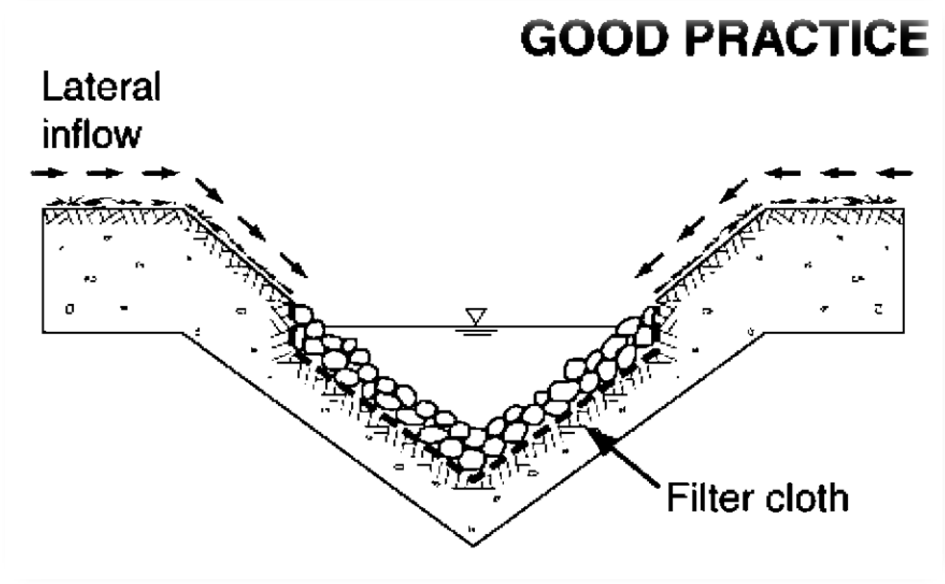


Plate 40 Schematic diagram of a rock lined chute

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

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

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

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

Constraints

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

5.8.2 Option Two: Wood Drop Structure

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

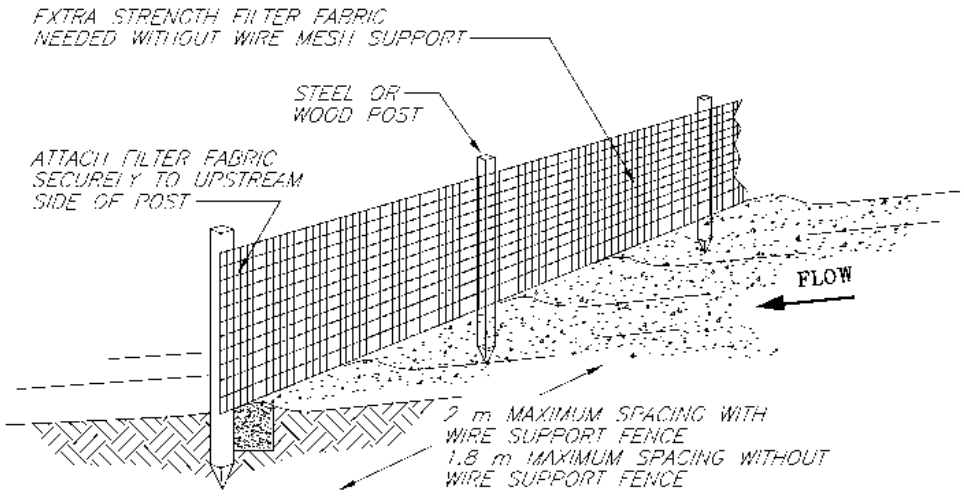


Plate 41 Schematic diagram of a wood Drop structure

Constraints

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

5.8.3 Option Three: Do Nothing Option

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

5.9 The Preferred Alternative

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

6 CHAPTER SIX: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.1 Overview

The range of environmental, social and occupational health and safety issues associated with the rehabilitation works for the Nnewichi Gully Erosion Site Project will be described in a *matrix table format* for the environmental and social management plan (ESMP). The table (17-19) also includes columns for Monitoring Indicators, monitoring parameters, monitoring instruments, monitoring locations, Monitoring Frequencies, monitoring responsibilities and costs.

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

6.2 Mitigation Measures for Nnewichi Gully Erosion

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

6.2.1 Selection of Mitigation Measures

The duty of selection of Mitigation Measures is bound on the Client (SPMU/World Bank) as recommended by the ESMP Consultant. The main criteria for selecting structural control measures (See Table 22) should be based on:

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

The various portions of the main gully channel and finger gullies should be stabilized either by brush fills; earth plugs and brushwood, log, and loose-stone check dams. The lower parts are treated with loose-stone or boulder check dams. At a stable point in the lowest section of the main gully channel, for example, on a rock outcrop, a gabion check dam or cement masonry check dam should be constructed. If there is no stable point, a counter-dam (gabion or cement masonry) must be constructed in front of the first check dam. The points where the other check dams will be constructed are determined according to the compensation gradient of the gully channel and the effective height of the check dams.

Table 14 Criteria for Selection of Control Measures for a Continuous Gully

Length of main gully channel portions (m)	Gradient of main gully channel portions (%)	Catchment area of gully portions (ha)	Required structural measures for each portion of main gully channel

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

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

6.3 Institutional Responsibilities and Accountabilities

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

6.4 NEWMAP Institutional Arrangement

Generally, the NEWMAP project is expected to run at two levels, namely the Federal and State. At the Federal level, the Federal Project Management Unit (FPMU) supervised by the Federal Ministry of Finance will manage the Coordination and Program Support. The FPMU will establish coordination and support relationship with the State Counterpart Agencies. Thus, at the State level, the governments of the 14 States have set up by State Law, agencies that would work in collaboration with the FPMU, though operating independently. Albeit, the Ministry of Finance, Budget and /Economic Planning, as the case may be in the various State is at present taking the lead in the coordination of the NEWMAP preparatory programmes.

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

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

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

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

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

6.5 Roles and Responsibilities

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

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

Their roles and responsibilities are highlighted below

6.6 Federal Level Institutions

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

6.6.1 Federal Ministry of Environment (FMEnv)

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

6.6.2 Department of Erosion, Flood and Costal Management

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

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

6.6.3 Federal Ministry of Water Resources (FMWR)

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

6.6.4 Nigerian Hydrological Services Agency (NIHSA)

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

6.6.5 Integrated Water Resources Commission

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

6.6.6 Federal Ministry of Works (FMW)

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

6.6.7 Federal Ministry of Agriculture and Rural Development (FMARD)

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

6.6.8 National Environmental Standards and Regulatory Enforcement Agency (NESREA)

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

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

Table 15 Safeguard Responsibilities for NEWMAP

S/No	Category	Roles
I	Federal Government MDAs (Federal Ministry of Environment and her agencies (Such as NESREA)	Lead role -provision of advice on screening, scoping, review of Draft RAP/EA report (in liaison with State Ministry of Environment), receiving comments from stakeholders, public hearing of the project proposals, and convening a technical decision-making panel, Project categorization for EA, Applicable standards, Environmental and social liability investigations, Monitoring and evaluation process and criteria
II	State Government MDAs (Ministry of Lands, Survey and Urban Development, Ministry of Environment, etc.	Compliance overseer at State Level, on matters of Land Acquisition and compensation and other resettlement issues, Lead role -provision of advice on screening, scoping, review of Draft RAP/EA report (in liaison with Federal Ministry of Environment), receiving comments from stakeholders, public hearing of the project proposals, and convening a technical decision-making panel, Monitoring and evaluation process and criteria.
	Other MDAs	The MDAs applies when relevant areas or resources under their jurisdiction are likely to be affected by or implicated sub-projects. They participate in the EA processes and in project decision making that helps prevent or minimize impacts and to mitigate them. These institutions may also be required, issue a consent or approval for an aspect of a project; allow an area to be included in a project; or allow impact to a certain extent or impose restrictions or conditions, monitoring responsibility or supervisory oversight.
III	World Bank	Assess implementation Recommend additional measures for strengthening the management framework and implementation performance.

IV	NEWMAP SPMU Safeguards Unit	Liaise closely with Ministry of Environment in preparing a coordinated response on the environmental and social aspects of project development.
V	Local government	Liaising with the PMU to verify adequacy of resettlement location and provide approval for such sites, Providing additional resettlement area if the designated locations are not adequate, Provide necessary infrastructures in relocated areas, engage and encourage carrying out comprehensive and practical awareness campaign for the proposed sub-projects, amongst the various relevant grass roots interest groups.
VI	CDA (Community Development Associations) Consultants, Contractors, and Site Engineers	Ensure Community participation by mobilizing, sensitizing community members; Will work with the PMUs at Federal and State levels, and other stakeholders. They are to ensure effective project delivery in a timely, safe and environmentally sound manner.
VII	NGOs/CSOs	Assisting in their respective ways to ensure effective response actions, Conducting scientific researches alongside government groups to evolve and devise sustainable environmental strategies and rehabilitation techniques, Organizing, coordinating and ensuring safe use of volunteers in a response action, and actually identifying where these volunteers can best render services effectively & Providing wide support assistance helpful in management planning, institutional/governance issues and other livelihood related matter, Project impacts and mitigation measure, Awareness campaigns
VIII	The General Public	Same as above

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

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

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

6.7 State Level Institutions

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

6.7.1 Anambra State Waste Management Agency (ANSWAMA)

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

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

6.7.2 Anambra State Ministry of Agriculture & Rural Development (ANSMARD)

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

6.7.3 Anambra State Ministry of Works (SMW)

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

6.7.4 Anambra State Ministry of Lands

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

6.7.5 Anambra State Ministry of Information and Communications

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

6.7.6 Anambra State Ministry of Human Capital Development

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

6.7.7 Anambra State Ministry of Agriculture and Rural Development

The State Ministry of Rural Development is responsible for community-based matters such as community mobilization; self-help projects, rural industrialization, neighbourhood watch, training

and workshop for community development associations, listing of community development associations in the State etc. It will assist in educating the community members on the importance of the NEWMAP. It will provide indigenous communities with assurance. For example: that the NEWMAP will not disrupt any farming practices but rather provide a better environment for production systems to thrive.

6.7.8 State Project Management Unit (PMU)

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

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

6.7.9 PMU Safeguard Units

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

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

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

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

6.8 Local Government Level Institutions

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

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

6.8.1 Community Level and other Institutions

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

6.8.2 Community Based Organizations (CBO)

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

6.9 World Bank

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

6.10 Consultants, Contractors and Site Engineers

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

6.11 Safeguards Manual

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

6.12 Environmental and Social Monitoring Plan

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

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

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

6.13 Environmental and Social Management Monitoring Plan

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

6.13.1 Waste Management Plan

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

- Sensitization amongst the labourers on the need for effective waste management throughout the sub-project activity.
- Sensitization and mobilization on the adverse consequences of poor waste management.

It is important that the Anambra State Ministry of Environment and ASWAMA ensure that appropriate waste management control is employed.

6.13.2 Recommended Measures for Waste Management

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

- Identify and classify the type of waste generated. Proper procedures must be taken regarding their storage, collection, transportation and disposal
- Identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each.
- Dispose all wastes in authorized areas, metals, used oils, etc.
- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.

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

a. General Waste

- There should be adequate number of garbage bins and containers made available at strategic areas of the site. The use of plastic bin liners should be encouraged.
- All organic and inorganic materials will be placed and/or disposed of so as not to directly or indirectly impact any watercourse or groundwater. The placement and disposal of all

such products and materials will be done in an environmentally acceptable manner.

