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

FINAL REPORT

FOR:
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

NDIAGU IKENGA, OGIDI GULLY EROSION SITE
IDEMILI NORTH LGA, ANAMBRA STATE. NIGERIA

February, 2017
FINAL REPORT

FOR

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

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NDIAGU IKENGA, OGIDI GULLY EROSION PROJECT
IDEMILI NORTH LGA, ANAMBRA STATE

Submitted To:
Anambra State NEWMAP
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Awka, Anambra State
Nigeria

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February, 2017
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<tr>
<td>ANS-NEWMAP</td>
<td>Anambra State Nigeria Erosion and Watershed Management Project</td>
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<td>ANSG</td>
<td>Anambra State Government of Nigeria</td>
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<td>AQMP</td>
<td>Air Quality Management Plan</td>
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<td>ARAP</td>
<td>Abbreviated Resettlement Action Plan</td>
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<tr>
<td>BMP</td>
<td>Best Management Practices</td>
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<td>CAI</td>
<td>Community Administrative Institution</td>
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<td>CBO</td>
<td>Community Based Organization</td>
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<td>CDO</td>
<td>Community Development Organization</td>
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<td>CIP</td>
<td>Community Involvement Program</td>
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<td>CMP</td>
<td>Chemical Management Plan</td>
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<td>CRMCI</td>
<td>Community Resource Management and Conservation Initiative</td>
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<td>ERIP</td>
<td>Emergency Response and Incident Plan</td>
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<td>ESIA</td>
<td>Environmental and Social Impact Assessment</td>
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<td>ESMF</td>
<td>Environmental and Social Management Framework</td>
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<td>ESMP</td>
<td>Environmental and Social Management Plan</td>
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<td>ESMMP</td>
<td>Environmental and Social Management and Monitoring Plan</td>
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<td>ESO</td>
<td>Environmental Safeguard Officers</td>
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<td>FBO</td>
<td>Faith-Based Organization</td>
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<td>FGD</td>
<td>Focused Group Discussion</td>
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<td>FGN</td>
<td>Federal Government of Nigeria</td>
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<td>FMEnv</td>
<td>Federal Ministry of Environment</td>
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<td>GEF</td>
<td>Global Environmental Fund</td>
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<td>GIS</td>
<td>Geographic Information System</td>
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<td>GRASS</td>
<td>Gully Rapid Action and Slope Stabilization</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<td>GRM</td>
<td>Grievance Redress Mechanism</td>
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<td>LGA</td>
<td>Local Government Area</td>
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<td>NEWMAP</td>
<td>Nigeria Erosion and Watershed Management Program</td>
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<td>NGO</td>
<td>Non-governmental Organization</td>
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<td>OP</td>
<td>Operational Procedure of the World Bank</td>
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<td>OTG</td>
<td>OTG Enviroengineering Nigeria Limited</td>
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<tr>
<td>PAH</td>
<td>Project-Affected Household</td>
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<td>PAP</td>
<td>Project-Affected Person</td>
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<td>PC</td>
<td>Project Coordinator</td>
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<td>PCC</td>
<td>Project Complaints Committee</td>
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<td>PG</td>
<td>President General</td>
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<td>PPE</td>
<td>Personal Protection Equipment</td>
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<td>PRS</td>
<td>Government’s Poverty Reduction Strategy (PRS)</td>
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<td>RAP</td>
<td>Resettlement Action Plan</td>
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<td>SCCF</td>
<td>Special Climate Change Fund</td>
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<td>SMEC</td>
<td>SMEC International (Pty) Ltd, West African Region</td>
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<td>SMEnv</td>
<td>State Ministry of Environment</td>
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<td>SMLS</td>
<td>State Ministry of Lands and Survey</td>
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<td>SMOW</td>
<td>State Ministry of Works</td>
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<td>SPMU</td>
<td>State Project Management Unit</td>
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<td>ToR</td>
<td>Terms of Reference</td>
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<td>TVMP</td>
<td>Traffic and Vehicle Management Plan</td>
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<td>WB</td>
<td>World Bank</td>
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<td>Waste Management Plan</td>
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EXECUTIVE SUMMARY

Introduction

The Nigeria Erosion and Watershed Management Project (NEWMAP), initiated by the Federal Government of Nigeria (FGN) and funded by the World Bank (WB) and International Development Fund (IDF), is being implemented in Anambra State, Nigeria and other participating states to help reduce soil erosion vulnerability in the States and to develop the States’ watersheds. Ndiagu Ikenga Ogidi is one of the locations in the State acutely being degraded and destroyed by active gully erosion and perennially suffer huge losses resulting from the impacts of the gully erosion. With each passing year, uncontrolled storm water flow threatens lives and properties as the existing gullies become widened and more menacing. The Anambra State NEWMAP is targeting to remedy and rehabilitate the existing gully and reduce the impacts through the NEWMAP opportunity.

The implementation of projects under the NEWMAP is guided by two safeguard documents - the Environmental and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF) prepared for NEWMAP. This Environmental and Social Management Plan (ESMP) has been prepared in support of the proposed Ndiagu Ikenga Ogidi Gully Erosion sub-project in Anambra State. The project traverses through Ndiagu Ikenga village of Ogidi town in Idemili North Local Government Area (LGA) of the State. Consistent with the ESMF, this ESMP specifically identifies, evaluates and documents the set of environmental and social impacts associated with the gully erosion project activities and the mitigation measures necessary to address the adverse impacts identified or reduce the impacts to acceptable levels. The ESMP also provides necessary institutional framework and monitoring actions to be taken before, during and after the remedial construction and development works.

Project Location

Anambra State is located in the Southeast geopolitical zone of Nigeria. Ogidi is located within the co-ordinates: Longitude 6° 9'1"N, Latitude 6°52'1"E and Longitude 6° 150'1"N, Latitude 6° 867'1"E (Degrees, Decimal Minutes) and situated in Idemili North LGA in the central part of the Anambra State.

Project Description

The Ndiagu Ikenga Ogidi gully erosion project consists of remedial structural and non-structural developments that include civil works and vegetative development along the gully corridor. The proposed ground interventions will address, prevent and reverse land degradation for the long-term and will involve rehabilitation and reconstruction of the existing gully corridor. The rehabilitation and reconstruction activities will involve civil works as well as biophysical restoration along the gully corridor and will result in disruptions in the physical environment, habitat, pests and cause inland river siltation as well as involuntary resettlement thereby triggering the relevant World Bank Safeguard Policies.

The key activities for the Civil Construction Works involve:

- River re-alignment through channelization;
- cutting and filling for percentage recovery;
- compaction of soils;
- concrete casting;
- assembling of structures, and,
- Slope stabilization.

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

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

The initial scoping of the sub-projects under NEWMAP, as contained in the Environmental and Social Management Framework (ESMF) indicates that NEWMAP is categorized by the WB as a Category A project whose impacts are sensitive, diverse, unprecedented, felt beyond the immediate project environment and are potentially irreversible over the long term. For Ndiagu Ikenga Ogidi erosion control sub-project, the scale of the construction and development works will involve a significant disturbance of the environmental conditions, with both localized and regional impacts.

The reconstruction of the existing critical infrastructures that serve as inter- and intra-community linkages (rural roads and drainage channels) providing access to the project location will result in social disruptions and in long detours for community members who go to trade/market their goods and children who attend schools in neighboring communities. Large areas of farmlands will also be majorly impacted with many homes and families losing their primary means of livelihoods. It is envisaged that about 8.498 Ha of land will be required for the stabilization of the gully walls with the attendant loss of economic trees/crops and the permanent loss of use of that portion of land. Consequently, this ESMP as a site-specific safeguard instrument is required to provide necessary procedures and criteria that will guide the proposed Ndiagu Ikenga gully erosion control intervention.

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

- Environmental Assessment (OP/BP 4.01)
- Involuntary Resettlement (OP/BP 4.12)
- Natural Habitat (OP/BP 4.04)
- Cultural Physical Property (OP 4.11)

General Project and Area Information

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

The project area lies within the humid tropical rainforest belt of southeastern Nigeria and evidences savannah type vegetation. But pressure on land mainly in form of commerce has largely reduced the vegetation to mixed savanna. The vegetation cover is highly heterogeneous due to intense disturbance arising from human activities. A listing of plant species with frequent or abundant distribution in the various categories are shown in Chapter 3. The cultivated species on farmlands include Dioscorea spp (yam) and Manihot esculenta (cassava). There was indication by the people that other species of interest such as Zea mays (maize), Telfairia occidentalis (ugu), Musa paradisiaca (plantain), Abelmoscus esculenta (okoro), Ipomea batata (potato), and Citrullus vulgaris (melon/egusi) are also cultivated.

Socioeconomic Analysis

Based on the 2006 national population census records and the recommended annual population growth factor, the population of Idemili North LGA and Ogidi town are 528,887 and 86,410, respectively in 2015. Ndiagu Ikenga Ogidi has about equal ratio of male-female population at the household level. There is a seeming low public participation among the women at Ndiagu Ikenga possibly due to their predominant occupation with petty trading activities.
The people of Ndiagu Ikenga Ogidi are of the Igbo ethnic group and generally, speak and write mainly the Ibo and English languages. Clanism and kinship are strong elements and driving forces in control of political and cultural institutions and service points. The villages consist of groups of households whose families are inter-related through marriages. The community however, in recent times, is witnessing an influx of persons from other parts of the state/ country who are settling in the area mainly for trading purposes.

Residents of Ndiagu Ikenga community are predominantly of the Christian faith, mostly Catholics and Anglicans with some traditionalists and a very small Muslim group. Three major types of customary land tenure system exist in the village, viz: – (1) individual land ownership; (2) family land ownership; and. (3) communal land ownership. Individual ownership may be for indigenes or for residents of the community. Family lands (as well as individual lands) are inherited from generational relatives. Communities retain family lands which may never be sold but mostly used for agricultural purposes. About 50% of land is committed to agricultural production of food crops which include mainly maize (Zea mays), cassava (Manihot esculenta), yams (Dioscorea spp), plantain (Musa paradisiacal), vegetables, etc.

About 54% of the households in the project area are below the age of 21 years while about 43% are between the ages of 22 and 60 years. About 3% of the household members are above the age of 60 years. The household size distribution ranges from 1-8 persons with an average household size of 6 persons for the area. About 32% of the households in Ndiagu are married; about 65% are single and about 3% are widowed. The literacy level within Ndiagu Ikenga community is relatively high with 94% of the surveyed population having attained the FSLC level of education and higher. There is a high rate of unemployment (about 27%) in the community. This situation potentially could pose some serious social risk when not properly managed.

Solid wastes pose considerable hazards to human health due to the indiscriminate dumping of household wastes at illegal points or dumpsites adjacent to and along the gully corridor. The continued and uncontrolled waste dumping cause regular obstructions to the storm water drainage systems. The common diseases in project area include diarrhea, malaria, typhoid, pneumonia, cough, skin diseases, deficiency diseases, eye diseases, ear diseases, and waterborne diseases resulting mainly from malnutrition and lack of hygiene. The quality of the health services in the area is generally poor with most residents patronizing quacks and medicine shops for their medical treatment.

Environmental and Social Impacts

There are both positive and negative impacts associated with this project. On the positive side, this project will effectively control the gully erosion and perennial flooding of Ndiagu Ikenga community and improve the flow of traffic in and out of the community. The successful remediation of the gully will reclaim arable land for agriculture and expectedly will greatly appreciate the value of properties within the area as most erosion threatened properties have lost market value. It is also expected that people who have been displaced by the erosion will return back to their settlements. Other positive impacts include reduced costs of transportation and delays on travel time; improved livelihoods for the area residents due to reduced cost of transportation; improved landscape vista; and provision of temporary job opportunities for both skilled and un-skilled labors.

The potential adverse impacts for which appropriate mitigation and monitoring measures have been provided include: Loss of physical assets, Loss of means of livelihood, loss of vegetation, dust generation and air quality, surface and groundwater quality, noise and vibration impacts, earth movements, occupational health and safety and HIV/AIDS and STIs risks, waste generation as well as impacts of road diversion and climate change impacts.
About 8.498 Ac of land will be required as Setback for the stabilization of the gully wall particularly at the deep sections with the attendant loss of land and economic trees/crops.

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

**Impact Mitigation Measures:**

The designed measures to mitigate the identified adverse impacts include: creating of sustained community awareness and sensitivity to the project activities as well as capacity building and training programmes for the various ESMP responsible and implementing agents. Other measures include water dousing and heaped soil covering; regular maintenance of plant and machineries; erection of embankments around fueling and servicing areas; protection of water bodies from deposition of wastes and construction materials; exposure control of workers and the public to noise and vibrations; selective vegetative clearing and quick regeneration of vegetation; erection of road warning signs, imposition of speed limits and road diversions; provision and use of PPE; provision of first aid kits as well as erection of warning signs; sensitization and awareness on transmission and prevention of HIV/AIDS and STIs; segregation and composting of waste and maintaining high hygienic standards.

**ESMP Monitoring Plan:**

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

**Public Participation and Consultations**

The methodology adopted in this ESMP includes a qualitative and quantitative mixed method that offers an effective means to interact widely with the project area general public as well as stakeholder groups. Individual stakeholders and project affected persons (PAPs) were also engaged during the ESMP preparation. A comprehensive questionnaire for socioeconomic data collection was developed and used for this purpose. To ensure that the rights and interests of PAPs are considered seriously local level consultative forums serve as community voices and become part of the entire project process.

One general community meeting and several focused group discussions were held between April 20 and May 15, 2016 at the Ndiagu village square and other locations. Separate meetings were also held with the community leaders. Particularly, the community members welcomed the project and expressed anxiety that remedial work should commence expeditiously to prevent occurrence of further gully and flood damages from the rainfalls. The most frequent comments, concerns, questions and suggestions raised by stakeholders during the project community consultations and meetings are summarized in Table ES-2 below.
Table ES-2: Summary of Frequently Raised Comments, Concerns, Questions at Community Meetings and Consultations

<table>
<thead>
<tr>
<th>Comments/Concerns/Questions Raised</th>
<th>Consultant’s Responses to Issues Raised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residents welcomed the proposed project and are very positive about the measures being taken to address the problems of flooding and erosion which are currently affecting their lives significantly.</td>
<td>The widespread support for the proposed project is appreciated and encouraged to be sustained throughout the project cycle and beyond</td>
</tr>
<tr>
<td>Flooding and erosion have caused damages to the people’s homes and have also caused loss of livestock, personal possessions in the past. Will project compensate those that were affected in these losses?</td>
<td>No. The project will compensate only damages resulting from the implementation of project activities</td>
</tr>
<tr>
<td>Many of the stakeholders reported that there have been numerous collective efforts in the past to effectively manage the gully erosion and flooding but these have failed largely due to a lack of funding resources. Will funds be made available to tackle future floods beyond the current project?</td>
<td>The goal of Ndiagu Ikenga NEWMAP sub-project is to effectively check the gully erosion and perennial flooding of the community living along the corridor. It is envisaged that no future gullying and flooding is envisaged beyond the project</td>
</tr>
<tr>
<td>Many attendees commented that awareness creation was essential for long-term success of the watershed management programme; and that manpower development should be included in the programme.</td>
<td>This view was endorsed by the Consultant.</td>
</tr>
<tr>
<td>The construction activities may result in loss of their properties, lands or damage to their economic trees and crops. In such cases, will there be compensations for such damages?</td>
<td>Yes there will be compensations for property damages or loss of assets as a result of project implementation. The purpose of the ARAP is to methodically identify such properties and assets that may be impacted and establish level of compensations that may be made</td>
</tr>
<tr>
<td>Community safety concerns regarding the next cycle of rainy season were keenly expressed. The community is very apprehensive of the destruction to their agricultural produce when the next rains come. There were also health and safety concerns for the school children during the rainy season.</td>
<td>The concerns here were noted. It is important that the community provide the necessary support to help speed up conclusion of all due diligent aspects of the project. It is hoped that the project will proceed expeditiously enough as to not cause further damages and concerns to the community.</td>
</tr>
<tr>
<td>Will there be compensation for impacts associated with resettlement and for economic losses and physical displacement?</td>
<td>Yes. Any losses resulting from the project implementation will be determined and compensated in accordance with extant policies.</td>
</tr>
<tr>
<td>Will there be compensation for loss of crop lands and pasture?</td>
<td>Yes. Any losses resulting from the project implementation will be compensated.</td>
</tr>
</tbody>
</table>

**ESMP Coordination and Implementation**

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

The key actors in the implementation of this ESMP include:

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

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

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

<table>
<thead>
<tr>
<th>Programme Description</th>
<th>Participants</th>
<th>Form of Training</th>
<th>Duration</th>
<th>Training Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding the Environment:</td>
<td>Officials of SMENV, SMOW, SMLS, SPMU, Contractor, Community Leaders, NGOs, CBOs &amp; Other Relevant Groups</td>
<td>Workshop</td>
<td>One Day</td>
<td>External Agency for capacity building or Environmental &amp; Social Specialist</td>
</tr>
<tr>
<td>• Concepts, Regulations &amp; Statutory Requirements;</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• Environmental Management;</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>• Flood and Erosion Prevention &amp; Control;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stakeholder &amp; Community Participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scope of Ndiagu Ikenga Gully Erosion Intervention Project:</td>
<td>Contractor, Safeguard Officers, Engineers, SMENV &amp; relevant MDAs, Community Leaders, CDOs, &amp; NGOs</td>
<td>Workshop</td>
<td>One Day</td>
<td>External Agency for capacity building or Environmental &amp; Social Specialist</td>
</tr>
<tr>
<td>• Environmental &amp; Social Impacts;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Engineering Design and Associated ESMP;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Coordination with Other MDAs and the Community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Implementation:</td>
<td>SPMU Engineer, Safeguard Officers, Contractors, SMENV</td>
<td>Lecture and Site Visit</td>
<td>One Day</td>
<td>External Agency for capacity building or Environmental &amp; Social Specialist</td>
</tr>
<tr>
<td>• Civil Works with Use of Vegetation in the project;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Roles and Responsibilities of Key Actors;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Environmental Monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring and Evaluation:</td>
<td>Contractor, Safeguard Officers, Engineers, SMENV &amp; relevant MDAs, Community Leaders, CDOs, &amp; NGOs</td>
<td>Workshop</td>
<td>Half Day</td>
<td>Environmental &amp; Social Specialists; External Agency engaged for capacity building</td>
</tr>
<tr>
<td>• ESMP Monitoring and Reporting Strategy;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stakeholder and Community Participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watershed Protection and Management:</td>
<td>Watershed Committee, Community Leaders, LGA Staff, Support Professionals</td>
<td>Workshop</td>
<td>One Day</td>
<td>World Bank/External Agency Engaged for Capacity Building/ Environmental &amp; Social Specialists</td>
</tr>
<tr>
<td>• Alternative income generation programme for stakeholders and skills requirements;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Promotion of Agricultural Methods and Technologies for Improving Farm Production and Erosion Prevention;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Grievance Redress Mechanism

A mechanism through which complaints and disagreements can be smoothly resolved has been devised for this project. As part of the grievance redress mechanism, formation of a project complaints committee (PCC) is recommended to receive and document all public complaints relating to the project. Currently, there is a system of customary avenue that exist in each of the communities to deal with dispute resolution in the community and this will be employed as the “court of first appeal”, where relevant. It is anticipated that this will allow unencumbered platform for people to express their dissatisfaction over any environmental and social (E&S) issues arising from the project. The SPMU has also opened toll free lines and a public complaints/suggestion box for Communities to bring up their complaints. This ensures that Communities can forward their grievances at absolutely no cost. All grievances or complaints must be registered and compiled regularly for project management. The devised mechanisms are fundamental to achieving transparency in the ESMP process.