- Solids, sludge and other pollutants generated as a result of construction or those removed during the course of treatment or control of wastewaters will be disposed of in a manner that prevents their direct or indirect re-entry into any watercourse or ground waters.
- Any waste material that is inadvertently disposed of in or adjacent to watercourses will be removed immediately in a manner that minimizes adverse impacts, and the original drainage pattern should be restored.
- Waste materials should be placed and stored in suitable containers. Storage areas and containers will be maintained in a sanitary condition and shall be covered to prevent spreading of wastes by water, wind or animals.
- All food wastes should be collected and stored in containers at appropriate locations and should be emptied at regular intervals and the collected waste should be transported to Government designated waste management facilities.

b. Oil waste

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

e. Vegetative waste

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

6.14 Emergency Response and Incidence Management

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

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

As much as possible ERIM procedures should address:

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

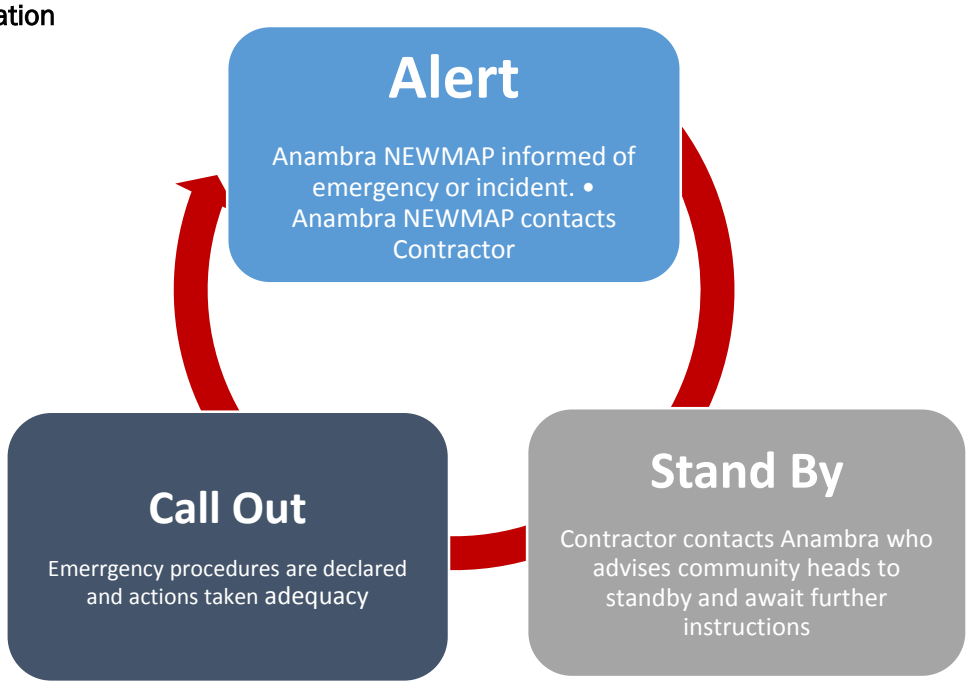
Incident Prevention

Incident preparedness procedures for potential incidents and emergencies include:

- Ongoing training for project personnel;

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

Stages of Activation



6.15 Recommended Measures for Chance Find/Cultural Heritage Management

In the event of chance finds of items of cultural significance, all forms of excavation in and around the site will be stopped. Subsequently, the SPMU will contact the line Ministry (Ministry in charge of Culture) for the recruitment of an experienced archaeologist/ anthropologist (or use of government expert archaeologist/anthropologist) to carry out an investigation and proposed plans for the preservation of such cultural artifacts.

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

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

- All construction activity in the vicinity of the find/feature/site will cease immediately.
- Delineate the discovered find/ feature/ site will be delineated.
- Record the find location, and all remains are to be left in place.
- Secure the area to prevent any damage or loss of removable objects.

- The on-site archaeologist will assess, record and photograph the find/feature/ site.
- The on-site archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer (to be called in if there is none).

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

6.16 Reasons for Failure in Gully Rehabilitation

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

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

6.16.1 Management of Rehabilitated Erosion Site

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

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

other fruit trees. Wide gullies can have tree planted on the side slopes provided they are not too steep.

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

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

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

6.17 Grievance Redress mechanism

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

More complicated matters like RAP (developed in a separate document) and implementation issues that may involve private sector entities and third party agencies are likely to require the attention of the PMU.

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

Grievance Procedures

Registration

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

Verification

The verification will determine among other things whether the matter has any relationship with the Project and whether the level at which it is presented can handle it. This will mean a quick

referral of the case either to the next level or the traditional rulers or to law enforcement. Part of investigation will also be assessing the cost of loss or risk involved in the grievance.

Processing

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

Implementation and case closing

The social contact personnel then refer the case to the responding authority within the level for GRM implementation. This authority may be the chairman of the GRC or the officers with direct responsibility over the nature of the case within the PMU. Putting this in writing makes the appeal process faster in case of dissatisfaction on the part of the complainant. And in the case of satisfaction, it is an instrument to compel execution of decision. The outcome of the Grievance Redress process is therefore communicated to the complainant and other concerned party. The result of the process can vary. The request of the complainant may be turned down, compensation may be recommended, or Management may simply apologise to the grievant.

Feedback

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

Guiding Principles

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

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

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

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

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

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

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

Process: This GRM will have a predictable process that will operate in all the intervention sites and in all the components of the project. There will be specified grievance uptake points where grievances/complaints will be lodged. The time frame for a response will be known to the grievant. Investigation and deliberations on the complaint will be open and communicated promptly.

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

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

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

6.18 Community Security, Health and Safety Management

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

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

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

Community Security, Health and Safety Management should be established during the environmental and social risks and impacts identification process. The implementation of the

actions necessary to meet the community security, health and safety should be managed by Anambra NEWMAP's Environmental and Social safeguards officers.

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

Table 16: A guide to some of the trainings and timeline for delivery

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

6.19 Stakeholders Engagement Plan

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

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

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

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

Envisaged Benefits

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

- Provision of opportunities to foresee and/or resolve potential obstacles, constraints and conflicts;
- Means to identify and address potential negative social and environmental impacts as envisaged by stakeholders;
- Opportunities to generate social learning and innovations based on local field experiences;
- Means of ensuring that project benefits are distributed equitably, and;
- Strengthened working relations between stakeholders; Federal and State Governments, etc., and the World Bank.

6.20 Fundamentals of Stakeholder Engagement Approach

Consultations

Meaningful consultations can contribute to improved design, implementation, and sustainability of development interventions. The objectives of consultations include receiving input for improved

decision-making about the design and implementation arrangements of a development program or project, to contribute to improved results and sustainability. In this context, consultations can potentially give voice to the needs of different population groups, including vulnerable and marginalized groups; improve risk management by identifying opportunities and risks from and to a project; and increase transparency, public understanding, and stakeholder involvement in the development of decision-making.

Consultations with key stakeholders, including project-affected people and civil society, are mandatory in development projects so as to satisfy *"best practices"*. Consultation methods include public hearings or meetings, focus group discussions, household surveys and interviews, electronic consultations, and advisory/expert groups. In addition, consultations can include informal structures at the local level, such as village councils and women's groups. Good practice approaches to consultation, including closing the feedback loop, need to be applied more systematically.

Collaboration

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

Collecting, Recording, and Reporting on Inputs from Stakeholders

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

Grievance Redress Mechanisms

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

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

Grievances and Appeals Procedure

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

Grievance Redress Process

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

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

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

Procedure for Effective Local Resolution of Grievance

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

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

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

Court Resolution of Grievance Matters

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

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

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

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

Stakeholders-led Monitoring

Involving stakeholders in monitoring service delivery, revenues, budget execution, procurement, contract awards, and reform policies can increase transparency, improve efficiency of service delivery or budget execution, and reduce opportunities for corruption. Some mechanisms for stakeholders-led monitoring include public expenditure tracking surveys, social audits, or stakeholder report cards.

Additional entry points for stakeholder's engagement in monitoring include collaboration with local CBOs/NGOs, communities, local academia, or think-tanks in gathering results data and conducting joint evaluations of project results after project completion (including in the preparation of project Implementation Completion Reports).

Capacity Building for Stakeholder Engagement

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

6.21 Social Investment Plan

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

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

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

6.22 Capacity of Anambra State NEWMAP in Implementing ESMP

The M&E Unit of Anambra SPMU will be responsible for monitoring. Although the staffing levels at the Unit are sufficient with adequate experience to carry out these roles, additional manpower for further capacity strengthening is needed.

The designated environmental specialist for the SPMU will be responsible for day to day monitoring and reporting feedback throughout the life of the project, which specifically include ooverseeing implementation of the ESMP and Monitoring of environmental issues during operations. However,

just as the M&E Unit, there is good experience on the part of the environmental officers, however knowledge sharing as well as retraining for further capacity strengthening is needed.

6.23 ESMP Costing and Cost Analysis

This section outlines the identified impacts by project phase as well as the cost analysis for implementation of the ESMP

Table 17 ESMP - Pre-Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
Environment	Air	Mobilization of workers, equipment and other materials into Nnewichi Gully Erosion Site	Increase in amounts of fugitive dusts and exhaust fumes from movement of heavy-duty vehicles and equipment into work areas.	Sprinkling of water via spraying devices to limit dusts.	Air quality parameters are within permissible Limits	2-3km Radius of project area	Air quality test	Twice monthly	Mitigation: Contractor	Monitoring: NESREA (state), SMENV, PMU, Contractor	4,500
				Ensure that vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES) as laid down in the NESREA guidelines.	Ensure that vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES) as laid down in the NESREA guidelines.	2-3km Radius of project area	Air quality test	Every two months			

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
	Soil	Mobilization of workers, equipment and other materials into Nnewichi Gully Erosion Site	Loss of top soil and soil compaction due to movement of vehicles to site and stacking of heavy-duty equipment	Limit zone of vehicle and equipment weight impacts (designate an area for parking and stacking equipment)	Visible demarcation of vehicles and equipment limit zone Warning signs, flags will be utilized to alert users, so as to reduce risks associated with the rehabilitation of the project	Project camp sites and equipment packing zones	Visual observation, Soil Compaction test	Weekly	Mitigation: PMU and Contractors		8,000
			Leakages from stacked equipment and subsequent intrusion of oil and chemical substances into soil.	Ensure fastening of loose parts (bolts, nuts); Install impermeable surface at the limit zone to contain potential leakages	Installation of impermeable platform at limit zone.	Project camp sites and equipment packing zones	Soil quality test	Weekly		Monitoring: SMENV, ASWAMA, PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
Environment	Noise	Mobilization of workers, equipment and other materials into Nnewichi Gully Erosion Site	Increase above permissible noise level, (90dB) during movement of vehicles, equipment and machines (site-specific and widespread). A Logarithmic scale in decibels (i.e. Decibel Sound Pressure Level) was used.	The effective control of noise from vehicles and equipment during this phase may be achieved by considering the following techniques: • Alternative design options; • Mitigation at the source; • Mitigation along the path; and • Mitigation at the receiver For minimal disturbance it will be advised that equipment is transported when it will cause least disturbance	Options for noise impact mitigation are being implemented	2-3Km Radius of project site	Noise level testing	Weekly	Mitigation: PMU, Contractor	Monitoring: SMEnv, ASWAMA	800

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility(Monitoring)	Costs (USD)
	Vegetation	Vegetation clearing	Displacement of soil fauna and damage to flora.	Contractors should limit vegetation clearing to minimum areas required particularly areas with indigenous vegetation	Vegetation clearing is limited to precise areas	Project Community especially access routes to gully as well as gully corridors	For a and fauna studies in selected areas	Monthly	Mitigation: Contractors	Monitoring: PMU	2,000
			Predisposing of soils to erosion	Cleared areas should be re-vegetated with beneficial local species known to mitigate against erosion	Re-vegetation is ongoing where appropriate.	Community especially access routes to gully	Ground trotting	Monthly			
SUB-TOTAL :											$15,300

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Traffic	Mobilization of workers, equipment and other materials into Nnewichi Gully Erosion Site	Traffic congestion/travel delay along some major roads	Apply lane configuration changes to affected roads and streets.	Lane configuration changes are being made where applicable.	Project routes within community	Site visits and observation	Daily	Mitigation: Contractors, FRSC (Federal Road Safety Corps)	Monitoring: FRSC;	2,000
	Noise	Mobilization of workers, equipment and other materials into Nnewichi Gully Erosion Site	Nuisance to nearby residential areas	Retrofit with suitable cost effective vehicle sound proofing materials/ technologies.	Retrofitting with vehicle sound proof materials is being performed	Project community	Inspect Contractors equipment	Daily	Mitigation: Contractors	Monitoring: SMENV, ASWAMA	2,000
Social	Air	Mobilization of workers, equipment and other materials into Nnewichi	Exposure to health risks from fugitive dusts and exhausts fumes.	Provision of facemasks to residents and project personnel.	Provision of face masks and appropriate PPEs are being provided.	Project area	Site visits and inspections	Weekly	Mitigation: SMENV, PMU, Public Health depts. Nnewi North LGA	Monitoring: ASWAMA	2,000

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
		Gully Erosion Site		Restrict access of non-project personnel to work areas where dusts and emissions exist/persist from project works.	Restriction barrier are being installed.	Project site	Site visits and inspection				
	Land	Land Acquisition	Conflict owing to unresolved land acquisition and involuntary displacement during the construction	The PMU will carry out an extensive enlightenment program to inform farmers and communities on the aim, scope and nature of the work	Documented evidence of enlightenment carried out showing method, coverage and dates of programs	Project community	Examine grievance redress reports	Monthly for 6months before and during construction/rehabilitation phase	Mitigation: PMU	Monitoring: PMU, Independent Consultant, Contractors	2,000

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Construction camping	Transportation and movement of heavy equipment	Public Safety and Traffic congestion	Transportation of heavy equipment will be carried out during off pick hours when it will not disturb public movement Where movement cannot be avoided during work hour, the contractor must attach a warning signal	Evidence of warning signal Log record of time of lorry arrival/discharge of equipment	Project communities and transport routes	Site visits and inspections	Weekly during pre-construction phase	Mitigation: Contractor PMU	Monitoring: PMU,	-
	Others	Mobilization of workers, equipment and other materials into Nnewichi Gully Erosion Site .	Disruption of vehicle and pedestrian access to where rehabilitation works will be conducted	Adequate and timely sensitization of identified Respondents; Lane configuration	Adequate and timely sensitization program is being conducted Lane configuration change have been made	Project communities and transport routes	Site visits and inspections	Monthly	Mitigation: Contractor, PMU	Monitoring: PMU	800

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			Grievances and negative community perception about the project.	Adequate and timely sensitization of identified Respondents	Sensitization exercise are conducted	Project communities and transport routes	Examine Awareness reports, site visits and consultations			Monitoring: PMU	2,250
SUB TOTAL –											11,050

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Air	Mobilization of workers, equipment and other materials into gully erosion site	Respiratory disease risks from exposure to exhaust fumes of equipment and vehicles	Institute workers respiratory protection program (WRPP)	Institution of WRPP	Contractors project camp/office	Examine contractors WRPP	Weekly	Mitigation: Independent Consultant, Contractors	Monitoring: ASWAMA, PMU	4,000

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Noise	Mobilization of workers, equipment and other materials into gully erosion site	Noise pollution	Institute noise control plan	Institution of noise control plan	Contractors project camp/office	Examine Contractors Noise control plan	Weekly	Mitigation: Independent Consultant, Contractor	Monitoring: ASWAMA, PMU	1,200
	Accidents	Mobilization of workers, equipment and other materials into gully erosion site	Accidents involving pedestrians	Education and training of Respondents about the project and accident occurrence	Education and training has been conducted	Contractors project camp/office	Examine Contractors Accident prevention plan	One-off	PMU, Contractor, Independent Consultant	PMU	800
				Contractor(s) education and training on pedestrian safety	Training has been conducted	Contractors project camp/office	Examine Contractors Accident prevention plan	One-off	PMU	PMU	300
				Install safety signage	Safety signage have been installed	Project site	Site visits and inspection	Weekly	PMU, Contractor	PMU	800

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			Collapse of heavy equipment etc. being conveyed to rehabilitation work area	Conduct haulage safety training	Number of trainings that have been conducted	Contractors project camp/office	Inspection and consultation with workers	One-off	Contractor	PMU	550
				Enhanced fastening of equipment to carriage section of vehicles.	Level of Contractor(s)' Compliance	Contractors project camp/office	Site visits and inspection	Weekly	Contractor	PMU	800
	Personnel Safety		Attack from dangerous animals during de-vegetation activities	Conduct safety and first aid training	Training has been conducted	Contractors project camp/office	Inspection and consultation with workers	One-off	Contractor	PMU	650
SUB-TOTAL –											$20,150
PRE-CONSTRUCTION PHASE TOTAL –											$46,500

Table 18 ESMP - Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Climate Change	Operation of equipment used during the construction phase	GHG Emissions	Fuel switching- Fuel switching from high- to low-carbon content fuels (where available) can be a relatively cost effective means to mitigate GHG emissions during this phase. Transition to renewable energy sources i.e. solar energy (where applicable) Energy efficiency- Machines e.g. generator plants could be turned off when not in use, in order to reduce carbon emissions.	Level of Compliance to proffered mitigation measures.	2-3km Radius of project area Project site	Air quality test Site visits and inspection	Weekly	Mitigation: PMU, Contractors	Monitoring: ASWAMA, PMU	1,750

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				Multiple trips reduction: In order to reduce vehicular movement and subsequent increased carbon emissions. Hire vehicles, plants and equipment that are in good condition (current models) generally less than 3 yrs. old.							
	Air	Operation of equipment used during the constructio n phase	Fugitive and cement dusts	Routine watering of the rehabilitation site	Number & use of PPE distributed, level of Contractors' Compliance	2-3km Radius of project area	Air quality test	Daily	Mitigation: Contractors	Monitoring: ASWAMA, PMU	-
		Rehabilitati on works – including filling and compaction activities,						Daily	Mitigation: Contractors	Monitoring: ASWAMA, PMU	1,700

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
		construction of side drains, culverts and other hydraulic structures									

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Air	Heavy equipment operations during construction	Exhaust fumes, fugitive dust, hazardous gases (NOx, CO, SOx, SPM,), Oxides from welding activities.	Wet Right-of-Way to reduce dust production	QC and QA are in practice	Project site	Site Visit and inspection	Monthly	Mitigation: PMU, Contractors	Monitoring: PMU, Contractors	700
				Test Procedures – Routine measuring of HC and CO concentrations during rehabilitation works should be employed for PMS powered vehicles. Diesel (AGO) vehicles should be tested for exhaust opacity during unloaded engine	Level of Contractor's Compliance, frequent assessment of air pollution			Monthly		Monitoring: PMU, SMEnv	2,000

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				free acceleration periods.							
				Quality Control – Routine equipment efficiency audits Quality Assurance – Continuous training of contractor(s) personnel on air quality management	Contractors Compliance	Project site	Site visits, inspection and consultation with workers	Monthly	Mitigation: Contractors	Monitoring: PMU, SMEnv	-

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Water quality/Hydrology	All rehabilitation works	Contamination of surface water (discharge of sediment laden run-off into drainages, waterways etc.)	Attempts to dispose of sediment-laden run-off into surface water should be discouraged and prevented. Implement site-specific waste management plans	Contractors Compliance	Surface water within project area	Water quality test	Daily	Mitigation: Contractors	Monitoring: PMU, SMEnv	-
		Defecation near gully erosion site	Generation of sewage overtime (from use of temporary mobile toilets by personnel involved in civil works)	Liaise with the municipal sewage collection authorities for collection and treatment of waste with ASWAMA	PMU Compliance	Surface water within project area	Water quality test, consulatation with monitoring agency	Monthly	Mitigation: Contractor	Monitoring: SMENV, ASWAMA	800

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Soil/geology	Movement of heavy vehicles/Stationary vehicles and equipment	Surface soil compaction	Creation of limit zones Minimize compaction during stockpiling by working the soil in the dry state. Rip compacted areas to reduce runoff and re-vegetate where necessary All topsoil and other soil profiles must be managed strictly	PMU, and level of Contractor's Compliance	Project site and routes	Site visits and inspection, soil testing	Monthly	PMU, Contractors	Monitoring: SMENV, PMU	450
		Contamination by oil spills, lubricants and other chemicals	Pollution of soil and groundwater	All oil and lubricants should be sited on an impervious base and should have drip pans The storage area should be far from water course All containers should be clearly labelled	Level of Contractor's Compliance	Project site and routes	Site visits and inspection, soil and groundwater testing	Periodically	Mitigation: Contractor	Monitoring: SMENV, PMU	900

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
		Filling and Compaction activities for gully head and finger gullies reclamation	Loss of top soil; possible minor to moderate soil instability	Ensure excavation is limited to desired areas Filling and compaction in layers must range between 150-200mm thicknesses as recommended.	Level of Contractor's Compliance	Project site and routes	Site visits and inspection	Monthly	Contractor	Monitoring: PMU	1900
		Erosion management	Erosion management	The contractor must implement appropriate erosion control measures to avoid further erosion in this watershed. Construct soil conservation measures at appropriate locations Execution of major works that would impact on soil structure should be carried out during the dry	Lrvrl of Contractor's Compliance	Project site and routes	Site visits and inspection	Weekly	Contractor	Monitoring: SMENV, PMU	3400

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				season. If done during the wet season, temporal drain should precede the permanent drain so that run-off from rain can be managed properly.							

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Noise	Construction of all hydraulic structures Rehabilitation and stabilization of gully	Extensive noise site-specific pollution as a result of on-going construction works.	Mitigation at source (for all activities) A noise barrier or acoustic shield will reduce noise by interrupting the propagation of sound waves.	Level of Contractors' Compliance	Project site and routes	Site visits and inspection, of equipment	Weekly	Mitigation: PMU, Contractors	Monitoring: SMENV, Monitoring: SMENV,	3,100

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Waste	All rehabilitation/construction works	Increase in waste generated	Implement site-specific waste management plan Liaise with ASWAMA for effective waste management	Level of Contractors Compliance	Project site	Site visits, inspection, and consultation with monitoring agencies	Weekly	Mitigation: Contractor	Monitoring: SMENV, ASWAMA,	1000
	Sanitary Concerns	Increased human faecal waste	Increased human faecal waste	Provision of on-site sanitary facilities	Level of Contractors' Compliance	Project community	Site visits and inspection	One-off	Mitigation: Contractor	Monitoring: SMENV, ASWAMA,	900
	Design	All Rehabilitation Works	Interference with the physical setting	The design shall in no way propose to implement developments that will hinder drainage, change the topography or introduce physical changes that are not in harmony with the physical setting of the Project area. The structures to be developed	Level of Contractors' Compliance	Project site	Site visit and inspection	During Design	Monitoring: Contractor	PMU	No additional costs to BOQ

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				should be aesthetically acceptable to blend in with the surrounding. These structures should not form or end up being used by the resident population as access or bridges. No residential facilities shall be erected on site and the proponent shall as much as possible complete the works in such a way that natural aesthetics shall be retained at the locations. Restoration shall be undertaken to ensure that the original setting is as much as possible retained.							
SUB-TOTAL											– $18,600

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Livelihood Impacts	Rehabilitation/ Construction of drainage network	Disruptions to residents activities – (e.g. blocked access to residents)	Conduct survey to identify best alternatives to prevent disruptions to livelihood within on & off-site work areas before commencement of rehabilitation works.	Independent Consultants Compliance	Project community	Examine Community Livelihood enhancement plan	One-off	Mitigation: PMU, Independent Consultant	Monitoring: PMU	2,000
	Traffic	Mobilization of equipment and other materials	Loss of travel time due to heavy concentration of construction/project vehicles on and off the project site	Lane configuration changes	Level of Contractors' Compliance	Project area	Site visits and inspection	Weekly	Mitigation: FRSC	Monitoring: PMU,	500
			Grievances and negative perception among residents and commercial establishments about the project	Involve Respondents at certain levels of decision making and implementation of activities	PMU to ensure onsite Compliance	Project community	Site visit and consultation with community	Monthly	Mitigation: PMU, Contractors	Mitigation: PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Education	Extensive civil work/rehabilitation activities	Noise disturbances to the serene environments for the residence	Mitigation at source Inform residents prior to commencement of works	Ensure Onsite Compliance	Academic institutions within project area	Visits , inspection and consultation with institutions	Monthly	Mitigation: PMU, Contractors	Monitoring: Nnewi North LGA	2,000
Social	Health	Continuous civil work activities and steady influx of workforce	Increase in sexual activities leading to possible spread of STIs	Awareness campaign on sexual diseases, and distribution of male and female condoms.	Number of awareness campaigns Conducted	Project community, contractors camp	Consultations,	Quarterly	Mitigation: MWR, Public Health dept. of the Nnewi North LGA.	Monitoring: SMH	900