ESMP Implementation Budget
The budget estimate for the E&S safeguards as determined under this ESMP, including cost for administration, monitoring and evaluation is **N10,972,500.00** (Ten Million Nine Hundred and Seventy Two Thousand, Five Hundred Naira) only. The proposed budget will facilitate the implementation of the various measures, monitoring plan and capacity building of the ESMP and should be made an integral part of financing for the Ndiagu Ikenga Ogidi gully erosion intervention and development project. The specific E&S safeguards obligations for the contractor should be incorporated into the contract specifications along with other contract provisions.

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

1. The magnitude of the flood control problem;
2. The type of technology to be employed;
3. The volume of the project affected households and persons; and,
4. The area of coverage of the proposed project.

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

### Table ES-4: Breakdown of Cost Estimates

<table>
<thead>
<tr>
<th>S/No</th>
<th>ITEM</th>
<th>RESPONSIBILITY</th>
<th>COST BREAKDOWN IN (N)</th>
<th>COST ESTIMATE IN NAIRA (N)</th>
<th>COST ESTIMATE IN (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre-Construction Phase</td>
<td>Construction Phase</td>
<td>Post-Construction Phase</td>
</tr>
<tr>
<td>1</td>
<td>MITIGATION</td>
<td>SPMU/Contractor</td>
<td>To be built into Contractor costs</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>MANAGEMENT</td>
<td>SPMU/ SMENV</td>
<td>1,300,000.00</td>
<td>900,000.00</td>
<td>1,500,000.00</td>
</tr>
<tr>
<td>3</td>
<td>MONITORING</td>
<td>SPMU/ FPMU/ FME/ SMENV/ Environmental Consultants/ Contractor</td>
<td>1,150,000.00</td>
<td>2,550,000.00</td>
<td>1,100,000.00</td>
</tr>
<tr>
<td>4</td>
<td>CAPACITY BUILDING &amp; TRAININGS</td>
<td>SPMU/ MOH/ Consultants/ Contractor</td>
<td>1,500,000.00</td>
<td>450,000.00</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Sub-total</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>CONTINGENCY (5%)</td>
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</tr>
<tr>
<td></td>
<td>GRAND TOTAL</td>
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</tr>
</tbody>
</table>

### Monitoring and Evaluation

In order to achieve success with the ESMP implementation and also maintain the implementation schedule and compliance, monitoring and evaluation of the ESMP implementation will be a continuous process and will include internal and external monitoring. The Anambra NEWMAP Safeguard Officer will play a key role in reporting the progress of implementation as well as compliance to the SPMU, FPMU and the World Bank.

### Review and Disclosure

This ESMP is expected to be subjected to public review and it should be disclosed in-state to the general public for review and comment at designated locations in Anambra State and in World Bank Info Shop.
CHAPTER 1: INTRODUCTION

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

Anambra State is located in the Southeast geopolitical zone of Nigeria. Ogidi is located within the co-ordinates: Latitude 6° 9' N/Longitude 6°52' E and Latitude 6° 15' N/Latitude 6° 867'E and situated in Idemili North LGA in the central part of the Anambra State. Figure 1-1 shows the location of Anambra State within the Southeast of Nigeria. Figure 1-2 shows the location of Idemili LGA in Anambra State.

![Figure 1-1: Map of Nigeria Showing Anambra State](image1)

![Figure 1-2: Map of Anambra State showing Idemili North LGA](image2)

Ogidi town is one of the many towns in Anambra State whose communities are perennially devastated by erosion gullies resulting from storm water flow. The gully erosion hazards of Ndiagu Ikenga Ogidi have caused major loss of properties to residents and remain a serious threat to lives in the community.

With each passing year, uncontrolled storm water flow creates new gullies that threaten lives and properties while existing gullies are deepened and widened. In an effort to reduce the impacts of erosion on the State, the Anambra State Government (ANSG) has proposed to rehabilitate and remedy the Ndiagu Ikenga gully erosion corridor through the NEWMAP opportunity. Urgent intervention is therefore needed at the site to salvage the environment, save lives, property and infrastructure and to restore the people’s confidence in Government.

1.2 Responsible Lead Agencies
The lead Agencies for NEWMAP at the federal and state tiers of government are as follows:

Federal Lead Agency:
Federal NEWMAP  
Federal Project Management Unit (FPMU)  
The Federal Ministry of Environment  
Abuja, Nigeria 

State Lead Agency:  
Anambra State NEWMAP  
State Project Management Unit (SPMU)  
State Ministry of Environment  
Awka, Anambra State  

1.3. Project Rationale:  
Ogidi town is one of the many towns in Anambra State whose communities are perennially  
devastated by erosion gullies resulting from stormwater flow. With each passing year,  
uncontrolled stormwater flow creates new gullies that threaten lives and properties while  
existing gullies are deepened and widened. The gullying and erosion hazards within Ndiagu in  
Ikenga village of Ogidi have caused loss of lives and properties to the residents and, continue to  
pose serious threats to lives and properties in the community. Undocumented reports of loss of  
lives, particularly children running family errands or on their way to school have been reported  
during the yearly rainy periods particularly at the area where improvised metal crossing (bridge)  
has been constructed across the gully (see Figure 1-3). Many community members have also  
lost their ancestral homes, farmlands and properties to the devastating gullies.  

It is highly envisaged that the damaging impacts of the gully will increasingly be more  
devastating with each passing rainy season and as the density of settlements increase in the  
catchment area. There are concerns of losing lives particularly children, to landslides or caving  
gully banks among the residents of the area while economic activities are often disrupted with  
increased cost of movements. It is known that involuntary resettlement can cause loss of  
income, assets, and community ties that, especially among the poor, can be essential for  
survival and well-being. In extreme cases, involuntary resettlement can lead to the dissolution of  
families, impoverishment and health problems. Urgent intervention is therefore needed at the  
site to salvage the environment, save lives, property and government infrastructure and to  
restore the people’s confidence in Government. It is in the effort to reduce the impacts of  
erosion on the Ogidi communities that the Anambra State Government (ANSG) has proposed to  
rehabilitate and remedy one of the existing gullies in Ogidi (Ndiagu Ikenga Gully Erosion Site)  
through the NEWMAP opportunity.  

The ground intervention along the gully corridor at the Ndiagu Ikenga Ogidi project site will  
address, prevent and expectedly reverse land degradation within the project area, and will  
involve construction of civil works and rehabilitation of the existing flood plain. These activities  
trigger the WB Safeguard Policies that include environmental assessment (OP 4.01), Natural  
Habitats (OP 4.04), cultural physical property (OP 4.11), involuntary resettlement (OP 4.12), and  
projects on international waterways (OP 7.50) as specified in the ToR. The ToR has been  
included as Annexure 1.  

1.3.1 Environmental Impacts:  
The proposed intervention at Ndiagu Ikenga gully corridor will redress the impacts of gullying  
and erosion on the residents along the gully corridor and reverse land degradation within the  
catchment area for the long-term. The project consists of remedial structural and non-structural  
developments that include civil works and, gabion protection and vegetative restoration to  
prevent erosion and further land degradation as well as provide aesthetic view along the  
corridor.
1.3.2 Social Impacts:

Ndiagu Ikenga gully corridor runs from the two gully heads located off the Enugu-Onitsha Expressway along Benax and Onwuteaka Roads, respectively through the upper sections of the watershed to the outfall on the lower watershed. The project includes the reconstruction of existing degraded infrastructures (access roads and drainage channels) located in areas through which access is gained to the project corridor. These infrastructures are critical inter- and intra-community linkages and their disruption will result in detours for community members who travel to neighboring communities to trade/market their goods and children who attend schools in neighboring communities. Large areas of farmlands will be majorly impacted with many homes and families losing their primary means of livelihoods.

It is envisaged that about 34400 m$^2$ (3.44 Ha. or 8.498 Ac.) of land will be required for the stabilization of the gully walls with the attendant loss of economic trees/crops and the permanent loss of use of that portion of land. The scale of the proposed erosion control intervention works will therefore involve a significant disturbance of the environmental conditions, with both localized and regional impacts. Consequently, this ESMP as a site-specific safeguard instrument is required to provide necessary procedures and criteria that will guide the proposed gully erosion control intervention in accordance with the World Bank Safeguard Policies and the Nigerian national environmental policies, guidelines and assessment procedures as well as those of Anambra State and the local agencies.

1.4 Project Scope:

Ndiagu Ikenga gully includes a Main Gully (MG) and several finger gullies as shown in Figure 1-3. The major gully heads can be accessed from Binax Road by Building Materials Market and Lawrence Onwuteaka Road. Both Binax Road and Onwuteaka Road are off Enugu-Onitsha Expressway. Based on the engineering design documents, the Ndiagu Ikenga Ogidi gully includes the Main Gully with a total length of 0.7 km and two finger gullies, Finger 1 Gully and Finger 2 gully with total lengths of 0.15 km and 0.60 km, respectively. It should however, be noted that there exists several other minor finger gullies besides the two identified in the engineering design documents as depicted in the digital satellite imagery shown in Figure 1-3.

The proposed project consists of remedial structural and non-structural developments that include civil works and gabion protection to prevent erosion and provide aesthetic view along the gully corridor as well as prevent further degradation of land. The site location plan showing the gully corridor is shown in the satellite imagery, Figure 1-3. The twin box culvert under the Enugu-Onitsha Expressway which significantly contributes to the gully along Onwuteaka Road is shown in Figure 1-4.

The gully head areas of the site are highly populated and residential buildings are situated at some gully edges. This can be seen from the satellite view of the Ndiagu gully area shown in Figure 1-3. According to the engineering designs, stone pitching bank protection is to be implemented without terracing on the steeper slopes of the gully corridor to avoid relocation of existing buildings during implementation and to prevent surface erosion because of its impervious character. Figure 1-4 shows the damaged and eroded discharge end of the twin box culvert under the Enugu-Onitsha Express Highway at Ogidi. Storm water runoff from this culvert has contributed significantly to the formation of the second main gully in the area.

1.5 Purpose of the ESMP:

This Consultancy documents the environmental and social management plan (ESMP) for the Ndiagu Ikenga gully erosion intervention project. The ESMP specifically identifies, evaluates and documents the set of environmental and social impacts of the project and their associated mitigation measures, as well as the monitoring and institutional actions to be taken before, during and after the remedial construction and rehabilitation works. The evaluations have taken
into account the proposed civil engineering designs, vegetative land management measures and other activities aimed at reducing or managing gullying and soil erosion within the watershed. This ESMP Report also addresses the necessity and adequacy of the monitoring and institutional arrangements for the project on a sustainable basis. The report further provides some guides to necessary capacity building and training of stakeholders participating in the mitigation of environmental and social impacts of the project including rehabilitation/resettlement of the project affected persons (PAPs).

Fig. 1-3: Satellite View of Ndiagu Ogidi Gully Area Showing the Gully Corridor
1.6 Description of Proposed Intervention
The interventions along the Ndiagu Ikenga gully corridor will involve construction of civil works and rehabilitation of the catchment area. The principal features of the remedial measures to be undertaken as part of the Ndiagu Ikenga, Ogidi gully erosion intervention as proposed in the remedial engineering design by SMEC (shown in Figure 1-5), include:

1) The construction of concrete and Reno-mattress drainage canals, gully bank protection works, box culvert, chutes and stilling basin structures for the two main gullies. There will also be the upgrading of the access road approach and road side longitudinal and cross-drainage structures for the Finger 2 Gully.

2) Stabilization of the existing components of the Main Gullies using reinforced concrete canals, stone pitching and bio-remediation using Vetiver grass; Stabilization of the Finger 1 Gully with detention basin provided at the head of Finger 1 Gully; and, Stabilization of Finger 2 gully using reinforced concrete canals, stone pitching and bio-remediation using Vetiver grass;

3) Bio-remediation and stone pitching measures will be used to protect the gully bank walls and prevent erosion. This provides important resistance to erosion forces and will be more aesthetic and environmentally friendly than other structures. Terracing is also proposed to reduce bank slopes and provide more stability. About half of the main gully and the entire finger gully corridors shall be stone pitched as a bank protection measure, while Vetiver grass protection shall be deployed for the rest of the reach of the main gully.

Although there are other grasses such as crown grass, lemon grass, etc and economic trees such as rubber plant, bread fruit plant, mango tree, etc, that may be used for bioremediation, Vetiver grass is considered the most suitable due to its unique characteristics that include - wide adaptability, inexpensive, easy to handle, sediment control, low maintenance, and its effectiveness in stabilizing and rehabilitating land, etc. as well as the usefulness in combating erosion.
Civil Construction Works:

- The key activities in putting up the civil works include:
  - cutting and filling for percentage recovery;
  - concrete casting;
  - assembling of structures; and,
  - slope stabilization.

- The foundations of the lattice structures and concrete casting may be dug mechanically. The depth will be consistent with the geotechnical study and the engineering designs;

- Vegetation clearing will be done manually;

- A number of transport vehicles shall be employed in the project but there will be no on-site maintenance of vehicles;

- Powered equipment is expected to be used in the construction (as required) as well as earth moving equipments such as excavators, compactors, bulldozers and pay loaders;

- Skilled and unskilled labour shall be employed in the project.

![Fig. 1-5: Proposed Engineering Design of Remedial Activities](image-url)
1.6.1 Activity Description

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

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

Each phase of the project activities is as described below.

Pre-construction Phase

As part of the pre-construction stage, SMEnv/ANS-NEWMAP commissioned Messrs SMEC International (Pty) Ltd, West African Region to develop the detailed engineering design for the remedial intervention and development of the Ndiagu Ikenga gully corridor. The preparation of this ESMP and a separate Abbreviated Resettlement Action Plan (ARAP) forms part of the pre-construction phase. The commencement of the remedial construction activities is expected to begin after the completion of the ESMP and ARAP process.

Construction Phase

The construction of the gully erosion control infrastructure and the site development activities, as designed, will require the use of existing access roadways to reach sections of the project location. The two access roadways are the Binax Road (Access Road No.1) and the Onwuteaka Road (Access Road No.2), the second of which have been severely degraded. Civil works associated with the degraded access roadways include re-grading and rehabilitation of the roads and associated drainages, and creation of hard standing areas. The need for the rehabilitation of the access roads is heightened by the level of destruction that will arise from movement of heavy duty vehicles and equipment for project construction activities.

The preparation of the construction staging areas will require some localized vegetation clearance along the gully corridor and the removal of incipient solid waste materials. Materials arising from the excavation for the gully corridor, foundations, stabilization walls (soil, rock etc.) and installation of gabions would be used to fill appropriate areas. The foundations will be infilled with cement supplied via ready-mix-cement trucks or alternatively mixed on site. Vegetation clearing may be done manually or mechanically. A number of transport vehicles will be employed in the project but there will be no on-site maintenance of vehicles. The power equipment is expected to be used in the construction including power saws and compressor to break hard ground (if required). Earth moving equipments such as excavators, compactors, bulldozers and pay loaders will also be used at the site. Additionally, skilled and unskilled labor will be employed during the project implementation.

Post-Construction (Operations & Maintenance) Phase

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

1.6.2 Analysis of Alternatives

Usually there are several alternatives to any project. The selection of a particular alternative is premised on several considerations, including the desirability/acceptability of the project, the government’s position or inclinations to the project, the potential environmental and social impacts of the project, the economic viability of the project, etc. For the proposed Ndiagu Ikenga gully erosion project, a number of alternatives were considered and these include: delayed
project alternative; a do-nothing alternative; and the planned project alternative. A summary of these alternatives is presented below:

**Delayed Project Alternative**

This option means that the project will not be implemented at this time; rather, a delay will be in effect until such a time when certain conditions are met or requirements fulfilled. This kind of option is usually adopted when there are regulatory requirements that need to be met, when the political and economic climate is inclement for project implementation or in a period of war. Presently, the country is not at war. Furthermore, the government of Nigeria is vigorously encouraging and courting foreign direct investment and socio-economic development. The planned project can attract foreign investment, in addition to all the added values indicated earlier. Therefore, delaying the project will in turn delay the realization of the positive benefits expected from the project. In addition, given the very high level of inflation in Nigeria’s economy, a delay of one year could potentially cause up to a 25% increase in project costs. Therefore the option of delaying the project is not considered a viable option.

**The Do-Nothing (No-Project) Alternative**

This alternative assumes that the entire project concept will be cancelled and scrapped. There will be no improvement or changes in the present state of Ndiagu Ikenga gully erosion as well as the access roads to and from the community. This is an inferior alternative when compared to the option of going ahead with the project. Although if this option is taken, it would mean that the negative environmental and social impacts of the project would be completely avoided; however, not implementing the project will also lead to:

(i) Lives (particularly of school children) will continue to be lost with each rainy season;
(ii) Continued lack of rural access and mobility and increased pains in movement within Ndiagu Ikenga community;
(iii) Continued lack of economic empowerment, development and transformation in Ndiagu Ikenga community.
(iv) Failure to generate employment opportunities as anticipated;

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

**The Ndiagu Ikenga Ogidi Gully Erosion Project (Proposed Project) Alternative**

The Ndiagu Ikenga gully erosion intervention project Alternative requires the rehabilitation of the existing gully corridor and improving (upgrading, rehabilitation and maintenance) of the existing access roads and drainage channels to an acceptable safety and environment standard. The advantages associated with this alternative far outweigh the disadvantages. Although initial costs would be high; the accrued economic and cultural benefits far outweigh the no-project alternative. The objective of the project is to eliminate gully erosion in the project area including the agricultural lands of the affected Ikenga village and also boost agricultural production through the provision of access roads for easy transportation of products. Moreover, post-harvest losses will be reduced and thus creating more benefits to the farmers in particular and Anambra State in general.

This alternative involves a lot of construction work, along with the associated positive and negative impacts. The essence of a project of this nature is to ensure that activities are undertaken in a way that minimizes the negative impacts of the project while enhancing the positive impacts. To this end, there is a need to ensure any activity that can result in negative
impacts on the environment (biophysical and socio-economic) are identified and mitigating measures planned for each negative impact. A detailed description of the identified impacts and the mitigating measures for the proposed project is presented in Chapters 5 and 6 of this report.
CHAPTER 2: LEGAL AND INSTITUTIONAL FRAMEWORK

This ESMP is guided by the requirements of the relevant and applicable state, national and international regulation, guidelines, conventions, industrial best management practices including the World Bank safeguard policies that are triggered by the project. The relevant legal and institutional framework applicable to NEWMAP has been fully discussed in the ESMF. These legal requirements and regulations are summarized below:

2.1 Applicable Nigerian Legal and Institutional Framework

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

The applicable environmental laws include the Environmental Impact Assessment Act No. 86 of 1992; the National Guidelines and Standards for Environmental Pollution Control in Nigeria (March 1991); the National Environmental Standards and Regulations Enforcement Agency (establishment) Act 2007 (NESREA), the Land Use Act 1978 (modified in 1990); the Forestry Act 1958; and the National Agricultural Policy 1988.

2.1.1 National Policy on Environment

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

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

2.1.2 National Environmental Impact Assessment Act 1992:

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

2.1.3 Nigerian Land Use Matters

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

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

2.1.4 National Erosion and Flood Control Policy 2005:
The general soil erosion & flood control guidelines provide necessary instructions for soil and water resources users to develop, implement and monitor plans that are to assure erosion and flood hazard mitigation. The maintenance of levees and other protective structures are also to be developed at areas with potential impacts. In addition to this, all requests for project plan approvals must include soil type and drainage pattern/structures in and around project area and the likely impact of the project on these duly certified.