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Health	Continuous civil work activities and steady influx of workforce	Incidence of respiratory diseases due to air contamination by fugitive dusts and exhaust fumes	Distribute facemasks to residents as a means to reduce allergic reactions and respiratory disease occurrence. Regular sprinkling of water in during construction works.	Number of Facemasks that are distributed	Project community	Site visits and inspection	Monthly	Mitigation: PMU, Contractors	Monitoring: SMH, Public Health dept. of the Nnewi North LGA,	2,100
		Blocked drainage channel	Possible spread of water borne diseases	Creation of temporary channels to collect flood water	Compliance	Project community	Site visits and inspection		Mitigation: Contractors	Monitoring: SMENV, SMH	
	Environmental hygiene and aesthetics	Waste management	Increase in waste generated from construction works	Ensure that all construction wastes are gathered on-site and disposed off accordingly through the available waste disposal operation in	Contractors Compliance	Project community	Site visits and inspection	Weekly	Contractors	Monitoring: SMENV, ASWAMA	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				the project area.							
	Behaviour	Implementation of civil works and Rest periods	Occurrence of on-site/off-site social vices (Fights, rape, sexual harassments, theft, vandalism, drug use etc.	Enforce and ensure proper orientation on acceptable behaviours for construction personnel on/off-site.	Compliance	Project community	Site visits and inspection and consultations	Monthly	Contractors	PMU	
	Project performance	Implementation of all construction phase activities	Conflicts between contractors, communities etc. may	Good work ethic enforcement program	Compliance	Project community	Site visits and consultations	Monthly	Contractors	PMU	1050
				Conflict resolution							4,300

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			disrupt completion of tasks.	Regular stakeholders meetings							2,200
Social	Noise	Massive use of heavy machinery for land clearing, levelling and excavation of soil	Hearing impairment for machinery operators	Operators of heavy duty machines must wear ear muffs They must not exceed 8 working hours per day	Evidence of procurement of ear muffs Evidence of use of the PPE Record of signing out time	Project community	Site visits and inspection and consultation	Daily	Contractor	Monitoring: SMENV, PMU	320
			Noise nuisance for Residents.	Mitigation at source Inform residents prior to commencement of works	Compliance	Project community	Site visits and inspection, consultation	Monthly	Mitigation: PMU, Contractors	Monitoring: PMU	1,200
	Loss of occupation	Land Acquisition	Disincentive to land owners	The pastoralist must be carried along all through	Minutes of meetings with land owners	Project community	consultation	monthly	Mitigation: Contractor	Monitoring: PMU	-
SUB-TOTAL –											$16,570

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Personnel safety	All construction activities	Fugitive dust and fumes from grinding, welding, cutting, or brazing surfaces coated with lead-based paint; Silica dust from cutting concrete; solvent vapours from adhesives, paints, strippers, cleaning solvents, and spray coatings; and isocyanate vapours from spray foam insulation	Develop and implement on-site occupational health and safety management plan; Routine OHS training and education; Conduct routine JHA/PHA; Use of PPE; Establish electrical safety program; Establish fall protection program; Establish fleet safety management program; Establish and implement HazCom; Conduct hazard identification, control and analysis; Establish fire prevention program; Use material safety data sheets (MSDS); Employ hierarchy of controls procedure; Conduct OHSRA, Cost Benefit Analysis(CBA), Return on Investment(ROI)/pa	Independent Consultants/ Contractors Compliance	Project community	Inspection and consultation with contractor, examining contractors health and Safety management plan and consultants report	Monthly	Independent Consultant, Contractors	Monitoring: PMU	3,000

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			and certain spray paints or coatings.	y-back period analysis							
				Contractors should prepare and implement a Community Affairs, Safety, Health, Environment and Security (CASHES) manual, to coordinate OHS issues during the construction phase.				Monthly	Contractors	Monitoring: PMU	
SUB-TOTAL - $3,000											
CONSTRUCTION PHASE TOTAL - $38,170											

Table 19 ESMP - Operational Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Air	Increased Vehicle movement	Increase of road users on Access Road	Air sampling and monitoring	Compliance	Project community	Air quality testing	Monthly	Monitoring: SMENV	Monitoring: SMENV, NESREA (state), ASWAMA	-
	Soil	Change of topography	Change in soil profile	Training on Sustainable Land Management (SLM) practices	Trainings are conducted	Project community	Soil quality testing	Monthly	Mitigation: PMU, SMENV	Monitoring: SMENV, NESREA (state), ASWAMA	3,000
			Increase in soil salinity							Monitoring: SMENV, NESREA (state), ASWAMA	
			Change in land use							Monitoring: SMENV, NESREA (state), ASWAMA	
	Noise	Increase of road users on Access Road	Noise nuisance to local residents	Noise sampling and monitoring		Project community	Noise level testing	One-off	Mitigation: PMU, SMENV	Monitoring: SMENV, NESREA (state), ASWAMA	900
	Water Quality	Roadway runoff	Potential surface water pollution	Water sampling and monitoring	Compliance	Project community, surface water	Water quality testing	Bi-Annual	Mitigation: PMU, SMENV	Monitoring: SMENV, NESREA (state), ASWAMA	2,000

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Waste	Waste generation	Social and health concerns arising due to poor waste management practices	Dispose waste streams through the municipal waste management system in the project area.	Proper waste management	Project community	Visits and Inspections	Monthly	Mitigation: PMU, SMENV	Monitoring: SMENV, NESREA (state), ASWAMA	1,300
			Blocked drainage due to poor waste disposal	Flooding on roads						Monitoring: SMENV, NESREA (state), ASWAMA	
Environment	Others	Negligence of rehabilitated Nnewichi gully erosion site	Negligence of rehabilitated Nnewichi gully erosion site	Regular maintenance and dredging of sediments in drainage channels and chute	PMU Compliance	Project community	Visits and Inspections	Monthly Weekly Monthly	PMU		1,300
SUB-TOTAL – $8,500											

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Social	Employment	Closure of civil works	Loss of employment	Inform personnel that employment is short-term prior to their engagement.	Proper engagement of service documentation	Project community	Consultations	One-off	Contractors	Monitoring: PMU	450
	Health	Operation of rehabilitated gully site	Blocked drainage structure Breeding site for disease vectors Possible increase of malaria cases due to stagnant water in drainage structures	Regular maintenance of drainage structures	Compliance	Project community	Visits and Inspections and consultation with health institutions and community members		Independent consultant, PMU	Monitoring: NESREA, SMH	-
		Increase in number of vehicles using roads	Increase in respiratory problems amongst local residents	Regular sampling and monitoring	Regular monitoring	Project community	Visits and Inspections and tests			Monitoring: NESREA, SMH	-

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Land use conflicts	Land use conflicts	Land use conflict	Control land use conflicts through Land use planning that should be participatory to designate areas for ecological, grazing and farming	Inspections are conducted	Project community	Visits and Inspections and consultations		Contractors	Monitoring: PMU	500
	Safety	Increase in number of road users	Increase in vehicular accidents	Use of road safety signage	Compliance	Project community	Visits and Inspections	One-off		Monitoring: FRSC	-
		Operation of rehabilitated gully site	Seepage or flow back action Collapse of rehabilitated gully head or finger gullies	Re-vegetation activities using approved plant/tree species to establish green belt along the gully as a stabilization measure	Compliance	Project site	Visits and Inspections	One-off		Monitoring: PMU	4,800
SUB-TOTAL –											$5,750

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Personnel safety	Tasks implementation	Injuries, accidents, deaths	Implement on-site occupational health and safety management plan; Routine OHS training and education; Conduct routine JHA/PHA; Use of PPE; Establish electrical safety program; Implement fall protection program; fleet safety management program; Implement HazCom; Conduct hazard identification, control and analysis; Implement fire prevention	Independent Consultants, Contractors Compliance.	Project community	Site Inspections	Monthly	SMEnv	PMU	6,000

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				program; Use material safety data sheets (MSDS); Implement hierarchy of controls procedure; Conduct OHSRA, Cost Benefit Analysis(CBA), Return on Investment (ROI)/pay-back period analysis							
SUB-TOTAL –											$6,000
OPERATIONAL PHASE TOTAL											$20,250

6.24 Summary Budget for ESMP and Monitoring

Table 20 Summary of ESMP and Monitoring Budget

Item	Responsibility for implementation and Monitoring	Cost Breakdown	Cost Estimate in Nigerian Naira (₦)	Cost Estimate in Us Dollars (US$)
Enhancement of +ve impacts and Mitigation of –ve impacts	Contractor, PMU, SMEnvr, ASWAMA, FRSC		**41,968,000.00**	**104, 920.00**
Management of ESMP Implementation	PMU, SMEnvr, ASWAMA	5% of Mitigation Cost	**2,098,400**	**5,246.00**
Monitoring, Evaluation & Audit	SMEnvr, ASWAMA, NESERA, FERMA, SMW	25%of Mitigation Cost	**10,496,000.00**	**26,230.00**
SUB- TOTAL				**136,396.00**
Contingency		10% of Sub-Total	**5,455,840.00**	**13,639.60**
TOTAL	—	—	**60,014,240.00**	**150,035.60**

The total cost for Implementing the ESMP and Monitoring Plan for the Nnewichi Gully Erosion Site Rehabilitation Works is estimated at Sixty Million Forteen Thousand Two hundred and Forty Naira Only (₦60, 014, 240); that correspond to One Hundred and Fifty Thousand Thirty Five US Dollars and Sixty Cents[USD150, 035.60]. The ESMP matrix for the implementation of the Rehabilitation works for the Nnewichi Gully Erosion Site is highlighted from Table 17-19. NB: $1 = ₦400.

7 CHAPTER SEVEN: SUMMARY, CONCLUSION AND RECOMMENDATIONS

In summary, the rehabilitation works to be carried out at Nnewichi Gully Erosion site will go a long way in preserving the assets and property of members of the community as well as restore livelihood within the Project Affected Persons. However, there is need to adhere to the provisions of this ESMP to ensure that the environmental and social impacts resulting from this project are enhanced (if positive) or minimized (if negative).

Based on the above and going by the general observations and findings during the conduct of field visits, environmental assessment, potential impacts identification, consultations with relevant stakeholders, the under-listed recommendation have been made to ensure quality assurance throughout the phases of the rehabilitation works.

i. There should be provision for laid down standard procedures to manage conflicts, which may arise during project implementation. Envisaged conflicts may result from increased vehicular flow during the pre-construction and construction phases, interference with water pipeline, comingling of staff, security and safety issues.
ii. Contractor's staff should be identified with distinct uniforms in order to facilitate easy and accurate identification.
iii. Regular conduct of toolbox meetings especially for tough or complex jobs is advocated.
iv. Contractor personnel should always be kitted with appropriate and durable Personal Protective Equipment (PPE) appropriate for any envisaged job.
v. Contractor should have a project Health and Safety manager, who will coordinate and implement health and safety mitigation, measures as addressed in this ESMP.

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ANNEX ONE: ENVIRONMENTAL MANAGEMENT CONDITIONS TO BE INCLUDED IN THE CONSTRUCTION CONTRACTS

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

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

Minimize the effect of dust on the surrounding environment resulting from earth mixing sites, asphalt mixing sites, dispersing coal ashes, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of dust producing activities.