2.1.5 NESREA Establishment Act, 2007.
The National Environmental Standards and Regulations Enforcement Agency (NESREA) has responsibility for the enforcement of the environment regulations and biodiversity conservation, including coordination and liaison with relevant stakeholders within and outside Nigeria on matters of enforcement of environmental standards, regulations, rules, laws, policies and guidelines.

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

2.1.7 Waste Management Regulations of 1991
This regulation mandates the collection, treatment, and disposal of solid and hazardous waste from municipal and industrial sources.

2.1.8 Approved National Forestry Policy 2006
The extant national forest policy which is included within the document “Agricultural Policy for Nigeria” published by the Federal Ministry of Agriculture in 1988 recognized forestry as the management and utilization of forests as renewable natural resources. The policy overall objective is to achieve sustainable forest management that would ensure sustainable increases in the economic, social and environmental benefits from forests and trees for the present and future generation including the poor and the vulnerable groups.

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

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

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

### 2.2 World Bank Environmental and Social Safeguard Policies

The ISDS identifies the World Bank safeguard policies applicable to NEWMAP to include: OP 4.01 Environmental Assessment; OP 4.04 Natural Habitats; OP 4.11 Cultural Physical Resources; OP 4.12 Involuntary Resettlements. These World Bank safeguard policies are summarized as follows:

#### 2.2.1. Environmental Assessment (EA) (OP 4.01):

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

#### 2.2.2. Natural Habitats (OP 4.04):

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

#### 2.2.3 Physical Cultural Resources (OP 4.11):

The Bank seeks to assist countries to manage their physical cultural resources (PCR) and avoid or mitigate adverse impact of development projects on these resources. PCR are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. This policy is triggered for any project that requires an EA.

#### 2.2.4 Involuntary Resettlement (OP 4.12):

Key objectives of the World Bank’s policy on involuntary land acquisition are to avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; assist displaced persons in improving their former living standards, income earning capacity and production level, or at least in restoring them; encourage community participation in planning and implementing resettlement; and provide assistance to affected people regardless of the legality of land tenure. The policy covers not only physical relocation, but any loss of land or other assets resulting in relocation, or loss of shelter; loss of assets or access to assets; loss of income sources or means of livelihood whether or not the affected people must move to another location. When the policy is triggered, a Resettlement Action Plan (RAP), must be prepared. An abbreviated plan may be developed when less than 200 people are affected by the project. In situations, where all the precise impacts cannot be assessed during project preparation, provisions are made for preparing a Resettlement Policy Framework (RPF). The RAP/RPF must
ensure that all Bank’s policy provisions detailed in OP 4.12 are addressed particularly the payment of compensation for affected assets at their replacement cost.

2.3 International Protocols, Agreements, Conventions and Administrative Instruments

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

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

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

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

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

2.3.3 Agenda 21 - UN Conference on Environment and Development

At the United Nations Conference on Environment (also the Earth Summit) – held in Rio de Janeiro (1992), with recommendations from the WHO Commission, more than 150 member states adopted Agenda 21 - an action plan to guide future strategies for health and environment activities on a national and international level. This fact provided the background for FEPA’s EIA framework to ensure environmental sustainability of all types of activities in the oil and gas industry (FEPA, 1995).

2.3.4 Public Health Legislations and regulations

Several countries have legislation and regulations that stipulate the administrative and policy framework for conducting health impact assessment for a development project, whether as part of an EIA or a standalone study. In addition, a number of international agencies have endorsed this process, such as the World Banks, Asian Development Commission, and the World Health Organizations. In Nigeria, the Public Health Law (L.N47 of 1955, Cap 103) provides justification for the execution of developmental projects under guidelines that promote health by protecting the environment and safeguarding the health of humans.

2.3.5 WHO Health and Safety Component of EIA, 1987

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

i. One of the fundamental considerations in the approval of projects, policies and plans should be the health of communities affected by them; greater consideration should be given to the consequence of development policies/programs for human health;

ii. Environmental Impact Assessment should provide the best available factual information on the consequence for health of projects, policies and plan; and

iii. Information on health impact should be available to the public.
2.3.6 Convention on Conservation of Migratory Species of Wild Animals, Bonn, 1979

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

2.3.7 United Nations Guiding Principle on the Human Environmental

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

2.3.8 The Rio Declaration on Environmental and Development

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

Other relevant international conventions include:

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

2.4 Gaps between Nigerian Legislation and World Bank Policies

Nigeria currently has a comprehensive framework for assessing and managing the environmental impacts of development projects. However, in comparison with the World Bank Safeguard Policies, it would appear that the Nigeria framework lacks the provision of clear requirements or guidance in the following areas:

- Bylaws and Regulations in the defunct FEPA, now FMENV
- Land Use act of 1978
- Standards applying to Wildlife protection and Biodiversity conservation

Nearly all agencies collecting and managing natural resources and environmental information in Nigeria are institutionally weak and suffer from lack of human and financial resources. Units established with donor support flourish during the life of the project, but experience slow death following project completion. Aside from these inadequacies, the Nigeria requirements are generally consistent with those of the World Bank. There is no real contradiction between Nigerian legislation and Bank policies regarding public consultation and disclosure.

While the responsibility for assessing and mitigating environmental impacts lies with developers in Nigeria, the monitoring falls under the Federal (represented by NESREA) and state ministries of environment. These Agencies however lack the logistic capability to carry out the tasks assigned to it by the law.

The Nigerian laws do not require that an EIA include an assessment of the impact of an activity on public health. However, Nigeria through the Federal ministries of Health and Environment, is signatory to a number of international charters and legislations that require public health to be fully integrated with the EIA processes for all activities requiring Environmental Impact Assessment.
2.5 Triggered WB Safeguard Policies

Table 2.1 (Triggered Safeguard Policies) shows the World Bank Safeguard Policies determined to be triggered by NEWMAP. However, based on the scope of the construction and rehabilitation works required in the Ndiagu Ikenga gully erosion control, and considering the specific intervention activities proposed, the triggered Safeguard Policies for the sub-project include: Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Cultural Property (OP 4.11), and Involuntary Resettlement (OP/BP 4.12) as shown in the Table 2.1.
Table 2.1: Triggered Safeguard Policies

<table>
<thead>
<tr>
<th>WB Safeguard Policy</th>
<th>Triggered by NEWMAP?</th>
<th>Triggered by Ndiagu Ikenga Gully Project?</th>
<th>Applicable To Project Due To</th>
<th>How Project Addresses Policy Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Environmental Assessment (OP/BP4.01)</td>
<td>[x]</td>
<td>[]</td>
<td>[x]</td>
<td>[]</td>
</tr>
<tr>
<td>Natural Habitats (OP/BP4.04)</td>
<td>[x]</td>
<td>[]</td>
<td>[x]</td>
<td>[]</td>
</tr>
<tr>
<td>Pest Management (OP 4.09)</td>
<td>[x]</td>
<td>[]</td>
<td>[]</td>
<td>[x]</td>
</tr>
<tr>
<td>Physical Cultural Resources (OP/BP 4.11)</td>
<td>[x]</td>
<td>[]</td>
<td>[x]</td>
<td>[]</td>
</tr>
<tr>
<td>Involuntary Resettlement (OP/BP4.12)</td>
<td>[x]</td>
<td>[]</td>
<td>[x]</td>
<td>[]</td>
</tr>
<tr>
<td>Indigenous Peoples (OP/BP4.10)</td>
<td>[]</td>
<td>[]</td>
<td>[x]</td>
<td>[x]</td>
</tr>
<tr>
<td>Forests (OP/BP4.36)</td>
<td>[x]</td>
<td>[]</td>
<td>[]</td>
<td>[x]</td>
</tr>
<tr>
<td>Safety of Dams (OP/BP4.37)</td>
<td>[x]</td>
<td>[]</td>
<td>[]</td>
<td>[x]</td>
</tr>
<tr>
<td>Projects in Disputed Areas (OP/BP7.60)*</td>
<td>[]</td>
<td>[x]</td>
<td>[]</td>
<td>[x]</td>
</tr>
<tr>
<td>Projects on International Waterways (OP/BP7.50)</td>
<td>[x]</td>
<td>[]</td>
<td>[]</td>
<td>[x]</td>
</tr>
</tbody>
</table>

NA* = Not Applicable
CHAPTER 3: BIOPHYSICAL ENVIRONMENT

3.1 Introduction

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

3.2 Climate

The project area is situated within the sub-equatorial south climatic region characterized by uniformly high temperatures and a seasonal distribution of precipitation and high relative humidity. Figure 3.1 shows the plot of average monthly temperature and rainfall distribution through the year. The climate is of humid tropical climatic condition. Harmattan is felt between December & January. The average annual temperatures range from a minimum of about 24°C to a maximum of about 33°C.

The area experiences distinct wet and dry seasons (eight months of rainfall and four months of dryness) in the year. The rainy season begins in March and ends in October while the dry season runs through the months of November to February of each year as shown in Figure 3.1.

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

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

The project area forms a part of the Anambra sedimentary basin of the southeastern Nigeria. The Anambra basin covers about 40,000sq.km. The southern boundary coincides with the deltaic swamps of the Niger Delta basin and extends northwards beyond the Bende-Ameki formation. The basin is said to have originated contemporaneously with the folding and uplift of the Abakaliki – Benue area during the santonian stage. The Anambra basin constitutes a major depocenter of clastic sediments and deltaic sequences and resulting from the second tectonic activities of the lower Benue Trough. Figure 3-2 shows the geologic map of the southern Anambra basin.

3.4 Soil Conditions

The soils of Anambra State particularly have groundwater reservoirs that severely contribute to ecological problems in the region. Ogidi soils are typified by the coastal plain sands characteristics and are highly susceptible to erosion. Beneath the weak lateritic and acidic soils are unstable and poorly consolidated geologic rocks and material. The sandy members of these geologic units contain huge groundwater reservoirs in aquifers with attendant pore water pressures that become threatening when overlying structures carry uncompromising loads. The lateritic and sandy soils are easily eroded by storm water runoffs. The lithostratigraphic units of the Anambra Basin are shown in Table 3-1.

Table 3-1: Lithostratigraphic section of the Anambra Basin

<table>
<thead>
<tr>
<th>AGE</th>
<th>LITHOSTRATIGRAPHIC UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TERTIARY</td>
<td></td>
</tr>
<tr>
<td>EOCENE</td>
<td>AMEKI FORMATION / NANKA SAND</td>
</tr>
<tr>
<td>PALEOCENE</td>
<td>IMO SHALE</td>
</tr>
<tr>
<td>CRETACEOUS</td>
<td></td>
</tr>
<tr>
<td>DANIAN</td>
<td>NSSUKA FORMATION</td>
</tr>
<tr>
<td>MAESTRICHIAN</td>
<td>AJALI SANDSTONE</td>
</tr>
<tr>
<td>CAMPANIAN</td>
<td>ENUGU / NKPORO SHALE</td>
</tr>
</tbody>
</table>

Source: Agagu et al., 1985
3.5 Biodiversity

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

3.5.1 Vegetation

The project area lies within the humid tropical rainforest belt of southeastern Nigeria and evidences savannah type vegetation. But pressure on land in form of agriculture and commerce has largely reduced the vegetation to mixed savanna. Along stream courses and in few preserved areas, some rain forest trees such as Iroko (milicia excels), soft wood, domesticated species like oranges (citrus sinensis), mangoes (mangifera indica) etc. exist. Palm trees (elaeis guinensis) and coconut trees (cocos nucifera) are quite common in residential areas for their economic value. However, the predominant vegetation here is mixed savanna.

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

The project area lies within the humid tropical rainforest belt of southeastern Nigeria and evidences savannah type vegetation. The vegetative cover presents typical features of the derived savannah ecosystem and shows signs of intense disturbance due to human anthropogenic factors. Sampling of flora and fauna in the project area was conducted using the quadrat method. Known species and others species of interest were identified and classified using standard taxonomic procedures. A listing of plant species with frequent or abundant distribution identified in the various categories are shown in Table 3.2. The complete listing of plant species and their distribution found in the vegetation covers are given in Annexure I.

Table 3-2: Listing of Frequent Plant Species in the Project Areas

<table>
<thead>
<tr>
<th>S/No</th>
<th>Species</th>
<th>Family</th>
<th>Life Form</th>
<th>Local/ Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Mimosa pigra</em></td>
<td>Fabaceae</td>
<td>Herb</td>
<td>Touch and die</td>
</tr>
<tr>
<td>2</td>
<td><em>Sidastipulate</em></td>
<td>Malvaceae</td>
<td>Herb</td>
<td>Eshioku</td>
</tr>
<tr>
<td>3</td>
<td><em>Centrosomaspp</em></td>
<td>Fabaceae</td>
<td>Herb</td>
<td>EfiaObubu/butterfly pea</td>
</tr>
<tr>
<td>4</td>
<td><em>Napoleonavogelii</em></td>
<td>Lecythidaceae</td>
<td>Shrub</td>
<td>NnekeleOchenwayi/Nkpoda</td>
</tr>
<tr>
<td>5</td>
<td><em>Newbouldialaevis</em></td>
<td>Bignonaceae</td>
<td>Tree</td>
<td>Ogirisi/ boundary tree</td>
</tr>
<tr>
<td>6</td>
<td><em>Gmelinaarborea</em></td>
<td>Verbenaceae</td>
<td>Tree</td>
<td>Gmelina</td>
</tr>
<tr>
<td>7</td>
<td><em>Eleaiseguinesis</em></td>
<td>Palmae</td>
<td>Tree</td>
<td>Oil palm</td>
</tr>
<tr>
<td>S/No</td>
<td>Species</td>
<td>Family</td>
<td>Life Form</td>
<td>Local/ Common Name</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------</td>
<td>-------------</td>
<td>-----------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>8</td>
<td><em>Pentaclethramacrophylla</em></td>
<td>Fabaceae</td>
<td>Tree</td>
<td>Oil bean</td>
</tr>
<tr>
<td>9</td>
<td><em>Ipomeaeriodocarpa</em></td>
<td>Convolvulaceae</td>
<td>Herb</td>
<td>Morning glory</td>
</tr>
<tr>
<td>10</td>
<td><em>Anthooleistadajalonensis</em></td>
<td>Loganiaceae</td>
<td>Tree</td>
<td>Forest fever/okpokolo</td>
</tr>
<tr>
<td>11</td>
<td><em>Dracaena mannii</em></td>
<td>Agavaceae</td>
<td>Shrub</td>
<td>Dragon tree</td>
</tr>
<tr>
<td>12</td>
<td><em>Combretumspp</em></td>
<td>Combretaceae</td>
<td>Shrub</td>
<td>Ikedike</td>
</tr>
<tr>
<td>13</td>
<td><em>Bambusavulgris</em></td>
<td>Palmae</td>
<td>Shrub</td>
<td>Bamboo</td>
</tr>
<tr>
<td>14</td>
<td><em>Aspiliabussei</em></td>
<td>Asteraceae</td>
<td>Herb</td>
<td>Hemorrhage plant</td>
</tr>
<tr>
<td>15</td>
<td><em>Euphorbia hyssopifolia</em></td>
<td>Euphorbiaceae</td>
<td>Herb</td>
<td>Asthma weed</td>
</tr>
<tr>
<td>16</td>
<td><em>Mimosa pudica</em></td>
<td>Fabaceae</td>
<td>Herb</td>
<td>Uke/ touch and die</td>
</tr>
<tr>
<td>17</td>
<td><em>Urenalobata</em></td>
<td>Malvaceae</td>
<td>Herb</td>
<td>Caesarweed/odoazezo</td>
</tr>
<tr>
<td>18</td>
<td><em>Chromoleanaodorata</em></td>
<td>Asteraceae</td>
<td>Shrub</td>
<td>Awolowo/ siam weed</td>
</tr>
<tr>
<td>19</td>
<td><em>Maytenus senegallensis</em></td>
<td>Celastraceae</td>
<td>Tree</td>
<td>Spike thorn</td>
</tr>
<tr>
<td>20</td>
<td><em>Imperatacylinderica</em></td>
<td>Poaceae</td>
<td>Herb</td>
<td>Ekperima/ spear grass</td>
</tr>
<tr>
<td>21</td>
<td><em>Vitex doniana</em></td>
<td>Verbanaceae</td>
<td>Tree</td>
<td>Black plum</td>
</tr>
<tr>
<td>22</td>
<td><em>Cassia obtusifolia</em></td>
<td>Fabaceae</td>
<td>Herb</td>
<td>Sickle pod</td>
</tr>
<tr>
<td>23</td>
<td><em>Amaranthus spinosus</em></td>
<td>Amaranthaceae</td>
<td>Herb</td>
<td>Prickly green/ ininendimuo</td>
</tr>
<tr>
<td>24</td>
<td><em>Acacia ataxacantha</em></td>
<td>Fabaceae</td>
<td>Herb</td>
<td>Flame thorn</td>
</tr>
<tr>
<td>25</td>
<td><em>Spigeliaanthelmsia</em></td>
<td>Loganiaceae</td>
<td>Herb</td>
<td>Worm grass</td>
</tr>
<tr>
<td>26</td>
<td><em>Cyperusesculentus</em></td>
<td>Cyperaceae</td>
<td>Herb</td>
<td>Tiger nutsedge</td>
</tr>
<tr>
<td>27</td>
<td><em>Leucaena leucocephalus</em></td>
<td>Fabaceae</td>
<td>Tree</td>
<td>River tamarind</td>
</tr>
<tr>
<td>28</td>
<td><em>Cassia tora</em></td>
<td>Fabaceae</td>
<td>Tree</td>
<td>Sickle senna</td>
</tr>
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<td>S/No</td>
<td>Species</td>
<td>Family</td>
<td>Life Form</td>
<td>Local/ Common Name</td>
</tr>
<tr>
<td>------</td>
<td>------------------------</td>
<td>-------------</td>
<td>-----------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>29</td>
<td><em>Corchorus olitorius</em></td>
<td>Tiliaceae</td>
<td>Herb</td>
<td>Ewedu/ulogburu</td>
</tr>
<tr>
<td>30</td>
<td><em>Ricinus communis</em></td>
<td>Euphorbiaceae</td>
<td>Tree</td>
<td>Castor oil tree</td>
</tr>
<tr>
<td>31</td>
<td><em>Ocimum gratissimma</em></td>
<td>Lamiaceae</td>
<td>Herb</td>
<td>Scent leaf/ nchianwu</td>
</tr>
<tr>
<td>32</td>
<td><em>Thevetia euphoria</em></td>
<td>Euphorbiaceae</td>
<td>Shrub</td>
<td>Africana lily</td>
</tr>
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<td>33</td>
<td><em>Milicia excels</em></td>
<td>Moraceae</td>
<td>Tree</td>
<td>Iroko/mulberry</td>
</tr>
<tr>
<td>34</td>
<td><em>Elaeis quineensis</em></td>
<td>Palmae</td>
<td>Tree</td>
<td>Oil palm</td>
</tr>
<tr>
<td>35</td>
<td><em>Artocarpus communis</em></td>
<td>Moraceae</td>
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<td>Ukwaoyibo</td>
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<tr>
<td>36</td>
<td><em>Lonchocarpus sericeus</em></td>
<td>Fabaceae</td>
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<tr>
<td>37</td>
<td><em>Tabernaemontana pachysiphon</em></td>
<td>Apocynaceae</td>
<td>Tree</td>
<td>Nil</td>
</tr>
<tr>
<td>38</td>
<td><em>Assysteciavogaliana</em></td>
<td>Asteraceae</td>
<td>Tree</td>
<td>Nil</td>
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<tr>
<td>39</td>
<td><em>Elusine indica</em></td>
<td>Poaceae</td>
<td>Herb</td>
<td>Goose grass</td>
</tr>
<tr>
<td>40</td>
<td><em>Bryophyllum pinnatum</em></td>
<td>Fabaceae</td>
<td>Herb</td>
<td>Air plant/Odaapuo</td>
</tr>
</tbody>
</table>

Source: Field Survey; April, 2016

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

### 3.5.2 Animal Inventory of the Watershed

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

**Wild Animals:** As a result of habitat loss due to urbanization and the flooding menace, burrowing animals have seemingly disappeared. None of existing reported animals are listed on the International Union for the Conservation of Nature (IUCN) endangered red list.
3.6 Slope Instability and Subsidence

The stability or instability of a slope is greatly dependent upon factors such as gradient, available water content, existing vegetation, and stresses (natural and anthropomorphic) affecting the slope. For example, a denuded, saturated slope could be further destabilized and fail if it was to be stressed by considerable earth moving activities. The terrain of the project area is relatively of undulating surfaces.

Land subsidence is the loss of surface elevation due to removal of subsurface support. Subsidence has many causes, including seismically induced stresses and the extraction of mineral or liquid and gas deposits. Although mineral and gas can and do cause subsidence, it is more common for subsidence to occur as a result of groundwater extraction in excess of groundwater recharge. There are no known studies on subsidence in the project area or surrounding region. However, subsidence in the region as a whole may be limited because the various geologic and hydrologic conditions associated with subsidence are not known to occur in the area.

3.6 Natural Drainage Corridors

3.6.1 Watershed Drainage Network

Survey maps that included Satellite Imagery and Topographic profiles were used to guide interpretations of storm water flows throughout the project area. The watershed drainage features were identified through interpretation of 5-meter contour intervals topographic map. Drainage features within the scope of this investigation included any topographic feature that could potentially concentrate surface runoff, including convergent topography, swales and existing channels. The Ndiagu Ikenga Ogidi watershed is drained by the Nkisi River together with its main tributary, the Ododor River and their numerous smaller tributaries. Figure 3-3 is the digital elevation model of the study area showing the drainage systems in the area.

3.6.2 Main Agents of Site Gully Erosion

Based on field observations of Ndiagu Ikenga Ogidi landscape, soil erosion at the project site, and indeed all areas of Ikenga village, is a result of gravity-driven surface water flow enhanced by the topography of the area. Furthermore, development in the area is not in tandem with the natural stormwater flow routes within the catchment and sub-catchment areas thereby creating flow blockades. The major cause of the erosion problem at Ndiagu Ikenga Ogidi is the abrupt termination of drainage channels built as part of the construction of the Enugu – Onitsha express road that traverses the community as shown in Figures 3-4a and 3-4b.
Fig. 3-4a: Abruptly Terminated Drainage Channels Associated with Enugu-Onitsha Express at Ndiagu

Fig. 3-4b: Abruptly Terminated Drainage Channels within Ndiagu Ikenga Ogidi

Fig. 3-5: Indiscriminate Discharge of Untreated Effluent from a Paper Production Factory at Oyi. Effluent Flows into Silted up Odordor River Destroying the Aquatic Ecology
The Odordor River empties into the Nkisi River. This means that the untreated effluents from the paper production factory have a wider impact area beyond the local (Figure 3-5). It is also noted that previous intervention has been carried out to control or abate the erosion scourge at this site. These interventions by Government obviously have not been successful or effective. This may be a direct consequence of abrupt termination of the drainage channels.

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

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

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

3.10 Baseline Environmental Setting

3.10.1 Soil Conditions
The project area is situated within a depressed topographic layout bordered by two major roadways (Enugu-Onitsha Express Roadway and Banex Roadway) that are at higher elevations than the general area and also bordered by a hilly plane on the southeast end. The area is drained by the drainage channels along the two major roadways. The major drainage channel along Banex Roadway conveys stormwater from the higher planes of the region including the Enugu-Onitsha Expressway to the lower planes and currently terminating at the collapsed portion of the drainage channel adjacent to the south-end gully head. A secondary drain channel runs from a nearby Paper Mill Facility and merges with the Banex Roadway drainage close to the gully head.

The second major drainage channel runs from the twin box culvert under the Enugu-Onitsha Expressway to the lowlands but currently collapsed at the outlet of the twin box outlet and other vital points giving rise to the several gully fingers in the area. The general area of the project site showing the major drainage channels is as depicted in Figure 3.6.

Representative soil samples for laboratory analysis were collected near the collapsed sections of the two major drainages. The soil sampling locations are shown in Figure 3.6. Each near surface soil sample (0 - 6 inches depth) was collected using the Dutch hand auger and put in a properly labeled self-sealing plastic bag for shipment to the FMEnv-certified MGG Resources laboratory at Nsukka for chemical analysis.

The laboratory analytical results of the soil samples are shown in the Tables 3-3 and 3.4 below.
<table>
<thead>
<tr>
<th>S/N</th>
<th>Parameters</th>
<th>Units</th>
<th>Sample Results</th>
<th>FMENV/NESREA</th>
<th>METHOD</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>pH (KCl)</td>
<td></td>
<td>7.4</td>
<td>pH meter</td>
<td>Satisfactory</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>pH (10% solution @ 25°C)</td>
<td></td>
<td>7.7</td>
<td>6.5-9</td>
<td>pH meter</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>3</td>
<td>Nitrate</td>
<td>mg/l</td>
<td>-</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>4</td>
<td>Moisture</td>
<td>%</td>
<td>16.360</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>5</td>
<td>Electrical conductivity</td>
<td>-</td>
<td>-</td>
<td>Conductivity meter</td>
<td>Satisfactory</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Soil Colour</td>
<td>-</td>
<td>Redish</td>
<td>-</td>
<td>Visual Inspection</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>7</td>
<td>Potassium (K⁺)</td>
<td>Meq/100g</td>
<td>0.947</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>8</td>
<td>Magnesium(Mg²⁺)</td>
<td>Meq/100g</td>
<td>0.053</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>9</td>
<td>Calcium (Ca²⁺)</td>
<td>Meq/100g</td>
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<td>-</td>
<td>ATM</td>
<td>Satisfactory</td>
</tr>
<tr>
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<td>ATM</td>
<td>Satisfactory</td>
</tr>
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<td>11</td>
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<td>5</td>
<td>ATM</td>
<td>Unsatisfactory</td>
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<tr>
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<td>%</td>
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<td>-</td>
<td>ATM</td>
<td>Satisfactory</td>
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<tr>
<td>13</td>
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<td>%</td>
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<td>-</td>
<td>ATM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>14</td>
<td>Organic Carbon</td>
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<td>-</td>
<td>ATM</td>
<td>Satisfactory</td>
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<td>mg/l</td>
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<td>0.03</td>
<td>ATM</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>16</td>
<td>Lead ( Pb²⁺)</td>
<td>mg/l</td>
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<td>164</td>
<td>ATM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>17</td>
<td>Copper (Cu²⁺)</td>
<td>mg/l</td>
<td>0.645</td>
<td>100</td>
<td>ATM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>18</td>
<td>Zinc(Zn²⁺)</td>
<td>mg/l</td>
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<td>ATM</td>
<td>Satisfactory</td>
</tr>
<tr>
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<td>%</td>
<td>62.00</td>
<td></td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>20</td>
<td>(Coarse Sand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Grain Size Distribution (Clay)</td>
<td>%</td>
<td>9.00</td>
<td></td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>22</td>
<td>Grain Size Distribution (Silt)</td>
<td>%</td>
<td>3.00</td>
<td></td>
<td>ATM</td>
<td>Satisfactory</td>
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<td>23</td>
<td>Grain Size Distribution (Fine</td>
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<td></td>
<td>ATM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>Sand)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Textural Class</td>
<td></td>
<td>Loamy sand</td>
<td></td>
<td>Visual Inspection</td>
<td>Satisfactory</td>
</tr>
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</table>
Table 3-4: Analytical Result of Soil Sample Collected from Twin Box Culvert Area (Location SS-2)

<table>
<thead>
<tr>
<th>S/N</th>
<th>Parameters</th>
<th>Units</th>
<th>Sample Results</th>
<th>FMENV/NESREA</th>
<th>METHOD</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>pH meter</td>
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<td>Satisfactory</td>
</tr>
<tr>
<td>2</td>
<td>pH (10% solution @ 25°C)</td>
<td>-</td>
<td>6.3</td>
<td>6.5-9</td>
<td>pH meter</td>
<td>Satisfactory</td>
</tr>
<tr>
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<td>Nitrate</td>
<td>mg/l</td>
<td>-</td>
<td>ASTM</td>
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<tr>
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</tr>
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<td>Satisfactory</td>
</tr>
<tr>
<td>6</td>
<td>Soil Colour</td>
<td>-</td>
<td>Redish</td>
<td>Visual Inspection</td>
<td></td>
<td>Satisfactory</td>
</tr>
<tr>
<td>7</td>
<td>Potassium (K⁺)</td>
<td>Meq/100g</td>
<td>0.921</td>
<td>AST</td>
<td></td>
<td>Satisfactory</td>
</tr>
<tr>
<td>8</td>
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<td>Meq/100g</td>
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<td></td>
<td>Satisfactory</td>
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<td>Meq/100g</td>
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<td>Unsatisfactory</td>
</tr>
<tr>
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<td></td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>13</td>
<td>Nitrogen</td>
<td>%</td>
<td>0.154</td>
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<td>Satisfactory</td>
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<td>Organic Carbon</td>
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</tr>
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<td>Satisfactory</td>
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<td>0.906</td>
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<td>ASTM</td>
<td>Satisfactory</td>
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<td>mg/l</td>
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<td>Satisfactory</td>
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<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>(Coarse Sand )</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Grain Size Distribution</td>
<td>%</td>
<td>11.00</td>
<td></td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>(Clay )</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>21</td>
<td>Grain Size Distribution</td>
<td>%</td>
<td>7.00</td>
<td></td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td></td>
<td>(Silt)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>ASTM</td>
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<td></td>
<td>(Fine Sand)</td>
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<td></td>
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</tr>
<tr>
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<td>Loamy sand</td>
<td></td>
<td>Visual Inspection</td>
<td></td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>
3.10.2 Surface/Ground Water Condition

A continuous flow of milky effluent from a neighbourhood Paper Mill Facility was observed in the secondary drainage channel adjacent to the school wall by the Banex Road gully head. This drainage channel empties into the main collapsed drainage channel before discharging into the gully head. Representative sample of the milky water (effluent) was collected from the secondary drainage channel in a clean sampling bottle for laboratory analysis. To assess the groundwater condition, water sample was also collected in a clean sampling bottle from one of the existing household boreholes. The water samples were sealed, labeled and preserved in an ice-filled chest before shipping to the FMEnv-certified MGG Resources laboratory for chemical analyses. The water sampling locations are shown in Figure 3.6.

The laboratory analytical results of the water samples are shown in the Tables 3-5 and 3.6 below.
<table>
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<tr>
<th>S/N</th>
<th>PARAMETERS TESTED</th>
<th>UNITS</th>
<th>Average Value/Results</th>
<th>NESREA/FMENV LIMITS/WHO/NAFDAC LIMIT S/WHO/NAFDAC METHOD</th>
<th>REMARK</th>
</tr>
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<td>ASTM</td>
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<td>pH</td>
<td></td>
<td>6.4</td>
<td>7.0-8.5</td>
<td>ASTM</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
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<td>Unobjectionable</td>
<td>Organoleptic</td>
</tr>
<tr>
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<td>Appearance</td>
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<td>Unobjectionable</td>
<td>Unobjectionable</td>
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<tr>
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<tr>
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</tr>
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<td>ASTM</td>
</tr>
<tr>
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</tr>
<tr>
<td>17</td>
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<td>7.63</td>
<td>-</td>
<td>ASTM</td>
</tr>
<tr>
<td>18</td>
<td>BOD</td>
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<td>5.20</td>
<td>6.0</td>
<td>ASTM</td>
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<tr>
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<td>mg/l</td>
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<td>ASTM</td>
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<tr>
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<td>Chromium</td>
<td>mg/l</td>
<td>Bdl</td>
<td>0.05</td>
<td>AAS</td>
</tr>
<tr>
<td>21</td>
<td>Copper</td>
<td>mg/l</td>
<td>0.0425</td>
<td>2.0</td>
<td>AAS</td>
</tr>
<tr>
<td>22</td>
<td>Iron</td>
<td>mg/l</td>
<td>0.0617</td>
<td>0.05-0.3</td>
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</tr>
<tr>
<td>23</td>
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<td>AAS</td>
</tr>
<tr>
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<td>Lead</td>
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<td>Bdl</td>
<td>0.01</td>
<td>AAS</td>
</tr>
<tr>
<td>25</td>
<td>Nickel</td>
<td>mg/l</td>
<td>Bdl</td>
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</tr>
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<td>26</td>
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<td>0.2662</td>
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<td>AAS</td>
</tr>
<tr>
<td>27</td>
<td>Silver (Ag⁺)</td>
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<td>Bdl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S/N</td>
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<td>UNITS</td>
<td>Average Value/Results</td>
<td>NESREA/FMENV LIMITS/WHO/NAFDAC</td>
<td>METHOD</td>
</tr>
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<td>-----------------------</td>
<td>---------------------------------</td>
<td>--------</td>
</tr>
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<td>50.00</td>
<td>ASTM</td>
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<td>31</td>
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<td>100.00</td>
<td>ASTM</td>
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<tr>
<td>32</td>
<td>Hydroxide</td>
<td>mg/l</td>
<td>Nil</td>
<td>-</td>
<td>ASTM</td>
</tr>
<tr>
<td>33</td>
<td>Bicarbonate</td>
<td>mg/l</td>
<td>8.00</td>
<td>-</td>
<td>ASTM</td>
</tr>
<tr>
<td>34</td>
<td>Carbonate</td>
<td>mg/l</td>
<td>24.00</td>
<td>-</td>
<td>ASTM</td>
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</table>

**Microbial Analysis**

<table>
<thead>
<tr>
<th>S/N</th>
<th>PARAMETERS TESTED</th>
<th>UNITS</th>
<th>Average Value/Results</th>
<th>NESREA/FMENV LIMITS/WHO/NAFDAC</th>
<th>METHOD</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>E-Coli</td>
<td>cfu/ml</td>
<td>8.0x10</td>
<td>0</td>
<td>ASTM</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>36</td>
<td>Aerobic mesophiles</td>
<td>cfu/ml</td>
<td>5.8x10^4</td>
<td>1x10^2</td>
<td>ASTM</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>37</td>
<td>Coliform</td>
<td>cfu/ml</td>
<td>3.6x10^2</td>
<td>1</td>
<td>ASTM</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>

µS/Cm = MicroSiemens per centimeter; NS = Not Specified
mg/l = milligram per litre; cfu = Coliform forming units.

Table 3-6: Analytical Result of Water Sample from the Paper Mill Facility (Location WS-2)

<table>
<thead>
<tr>
<th>S/N</th>
<th>PARAMETERS TESTED</th>
<th>UNITS</th>
<th>Average Value/Results</th>
<th>NESREA/FMENV LIMITS/WHO/NAFDAC</th>
<th>METHOD</th>
<th>REMARK</th>
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<tr>
<td>1</td>
<td>Temperature</td>
<td>°C</td>
<td>20.9</td>
<td>Ambient</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>2</td>
<td>Ph</td>
<td>-</td>
<td>6.7</td>
<td>7.0-8.5</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
<td>-</td>
<td>Slight Taste</td>
<td>Unobjectionable</td>
<td>Organoleptic</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>4</td>
<td>Appearance</td>
<td>-</td>
<td>Slight colour</td>
<td>5 NTU^2</td>
<td>Organoleptic</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>5</td>
<td>Odour</td>
<td>-</td>
<td>Slight Odour</td>
<td>Unobjectionable</td>
<td>Organoleptic</td>
<td>Unsatisfactory</td>
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<tr>
<td>6</td>
<td>Total Dissolved Solids</td>
<td>mg/l</td>
<td>260</td>
<td>500</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>7</td>
<td>Conductivity</td>
<td>uS/Cm</td>
<td>606.7</td>
<td>1000</td>
<td>Conductivity Meter</td>
<td>Satisfactory</td>
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<tr>
<td>8</td>
<td>Total hardness</td>
<td>mg/l</td>
<td>200.00</td>
<td>100</td>
<td>ASTM</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>9</td>
<td>Chloride</td>
<td>mg/l</td>
<td>21.3</td>
<td>200</td>
<td>ASTM</td>
<td>Satisfactory</td>
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<tr>
<td>10</td>
<td>Fluoride</td>
<td>mg/l</td>
<td>0.037</td>
<td>1.5</td>
<td>ASTM</td>
<td>Satisfactory</td>
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<tr>
<td>11</td>
<td>Sodium</td>
<td>mg/l</td>
<td>23.64</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>12</td>
<td>Potassium</td>
<td>mg/l</td>
<td>11.64</td>
<td>1-2</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>13</td>
<td>Sulphate</td>
<td>mg/l</td>
<td>46.65</td>
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<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>14</td>
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</tr>
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<td>UNITS</td>
<td>Average Value/Results</td>
<td>NESREA/FMENV LIMITS/WHO/NAFDAC</td>
<td>METHOD</td>
<td>REMARK</td>
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<td>--------------------------------</td>
<td>--------</td>
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<tr>
<td>15</td>
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<tr>
<td>16</td>
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<td>2.0</td>
<td>AAS</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>17</td>
<td>Phosphate</td>
<td>mg/l</td>
<td>0.2467</td>
<td>0.05-0.3</td>
<td>AAS</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>18</td>
<td>BOD</td>
<td>mg/l</td>
<td>0.0568</td>
<td>0.05-0.3</td>
<td>AAS</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>19</td>
<td>COD</td>
<td>mg/l</td>
<td>0.1436</td>
<td>-</td>
<td>AAS</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>20</td>
<td>Chromium</td>
<td>mg/l</td>
<td>Nil</td>
<td>0.05</td>
<td>AAS</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>21</td>
<td>Copper</td>
<td>mg/l</td>
<td>0.1404</td>
<td>-</td>
<td>AAS</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>22</td>
<td>Iron</td>
<td>mg/l</td>
<td>0.2467</td>
<td>0.05-0.3</td>
<td>AAS</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>23</td>
<td>Zinc</td>
<td>mg/l</td>
<td>0.2467</td>
<td>0.05-0.3</td>
<td>AAS</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>24</td>
<td>Lead</td>
<td>mg/l</td>
<td>Nil</td>
<td>0.01</td>
<td>AAS</td>
<td>Satisfactory</td>
</tr>
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<td>25</td>
<td>Nickel</td>
<td>mg/l</td>
<td>0.1404</td>
<td>-</td>
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<td>26</td>
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<td>0.05-0.3</td>
<td>AAS</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>27</td>
<td>Silver (Ag⁺)</td>
<td>mg/l</td>
<td>0.1436</td>
<td>-</td>
<td>AAS</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>28</td>
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<td>50.00</td>
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</tr>
<tr>
<td>31</td>
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<td>mg/l</td>
<td>Nil</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
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<td>32</td>
<td>Bicarbonate</td>
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<td>176.00</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>33</td>
<td>Carbonate</td>
<td>mg/l</td>
<td>184.00</td>
<td>-</td>
<td>ASTM</td>
<td>Satisfactory</td>
</tr>
</tbody>
</table>

**Microbial Analysis**

<p>| | | | | | | |</p>
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<th></th>
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</thead>
<tbody>
<tr>
<td>34</td>
<td>E-Coli</td>
<td>cfu/ml</td>
<td>1.0X10²</td>
<td>0</td>
<td>ASTM</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>35</td>
<td>Aerobic mesophiles</td>
<td>cfu/ml</td>
<td>1.0X10⁵</td>
<td>1x10²</td>
<td>ASTM</td>
<td>Unsatisfactory</td>
</tr>
<tr>
<td>36</td>
<td>Coliform</td>
<td>cfu/ml</td>
<td>3.8X10⁸</td>
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<td>ASTM</td>
<td>Unsatisfactory</td>
</tr>
</tbody>
</table>

µS/Cm = MicroSiemens per centimeter; mg/l = milligram per litre; cfu = Coliform forming units.