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

Ensure that existing water flow regimes in rivers, streams and other natural or irrigation channels is maintained and/or re-established where they are disrupted due to works being carried out.

Prevent bitumen, oils, lubricants and waste water used or produced during the execution of works from entering into rivers, streams, irrigation channels and other natural water bodies/reservoirs, and also ensure that stagnant water in uncovered borrow pits is treated in the best way to avoid creating possible breeding grounds for mosquitoes.

Prevent and minimize the impacts of quarrying, earth borrowing, piling and building of temporary construction camps and access roads on the biophysical environment including protected areas and arable lands; local communities and their settlements. In as much as possible restore/rehabilitate all sites to acceptable standards.

Upon discovery of ancient heritage, relics or anything that might or believed to be of archaeological or historical importance during the execution of works, immediately report such findings to the SE so that the appropriate authorities may be expeditiously contacted for fulfilment of the measures aimed at protecting such historical or archaeological resources.

Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.

Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.

Ensure that garbage, sanitation and drinking water facilities are provided in construction worker scamps.

Ensure that, in as much as possible, local materials are used to avoid importation of foreign material and long distance transportation.

Ensure public safety, and meet traffic safety requirements for the operation of work to avoid accidents.

3. The Contractor shall indicate the period within which he/she shall maintain status on site after completion of civil works to ensure that significant adverse impacts arising from such works have been appropriately addressed.

4. The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan / strategy to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.

5. Besides the regular inspection of the sites by the Supervising Engineer for adherence to the contract conditions and specifications, the Owner may appoint an Inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. State environmental authorities may carry out similar inspection duties. In all cases, as directed by the SE, the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.

6. All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous chemicals shall be bonded in order to contain spillage. All waste containers, litter and any other waste generated during the construction shall be collected and disposed off at designated disposal sites in line with applicable government waste management regulations.

7. All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.

8. Used oil from maintenance shall be collected and disposed off appropriately at designated sites or be reused or sold for re-use locally.

9. Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

10. Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a daily basis.

11. If disposal sites for clean spoil are necessary, they shall be located in areas, approved by the SE, of low land use value and where they will not result in material being easily washed into drainage channels. Whenever possible, spoil materials should be placed in low-lying areas and should be compacted and planted with species indigenous to the locality.

12. The Contractor shall obtain appropriate licenses/permits from relevant authorities to operate quarries or borrow areas.

13. The location of quarries and borrow areas shall be subject to approval by relevant local and national authorities, including traditional authorities if the land on which the quarry or borrow areas fall in traditional land.

14. New extraction sites:

Shall not be located in the vicinity of settlement areas, cultural sites, wetlands or any other valued ecosystem component, or on high or steep ground or in areas of high scenic value, and shall not be located less than 1km from such areas.

Shall not be located adjacent to stream channels wherever possible to avoid siltation of river channels.

Where they are located near water sources, borrow pits and perimeter drains shall surround quarry sites.

Shall not be located in archaeological areas. Excavations in the vicinity of such areas shall proceed with great care and shall be done in the presence of government authorities having a mandate for their protection.

Shall not be located in forest reserves. However, where there are no other alternatives, permission shall be obtained from the appropriate authorities and an environmental impact study shall be conducted.

Shall be easily rehabilitated. Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height, are preferred.

Shall have clearly demarcated and marked boundaries to minimize vegetation clearing.

15. Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

16. Stockpile areas shall be located in areas where trees can act as buffers to prevent dust pollution. Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exits from workings.

17. The Contractor shall deposit any excess material in accordance with the principles of these general conditions, and any applicable ESMP, in areas approved by local authorities and/or the SE.

18. Areas for depositing hazardous materials such as contaminated liquid and solid materials shall be approved by the SE and appropriate local and/or national authorities before the commencement of work. Use of existing, approved sites shall be preferred over the establishment of new sites.

19. To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.

20. Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.

21. Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.

22. Re-vegetate stockpiles to protect the soil from erosion, discourage weeds and maintain an active population of beneficial soil microbes.

23. Locate stockpiles where they will not be disturbed by future construction activities.

24. To the extent practicable, reinstate natural drainage patterns where they have been altered or impaired.

25. Remove toxic materials and dispose of them in designated sites. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.

26. Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.

27. Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term land use, and allow natural regeneration of vegetation.

28. Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.

29. Minimize erosion by wind and water both during and after the process of reinstatement.

30. Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

31. Re-vegetate with plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local research institutions, forest department and the local people.

Water Resources Management

32. The Contractor shall at all costs avoid conflicting with water demands of local communities.

33. Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the relevant Water Authority.

34. Abstraction of water from wetlands shall be avoided. Where necessary, authority has to be obtained from relevant authorities.

35. Temporary damming of streams and rivers shall be done in such a way avoids disrupting water supplies to communities downstream, and maintains the ecological balance of the river system.

36. No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.

37. Wash water from washing out of equipment shall not be discharged into water courses or road drains.

38. Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.

39. Location of access roads/detours shall be done in consultation with the local community especially in important or sensitive environments. Access roads shall not traverse wetland areas.

40. Upon the completion of civil works, all access roads shall be ripped and rehabilitated.

41. Access roads shall be sprinkled with water at least five times a day in settled areas, and three times in unsettled areas, to suppress dust emissions.

42. Blasting activities shall not take place less than 2km from settlement areas, cultural sites, or wetlands without the permission of the SE.

43. Blasting activities shall be done during working hours, and local communities shall be consulted on the proposed blasting times.

44. Noise levels reaching the communities from blasting activities shall not exceed 90 decibels.

45. Unusable materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures will be disposed of in a manner approved by the SE. The Contractor has to agree with the SE which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.

46. As far as possible, abandoned pipelines shall remain in place. Where for any reason no alternative alignment for the new pipeline is possible, the old pipes shall be safely removed and stored at a safe place to be agreed upon with the SE and the local authorities concerned.

47. AC-pipes as well as broken parts thereof have to be treated as hazardous material and disposed of as specified above.

48. Unsuitable and demolished elements shall be dismantled to a size fitting on ordinary trucks for transport.

49. In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of AIDS.

50. Adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points.

51. Construction vehicles shall not exceed maximum speed limit of 40km per hour.

52. Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.

53. In cases where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the SE. This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation.

54. Within 6 weeks of signing the Contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the health, safety, environmental and social aspects of the

works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works.

The Contractor's EHS-MP will serve two main purposes:

For the Contractor, for internal purposes, to ensure that all measures are in place for adequate HSE management, and as an operational manual for his staff.

For the Client, supported where necessary by a SE, to ensure that the Contractor is fully prepared for the adequate management of the HSE aspects of the project, and as a basis for monitoring of the Contractor's HSE performance.

55. The Contractor's EHS-MP shall provide at least:

A description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an EMP;

A description of specific mitigation measures that will be implemented in order to minimize adverse impacts;

A description of all planned monitoring activities (e.g. sediment discharges from borrow areas) and the reporting thereof; and

The internal organizational, management and reporting mechanisms put in place for such.

56. The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts, and has defined appropriate measures to counteract any potential impacts.

57. The Contractor shall prepare bi-weekly progress reports to the SE on compliance with these general conditions, the project EMP if any, and his own EHS-MP. An example format for a Contractor HSE report is given below. It is expected that the Contractor's reports will include information on:

HSE management actions/measures taken, including approvals sought from local or national authorities;

Problems encountered in relation to HSE aspects (incidents, including delays, cost consequences, etc. as a result thereof);

Lack of compliance with contract requirements on the part of the Contractor;

Changes of assumptions, conditions, measures, designs and actual works in relation to HSE aspects; and

Observations, concerns raised and/or decisions taken with regard to HSE management during site meetings.

58. It is advisable that reporting of significant HSE incidents be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, it is advisable that the Contractor keeps his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as copies of incident reports, as appendices to the bi-weekly reports. Example formats for an incident notification and detailed report are given below. Details of HSE performance will be reported to the Client through the SE's reports to the Client

59. The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project EMP, and his own EHS-MP, and are able to fulfill their expected roles and functions. Specific training should be provided to those employees that have particular responsibilities associated with the implementation of the EHS-MP.

General topics should be:

- Occupational Health and Safety Basics
- Occupational Health and Safety in water supply pipeline installation
- Safety Practices in Borehole installation and Aquifer Abstraction
- Electrical Safety Basics
- Hazard Identification and Control
- Hazard Communication Program
- Accident Investigation
- Asbestos Management
- Safe work Procedures
- Fall Protection
- Noise Management Program
- Workers Respiratory Program
- Work place Violence Management
- Fire Safety
- Emergency Management; and
- Social and cultural awareness

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

Example Format: HSE Report

Contract:

Period of reporting:

HSE management actions/measures:

Summarize HSE management actions/measures taken during period of reporting, including planning and management activities (e.g. risk and impact assessments), HSE training, specific design and work measures taken, etc.

HSE incidents:

Report on any problems encountered in relation to HSE aspects, including its consequences (delays, costs) and corrective measures taken. Include relevant incident reports.

HSE compliance:

Report on compliance with Contract HSE conditions, including any cases of non-compliance.

Changes:

Report on any changes of assumptions, conditions, measures, designs and actual works in relation to HSE aspects.

Concerns and observations:

Report on any observations, concerns raised and/or decisions taken with regard to HSE management during site meetings and visits.

Signature (Name, Title Date):

Contractor's Representative

Example Format: HSE Incident Notification

Provide within 24 hrs to the Supervising Engineer

Originators Reference No:

Date of Incident: Time:

Location of incident:

Name of Person(s) involved:

Employing Company:

Type of Incident:

Description of Incident:

Where, when, what, how, who, operation in progress at the time (only factual)

Immediate Action:

Immediate remedial action and actions taken to prevent reoccurrence or escalation

Signature (Name, Title, Date):

Contractor's Representative

ANNEX TWO: ESMP DISCLOSURE PROCESS

Whenever the Bank requires an environmental assessment (EA), the proposed borrower prepares an EA report as a separate, free-standing document. The EA report is publicly available (a) after the borrower has made the draft EA report available at a public place accessible to project-affected groups and local NGOs in accordance with OP/BP 4.01, *Environmental Assessment,* and (b) after such EA report has been officially received by the Bank, but before the Bank begins formal appraisal of the project.

To comply with World Bank policies on Environmental Assessment of projects and disclosure of information, all sponsors of projects are required to prepare and publicly disclose the ESMP.

Sponsors must provide copies of the ESMP—along with all other documents related to a project's environmental assessment—for submission to the World Bank website for public access at least 60 days before the Bank's formal consideration of the project for financing.

In addition to complying with Nigeria disclosure requirements, the sponsor must ensure that the ESMP is available throughout the project area.

Members of the community will be informed about the disclosure via National dailies as well as community leaders prior to the disclosure.

To this end, the sponsor may be required to prepare summaries of the ESMP in local languages for distribution to accessible points within the project area. The 60-day disclosure period will allow time for all interested and affected parties to submit their comments and concerns about the ESMP.

This makes room for addressing grievances that may arise. The document also contains a section that gives a guide line on how grievances can and will be handled if they arise which is an important section of the document.

However, under certain circumstances, based entirely on the judgment of World Bank specialists, a RAP may warrant a shorter period of public review. Under these circumstances, sponsors will be required to publicly disclose the RAP 30 days before formal consideration of project financing.

More detailed information on public disclosure requirements is contained in the World Bank's Operational Policy 4.01 on Environmental Assessment and its policy on the disclosure of information.

Failure to follow these guidelines may give room to some unscrupulous elements within the community to try and destabilize the success of the project by bringing forward unnecessary and unrealistic claims.