**COMMENTS.**
Sample is suitable for treatment.

**3.10.3 Air Quality**

Air quality assessment was carried out at the Ndiagu Ikenga Community Square using the Dragner CMS Gas Analyzer. Ambient air was drawn into the calibrated equipment at the location of Ndiagu Ikenga Community Square and subsequently the digital readings for the
various parameters were read off the instrument. The air sampling location is shown in Figure 3.6.

The analytical results of the baseline air pollution indicators within and around the project area show concentrations below the regulatory threshold limits as shown in the Table 3-7 below.

### Table 3-7: Air Quality Analysis at Ndiagu Ikenga Community Square (Location AS-1).

<table>
<thead>
<tr>
<th>S/N</th>
<th>Parameters</th>
<th>Unit</th>
<th>NESREA</th>
<th>RESULT</th>
<th>METHOD</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hydrogen Sulphide (H₂S)</td>
<td>Mg/Nm³</td>
<td>5</td>
<td>4</td>
<td>M40 Gas Analyser (direct reading method)</td>
<td>BSL</td>
</tr>
<tr>
<td>2</td>
<td>Carbon monoxide (CO)</td>
<td>Mg/Nm³</td>
<td>500</td>
<td>35</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>3</td>
<td>Nitric Oxide (NO)</td>
<td>Mg/Nm³</td>
<td>300</td>
<td>57.7</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>4</td>
<td>Nitric dioxide (NO₂)</td>
<td>Mg/Nm³</td>
<td>300</td>
<td>1.38</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>5</td>
<td>Sulphur dioxide</td>
<td>Mg/Nm³</td>
<td>500</td>
<td>-12.49</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>6</td>
<td>Hydrogen Cyanide (HCN)</td>
<td>Mg/Nm³</td>
<td>NS</td>
<td>-10.33</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>7</td>
<td>Ammonia (NH₃)</td>
<td>Mg/Nm³</td>
<td>NS</td>
<td>3.13</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>8</td>
<td>Toluene</td>
<td>Mg/Nm³</td>
<td>NS</td>
<td>6.63</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>9</td>
<td>Isopropanol</td>
<td>Mg/Nm³</td>
<td>NS</td>
<td>10.05</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>10</td>
<td>Hydrogen (H₂)</td>
<td>Mg/Nm³</td>
<td>NS</td>
<td>27.2</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>11</td>
<td>Chlorine (Cl₂)</td>
<td>Mg/Nm³</td>
<td>NS</td>
<td>1.25</td>
<td></td>
<td>BSL</td>
</tr>
<tr>
<td>12</td>
<td>Oxygen</td>
<td>Mg/Nm³</td>
<td>NS</td>
<td>23.4</td>
<td></td>
<td>BSL</td>
</tr>
</tbody>
</table>

<dl. = below detection limit .dl for NO₂ = 0.01 ppm, SO₂ = 0.01 ppm, NH₃ = 1 ppm, H₂S = 0.1 ppm; NA = Not available

#### 3.10.4 Noise and Vibration:

The project area is generally a quiet neighborhood being a village. Noise levels were measured using the Digital Sound Level Meter (BAFX Products), Type BAFX3370. Measurement of minimum noise levels, maximum noise levels as well as noise exposure levels were recorded at two assessment points (NV-1 and NV-2) with locations as shown in Figure 3.6.

Noise levels taken during field study indicate very low ambient noise levels. There are generally no significant noise emissions in the project area. The ambient noise levels recorded within the village along the gully corridor range from 35.8 dB to 56.2 dB. These levels are well below the FMEnv regulatory standard of 90 dB.
CHAPTER 4: SOCIOECONOMIC CHARACTERISTICS

4.1 DESCRIPTION OF CULTURAL AND SOCIOECONOMIC ENVIRONMENT

4.1.1 Introduction:
The cultural/socioeconomic elements and characteristics of Ndiagu Ikenga Ogidi project area considered in this Consultancy include population, land use and tenure system, social setups, economic activities, education, vulnerability profile, gender, religion, settlement and migration patterns and health services system.

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

4.1.2 Socioeconomic Survey:
This involved detailed enumerations/inventories of households/persons resident or doing business within the project area as well as formal and informal discussions with focus groups, including the community traditional and administrative leadership. A comprehensive questionnaire for data collection was used for this purpose. The questionnaire captured the following information:
   a) Household bio-data (demographic information);
   b) Livelihoods;
   c) Inventory of structural and nonstructural assets including land, common properties, houses, economic trees and cash crops.
Also, census of the PAPs was also conducted to fully characterize the impact on each affected person.

4.1.3 Public Consultation:
This was conducted as part of the participatory approach aimed at gaining good knowledge of the social issues/risks associated with the project as perceived by the communities. Public meetings were held in one location within the project immediate impact areas. The location is the Community Village Square. Minutes of, and attendance to, these meeting are included in Annexure II.

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

The qualitative analysis involved an assessment of information obtained during the stakeholders' consultations and public participation forums and discussions. The socioeconomic study provided necessary primary quantitative data for the project assessment. This quantitative data included:
   • Household census of the people identified as PAPs;
   • Establishing the socioeconomic profile of the project area population including health related status of respondents;
   • Establishing the structural assets to be affected by project;
   • Establishing area of land to be affected.
4.2 Cultural Environment

4.2.1 Population
Based on the 2006 Nigerian National Census, Ogidi in Idemili North LGA of Anambra has a projected total population of 86,410 for 2015.

4.2.2 Ethnic Groups
The people of Ogidi consist of one of Nigeria’s major ethnic groups – the Igbos. The ethnic group has its unique culture, social organization and traditions. The social and cultural aspects in the project area are closely intertwined with the ethnic groupings. The Igbos have elaborate cultural practices that include strong kinship linkages with organizations spanning from localized social groups to strong clan relations. The cultural associations and social interactions are epitomized during cultural and religious ceremonies and festivities. The people generally speak and write mainly the Ibo and English languages.

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

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

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

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

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

A review of the land use pattern within the project areas reveals the following:
   i) The frontal land areas in the vicinity of, and along the Enugu-Onitsha Express Road corridor, are predominantly residential and commercial property development areas;
ii) There are several structures (both residential and commercial) in close proximity to a section of the gully corridor. These structures are proposed to be appropriately protected during the remedial construction phase of the project.

iii) The land areas closest to the gully corridor towards the hinterland are essentially dominated by agricultural farmlands and protective bamboo trees.

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

4.4 Analysis of Socioeconomic Survey
The measurement of precise impacts of the project on persons living or earning their living along the gully corridor cannot be effectively established without appropriate and accurate social and economic baseline data. The socioeconomic study helps to assess the social economic changes that may occur in the living conditions of the project area population as a result of the project impacts.

4.4.1 Objectives of the Socioeconomic Survey
The primary objectives of the socioeconomic survey are as follows:

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

The respondents to the socioeconomic survey included the following:

(1) Owners of any buildings or structures located within 50 meters from the edges of the Ndiagu Ikenga gully corridor;

(2) Owners of any buildings or structures located in areas to be used as construction staging areas during the construction phase of the project;

(3) Residents/tenants of the buildings or structures identified in items (1) and (2) above whether the structures are permanent or temporary; residential or commercial;

(4) Land owners along the proposed gully rehabilitation corridor whose lands would be required for the purpose of the project;

(5) Economic trees/crops owners along the gully side Setbacks whose lands would be required for the purpose of stabilizing the gully edges.

The socioeconomic survey was conducted in conjunction with the census of the project affected persons to profile the impacted project area and provide baseline data against which
mitigations measures and support will be measured. The analysis is based on respondents to
the questionnaire administered to residents of Ndiagu Ikenga village who are most likely to be
impacted by the project. On the basis of the responses obtained in the exercise, the following
determinations are made.

4.4.2 Respondent and Household Distribution in Project Area

Figure 4-1 shows how the residents of the project area responded to the socioeconomic survey
and their corresponding household members. A total of 70 questionnaires were administered
with a 100% return. The plot of the 70 respondents with their 375 household members is shown
in Figure 4-1 above.

4.4.3 Gender, Age and Household Size of Respondents

The survey data indicates that of the respondents in the survey 91% are males while 9% are
females as shown in Figure 4-2. The respondents’ household data however, reflects a fairly
even male/female distribution for the project area as shown in Figure 4-3.

Women in the project area are mainly involved in traditional agriculture and home-
keeping. Some of the women also serve as stores sales persons at the many
merchandizing outlets in Ndiagu Ikenga. Generally, men are more mobile than the
women as the men are more involved in general pursuits to provide for the family.

The age distribution data of the respondents (Figures 4-4) shows 3% of respondents are
21 years or less while 11% are over 60 years of age. Respondents between the ages of 22 and 45 years are 47% while those between the
ages of 46 and 60 years are 39%. The age distribution data (Figures 4-5) of the respondents’ household members indicate that 54.0% of the households are 21 years of age and below while only 3.0% are in their 60s and above. The survey further shows that 31.0% of the households are within the youthful ages of between 21 and 45 years. 12.0% of the household members are between the ages of 45 and 60 years. The low percentage of the number of household members of ages 60 and above is reflective of urbanization effect in the area. There is clearly an increasing trend of youthful persons taking up residency within Ndiagu Ikenga village as reflected in the percentage of youths in the households (Figure 4-5).

The respondents’ household size distribution from the survey ranged from a minimum of one person to a maximum of 8 persons. The average size of households is 6 persons for the respondents. On the extreme household size ends, 10.8% of the respondents have household sizes of one to two members while another 6.2% have household members of more than 8 persons (Figure 4-6). A majority (40.0%) of the respondents has household sizes of 5 or 6 persons and 24.6% has sizes of 7 or 8 persons. The data shows 83.1% of respondents have household sizes of between 3 and 8 persons.

### 4.4.3 Marital Status of Respondents

Figure 4-7 shows the marital status of respondents in the project area. About thirty two percent (32%) of the respondents are married while about 65% are single. Approximately three percent (3%) of the respondents are widowed.

### 4.4.4 Access to Education

The survey responses indicate that only 6% of the population of schooling age never attended school (Figure 4-8). The level of basic education for the surveyed households is relatively high with 94.0% of the surveyed population having attained the basic primary (FSLC) level of education and higher. The data further shows that 69.0% of the population has attended and/or graduated from the primary and secondary education. This high literacy level within the project affected area is also a reflection of the literacy rate in the Ogidi community as a whole.

### 4.4.5 Occupational and Income Distribution of Respondents

The occupational distribution data from the questionnaire indicate that 57% of Ndiagu Ikenga surveyed households are either unemployed or are students. Approximately, 3% are engaged in farming, 26% are self-employed while 14% are employed in either the private sector or civil service (Figure 4-9).
The main source of income for the households surveyed is income from trading/business across the community. More than 26% of the respondents reported owning a business or being self-employed. A significant number of persons (17%) in the community are unemployed. Based on the income data provided by respondents in the survey, 7% of households in Ndiagu Ikenga earn less than N20,000 monthly with 9% earning up to N30,000 monthly. Worthy of note is that over 84% of the households in the community earn more than N30,000 per month. The margin of error in the information provided on incomes may be significant considering that some of the respondents may have grossly inflated data provided with the intent to receive compensations in accordance with incomes indicated in the survey. The data provided could not be independently verified.

### 4.4.6 Household Waste Disposal

Most of the respondents indicate that their household wastes are disposed off at convenient locations including crevices. In many areas, the wastes are also indiscriminately dumped inside the gullies or at illegal dumpsites created only as a matter of convenience. Solid waste management in the project area is a considerable hazard to the health of the population and the effective functioning of the storm water drainage systems. The unmanaged refuse causes regular obstruction of the storm water drainage systems.

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

### 4.5 Desirability of the Project

Most of the respondents in the survey (99%) indicated immense desirability for the project to proceed as shown in Figure 4-12. Many of them expressed a clear wish for the project to proceed before the next round of rainfall.
4.6 Conflict Resolution
Most respondents in the survey (99%) prefer and find it most convenient to have conflicts resolved through informal traditional modes of conflict resolution which currently exist within the communities. The court system is seen as an alternative means to resolve issues but no respondent favoured it as a means of resolving conflict. One percent (1%) of the respondents however, remained indifferent to the preferred approach as shown in Figure 4.13.

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

Community participation improves understanding of the project and communication between the SPMU, the consultants or contractors and the community. The decision-making process for the project will also be enhanced by actively involving relevant stakeholders, especially the project affected persons and organizations with a stake in the project.
Table 4.1: Summary of Findings for All Socioeconomic Indicators

<table>
<thead>
<tr>
<th>S/No</th>
<th>Socioeconomic Indicator</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Population</td>
<td>Based on the 2006 national population census records and the 2.3% annual population growth factor recommended by the national population commission (NPC), Idemili North LGA has a projected population of 528,887 for 2015 while Ogidi town has a projected population of 86,410. The survey data indicates that Ndiagu Ikenga Ogidi has about equal ratio of male-female population with only about 2% differential margin between them at the household level. At the respondent level, there is a marked difference (82%) between the participation of men and women in the survey exercise. While it is not certain why there is such a wide margin, it is however noted that the women appeared to be grossly involved with their petty trading activities.</td>
</tr>
<tr>
<td>2</td>
<td>Ethnic Groups and Language Spoken</td>
<td>The people of Ndiagu Ikenga Ogidi consist of one major Nigerian ethnic group – the Igbos. The people generally speak and write mainly the Ibo and English languages. Clanism and kinship are strong elements and driving forces in control of political and cultural institutions and service points. The villages consist of groups of households whose families are inter-related through marriages. The community however, in recent times, has witnessed an influx of persons from other parts of the state/country who have settled in the area mainly for trading purposes.</td>
</tr>
<tr>
<td>3</td>
<td>Religion</td>
<td>The members of Ndiagu Ikenga community are predominantly of the Christian faith, mostly Catholics and Anglicans with some traditionalists and negligible Muslim community.</td>
</tr>
<tr>
<td>4</td>
<td>Land Use System</td>
<td>Three major types of customary land tenure system exist in the six villages, viz: – (1) individual land ownership; (2) family land ownership; and. (3) communal land ownership. Individual ownership may be for indigenes or for residents of the community. Family lands (as well as individual lands) are inherited from generational relatives. Communities retain family lands which may never be sold but mostly used for agricultural purposes. About 50% of land is committed to agricultural production of food crops which include maize, cassava, yams, plantain, vegetables, etc.</td>
</tr>
<tr>
<td>5</td>
<td>Household Distribution in Project Area</td>
<td>Based on the survey, 70 respondents with 375 household members were documented in Ndiagu Ikenga Quarters.</td>
</tr>
<tr>
<td>6</td>
<td>Gender, Age and Household Size of Respondents</td>
<td>The survey shows that about 54% of the households in the community are below the age of 21 years while about 43% are between the ages of 22 and 60 years. The percentage of the respondents’ household members that are above the age of 60 years is about 3%. Household size distribution in the project area range from 1-8 persons with an average household size of 6 persons for the community.</td>
</tr>
<tr>
<td>7</td>
<td>Marital Status of Respondents</td>
<td>About 32% households in Ndiagu community are married while about 65% are single and about 3% of the households are widowed.</td>
</tr>
<tr>
<td>8</td>
<td>Access to Education</td>
<td>There is a relatively high literacy level within Ndiagu Ikenga community with 94% of the surveyed population having attained the FSLC level of education and higher. Only about 6% of respondents have not attained the basic primary education.</td>
</tr>
<tr>
<td>9</td>
<td>Occupational and Income Distribution of Respondents</td>
<td>The occupational distribution data shows a moderately high rate of unemployment (27%) in the community. This situation could pose some serious social risk when not properly managed.</td>
</tr>
<tr>
<td>10</td>
<td>Household Waste Disposal</td>
<td>Household wastes are indiscriminately dumped at illegal points or dumpsites adjacent to the gully corridor. Solid waste management is a considerable hazard to health and the effective</td>
</tr>
<tr>
<td>S/No</td>
<td>Socioeconomic Indicator</td>
<td>Findings</td>
</tr>
<tr>
<td>------</td>
<td>---------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>functioning of the storm water drainage systems. Unmanaged refuse disposal causes regular obstruction of the storm water drainage systems.</td>
</tr>
<tr>
<td>11</td>
<td>Health Services</td>
<td>Records show that common diseases in project area include diarrhea, malaria, typhoid, pneumonia, cough, skin diseases, deficiency diseases, eye diseases, ear diseases, and waterborne diseases due to malnutrition and lack of hygiene. The quality of the health services in the project area is generally poor. Most people go to quacks and medicine shops for minor medical treatment.</td>
</tr>
<tr>
<td>12</td>
<td>Desirability of Project</td>
<td>99% of survey respondents indicated immense desirability for the project to proceed.</td>
</tr>
<tr>
<td>13</td>
<td>Conflict Resolution Mechanism</td>
<td>99% of survey respondents prefer that their conflicts be resolved through informal traditional modes of conflict resolution. While no respondent favoured resolution through the court system, 1% of the respondents expressed indifference.</td>
</tr>
</tbody>
</table>
CHAPTER 5: PUBLIC PARTICIPATION AND CONSULTATIONS WITH STAKEHOLDERS

5.1 Objective of Community Consultation
The aims of the public participation and consultation process are:

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

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

1. Rapid Assessment Technique:
   This involved a quick professional assessment of the project potential impacts based on nearness of residential/commercial assets to the gully edge, anticipated nature and intensity of impacts, and the significance of the impacts along the proposed project corridor. Any affected property owner is directly engaged in discussions to create and gain better understanding between the parties.

2. Socioeconomic Survey:
   This involved the administration of structured questionnaire designed to provide socioeconomic profile of households/families resident or doing business within the project area as well as formal and informal discussions with focus groups, including the community traditional and administrative leadership.

3. Public Meetings:
   This was conducted as part of the participatory approach aimed at gaining good knowledge of the social issues/risks associated with the project as perceived by the communities. Public meetings were held at different locations within the project immediate impact areas.

5.2 Public Participation Process
The potentially project affected individuals or group of persons identified as stakeholders in this project include those who live in close proximity to gully corridor; those who will hear, smell or see the development; those who may be forced to temporarily relocate because of the project; those who have interest either traditionally or administratively, over developmental activities or policy changes in the project area (they may or may not necessarily live in proximity of the project); and, those who infrequently use the land on which the project is located.

Community consultation was driven in a manner that encouraged active and sustained participation of the Ogidi community members, particularly Ikenga village and Ndiagu quarters through which the active gully transverses. This was to promote community ownership of the project and to enhance sustainability.
A pre-defined socio-economic questionnaire at the household level was administered for Ndiagu community. The consultations are expected to remain an ongoing exercise throughout the duration of the project to give the communities the opportunity to make contributions aimed at strengthening the development while avoiding negative impacts as well as reducing possible conflicts. Issues relating to project displacements and compensations, particularly with the project affected persons will continue to be handled to minimize chances of possible conflicts.

5.2.1 Stakeholders’ Identification

Generally, five broad categories of stakeholders were identified by the Consultant for this project based on the degree to which the project activities may affect or involve such persons or group of persons. These stakeholders are grouped as shown in Table 5-1.

The adopted process consists of:

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

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

Table 5-2 gives an initial list of identified stakeholders including their activities and operational areas in the villages traversed by the project. The list includes government functionaries, NGOs, FBOs and CBOs among others.

<table>
<thead>
<tr>
<th>GROUP</th>
<th>DESCRIPTION</th>
<th>ROLE(S) IN COMMUNITY PROCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-1</td>
<td>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 25 meters of the gully edge.</td>
<td>The identified persons or group of persons in this category will ultimately represent the project potentially-affected persons (PAPs) or households (PAHs)</td>
</tr>
<tr>
<td>Group-2</td>
<td>Individuals or group of persons whose day-to-day traditional or administrative functions include oversight of developmental activities within the project areas.</td>
<td>This category of persons served as mobilization points around which the Consultant reached out to the other members of the community.</td>
</tr>
<tr>
<td>Group-3</td>
<td>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 project area but within the communities in which the project is located.</td>
<td>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.</td>
</tr>
<tr>
<td>Group-4</td>
<td>CBOs, FBOs and NGOs who provided frequent interface with the community members who may be directly or indirectly affected by the project activities.</td>
<td>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.</td>
</tr>
<tr>
<td>Group-5</td>
<td>Individuals or group of persons who are political office holders and have significant responsibilities toward community members within the project area.</td>
<td>This group of individuals is collectively responsible for the political and general socio-economic development of the communities among others within their respective political</td>
</tr>
</tbody>
</table>
Table 5-2: List of Stakeholders and Their Responsibilities

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>IDENTIFIED STAKEHOLDER</th>
<th>AREA OF INTEREST IN PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-1</td>
<td>Residents of Ndiagu Ikenga Village</td>
<td>PAPs/PAHs</td>
</tr>
<tr>
<td>Group-2</td>
<td>Office of the Ndiagu Quarters Chairman</td>
<td>Development and welfare of Ndiagu Quarters</td>
</tr>
<tr>
<td></td>
<td>Office of the Ikenga Village Chairman</td>
<td>Development and welfare of Ikenga Village</td>
</tr>
<tr>
<td></td>
<td>Office of the President General, Ogidi Town Association</td>
<td>Development and welfare of Ogidi Town</td>
</tr>
<tr>
<td>Group-3</td>
<td>Residents of Ndiagu Quarters of Ikenga Village</td>
<td>Individualized livelihood issues</td>
</tr>
<tr>
<td>Group-4</td>
<td>Community-based Organizations</td>
<td>Watershed protection and management</td>
</tr>
<tr>
<td></td>
<td>Faith-based Organizations in the Village (churches)</td>
<td>Community spiritual and physical welfare</td>
</tr>
<tr>
<td></td>
<td>Non-governmental Organizations</td>
<td>Protection of environmental health of communities</td>
</tr>
<tr>
<td>Group-5</td>
<td>Office of the Chairman – Idemili North LGA</td>
<td>Development of the Idemili North LGA</td>
</tr>
<tr>
<td></td>
<td>Office of the Hon. Member – Anambra State House of Assembly</td>
<td>Development of the Idemili North in the state constituency</td>
</tr>
<tr>
<td></td>
<td>Office of the Hon. Member – Idemili North &amp; South Federal Constituency</td>
<td>Development of Idemili North &amp; South federal constituency</td>
</tr>
<tr>
<td></td>
<td>Office of the Distinguished Senator – Anambra Central Senatoral Zone</td>
<td>Development of Anambra Central Senatoral Zone</td>
</tr>
</tbody>
</table>

5.2.2 Community Consultations and Meetings

An initial kick-off meeting was held with the State NEWMAP team and the project engineering designers. The meeting was held on April 19, 2016 at the office of the State NEWMAP Project Coordinator (PC). In attendance at this meeting, were the Principals of the ARAP Consultant team, OTG Enviroengineering Nigeria Limited, the Engineering Design team – and the State Focal NGO for the project. Discussions centered around available documents on the project and the requirements of the ARAP Consultant to assure smooth and effective take-off of work.

Community consultations began subsequently with separate meetings between the Consultant team and the respective community leaders of Ndiagu Quarters, Ikenga village and Ogidi Town Association to discuss the best and most effective approach towards mobilizing the community members as it relates to the proposed project. The several meetings helped to structure effective participation of all other relevant stakeholders and segments of the community including the PAPs in the project process. The community members were actively and enthusiastically engaged in all matters relating to the project and eagerly assisted the Consultant in identifying pertinent socio-cultural issues relevant to the project.
5.2.3 Summary of Meetings with Stakeholders

The community meetings discussed the need for the project and the associated potential impacts to the community members living or farming within the project corridor. The community members’ concerns and general thoughts were solicited and noted. The minutes of these meetings are included as Annex IV. The community members particularly welcomed the project and expressed anxiety that remedial work should commence expeditiously to prevent occurrence of further flooding damages from the next rainy season. Summary of the proceedings at the meetings are shown in Table 5.3. Additional meetings are expected to be held prior to the commencement of field construction work. Such meetings will include the project-affected persons and households. Issues pertaining to relocations and compensations for losses (means of livelihoods and properties) shall be discussed at such meetings.
Fig. 5-3: Ndiagu Community Meeting - Question and Answer Session in Photos
### Table 5.3 Summary of Stakeholders’ Meetings Held on April 20, 2016 at Ndiagu Ikenga Ogidi Village Square

The List of participants at the meetings is included in Annex 5.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Project</td>
<td>NEWMAP ESMP &amp; RAP</td>
</tr>
<tr>
<td>2. Name of community</td>
<td>Ndiagu Ikenga Ogidi</td>
</tr>
<tr>
<td>3. Date</td>
<td>April 20, 2016</td>
</tr>
<tr>
<td>4. Language of communication</td>
<td>Igbo and English</td>
</tr>
<tr>
<td>5. Introductions and opening remarks</td>
<td>The meeting started at 11a.m. at the village square with an opening prayer and the breaking of kolanuts. The key members of community were introduced to the State NEWMAP and Consultant Team following which the NEWMAP and Consultant team members were also introduced by the facilitators, Mr. Emeka Achebe and Victor Chukwu, respectively.</td>
</tr>
<tr>
<td>6. Remarks by the Consultant</td>
<td>The Principal Consultant, Dr. Odili Ojukwu, in his remarks gratefully acknowledged the huge turnout by the various segments of each of the communities.</td>
</tr>
<tr>
<td></td>
<td>• He informed the audience that it was the Ndiagu Gully Erosion problem and the consequent displacements of homesteads, farmlands and other assets that precipitated the meeting.</td>
</tr>
<tr>
<td></td>
<td>• The challenges posed by the gully erosion have drawn the attention of the Anambra State Government, the Federal Government and World Bank. This is being actualized through NEWMAP, with the State Project Management Unit (SPMU) as the Anambra State implementation agency.</td>
</tr>
<tr>
<td></td>
<td>• A key element of the gully control design is effective conveyance of storm water to safely terminate at the outfall. The gully walls will largely require about 10 meters of land along each side of the gully edge as Setback for the stabilization of the walls, particularly at the deep sections of the gully corridor. Therefore, there is the possibility that people’s land and other assets would be affected in the course of remedial construction at the site. The construction work and the gully wall stabilization would also affect other elements of the physical environment.</td>
</tr>
<tr>
<td></td>
<td>• The consultant will identify and document any persons and elements of the environment that would be affected by the project and recommend appropriate mitigation measures and compensation packages to the SPMU for necessary action.</td>
</tr>
<tr>
<td></td>
<td>• He requested the cooperation of the community members as staff of the Consultant proceeds with all aspects of the field work. He emphasized the need for the communities to show interest in the project, monitor every aspect of project implementation with a view of taking full ownership of the project upon completion.</td>
</tr>
<tr>
<td></td>
<td>• The communities were told of the socioeconomic and census survey that is part of the project with a cut-off date of April 28, 2016. Every member of the community that has structures, land, livelihoods or any other assets along the gully corridor should ensure such documentation within the census period. No further documentation would be allowed after the cut-off- date, April 28, 2016.</td>
</tr>
<tr>
<td>7. Questions and concerns</td>
<td>• The community members asked to know:</td>
</tr>
<tr>
<td></td>
<td>• The criteria for determining those that will be affected by the project;</td>
</tr>
<tr>
<td></td>
<td>• If the intra-community roadways destroyed by the gully would be rehabilitated in the project?</td>
</tr>
<tr>
<td></td>
<td>• Will there be compensation for farmlands?</td>
</tr>
<tr>
<td></td>
<td>• What specific roles would the youths play in the project implementation?</td>
</tr>
<tr>
<td>8. Responses to the concerns</td>
<td>The consultant informed the community that :</td>
</tr>
<tr>
<td></td>
<td>Any persons whose lands, buildings (whether residential or commercial), economic trees and cash crops fall within the proposed Setback will be affected will be affected by the project. The Setback is about 10m wide on each side of the gully edge.</td>
</tr>
</tbody>
</table>
### Items

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy equipments will be required during the project implementation. Because of the expected activities, there will be increase in vehicular traffic, increase in noise, increase in fugitive dusts, water ponding and solid waste management and all these will create some impacts on the people along the gully corridor.</td>
<td></td>
</tr>
<tr>
<td>Compensation for people’s assets and loss of livelihood means shall follow extant laws and World Bank policies on social safeguards. The SPMU is the agency statutorily charged with the project implementation in the state. The Consultant is employed by the SPMU to only undertake this assignment (ESMP and ARAP).</td>
<td></td>
</tr>
<tr>
<td>Access roads leading to the project site which will be subjected to extensive and heavy usage during remedial construction will be reconstructed and appropriate drainage channels installed.</td>
<td></td>
</tr>
<tr>
<td>The consultant encouraged the youths to mobilize and become a positive active part of the project. The youths are expected to play meaningful roles during project implementation.</td>
<td></td>
</tr>
</tbody>
</table>

#### 9. Perceptions about the Project

Community members lamented the adverse effects of the gully on their livelihoods and community over the years, and then expressed gratitude and commendation to the federal and Anambra State governments and the World Bank for the proposed gully erosion control intervention. They further expressed willingness to provide necessary support to all parties involved with implementation of the project and look forward to the immediate project commencement.

#### 10. Closing Comments & Remarks

The Ndiagu community thanked the State NEWMAP and Consultant teams for their visit and assured them of the community’s co-operation towards the project. The meeting ended at about 2:00pm. The attendance at the meeting was 54 persons.

### 5.3 Social Issues/Risks

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

1. Community safety – Concerns regarding community safety with the next cycle of the rainy season keenly expressed. The community is quite very apprehensive of the advancement of the floods when the rains come pounding;
2. Flooding leads to damages and loss of crops and livestock, personal possessions, spread diseases such as typhoid, cholera, diarrhea, and malaria, and cause pit latrines to overflow;
3. Livelihoods – loss of access to roadways, crop lands and pasture.
4. Resettlement – impacts and compensation measures for economic and physical displacement during project implementation.
5. Awareness creation was necessary for the long-term success of the project; and that manpower development should be included in the programme to enhance project sustainability.

Specific details of the resettlement/displacement of persons, livelihood issues, loss of cash crops and economic trees, vulnerability issues and compensations resulting from the project will be provided in the project’s ARAP.
6.1 Introduction
This chapter discusses the methods/techniques used in assessing and analyzing the potential social and environmental impacts of the project and, also discusses the alternatives to the proposed project and reasons for their rejection. The likely future scenario without the project is also considered.

The beneficial and adverse potential environmental, economic, social and cultural impacts are identified based on professional judgment and the use of unranked pair-wise comparison approach (Canter, L and Sadler, B; 1997). Other factors in predicting the potential impacts include the results of public consultations. The potentially significant environmental and social impacts of the project as well as the suitable mitigation measures are discussed. The assignment of responsibilities for implementation of the ESMP and the associated costs are presented in Chapter 7.

6.2 Discussion of Methods/Techniques Used In Assessing Impacts
6.2.1 Impact Rating Methodology
The assessment of the potential impacts of the project was based on specialists’ expertise, Consultant’s professional judgment, field observations and desk-top analysis. The significance of potential impacts that may result from the proposed project was determined to assist decision making.

Generally, the envisaged areas of potential impacts which could result from the activities of the project are evaluated for impact significance based on the comparative consequential effects of the potential impact on the social and biophysical environments. The significance of an impact may be defined as a combination of the consequence of the impact occurring and the probability that it will occur. The criteria used to determine impact consequence are shown in the Table 6-1.

Table 6-1: Criteria for Determining Impact Consequence

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

The numerical scores in Table 6-1 are positive or negative depending on whether the impact is adverse or beneficial. If impact is adverse, the numerical score is positive and if the impact is beneficial, the numerical score is negative. The combined score of the three criteria (extent, intensity and duration) corresponds to a Consequence Rating, as shown in Table 6-2:

**Table 6-2: Method used to determine Consequence Score**

<table>
<thead>
<tr>
<th>Combined Score (A+B+C)</th>
<th>3 – 4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8 – 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consequence Rating</td>
<td>Very low</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
<td>Very high</td>
</tr>
</tbody>
</table>

The probability of the impact occurring is determined using the probability classifications presented in the Table 6-3 below:

**Table 6-3: Probability Classification**

<table>
<thead>
<tr>
<th>Probability – the likelihood of impact occurring</th>
<th>Improbable</th>
<th>Possible</th>
<th>Probable</th>
<th>Definite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improbable</td>
<td>&lt; 40% chance of occurring</td>
<td>40% – 70% chance of occurring</td>
<td>&gt; 70% - 90% chance of occurring</td>
<td>&gt; 90% chance of occurring</td>
</tr>
</tbody>
</table>

The overall significance of impacts was determined by considering consequence and probability using the rating system prescribed in the Table 6-4 below:

**Table 6-4: Impact Significance Ratings**

<table>
<thead>
<tr>
<th>Probability</th>
<th>Improbable</th>
<th>Possible</th>
<th>Probable</th>
<th>Definite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>INSIGNIFICANT</td>
<td>INSIGNIFICANT</td>
<td>VERY LOW</td>
<td>VERY LOW</td>
</tr>
<tr>
<td>Low</td>
<td>VERY LOW</td>
<td>VERY LOW</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>Medium</td>
<td>LOW</td>
<td>LOW</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>High</td>
<td>MEDIUM</td>
<td>MEDIUM</td>
<td>HIGH</td>
<td>HIGH</td>
</tr>
<tr>
<td>Very High</td>
<td>HIGH</td>
<td>HIGH</td>
<td>VERY HIGH</td>
<td>VERY HIGH</td>
</tr>
</tbody>
</table>
As previously indicated under Chapter 1, the envisaged project activities will include:

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

2. Biological Remedial Construction Works:
   - Terracing;
   - Structured vegetation;
   - Specific trees planting with known root strength
   - Economic trees planting

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

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

Environmental Impact Areas:

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

Social Impact Areas:

1) Economic Activities:
6.3 Analysis of Potential Impacts Triggered by Project

The potential impacts as listed above are organized considering all phases of the project from the pre-construction phase through the construction phase to the post-construction phase and summarized based on whether the envisaged project impact area will result in positive or negative impacts. These are summarized as shown in Table 6.5.

### Table 6.5: Summary of Potential Impact Areas Triggered by Project

<table>
<thead>
<tr>
<th>S/No</th>
<th>Potential Impact Area</th>
<th>Does Project Affect Impact Area Negatively?</th>
<th>Aspects of Project that Trigger Impact (Positive or Negative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>1</td>
<td>Loss of means of livelihoods.</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2</td>
<td>Damage to building structures.</td>
<td>[ ]</td>
<td>[X]</td>
</tr>
<tr>
<td>3</td>
<td>Displacement of people.</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>4</td>
<td>Degradation of land</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>5</td>
<td>Loss of vegetation</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>S/No</td>
<td>Potential Impact Area</td>
<td>Does Project Affect Impact Area Negatively?</td>
<td>Aspects of Project that Trigger Impact (Positive or Negative)</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>6</td>
<td>Damage to archaeological and cultural resources</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>7</td>
<td>Enhancement of local Capacity</td>
<td>[ ]</td>
<td>[X]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Air quality</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2</td>
<td>Surface and ground water quality</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>3</td>
<td>Noise and vibrations</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>4</td>
<td>Public and Occupational Health and safety</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>5</td>
<td>Visual effects.</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>6</td>
<td>Traffic and transportation</td>
<td>[X]</td>
<td>[ ]</td>
</tr>
<tr>
<td>S/No</td>
<td>Potential Impact Area</td>
<td>Does Project Affect Impact Area Negatively?</td>
<td>Aspects of Project that Trigger Impact (Positive or Negative)</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------</td>
<td>--------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>7</td>
<td>Earth movements</td>
<td>[x]</td>
<td>[ ]</td>
</tr>
<tr>
<td>8</td>
<td>Solid and liquid wastes</td>
<td>[x]</td>
<td>[ ]</td>
</tr>
<tr>
<td>9</td>
<td>Climate change</td>
<td>[x]</td>
<td>[ ]</td>
</tr>
<tr>
<td>10</td>
<td>Off-site Resources</td>
<td>[x]</td>
<td>[ ]</td>
</tr>
<tr>
<td>11</td>
<td>Employment Generation</td>
<td>[ ]</td>
<td>[x]</td>
</tr>
<tr>
<td>12</td>
<td>Gender disparity</td>
<td>[ ]</td>
<td>[x]</td>
</tr>
</tbody>
</table>

**OPERATION & MAINTENANCE (POST CONSTRUCTION) PHASE**

<table>
<thead>
<tr>
<th>S/No</th>
<th>Potential Impact Area</th>
<th>Does Project Affect Impact Area Negatively?</th>
<th>Aspects of Project that Trigger Impact (Positive or Negative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Damage to erosion control structures post construction</td>
<td>[x]</td>
<td>[ ]</td>
</tr>
<tr>
<td>2</td>
<td>Erosion and flood control capacity</td>
<td>[ ]</td>
<td>[x]</td>
</tr>
<tr>
<td>3</td>
<td>Displacement of infrastructure (drainages, electric poles, etc).</td>
<td>[ ]</td>
<td>[x]</td>
</tr>
<tr>
<td>4</td>
<td>Degraded site access roadways</td>
<td>[ ]</td>
<td>[x]</td>
</tr>
</tbody>
</table>
Table 6-6 shows the detailed analysis of the impact significance rating for each of the potential project impact areas.