In the case of the Environmental and Social Management Plan prepared for the Nnewichi gully Erosion site, the SPMU is expected to disclose the document at the following locations;

- World Bank website,
- NEWMAP Anambra SPMU,
- NEWMAP FPMU,
- Environmental Assessment (EA) Department Federal Ministry of Environment,
- Office of the State Controller Federal Ministry of Environment,

- Office of the Anambra State Commissioner for Environment,
- The project LGA c/o the LGA NEWMAP liaison officer,
- The Project Community (Town Hall, Obi's Palace) and
- Office of the Commissioner for Local Government Matters.

Members of the community are freely obligated to visit any of the display centres for the purpose of requesting access to view the Draft ESMP document. It is expected that they will submit comments, suggestions and remarks on the document which will be received and collated by the SPMU. Furthermore, the SPMU should ensure that these comments are in turn communicated to the Consultant who will address where necessary d subsequently submit a Draft Final ESMP Report. This when in cleared will form the Final ESMP Report.

ANNEX THREE: CENSUS/ SOCIO-ECONOMIC DATA COLLECTION FORM

IDENTIFICATION

Affix Passport Here Photograph

Community: _____ Date_____

Name of Interviewer_____

Name of the Respondent: _____

Phone No_____

Relationship to Household head_____

Age___ Sex___

Address: _____

Nationality_____ Nativity _____

Length of stay within the community_____

GENERAL INFORMATION

Religious Group: Christians____Muslim___ATR___Others (specify) ___

Social Group: Vulnerable___General___

Family Pattern: Joint___Nuclear___Individual_____

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

FAMILY PARTICULARS (Start from head of the household)

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

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

COMMERCIAL/SELF EMPLOYMENT ACTIVITIES

Type of Shop/Business Enterprises (SBEs)

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

Employment Pattern

Owner/Operator____Employed 1 to 5 persons___Employed above 5____

VULNERABILITY

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

PUBLIC UTILITIES

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

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

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

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

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

What is your primary source of electricity

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

What is your secondary source of electricity?

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

What is the main fuel you use for cooking?

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

HEALTH AND SANITATION

What type of toilet facility do you use?

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

How do you dispose of your household refuse?

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

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

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

PROJECT PERCEPTION

Are you aware of the proposed Erosion Rehabilitation Project? Yes___No__

If Yes, Source of information_____

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

If good, what positive impacts do you perceive? _____

If bad, what negative impacts do you perceive? _____

INFORMATION ON AFFECTED PROPERTY

GPS Coordinates: _____

Name of PAP_____

Phone No_____

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

Type of document possessed to certify ownership type_____

If not owned, state name and Address of owner_____

_____

If informal use right, state type of agreement_____

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

Details of the structure

Type of Use: Residential____Commercial___Residential/Commercial___Other (Specify) __

Construction Type: Mud___Brick___Mud/Thatched roof__Brick/Zinc roof____

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

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

Other Affected Assets

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

Replacement Value (₦) _____

Assets distance to the wall edge_____

Agricultural Products

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

Average yearly household income from agriculture (₦) _____

Trees

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

RESETTLEMENT AND REHABILITATION

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

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

Which is your preferred replacement Option?

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

Factors to be considered in providing alternate place

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

ANNEX FOUR: CHECKLIST

SITE INFORMATION

INSTITUTIONAL & ADMINISTRATIVE	
Project title	Consultancy Services for the Preparation of an Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP) for Nnewichi Gully Erosion site
Scope of project and activity	✓ The Nnewichi Main gully (NNMG) includes the design of the box culvert, concrete channel, cascade drops, chute and stilling basin, gabion retaining wall, check dam and outlet structures. ✓ The Finger gully which has Right and Left Finger gully (RFG and LFG) followed by their respective sequential number on both right and left side of the main gully includes design of concrete canal, cascade drops, chute and stilling basin, Junction structure with the gabion retaining wall and outlet structures. ✓ The other main part of the design is the design of gully bank treatment works. The gully bank is largely provided with Bio-remediation and in some cases stone pitching works. This section of the design covers the design of bank treatment works, interceptor and collector drains on the gully.
SITE DESCRIPTION:	
Name of site	
Describe site location	
Who owns the land?	
Description of geographic, physical, biological, geological, hydrographic and socio-economic context	Geographic:
	Physical:
	Biological:
	Geological:
	Hydrographic:
	Socio-economic:
Locations and distance for material sourcing, especially aggregates, water, stones?	
LEGISLATION	
Identification of national & local legislation & permits that apply to project activity	
PUBLIC CONSULTATION	
Identification of when / where the public consultation process will take place	

SAFEGUARDS INFORMATION

The Project works will involve the following activities.	Activities	*Description of the issue, e.g. quantification of impact if possible.*
	Rehabilitation (Civil) works: • The Nnewichi Main gully (NNMG) includes the design of the box culvert, concrete channel, cascade drops, chute and stilling basin, gabion retaining wall, check dam and outlet structures. • The Finger gully which has Right and Left Finger gully (RFG and LFG) followed by their respective sequential number on both right and left side of the main gully includes design of concrete canal, cascade drops, chute and stilling basin, Junction structure with the gabion retaining wall and outlet structures. • The other main part of the design is the design of gully bank treatment works. The gully bank is largely provided with Bio-remediation and in some cases stone pitching works. This section of the design covers the design of bank treatment works, interceptor and collector drains on the gully.	Air Quality: a. What types of emissions to the air would result from the erosion site (i.e. dust, automobile exhausts, odours etc.) during construction and when the project is completed? …Dust and Exhaust fumes…….. b. Are there any off-site sources of emissions or odour that may affect the project? …… Noise: What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation and others)? …Construction, traffic…….. Indicate what hours noise would come from the site. …Morning to Evening hours…….. Water quality: 1. Is there any surface water body on or in around the site (including ponds, year-round and seasonal streams)? …Yes……. 2. What stream or river does the surface Water body flows into? Stream…… Will the project require any work over, in or adjacent to (within 200 feet) the described waters? Yes……. Will the project require surface water withdrawals or diversions? …Yec…… Does the project involve any discharges of waste materials to surface waters? …No…….. c. Ground 1. Will waste material be discharged onto the ground? ……Yes…….. c. Water runoff (including stormwater): 1. What is the source of runoff (including storm water)? …….. 3. Will this water flow into other waters? …Yes…… 4. Could waste materials enter ground or surface waters? …Possibly…… 5. 5. Could further erosion occur as a result of the project? …No……..
	New construction: • The Nnewichi Main gully (NNMG) includes the design of the box culvert, concrete channel, cascade drops, chute and stilling basin, gabion	Air Quality: a. What types of emissions to the air would result from the substation (i.e. dust, automobile, odors e.t.c) during construction and when the project is completed? …Dust, Exhaust fumes……..

	retaining wall, check dam and outlet structures. • The Finger gully which has Right and Left Finger gully (RFG and LFG) followed by their respective sequential number on both right and left side of the main gully includes design of concrete canal, cascade drops, chute and stilling basin, Junction structure with the gabion retaining wall and outlet structures. • The other main part of the design is the design of gully bank treatment works. The gully bank is largely provided with Bio-remediation and in some cases stone pitching works. This section of the design covers the design of bank treatment works, interceptor and collector drains on the gully.	b. Are there any off-site sources of emissions or odor that may affect the project? …… Noise: What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation and others)? …Traffic, Construction…….. Indicate what hours noise would come from the site. …Morning and Evening hours…….. Water quality: Is there any surface water body on or in the immediate vicinity of the substation (including ponds, year-round and seasonal streams)? …Yes……. What stream or river does the surface Water body flows into? ……Lagoon…… Will the project require any work over, in or adjacent to (within 200 feet) the described waters? ……. Will the project require surface water Withdrawals or diversions? …Yes…… Does the project involve any discharges Of waste materials to surface waters?..... c. Ground 1. Will waste material be discharged onto the ground? …….. d. Water runoff (including stormwater): 1. What is the source of runoff (including storm water)? …….. 2. Where will this water flow? …… 3. Will this water flow into other waters? …… 4. Could waste materials enter ground or surface waters? ……Possibly…… 5. Could further erosion occur as a result of the project? ……No……..
	Cultural Resource (s) :	a. Are there any places or objects listed on, or proposed for, national, state or local preservation registers known to be around the project site? ……Yes…… b. Any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be next to the site? ……Yes……
	Hazardous or toxic materials: Soil Oil Waste from project sites Electrical cables/ Debris from site	
	Impacts on Flora and Fauna:	a. What kinds of vegetation is found on the site?...Shrubs., Trees.....

		b. What kind and amount of vegetation will be removed or altered? Shrubs…….. c. Are there any threatened or endangered species known to be on or near the site? …….. d. Is there a proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site? …….
	Handling / Management of Hazardous waste: Temporary waste disposal site/ Collection	
	Traffic and Pedestrian Safety:	Will there be Direct hazards to public traffic and pedestrians by construction activities? …Yes…… Will there be Indirect hazards to public traffic and pedestrians by construction activities? Possibly……
	K. Environmental health:	a. What are the environmental health hazards, including exposure to toxic chemicals like PCBs, risk of fire and explosion, spill, electrocution or hazardous waste that could occur as a result of this project? …….. b. What are the risk of personnel contracting HIV and other sexually transmitted diseases? ……...
	L. Transportation	a. What public streets and highways currently serve the area? …….. b.. Will the area require any new roads or streets, or improvements to existing roads or streets? ……Yes……

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

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 19 States, namely Anambra, Abia, Cross River, Edo, Enugu, Ebonyi, Imo, Kogi, Gombe, Delta, Plateu, Sokoto, Oyo, Katsina, Nasarawa, Akwa-Ibom, Bauchi and Borono.

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 long-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; 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 plan.

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 an SA or an EA and/or (II) Environmental 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: the RPF applies when land acquisition leads to the temporary or permanent physical displacement of persons and/or loss of shelter and/or loss of livelihoods and/or loss denial or restriction of access to economic resources due to project activities it sets out the resettlement and compensation principles organizational arrangements and design

criteria to be applied to meet the needs of project affected people and specifies the contents for a resettlement action plan rap for each package of investments a resettlement policy framework (RPF) which serves as a practical tool during the programme formulation design implementation and monitoring was prepared for NEWMAP which serves as a guide for the present terms of reference.

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 1: Nnewichi and Ojoto

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:

k. Describe the existing status of the sub watershed and gullies;

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

m. Select and measure appropriate baseline indicators (for example, m3/sec of runoff collected in the sub watershed during a heavy hour-long rainfall);

n. 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;

o. 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;

p. 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);

q. 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;

r. Define technical assistance programs that could strengthen environmental management capability in the agencies responsible for implementation;

s. 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

t. 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 ES MP

- 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, etc.	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, etc.	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 SIX: LIST OF PEOPLE MET

Public ~~Forum~~ RAP Public Consultation for Nnewichi Gully Erosion

S/N	NAME	COMMUNITY	DESIGNATION	PHONE	SIGNATURE
1	Okolo Cyprian	Odida	Resident Coun	[illegible]	
2	Okeke Samuel	Okpuno	President Vice	[illegible]	
3	Fabian Ndubua	Obiofor Nnewichi	Secretary General	[illegible]	
4	Cyril Okeye Osuala	Abubor	Treasurer	[illegible]	
5	Chief Leo Onwuatuegwu	Okpuno	Member	[illegible]	
6	Elder Ezeuwa	Obiofor		[illegible]	
7	HON Azuka Okeke	Okpuno	Fmr PG	[illegible]	
8	DR OBINNA NGENABI	OKPUNO	MEMBER	[illegible]	
9	Iwetaba Nkem	Okpuno	Member	[illegible]	
10	Onyeama Nnaemeka	Okpuno	Member	[illegible]	
11	Ofoedile Josephine	Odida	Odida Leader	[illegible]	
12	Atuchukwu Pauline	Odida	Women leader	[illegible]	
13	Obinpama Josephine	Obiofia	WAI Chairman	[illegible]	
14	Juliana Udeogu	Abubor	Chair Lady	[illegible]	
15	Nwafor Ikechukwu	Abubor	P.G youth	[illegible]	
16	CHIKE AGWUCHA	Odida	Chairman Odida	[illegible]	
17	CHIEF IKECHUKWU	OBIOFIA	P.G OBIOFIA	[illegible]	
18	Chief Sunny Okafor	ABUBOR	PG ABUBOR	[illegible]	
19	Obi Henry Ofodile	Obuoha	OBI OBUOHA	[illegible]	
20	Obi Francis Okeke	Obi Abubor	OBI Abubor	[illegible]	
21	Obi Emeka Onyejekwe	Obi Obiofia	Obi Obiofia	[illegible]	
22	Godwin Mmuogalam	Obiofor Nnewichi	Provost	[illegible]	
23	Ikenna Udeze	Abubor Nnewichi	Provost	[illegible]	
24	Anambra Ephraim C	S/Fresh	IT/Adm	[illegible]	
25	Ikechi, Chiagozie	ANS-NEWMAP	ASS SHO	[illegible]	
26	Anaragasi, Chima	ANS-NEWMAP	ANRMO	[illegible]	
27	Nkebuna Lebonn D	ANS-FAGO	ED	[illegible]	
28	Okafor, Blessing	ANS-NEWMAP	SLO	[illegible]	
29	Anazodo, Humphrey	ANS-NEWMAP	M&E.O	[illegible]	
30	Lekwuwor, [illegible]	CONSULTANT	HRCDS	[illegible]	