Table 6-6: Impact Significance Rating

<table>
<thead>
<tr>
<th>S/No</th>
<th>Potential Impact Area</th>
<th>Consequence Rating</th>
<th>Probability Classification</th>
<th>Impact Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Loss of means of livelihood</td>
<td>High</td>
<td>Definite</td>
<td>High</td>
</tr>
<tr>
<td>2</td>
<td>Loss of physical assets</td>
<td>High</td>
<td>Definite</td>
<td>High</td>
</tr>
<tr>
<td>3</td>
<td>Displacement of persons</td>
<td>Low</td>
<td>Definite</td>
<td>Medium</td>
</tr>
<tr>
<td>4</td>
<td>Degradation of land</td>
<td>Medium</td>
<td>Improbable</td>
<td>Insignificant</td>
</tr>
<tr>
<td>5</td>
<td>Vegetation loss</td>
<td>Medium</td>
<td>Definite</td>
<td>Medium</td>
</tr>
<tr>
<td>7</td>
<td>Loss of archaeological and cultural resources</td>
<td>Low</td>
<td>Possible</td>
<td>Very Low</td>
</tr>
<tr>
<td><strong>CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Air Quality</td>
<td>Medium</td>
<td>Definite</td>
<td>Medium</td>
</tr>
<tr>
<td>2</td>
<td>Surface/ground Water</td>
<td>Medium</td>
<td>Definite</td>
<td>Medium</td>
</tr>
<tr>
<td>3</td>
<td>Noise and Vibrations</td>
<td>Medium</td>
<td>Definite</td>
<td>Medium</td>
</tr>
<tr>
<td>6</td>
<td>Stream ecological diversity</td>
<td>Very Low</td>
<td>Improbable</td>
<td>Insignificant</td>
</tr>
<tr>
<td>7</td>
<td>Safety and health</td>
<td>High</td>
<td>Probable</td>
<td>High</td>
</tr>
<tr>
<td>8</td>
<td>Visual Effects</td>
<td>Very Low</td>
<td>Improbable</td>
<td>Insignificant</td>
</tr>
<tr>
<td>9</td>
<td>Traffic and transportation</td>
<td>Very High</td>
<td>Definite</td>
<td>Very High</td>
</tr>
<tr>
<td>10</td>
<td>Earth movements</td>
<td>Very High</td>
<td>Possible</td>
<td>High</td>
</tr>
<tr>
<td>11</td>
<td>Solid wastes</td>
<td>Medium</td>
<td>Definite</td>
<td>Medium</td>
</tr>
<tr>
<td>S/No</td>
<td>Potential Impact Area</td>
<td>Consequence Rating</td>
<td>Probability Classification</td>
<td>Impact Significance</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------</td>
<td>--------------------</td>
<td>---------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>12</td>
<td>Liquid wastes</td>
<td>Medium</td>
<td>Definite</td>
<td>Medium</td>
</tr>
<tr>
<td>14</td>
<td>Climate change</td>
<td>High</td>
<td>Definite</td>
<td>High</td>
</tr>
<tr>
<td>6</td>
<td>Gender disparity</td>
<td>Medium</td>
<td>Possible</td>
<td>Low</td>
</tr>
<tr>
<td>15</td>
<td>Off-site Resources</td>
<td>High</td>
<td>Probable</td>
<td>High</td>
</tr>
</tbody>
</table>

### OPERATION & MAINTENANCE PHASE

<table>
<thead>
<tr>
<th>Operation and Maintenance Phase</th>
<th>Consequence Rating</th>
<th>Probability Classification</th>
<th>Impact Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Damage to erosion control structures</td>
<td>High</td>
<td>Possible</td>
</tr>
<tr>
<td>2</td>
<td>Site access roadways rehabilitation</td>
<td>Medium</td>
<td>Possible</td>
</tr>
<tr>
<td>3</td>
<td>Erosion &amp; flood control capacity</td>
<td>Medium</td>
<td>Improbable</td>
</tr>
<tr>
<td>4</td>
<td>Enhanced community leadership</td>
<td>Medium</td>
<td>Possible</td>
</tr>
<tr>
<td>5</td>
<td>Land use restrictions</td>
<td>High</td>
<td>Definite</td>
</tr>
</tbody>
</table>

### 6.5 Identified Social and Environmental Impacts

A combination of the outcome of Table 6.5 and Table 6-6 indicates that the following social and environmental impact categories will suffer medium to very high impact levels during the Pre-construction, Construction and Post-construction Phases of the project implementation: The Tables further indicate that the other environmental and social impact categories will suffer low to insignificant impact levels as a result of the project.

#### Pre-Construction Phase:
- Loss of means of livelihood
- Loss of physical assets
- Displacement of persons (temporary)
- Vegetation loss

#### Construction Phase:
- Dust and air quality
- Surface and ground water quality
- Noise and vibration
- Public/Occupational Health and Safety
- Traffic and Transport
- Earth movement (during construction and post construction phases)
- Solid wastes
- Liquid wastes
- Climate change
- Off-site Resources

#### Operation & Maintenance (Post Construction) Phase:
- Land use restriction
- Damage to erosion control structures post construction
CHAPTER 7: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

This Environmental and Social Management and Monitoring Plan (ESMMP) is necessary to achieve the health, safety, and environmental regulatory compliance objectives of the project. To this end, the Plan has focused on specific steps to be taken with respect to implementation of the mitigation measures and monitoring activities for the environmental and social impacts identified in Chapter 6. The plan highlights the specific mitigation measures that would be taken and the entities responsible for carrying out the mitigating measures. The ESMMP also contains a monitoring plan indicating the responsible parties, the frequency of monitoring, key indicators and the reporting format, and provides for necessary capacity building to facilitate the ESMP implementation. Cost estimates for implementation of the various measures, monitoring plan and capacity building are also given. The projected implementation budget will enable the ESMP to be an integral part of financing for the construction and maintenance works in the project.

7.1 Summary of Safeguard Measures for Implementation

Based on the environmental and social impact categories identified in Chapter 6 (see Section 6.5), the ESMP implementation will address measures that cover the following impacts during the pre-construction, construction and the post construction (operation and maintenance) phases of the project implementation:

Social Impacts:
- Loss of means of livelihood
- Loss of physical assets
- Displacement of persons (temporary)
- Land use restriction

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

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

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

The above environmental and social impact categories and the associated mitigation measures for the different phases of the project implementation are shown in Table 7.1.
### 7.2 Environmental and Social Impact Mitigation Measures

The environmental and social impacts mitigation measures to address the identified impact categories for this project are presented in Table 7.1. These mitigation measures will be implemented by the Contractor who shall be solely responsible through the course of the project and shall be contractually required to develop all the necessary management plans associated with the mitigation of each impact area. The monitoring aspects of the project implementation shall be carried out by other identified Agencies and organizations including the SPMU-ESO, SMEnv., SMoW, SMLS, Community leaders, Site Committees, NGOs/CBOs, etc in accordance with the provisions and requirements of this ESMP.

**Table 7.1: Summary of Impact Mitigation Measures**

<table>
<thead>
<tr>
<th>S/No</th>
<th>E&amp;S Impact Categories</th>
<th>Source of Impacts</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE-CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Impacts on Community and PAP Management (Loss of physical assets; Loss of means of livelihood; Displacement of persons (temporary))</td>
<td>Possible damage to building structures and other structural elements along the gully corridor; Permanent acquisition of land for gully setback to be used for gully wall stabilization; Temporary use of land for project staging areas, erection of workers’ camp and temporary offices. Croplands and economic trees along the gully setback may be destroyed during gully wall stabilization. Construction activities may affect persons with critical health conditions, including old persons, children and other vulnerable persons within project area may be temporarily relocated for construction phase. Possible disagreement over siting of staging areas and temporary facilities between community and contractor</td>
<td>Appropriate compensations shall be paid for structural damages; project acquired lands; temporary use of lands; destroyed crops and economic trees. Compensation to persons (PAPs) within project area who will need to be temporarily relocated prior to beginning of construction activities. Create awareness among community members and sensitize the people to all project activities Seek the consent of the landowner to erect the site office for the specified duration of the project; Identify the landowner through the Assembly member and/or traditional ruler of the community; Agree with the landowner to hand over the agreed structure to be erected to the landowner; and Agree on other measures to render the site safe and usable to the satisfaction of the landowner. A stand-alone Resettlement Action Plan has been prepared for the project addressing impacts on the community and the PAP management. The Contractor shall be required to implement the RAP in accordance with the provisions therein</td>
</tr>
<tr>
<td>2</td>
<td>Community Cultural Heritage</td>
<td>There may be shrines or other cultural relics in the vicinity of the gully corridor which could be impacted during construction activities.</td>
<td>Relocation of identified shrines/cultural relics; Compensation for any damaged cultural relic or for relocation issues. The Contractor shall be required to prepare and submit a Cultural Heritage Management Plan to the SPMU for approval and adoption for the contractor’s implementation</td>
</tr>
<tr>
<td>3</td>
<td>Public/Stakeholders Participation</td>
<td>Effective project implementation requires active involvement and cooperation of the project community.</td>
<td>Build capacities within community Incorporate community feedback into project implementation process Disseminate project study findings;</td>
</tr>
<tr>
<td>S/No</td>
<td>E&amp;S Impact Categories</td>
<td>Source of Impacts</td>
<td>Mitigation Measures</td>
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</table>
| 4    | Vegetation and Biomass Removal         | • Damage to the natural and planted vegetation on acquired gully setback lands during site clearance, areas for siting of temporary office and workers camp. | • Ensure that period of inaccessibility to land is as short as possible  
• Awareness campaigns and capacity building.  
• The Contractor shall be required to prepare and submit a Stakeholders’ Engagement Plan to the SPMU for approval and adoption for the contractor’s implementation  
• Mark out areas for clearance & where possible use manual method of vegetation clearing;  
• Undertake selective clearance by removing tall woody species leaving saplings for quick regeneration of vegetation;  
• Prevent colonization by invasive species-  
• Prevent damage to critical ecosystems and habitats  
• Prevent destruction of flora and fauna.  
• The Contractor shall be required to prepare and submit a Vegetation and Biomass Management Plan to the SPMU for approval and adoption for the contractor’s implementation |

**CONSTRUCTION PHASE**

| 5    | Dust and Air Quality Management       | • Air pollution is expected from dust and emissions from construction vehicles, plant and equipment. Dust is generated by excavation and earth moving operations and causes nuisance to residents and other sensitive receptors. Exhaust emissions occur from poor maintenance of plant and equipment or over revving of engines. | • Dust generation will be controlled mainly by the use of water, especially in the dry season.  
• Use of water tanker for purposes of water dousing to control dust emission.  
• Erection of speed control signals and ramps mounted in communities;  
• Covering of hauling trucks carrying sand and other aggregates;  
• Covering of heaped material e.g. sand will be covered;  
• Use of nose masks by all workers at road maintenance/works sites.  
• Surfaces of vegetation along the maintenance road will be monitored to verify the effectiveness of dust suppression method.  
• The Contractor shall be required to prepare and submit an Air Quality Management Plan to the SPMU for approval and adoption for the contractor’s implementation. |
| 6    | Water Resources, Erosion and Sedimentation Control Management | • Earthworks release suspended particles into watercourses, which can have temporary detrimental effects on water organisms. Spillages of fuel and other petroleum products cause contamination of the soil and water resources.  
• Excavation at the borrow pits may | • Location for heaping construction material (e.g. sand and other aggregates) not less than 50m from water bodies and drainage channels (i.e. a separation distance of 50m will be observed);  
• Site for fuelling of machinery and servicing of equipment will be located at a minimum distance of 100m from water bodies, wetlands and drainage channels;  
• Embankment erection around fuelling and |

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<tr>
<th>S/No</th>
<th>E&amp;S Impact Categories</th>
<th>Source of Impacts</th>
<th>Mitigation Measures</th>
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|      |                       | cause land degradation in the vicinity of the borrow pits; may cause soil erosion and siltation of nearby roads. | other liquid or spill-able storage sites in order to limit or contain such material from escape to potentially pollute water resources;  
- Side drains (where appropriate) will be provided with settling basins near water bodies to remove silt and debris from road surface and construction site run-off, before discharge to adjoining streams or rivers;  
- Adequate side drains provided to carry run-off into drainage channels to prevent erosion;  
- Culverts of suitable capacity constructed to contain and direct flow, especially at peak flow and run-off;  
- Road maintenance works to be carried out off peak rainy season;  
- Provision of toilets and urinal at locations not less than 50m away from water bodies; and  
- Adequate worker awareness on sanitation and measures to avoid water resource contamination.  
- The Contractor shall be required to prepare and submit a Water management Plan and an Erosion and Sedimentation Management Plan to the SPMU for approval and adoption for the contractor’s implementation. |
| 7    | Noise and Vibration Exposure Management | Noise will emanate from moving vehicles, excavators, generators, power tools (e.g. for vegetation clearing), and compressors during construction. Vibrations may come from soil compaction equipment and other vibroequipment to be used at the gully heads. | Equipment servicing plan will be prepared and strictly followed to ensure efficient machinery performance and optimum noise generation.  
- Stationary equipment shall be sited at safe distances from sensitive areas to minimize noise impacts  
- Workers operating noisy equipment will not be exposed continuously for more than 3 hours a day.  
- Workers will be provided with ear plugs.  
- Workers handling vibrating equipment or parts will be given pads to absorb the vibrations and will not be exposed continuously for longer than 3 hours a day.  
- Sanctions (ranging from a warning to dismissal) will be instituted by the contractor against workers who do not observe the use of appropriate PPEs |
| 8    | Occupational/Public Health and Safety Management | Construction operations pose hazards to people living or working near construction areas or employed to work on site. Excavations, construction traffic and stockpiled materials pose particular threats to children and livestock. Children may be inadvertently recruited to work on construction sites. | Health, safety and environmental training and awareness will be extended to community members and local residents;  
- Erection of warning signals and use of reflective tapes at approaches to excavations, heaped materials, stationary equipment, etc.  
- Posting of speed limits of 40km/hr at approaches to construction sites;  
- Safety meetings held twice a week and documented accordingly;  
- Inductions and awareness programmes held for all employees on occupational health and |
<table>
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<tr>
<th>S/No</th>
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<th>Source of Impacts</th>
<th>Mitigation Measures</th>
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</thead>
</table>
| 9    | HIV/AIDS and STIs Management | Construction workers camp give rise to health risks associated with poor sexual practices and prostitution. | • Provide quarterly HIV/AIDS and STIs awareness programmes for workers and nearby communities;  
• Health and HIV awareness team arranged from the State Health Ministry for the quarterly programmes;  
• Sponsored educational package put together by the team to be implemented to enlighten both workers and communities;  
• Training of peer educators within the work force and in communities by the team; and  
• The contractor to provide free condom supplies and encourage free discussions, counseling and testing. |
| 10   | Construction Operation and Slope Stabilization | Construction operations can pose earth movement hazards to people working near the construction areas due to unstable soil profiles from site excavations. | • Maximize local employment (including women) on construction works (this should be a contractual requirement to hire a percentage of local workforce including women)  
• Provide occupational health and safety awareness training and workshops,  
• Use of child labor shall be strictly prohibited  
• Monitor and maintain intervention work for continued stability and quality  
• Shortcomings in the control structures including the check dams (retention basins) along the gully corridor should be corrected before they develop into serious problems.  
• The Contractor shall be required to prepare and submit an Emergency Response and Incident Plan to the SPMU for approval and adoption for the contractor’s implementation |
| 11   | Traffic and Transportation Hazards | Traffic movements associated with site staff transportation, delivery of materials and the removal of waste during the construction is likely. | • A temporary structure to be constructed on one lane to allow for traffic flow while work is on-going on the other lane;  
• Traffic wardens to be posted at positions |
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<tr>
<td>10</td>
<td></td>
<td>Occasional movement of abnormal vehicular loads on local roads may result in temporary diversions.</td>
<td>100m from the construction points on either side of the road to ensure orderly traffic flow; • Actual working areas to be secured with barricades; • Adequate road warning signs to be posted at vantage points to warn and direct traffic; • Traffic and transport associated with project will adhere to existing roads or follow specified routes as established. • All measures shall be effectively monitored by Contractor to ensure their implementation. • The Contractor shall be required to prepare and submit a Traffic and Vehicle Management Plan to the SPMU for approval and adoption for the contractor’s implementation.</td>
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<tr>
<td>12</td>
<td>Waste Management (solid and liquid wastes)</td>
<td>• Proposed project will generate waste during construction including off specification materials such as cement, wood, plastic, paper and domestic waste from construction areas and worker camps. This could result in increased pressure on local waste dump facilities as well as potential for unauthorized disposal and littering if not properly managed.</td>
<td>• Waste bins to be provided for the disposal of waste generated; • Waste will be segregated into three at source - organic (food residues), recyclables (woods, metals) and non-recyclables (plastic and glass wastes); • Organic waste to be composted near the site office to enrich the soil, while plastics and glass are taken to the district dump-sites; • Topsoil removed from the right of way for maintenance work to be spread on the land to avoid disrupting drainage network; and • Toilets and urinals to be sited at least 100m from any stream or drainage channel and decommissioned at the end of project. • The Contractor shall be required to prepare and submit a Waste Management Plan to the SPMU for approval and adoption for the contractor’s implementation.</td>
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**OPERATIONS & MAINTENANCE PHASE (POST CONSTRUCTION)**

<p>| 13   | Land use restriction | Use of the acquired land associated with gully setback will be altered and restricted to limited community uses. Structures may never be erected on this portion of land but economic trees could be planted. | • Create awareness among community members; • Build capacities within community; • Incorporate community feedback mechanism into process • Ensure periodic monitoring of restricted areas • Continuous maintenance of erosion control structures including concrete channels and check dams, and bio-remediated areas for continued effectiveness. |
| 14   | Closure of temporary office, staging areas and decommissioning of project | Damage to land forms and vegetation                                                                                                                   | • Ensure that agreements with the community and landowners on post construction hand-over are kept. • Enforce agreed measures to render the site safe and usable post construction to the |</p>
<table>
<thead>
<tr>
<th>S/No.</th>
<th>E&amp;S Impact Categories</th>
<th>Source of Impacts</th>
<th>Mitigation Measures</th>
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</thead>
<tbody>
<tr>
<td>15</td>
<td>Erosion control system failure management</td>
<td>• Additionally check dams that are not properly constructed may suffer damage that could reduce the structural integrity of the erosion control structures during post-construction phase.</td>
<td>• Any treated gullies should be checked regularly and the healing process monitored closely. Structures built in the channelization for stabilization purpose should be observed for damage especially during rainy seasons and after heavy storms. Any damage observed should be repaired immediately to avoid further damage and the eventual collapse.</td>
</tr>
</tbody>
</table>

### 7.2 Summary of Institutional Responsibilities

The key actors as well as the roles and responsibilities of the various institutions with associated costs in the ESMP implementation are as shown in Table 7.2.