S/N	NAME	COMMUNITY	DESIGNATION	PHONE NUMBER	SIGN
1.	Bartholomew Ugoke	Obiofia	Chairman Com	08038550815	[illegible]
2.	Christopher Iyokahme	Abubor	Member	07013497687	[illegible]
3.	ONYEMA ERUJIA	NBUBOR	MEMBER	08165376193	[illegible]
4.	Raphael Chibuzor	Abubor	Member		[illegible]
5.	Edmund Chiokuma	Akabor Nnandi	Member	0703[illegible]411	[illegible]
	Michael Molokwu	Obior Nnandi	Member	—	[illegible]
6.	Agustina Onita	Okpuno Nnandi	Member	08055358541	[illegible]
7.	Harold Obiofuma	Obiofia	Member	08055[illegible]	[illegible]
8.	Rose Arinze	Okpuno Nnandi	Women Leader	08035509619	[illegible]
9.	Agnes Okafor	Obiofia Nnandi	Member	07066294983	A.N
10.	Anthony Okoye	Obiofia Nnandi	Member	07035538548	A.O
	JOHN Amanchukwu	Akabor Nnandi	Member	0803[illegible]	[illegible]
11.	Basil I. Ekeagwu	Abubor	Asst Sec APU	080[illegible]	[illegible]
12.	Raphael Okonye	Abubor	Member	08035297983	[illegible]
	Josephine Obiofia		PRO	08135745593	J.O
13.	Joy Amaechukwu	Obiofia	Member	09037129461	J.A
14.	Ignatius Nwonye	Obodo Nnandi	Task Force	08067[illegible]	[illegible]
15.	Paul Uzochukwu	Obiofia Nnandi	Task Force	08067467805	[illegible]

S/N	NAME	COMMUNITY	DESIGNATION	PHONE NUMBER	SIGN
1.	Emeka Okafor	Nkpologu Ezi	Nnewi-Chi	08032284750 07057445122	[illegible]
2.	Uche Okafor	Umuogbo Obiofia	Nnewichi	07037953841	[illegible]
3.	Ignatius Onyekaka	Nkpoku	Nnewichi		[illegible]
4.	Anthony Ikeke	Ahaba Nnewichi	Nnewichi	08032498402	[illegible]
5.	Edith Obiamalu	Umuogbo Obiofia	Nnewichi	08160601345	[illegible]
6.	Sarah Obiamalu	Umuogbo Obiofia	Nnewichi	09035082327	[illegible]
7.	Innocent Anyaku	Umuogbo	Nnewichi	08031558980	
8.	Mary Augustine	Umuogbo	Nnewichi		
9.	Chidozie Nkem	Okpuno	Nnewichi	08129152917	[illegible]
10.	Paul Umachukwu	Odida	Nnewichi	08067462285	[illegible]
11.	Okilolo Azuka	Odida	Nnewichi	[illegible]	[illegible]
12.	Onwuzurike Francis	Odida	Nnewichi	08058737049	
13.	Okeke Ifeanyi	Odida	Nnewichi	08064137102	
14.	Udeh IK	Odida	Nnewichi	08031350460	
15	Afam Udemezo	Odida	Nnewichi	08032087 68478	
16	Emma O. Okeke	Odida	Nnewichi	08063879055	
17	Odinaka Nkem	Abor		08037372004	[illegible]
18	Aguwacha Ben	Odida	Nnewichi	[illegible]	[illegible]

S/N	NAME	COMMUNITY	DESIGNATION	PHONE NUMBER	SIGN
16.	Okafor Ifeoma M.	Obiofia Nnewichi	Nnewichi	08069482450	
17.	OKONKWO JANE	SFNIC-O	ATTACH	08067339757	
18.	ONUCHUKWU, EJIKEME ELOZONA	ANS-NEWMAP	ENVIRONMENTAL SAFEGUARD OFFICER	08067544206	
19.	Emeka Achebe	ANS-NEWMAP	CO	08034700384	
20.	Ekene Ezekwesili	Hospitalia consultaire	TTA	08135979490	
21.	Okongwu C. Donald	Hospitalia Consultaire Ltd	RA	08039127013	
22.	ODIOBULU NKECHI	ABUBER	MEMBER	08037372004	

ANNEX SEVEN: PICTURES FOR NNEWICHI FIELD WORK

Plate 43 Consultants with the site committee at the site

Plate 42 Consultants with community members

Plate 44 One of the field workers interviewing a PAP

Plate 45 An endangered property

Plate 46 Consultants assessing a property

Plate 47 Discussion with PAPs in the field

Plate 49 Canal built by community to check erosion

Plate 48 Catchpit dug by community to check flooding

Plate 51 Cross section of Women group during consultation

Plate 50 Consultant with PAPs in the field

Plate 52 Soil Sampling

Plate 53 Endangered building

ANNEX EIGHT: MINUTES OF MEETINGS HELD ON BETWEEN 9TH-11TH FEBRUARY, 2017 AT NNEWICHI TOWN HALL.

The town hall meeting for the ESMP/RAP for the Nnewichi gully erosion site started with a presentation of kola-nut by Obi of Nnewichi at 10:13am. The traditional ruler used the opportunity to express his appreciation on-behalf of the entire Nnewichi people to the NEWMAP/World Bank and the consultant. He was optimistic that the essence of the gathering will yield its desired results.

The PG of Nnewichi Development Union called on the AN-NEWMAP representatives to state the reason for the meeting. The SPMU communication specialist introduced the SPMU team which included Environmental specialist, Social and Livelihood specialist, Natural Resources specialist, Assistant Procurement specialist, M&E specialist, Focal NGO consultant and ESMP/RAP consultant. Mr Emeka Achebe (AN-NEWMAP communication specialist) told the stakeholders that Anambra State registers up to 1,000 gullies alone, nearly double of other states in the southeast. With a growing population, these combined factors he said has put substantial pressure on land resources and the safety of the population living around the gullies. He maintained that the development could be attributed to anthropogenic and natural factors such as poor storm water drainage networks, topography, flood etc. and worried that the expansion of these gullies have degraded many plots of land and damaged houses, schools, churches, businesses as well as split communities and removed pathways.

The AN-NEWMAP spokesman told the participants that Nnewichi gully site was among other sites in Anambra state that have been approved by World Bank for intervention works. He however started that it is important that the World Bank safeguard policies which could be triggered as a result of project implementation will be addressed. Accordingly, the SPMU has engaged Hospitalia Consultaire Ltd (Environmental Health Consultancy Firm) to carry out the ESMP/RAP studies of the proposed site.

The consultant took the stage, he warmly welcomed every stakeholder present. He explained the rationale behind World Bank Operational Procedure 4.01 (Environmental Assessment) and 4.12 (Involuntary Resettlement) thus informed the stakeholders that his assignments is in two parts- Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP). He started that the paramount objective of his ESMP assignment is to develop procedures and plans to ensure that the mitigation measures would be implemented throughout the phases for the **Rehabilitation of the Nnewichi Gully Erosion site.** He stated that the ESMP report will ensure the effective long-term protection of the area and other biotic and abiotic components of the environment. Subsequently, he stated also that the RAP study will focus on the Identification and assessment of human impact of the proposed works at the targeted gully erosion site and to prepare an action plan to be implemented in coordination with the civil works. The resettlement action plan he said will identify the Project Affected Persons (PAPs), engage them in participatory discussions regarding the formulating of an action plan to adequately compensate people for their losses as well as assign adequate costing for implementing the resettlement plan.

The consultant enlightened the stakeholders on the NEWMAP livelihood restoration plans. He reiterated that NEWMAP has livelihood activities projects that focused on alleviating the sufferings impended on the PAPs and project communities by the lingering erosion menace.

The consultant called on the project community to take the ownership of the NEWMAP projects. He reminded them that until they protect and participate on the NEWMAP projects before the projects would be sustained. He also advised the community to protect the project equipment during construction works.

The AN-NEWMAP Social and Livelihood Officer (SLO) Mrs. Blessing Okafor sensitized the participants on the overall RAP implementation. She stated that RAP implementation involves stages and processes. She advised that stakeholders must remain resilient, patience and committed during these processes. She also stated that it's expedient to formulate the site committee in order to ensure community involvement and ownership. She advised to Focal NGO to immediately form the committee members in a credible and fair process.

The AN-NEWMAP Environmental specialist sensitized the stakeholders on the legacy issues. He stated the census and capturing exercise will be limited to properties that are still standing. He maintained that the compensation and evaluation would be done to the property/asset seen during census inventory.

Generally, the community members welcomed the project whilst expressing their worries that rehabilitation work should commence expeditiously to prevent exacerbation of the erosion damages as the raining season draws near.

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

Comments/Concerns/Questions Raised	Consultant's Responses to Issues Raised
Resident Stakeholders welcomed the proposed project and were very much delighted and positive with regards to the approach undertaken by the AN-NEWMAP and World Bank to address the current problems of watershed and erosion, which are currently affecting their lives negatively.	The consultant acknowledged the residents widespread support for the proposed project and encouraged them to sustain it throughout the project life cycle
Okeke Samuel sought to know if the proposed project is real or scam	Nnewichi erosion intervention has been approved by the World Bank. However, the proposed project works will trigger some environmental and social sensitivities which ESMP report is expected to address the commencement of remedial works.
Chief Ezikiel Izuchukwu (Obi Umuogbo Nnewichi) expressed happiness and pleaded with	Endorsed.

Comments/Concerns/Questions Raised	Consultant's Responses to Issues Raised
stakeholders to effectively participate through the project cycle.	
Felix Udeh observed that the gully has different fingers, some not connected to the major gully; he sought to know if all the sites were captured.	An-NEWMAP engaged SMEC Group, an engineering firm based in Australia to carry-out the engineering and feasibility study of the proposed site. They have carried out an in-depth studies and believed to have captured the affected sites.
Ofokile Josephine (Mrs.) expressed sadness over the mortality incidences the erosion menace has caused. She however expressed hope that the proposed project will bring a lasting solution to the problem.	Endorsed
Ifeoma Ukafor lamented over the communities insensitive on waste disposal practices. She stated that those who use gully sites or drainage channels as a dump site are being irrational. She called on the Obi of Nnewichi to take drastic action on the offenders and also set up Monitoring Committee to enforce his decision.	Her views were noted by the consultant.
Ogbuofi advised the members of the community to be sincere and upright with the consultant. He stated that the attitude and commitment of the community would enable the project to actualize its desired result.	View duly endorsed.
Emmanuel stated that he is unsure of the proposed until when contractors and equipment are on ground for the rehabilitation works. He however praised the World Bank, An-NEWMAP, FGN and Anambra State Government for the rescue mission	Noted and endorsed

The Obi of Nnewichi in his closing remarks thanked everyone that participated, urging them to be focused and committed throughout the project implementation phases. The meeting closed by closing prayer said by Mrs Ifeoma Elochukwu at 2:48pm.

Advocacy Visit with the Obi Nnewichi and Other relevant Stakeholders

The advocacy visit meeting was held on 9th Feb, 2017 at the resident of Chief Ogbuefi Ifeanyi Melie (Special Adviser to the Anambra State Governor on Budget, Efficiency and IGR) at 10:32am. The stakeholders present in the meeting includes: Obi Nnewichi, President General of Nnnewichi Development Union, and Special Adviser to Anambra State Governor on Economy and Strategic Planning, Women Group Leaders, Youth Group Leaders and other stakeholders. The advocacy visit was necessary to introduce the ESMP and RAP consultancy services to the stakeholders and seek their consent and opinion on the exercise. The visit was also scheduled to gain a better understanding of the project environment, social structure and existing livelihood activities of the area. It was also initiated to allow the relevant stakeholders to select a suitable date for a larger stakeholder's consultation including venue and time for the town hall meeting.

The President General of Nnewichi Development Union, Obi of Nnewich and the Special Adviser to the Anambra State Governor on Budget, Efficiency and IGR) were on separate notes welcomed the consultancy team and were particularly delighted for the visit. On his remarks, Chief Ogbuefi described the ugly incidences the community have experienced as a result of the erosion menace. He stated that the erosion adverse impacts have caused a lot of sorrows and concerns for the people. He lamented on the several efforts made by some concerned Nnewichi citizens in calling the attention of the state government and NEWMAP in salvaging the erosion problem. He described the NEWMAP intervention mission as a collective effort of the Anambra state government, Federal Government of Nigeria and World Bank. He maintained that Anambra state government had before now done the needful by paying her counterpart funding in making sure that this project is effectively and smoothly implemented.

The Obi of Nnewichi in a swift reaction assured the stakeholders that the community will play her part for effective project implementation. HRH expressed worries over the watershed problems ravaging across the quarters and pleaded that the work should cover all the erosion sites within the community.

The PG of Nnewichi Development Union reaffirmed the community commitment and willingness in ensuring that the NEWMAP proposed project would be slickly implemented. The AN-NEWMAP communication specialist acknowledged the presence of the participated stakeholders while assuring them that SPMU commitment towards efficient project implementation. He introduced the ESMP/RAP consultant to the stakeholders, urged them for unflinching support and corporation.

The consultant gave a brief on his assignment scope of work requesting the community to come out in numbers during the town hall meeting so as to express their concerns and ideas. He also stated that the Project Affected Persons (PAPs) should be on ground during census exercise to enable the consultant carry out an effective study.

The stakeholders utilized the opportunity to understand the scope of the consultancy and agreed that 11th Feb, 2017 would be effective date for the Town Hall Meeting. The meeting ended by the traditional blessing said by Obi Nnewichi. Time ended 1:37pm.

Group Consultations

These consultation meetings were carried out with representatives of the women group, youth group and people living within and around the gully area. Also, part of those interviewed were members of market group and Palm Oil Mill owners. The purpose was for the consultant and them to get a deeper understanding of the erosion intervention and overall NEWMAP processes. Also, the consultant sought to find out the measures the community have been engaged in to help prevent or reduce the progress of the erosion. As part of the information sought, the consultant was given a history of the community, cultural heritage and other project community baseline information.

Women Group

An in-dept interview carried out among some selected women in Nnewichi revealed that the women folks were fully enthusiastic about the project. They pledged to be committed throughout the project circle.

Palm Oil Mill Owners

This group expressed hope that the project will attract investors and reduced anxiety. Field work inspection revealed that gully expansion has encroached to some of the Oil Mill Facilities situated within the Nnewichi community.

Youth Group

Youth folks participated fully during the consultation processes and field work exercise. This group was identified as one of the "key stakeholders" by the consultation. The group consultation with them centered on contractor equipment security, protection of contractors and overall safety of the workers for the Nnewichi gully erosion rehabilitation. They were advised to remain committed and expect to be carried along during the construction and other sub project activities.

Haslab®

Hasilton Environmental Laboratory Services

135, Nnamdi Azikiwe Avenue, Wuse 2, Abuja, Nigeria
Phone: 234 (0) 807 643 2521

Name of Customer: Dr. Lekwuwa Isaac
Sample Type: Water and Soil
Test Required: Chemical/Physical Parameters
Received By: Chinenye Onwubuariri
Date Received: 2nd March, 2017

Analytical Results

Water Samples

Organism	Mmiri Agu Upstream	Mmiri Agu Downstream	NN3 (Borehole)	OJ 1 (Oto River Upstream)	OJ 2 (Oto River Downstream)	OJ 3 (Borehole)
Yeast and Mould (cfu/ml)	Nil	Nil	Nil	Nil	Nil	Nil
Coliform (cfu/ml)	226	374	8	82	101	9
Salmonella (cfu/ml)	Nil	Nil	Nil	Nil	Nil	Nil
E.coli (cfu/ml)	142	150	20	41	48	17
Faecal Streptococcus (cfu/ml)	Nil	Nil	Nil	Nil	Nil	Nil

Water Samples

S/N	Parameters	Mmiri Agu Upstream	Mmiri Agu Downstream	NN3 (Borehole)	OJ 1 (Oto River Upstream)	OJ 2 (Oto River Downstream)	OJ 3 (Borehole)	FMEnv Limit
1	pH	6.3	6.3	6.83	6.4	6.3	6.8	6-9
2	Conductivity (ug/cm)	70	120	179	63.04	50.91	112	1000
3	TDS (mg/l)	13	35.7	61.6	17.00	19.00	30.53	1000

5	Chlorine (mg/l)	17.6	16.5	357	23.51	14.74	230	250
6	Salinity (mg/l)	0.02	0.06	0	0.03	0.07	0	0.1
7	Nitrate (mg/l)	0.8	0.3	0.08	2.75	3.31	1.32	20
8	Sulphate (mg/l)	220	183	300	153	122	306	500
9	Calcium (mg/l)	31.3	29.6	51.7	31.5	34.4	26.3	150
10	Magnesium (mg/l)	11.3	11.4	5.19	11.00	16.00	9.00	50
11	Sodium (mg/l)	0.3	0.25	3.2	1.26	3.47	1.	200
12	Potassium (mg/l)	1.4	1.9	1.35	1.01	1.07	0.8	<1
13	Total Hardness (mg/l)	24.7	18.3	70	285.30	291.11	68.65	200
14	Dissolved Oxygen (mg/l)	2.8	4.1	1.7	6.4	6.9	3.9	7.5
15	BOD_5 (mg/l)	7.8	12.8	0.15	4.7	4.4	2.1	30
16	COD (mg/l)	18.7	27.5	1.8	42.2	45.8	35.7	80
17	Phosphate (mg/l)	0.03	0.02	1.8	1.73	1.92	0.21	5
18	Turbidity (NTU)	13.6	18.6	1.6	3.74	4.04	1.32	100
19	Resistivity	1.667	2.04	1.89	1.680	2.02	1.90	
20	Odour	Unobjective	Unobjective	Unobjective	Unobjective	Unobjective	Unobjective	Unobjective

Cfu/ml = Colony forming unit per100 milliliter of sample

Comment: None of the water sample is satisfactory going by WHO standards for portable water. Each of the water sources should be treated before use.

Hasan Bukar

Test Performed by

Signature of analyst

Analytical Results

Soil Samples

Sample ID	Parameters														
	Depth (cm)	pH	Oxygen Capacity %	Nitrates %	Phosphate Mg/kg	Calcium Meq/100g	Magnicium Meq/100g	Sodiuum Meq/100g	Potassium Meq/100g	Copper	Iron	Chronium	EC Ug/cm	%Sand	%Clay
NN 1	0-15	5.3	0.8	0.13	23.80	3.0	0.70	0.15	0.048	0.20	0.09	0.034	19	65.22	27.26
	15-30	5.6	0.63	0.09	25.70	2.60	0.60	0.16	0.045	0.26	0.07	0.047	23	60.87	21.87
NN 2	0-15	6.01	1.15	0.14	28.68	5.7	2.8	0.35	0.17	0.47	0.10	0.082	12	72.44	20.66
	15-30	6.14	0.89	0.11	28.68	2.6	1.86	0.35	0.08	0.54	0.14	0.093	18	71.56	21.32
NN 3	0-15	5.4	0.69	0.084	19.80	2.40	0.68	0.19	0.051	0.24	0.03	0.049	16	49.67	34.67
	15-30	5.72	0.70	0.076	24.50	2.0	1.04	0.23	0.043	0.31	0.01	0.053	7	52.56	31.56
NN 4	0-15	5.5	1.06	0.10	24.50	2.0	1.20	0.22	0.087	0.21	0.09	0.065	13	65.22	27.26
	15-30	5.8	0.86	0.064	25.73	3.40	0.75	0.21	0.056	0.25	0.06	0.043	10	60.87	21.87
NN 5	0-15	6.00	0.88	0.07	26.50	6.3	2.2	0.15	0.039	0.62	0.12	0.074	36	72.44	20.66
	15-30	6.12	0.75	0.067	25.60	5.7	1.85	0.14	0.033	0.62	0.12	0.088	37	71.56	21.32
NN 6	0-15	4.63	0.89	0.098	20.83	2.8	1.60	0.20	0.067	0.13	0.01	0.021	11	49.67	34.67
	15-30	4.88	0.80	0.080	20.76	2.55	1.60	0.17	0.055	0.18	0.02	0.018	9	52.56	31.56
OJ 1	0-15	4.5	0.93	0.081	24.20	2.60	0.60	0.139	0.026	5.30	0.07	1.04	0.80	65.22	27.26
	15-30	4.8	0.23	0.020	24.90	1.40	0.80	0.190	0.033	5.34	0.02	0.87	0.69	60.87	21.87
OJ 2	0-15	5.0	0.91	0.074	22.70	2.80	0.40	0.122	0.030	5.36	0.04	0.82	0.84	72.44	20.66
	15-30	4.9	0.65	0.063	3.40	1.60	1.20	0.139	0.015	4.20	0.04	0.54	0.55	71.56	21.32
OJ 3	0-15	5.2	0.87	0.044	3.50	2.40	0.80	0.146	0.026	4.46	0.07	0.76	0.91	49.67	34.67
	15-30	4.6	0.86	0.039	5.60	2.40	0.80	0.133	0.026	3.70	0.03	0.71	0.74	52.56	31.56

OJ 4	0-15	5.3	0.50	0.047	5.20	2.70	0.40	0.131	0.026	5.77	0.08	1.35	0.61	65.22	20.66
	15-30	5.0	0.4.9	0.040	6.50	1.90	1.60	0.131	0.031	5.11	0.03	0.90	0.57	60.87	21.32
OJ 5	0-15	4.6	0.90	0.079	4.40	2.80	0.70	0.127	0.022	4.32	0.05	1.19	0.82	72.44	34.67
	15-30	5.4	0.69	0.062	5.20	1.60	1.50	0.181	0.010	4.15	0.03	0.70	0.77	71.56	31.56
FME Limit		6-9		<1	0.1	100		200	-	1000	-	-			

Hasan Bukar

Test Performed by

Signature of analyst

ANNEX TEN: IMPORTANT CONTACTS

1. Toll free Phone Line - 2 680 8183 034431
2. Anambra State NEWMAP Office Phone Line - 0818 303 4336

Site Committee Members

1. Chieloka Ubajekwe(Chairman) 0803718626
2. Florence Osinuno 07035187662
3. Ifeoma Nnadi 08034492042
4. Anthony Onwuasoanya 08037465350.
5. George Udemba 08037558167
6. Innocent Obodoefuna(provost) 08037947421
7. Fracis Anigbogu 0806445925
8. Nkechi Odobulu 08037372004
9. Jonathan Uzochukwu 08105843441
10. Hallord Obiefuna 08033956084