**Table 7.2: Institutional Responsibilities**

<table>
<thead>
<tr>
<th>Institutional Category</th>
<th>Project Implementation Phase</th>
<th>Roles &amp; Responsibilities</th>
</tr>
</thead>
</table>
| Anambra State Ministry of Environment (SMENV) | All Phases (Preconstruction, Construction and Post Construction) | • Lead role to ensure adherence to this ESMP and applicable standards, environmental and social liability investigations, Monitoring and evaluation process and criteria  
• Executing agency with overall responsibility for NEWMAP implementation in the State.  
• Ensure that sufficient funds are made available to the SPMU  
• Ensure that SPMU, regardless of financing source, complies with the provisions of the ESMP and WB safeguard policy.  
• Ensure that SPMU complies with ANSG environmental policies and regulations.  
• Ensure that the SPMU retain dedicated Technical Support for the project duration including safeguard specialists to oversee ESMP implementation.  
• Ensure that SPMU monitor environmental protection and mitigation measures in the ESMP and those activities that are embodied in the detailed designs  
• Ensure that SPMU has secured environmental clearances certification from FMENV and WB prior to award and/or commencement of civil works contracts  
• Ensure that SPMU establishes and implements an environmental grievance redress mechanism, as described in this ESMP, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the Project's environmental performance  
• Ensure that the bidding and contract documents include the ESMP  
• Ensure that SPMU submits semi-annual monitoring reports on ESMP implementation to WB and FPMU. |
| SPMU (Safeguard Officers, Project Engineer) | Pre-Construction Phase | • Ensure that bidding and contract documents include the ESMP  
• Review and approve all required management plans necessary for the pre-construction, construction and post construction phases of the project;  
• Undertake monitoring of the implementation of the ESMP (mitigation and monitoring measures) with support from the appointed Focal NGO, the Site Committee, the Contractor and other stakeholders.  
• Report to WB and FPMU on all aspects of social and environmental management and monitoring at required frequency  
• Submit monthly and quarterly or semi-annual monitoring reports on ESMP implementation to FPMU and WB  
• Participate in grievance redress mechanism, as described in the this document, to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the sub-project's environmental performance  
• Based on the results of ESMP monitoring, identify environmental corrective actions and prepare a corrective action plan |
<table>
<thead>
<tr>
<th>Institutional Category</th>
<th>Project Implementation Phase</th>
<th>Roles &amp; Responsibilities</th>
</tr>
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</table>
|                        |                             | • Maintain and manage all funds effectively and efficiently for the project;  
|                        |                             | • Coordinate all policies, programmes and actions associated with the intervention construction works;  
|                        |                             | • Ensure the smooth and efficient implementation of the preconstruction phase of project’s various programmes;  
|                        |                             | • Have custody of a copy of this ESMP and disseminate information contained therein accordingly.  
| Construction Phase     |                             | • Cooperate with the Steering/Technical Committees to provide guidance to the technical aspects of all project activities;  
|                        |                             | • Provide oversight of contractors work plan and E&S implementation schedule;  
|                        |                             | • Conduct weekly or routine site inspection and monitor implementation of E&S safeguards;  
|                        |                             | • Receive and review reports from the contractor;  
|                        |                             | • Prepare and submit weekly/monthly and subsequent quarterly and annual reports to the SPMU Project Coordinator, FPMU and the WB.  
| Post Construction Phase|                             | • Ensure proper closures of all contractor’s temporary facilities;  
|                        |                             | • Ensure that the terms of Agreement between the Contractor and the community and land owners are fulfilled.  
| FPMU                   | All Phases (Pre-construction, Construction and Post Construction) | • Project assessment and monitoring of this ESMP implementation and the construction activities.  
|                        |                             | • Assessment of specific and general project implementation;  
|                        |                             | • Recommend additional measures for strengthening the management framework and implementation performance.  
| World Bank             | All Phases (Pre-construction, Construction and Post Construction) | • Provide necessary preconstruction and construction support to the SPMU  
|                        | Pre-Construction and Construction Phases | • Site assessment and monitoring of construction works and engineering activities;  
| State Ministry of Works| Pre-Construction Phases     | • Compliance overseer at State Level, on matters of land acquisition, compensation and other resettlement issues  
| State Ministry of Lands & Survey (SMLS) | Pre-Construction Phase | • Intervene in areas under their jurisdiction as and when project demands  
| Other MDAs             | Pre-Construction and Construction Phases | • Recruit qualified environmental safeguard specialist to ensure compliance with environmental statutory and contractual obligations and proper implementation of the ESMP  
|                        |                             | • Implement all the provisions of the ESMP in coordination with the SPMU and other relevant authorities  
|                        |                             | • Develop and submit for SPMU and FPMU approvals specific management plans as provided in the ESMP.  
|                        |                             | • Provide sufficient funding and human resources for proper and timely implementation of required mitigation measures in the ESMP  
|                        |                             | • Implement additional environmental mitigation measures for unexpected impacts, as necessary  
|                        |                             | • Develop a work plan which incorporates schedule for E&S safeguards implementation;  
|                        |                             | • Submit the work plan and schedule of E&S safeguard implementation to the SPMU;  
|                        |                             | • Train/create awareness of all personnel/workers on relevant E&S safeguard measures and their obligations;  
|                        |                             | • Ensure land disturbance activities are conducted in accordance with relevant legislation and the ESMP;  
|                        |                             | • Communicate content of ESMP to all employees and contractor agents;  
|                        |                             | • Provide oversight function during mobilization to ensure adherence to good practice and the ESMP.  
<p>| Contractor (Site Manager, Site Engineers/ Supervisors) | Pre-Construction Phase |</p>
<table>
<thead>
<tr>
<th>Institutional Category</th>
<th>Project Implementation Phase</th>
<th>Roles &amp; Responsibilities</th>
</tr>
</thead>
</table>
| Construction Phase     |                             | • Implement all E&S safeguards and other mitigation measures as planned;  
                          |                             | • Submit monthly and quarterly implementation reports on E&S safeguards to SPMU;  
                          |                             | • Comply with BEME specification in procurement of material and construction, and adherence to the ESMP and good construction practices;  
                          |                             | • Ensure land disturbance activities are conducted in accordance with relevant legislation and the ESMP;  
                          |                             | • Provide adequate onsite waste collection bins, ensure proper disposal, not to litter and not to create environmental nuisance;  
                          |                             | • Provide oversight function during construction to ensure adherence to good practice and the ESMP  |
| Post Construction Phase|                             | • Provide oversight function during decommissioning to ensure adherence to good practice and the ESMP  |
| Site Committee         | All Phases                  | • Monitor and ensure compliance to ESMP provisions as well as contractor implementation quality  |
|                        | (Preconstruction, Construction and Post Construction) | |
| Local government       | All Phases                  | • Provide support in monitoring project execution within their domains to ensure compliance with this ESMP and other relevant requirements  |
|                        | (Preconstruction, Construction and Post Construction) | |
| Local Community        | All Phases                  | • Promote environmental awareness  
                          | (Preconstruction, Construction and Post Construction) | • Assist and liaise with other stakeholders to ensure proper siting and provision of approval for such sites  
                          |                             | • Support with provision of necessary infrastructures and engage/encourage carrying out comprehensive and practical awareness campaign for the proposed projects, amongst the various relevant grass roots interest groups.  |
| CDOs                   | All Phases                  | • Ensure community participation by mobilizing, sensitizing community members;  |
|                        | (Preconstruction, Construction and Post Construction) | |
| Focal NGO              | All Phases                  | • Assist to ensure effective response actions, to evolve and devise sustainable environmental strategies and rehabilitation techniques, organize, coordinate and ensure safe use of volunteers in a response action, & provide wide support in management planning, institutional/governance issues and other livelihood related matter, awareness campaigns  |
|                        | (Preconstruction, Construction and Post Construction) | |
| General Public         | All Phases                  | • Identify issues that could derail the project  
                          | (Preconstruction, Construction and Post Construction) | • Support project impactsmitigation measures as well as awareness campaigns  |

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

### 7.3 Summary of Required Environmental and Social Management Plans

The construction Contractor for the project shall be required to meet the specific E&S safeguard obligations as provided in this ESMP which shall be incorporated into the contract specifications for the project as provided in Annex 3. This is in addition to other contractual provisions for the project. The required specific E&S management plans include the following:
7.3.1 Resettlement Action Plan
The WB requires the preparation, in advance of the project implementation, of a Resettlement Action Plan/Abbreviated Resettlement Action Plan (RAP/ARAP) where project impacts are known to displace persons within the project community or affect their social and economic well-being. The RAP/ARAP seeks to specifically identify, evaluate and document the set of mitigation, monitoring and institutional actions to be undertaken for the project to eliminate identified adverse community or individual social and livelihood impacts before commencing the remedial construction and rehabilitation works.

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

7.3.2 Public/Stakeholder Consultation Plan
A key element of sustaining stakeholders’ support in the project is to sustain the consultations and communication process that has already been effectively established in the course of the preparation of this ESMP. Stakeholders’ engagement needs to be enhanced and managed through a well-defined strategy. Table 7.3 provides a summary of the stakeholder consultation activities to be considered in the engagement plan. Public sensitization and consultation will continue throughout the project execution.

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

**Table 7.3: Summary of Stakeholder Consultation Plan**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Stakeholders / Community</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction / Prior to Project Commencement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project briefings, site tours, personal meetings, community sessions, consultation meetings</td>
<td>State Government, Local Government, Site committee, Residents of affected areas/ Community and interest groups</td>
<td>As required, subject to project updates and feedback from the community</td>
</tr>
<tr>
<td>Development/Dissemination of feedback and complaints mechanism and communications procedures</td>
<td>State Government, Local Government, Site committee, Residents of affected areas/ Community and interest groups</td>
<td>As required, subject to any updates on the project</td>
</tr>
<tr>
<td>Briefings, Site Tours and Community Sessions for flood control and intervention works</td>
<td>Government authorities, Local communities, Key/ relevant stakeholders</td>
<td>Prior to Work Plan approval</td>
</tr>
<tr>
<td><strong>Construction and Operations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responding to issues and inquiries as per feedback and complaints mechanism</td>
<td>All stakeholders</td>
<td>Ongoing / as required</td>
</tr>
<tr>
<td>Monthly/Quarterly reporting on status of project</td>
<td>All stakeholders</td>
<td>Monthly/quarterly/as required</td>
</tr>
<tr>
<td>Briefings, site tours and community sessions for flood control and intervention works closure plan</td>
<td>Government authorities, Local communities, Key/ relevant stakeholders</td>
<td>Prior to project completion</td>
</tr>
<tr>
<td><strong>Prior to Project Closeout/Post-Construction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project briefings, site tours, personal meetings, community sessions, consultation meetings with stakeholders</td>
<td>All stakeholders, State Govt, Local Govt, Site committee, Affected residents/ Community/ interest groups</td>
<td>As required, subject to approvals and feedback from the community</td>
</tr>
</tbody>
</table>
7.3.3 Cultural Heritage Management Plan

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

Specifically, the CHMP will provide details regarding the implementation of avoidance, mitigation and management measures for impacts related to the possibility of archaeological finds or any existing cultural heritage of significance. The scope of the CHMP will cover pre-construction, construction and post construction/closure phases of the Project.

7.3.4 Occupational/Public Health, Safety and Security Management Plan

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

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

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

- Possible pressure and/or additional demand on community health services associated with the influx of workers from outside the project area;
- Possible pressure and/or additional demand on utility services including water and wastewater system associated with the influx of workers from outside the project area;
- Possible pressure and/or additional demand for social services as a result of an increased family stress and violence;
- Possible change in community wellness as a result of alcohol, and substance abuse associated with the influx of workers from outside the project area;
- Possible Change in Community Health as a result of sudden spread of communicable and non communicable diseases including sexually transmitted diseases (STDs) associated with the influx of workers from outside the project area;
- Possible pressure on traffic and transportation network associated with construction and operations activities; and
- Possible change in water and air quality associated with construction and operations activities.
In addition to the potential negative impacts which would require mitigation, the rehabilitation of the erosion gully also has the potential to improve community health safety and security through the following means:

- Improved access to medical facilities for communities due to the gully rehabilitation and the restoration of connecting roadways;
- Improved healthcare infrastructure;
- Improved workforce health awareness;
- Improved standards of living of direct and indirect employees due to better income in the employees households; and
- Improved standards of living of vulnerable groups and their households, including support to the elderly within the respective households.

### 7.3.5 Vegetation Clearing and Biomass Management Plan

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

The specific objectives of the Plan are to:

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

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

### 7.3.6 Air Quality Management Plan

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

### 7.3.7 Emergency Response and Incident Plan

The Contractor shall be required to prepare and submit for approval of SPMU and FPMU, a comprehensive Emergency Response and Incident Plan (ERIP). The Plan will describe the set of necessary actions to be taken in response to defined circumstances, across all hazards, and through the phases of mitigation, preparedness, response, and recovery during this project.
The Plan will provide necessary guidance for how to organize assets to respond to an incident (system description) and processes to manage the response through its successive stages (concept of operations). The Plan will document the combination of facilities, equipment, personnel, procedures, and communications existing within the Contractor’s organizational structure and designed to help in the management of resources during incident response.

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

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

### 7.3.8 Water Management Plan

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

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

### 7.3.9 Erosion and Sedimentation Management Plan

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

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

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

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

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

Key issues to consider for managing traffic at the construction workplace include:
• Keeping pedestrians and vehicles apart including on site and when vehicles enter and exit the workplace;
• Minimizing vehicle movements;
• Eliminating reversing vehicles or minimizing the related risks;
• Ensuring vehicles and pedestrians are visible to each other;
• Using traffic signs, and,
• Developing and implementing a traffic management plan.

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

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

The waste management plan should cover the following:

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

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

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

7.3.13 Institutional Capacity Strengthening Plan

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

The capacity building should include equipping individuals with the understanding, skills and access to information and training that enables them to perform effectively. Personnel of the erosion control intervention project need to understand the purpose of the ESMP and their expected roles during its implementation.

The target groups for the training will include:
- SPMU E&S Safeguard Officers and Project Engineers;
- Contractor’s personnel;
- Construction workers and site personnel; and,
- Select members from the project communities.

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

**7.3.13.2 Capacity Building Cost**
The capacity building plan for the ESMP with the associated cost implications is shown in Table 7.3 below. To enhance the respective roles and collaboration of the relevant stakeholders, the broad areas for capacity building and effective ESMP implementation are identified and shown in Table 7.3.

**Table 7.3: Summary of Institutional Capacity and Training Needs with Costs**

<table>
<thead>
<tr>
<th>Programme Description</th>
<th>Participants</th>
<th>Form of Training</th>
<th>Duration</th>
<th>Training Agency</th>
<th>Estimated Cost In (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding the Environment:</td>
<td>Officials of SMEnv, SMOW, SMLS, SPMU, Contractor, Community Leaders, Focal NGO, CBOs &amp; Other Relevant Groups</td>
<td>Workshop</td>
<td>One Day</td>
<td>External Agency for capacity building or Environmental &amp; Social Specialist</td>
<td>450,000.00</td>
</tr>
<tr>
<td>Scope of Ndiagu Ikenga Ogidi Intervention Project:</td>
<td>Contractor, Safeguard Officers, SMENV &amp; relevant MDAs, Community Leaders, CDOs, &amp; NGOs</td>
<td>Workshop</td>
<td>One Day</td>
<td>External Agency for capacity building or Environmental &amp; Social Specialist</td>
<td>450,000.00</td>
</tr>
<tr>
<td>Project Implementation:</td>
<td>SPMU Engineer, Safeguard Officers, Contractors, SMEnv</td>
<td>Lecture and Site Visit</td>
<td>One Day</td>
<td>External Agency for capacity building or Environmental &amp; Social Specialist</td>
<td>450,000.00</td>
</tr>
<tr>
<td>Monitoring and Evaluation:</td>
<td>Contractor, Safeguard Officers, SMEnv &amp; relevant MDAs, Community Leaders, CDOs, &amp; Focal NGO</td>
<td>Workshop</td>
<td>Half Day</td>
<td>Environmental &amp; Social Specialists; External Agency engaged for capacity building</td>
<td>250,000.00</td>
</tr>
<tr>
<td>Watershed Protection and Management:</td>
<td>Watershed Committee, Community Leaders, LGA Staff, Support Professionals</td>
<td>Workshop</td>
<td>One Day</td>
<td>World Bank/External Agency Engaged for Capacity Building/Environmental &amp; Social Specialists</td>
<td>350,000.00</td>
</tr>
</tbody>
</table>

**TOTALS**                                                   |                                                                              |                  |          |                                                                               | **N1,950,000.00**      |
7.5. Grievance Redress Mechanism (GRM)

A Grievance Redress Mechanism (GRM) is necessary in order to prevent and address community issues, reduce exposure to risks and also provide the platform for the optimization of environmental and social benefits of the project. It is recommended that for dispute resolution, the Project Complaints Committee (PCC) be established for the resolution of disputes arising from the implementation of the Ndiagu Ikenga gully erosion control project. The PCC shall be responsible for providing support to the entire project and receive/resolve disputes associated with any aspects of the project.

The community traditional leadership structure currently constitutes the nucleus of traditional resolution of disputes among community members. It is therefore wise and advisable that this structure be necessarily retained in the event of any grievance or dispute relating to the ESMP implementation. Inputs from the leadership may also be limited to providing recommendations as to how a specific dispute is to be addressed. Aside from the traditional structure, Figure 7-1 provides a secondary mechanism for grievance resolution using the Project Complaints Committee (PCC). The proposed GRM will also help to achieve the following:

- To serve as the open channel for effective communication together with the identification of emerging environmental and social concerns due to the project;
- To prevent and mitigate any adverse environmental and social impacts as a result of any phase of the project;
- Promote harmonious relationship and respect among stakeholders; and,
- Ensure community acceptance of the project.

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

![Grievance Redress Procedure](image)

7.6 ESMP Implementation Schedule

The implementation and management of the ESMP schedule is designed to facilitate any necessary resettlement issues associated with the RAP. The ESMP activities also need to be implemented within an agreed timeframe and budget. Appropriate timing should be adhered to in order to avoid project delays especially if the situation arises where site clearing is to begin before the resettlement end date.
Execution of the ESMP activities is recommended in accordance with the schedule shown in Table 7-5. The period of the first week will be used to develop and set up all structures necessary to support all aspects of the programmes.

### Table 7-5: Proposed ESMP Implementation Schedule

<table>
<thead>
<tr>
<th>DESCRIPTION OF ACTIVITY</th>
<th>DURATION IN MONTHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Month</td>
</tr>
<tr>
<td>Disclosure of ESMP Report</td>
<td></td>
</tr>
<tr>
<td>Formation of Project Complaint Committee (PCC)</td>
<td></td>
</tr>
<tr>
<td>Review and Approval of Contractor’s ESMP and Health, &amp; Safety Plan</td>
<td></td>
</tr>
<tr>
<td>Hold Stakeholders Meetings and Consultations</td>
<td></td>
</tr>
<tr>
<td>Execute Capacity Building Programmes</td>
<td></td>
</tr>
<tr>
<td>Implementation of Mitigation Measures</td>
<td></td>
</tr>
<tr>
<td>Supervision of ESMP Implementation</td>
<td></td>
</tr>
<tr>
<td>Monitoring &amp; Reporting on ESMP Implementation</td>
<td></td>
</tr>
<tr>
<td>Conduct Monitoring and Evaluation</td>
<td></td>
</tr>
<tr>
<td>Programme Administration</td>
<td></td>
</tr>
</tbody>
</table>

7.7 Project Performance and ESMP Monitoring Plan

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

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

7.7.1 Project Monitoring and Reporting

Project performance monitoring has the overall objective of achieving the desired outcomes through reporting of as measurable events or parameters or aspects that can be monitored and verified. The following monitoring and reporting sequence is proposed for the ESMP implementation
The Contractor shall submit to SPMU a monthly monitoring report and the ESMP accomplishments during project implementation,

- The SPMU shall prepare monthly ESMP monitoring and accomplishment reports to be submitted to FPMU and the WB.

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

7.7.2 Post Construction Monitoring

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

A summary of the impacts mitigation and monitoring plan for the preconstruction, construction, and post-construction phases of the project with the associated monitoring frequencies, responsible parties and projected costs are presented in Table 7-6.
### Table 7-6 Summary of E&S Impact Mitigation and Monitoring Plan

<table>
<thead>
<tr>
<th>E&amp;S Impact Category</th>
<th>Source of Impact</th>
<th>Objective</th>
<th>Impact Mitigation</th>
<th>Performance &amp; Impact Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Proposed Mitigation Measures</td>
<td>Responsible to Implement</td>
</tr>
<tr>
<td><strong>PRE-CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
<td>Environment and social management measures as spelled out in this document (details are as enumerated below)</td>
<td>SMEnv &amp; SPMU</td>
</tr>
<tr>
<td>Safeguard Instrument (ESMP)</td>
<td>Ensure that identified E&amp;S impacts are addressed and mitigation measures are executed properly</td>
<td>SMEnv &amp; SPMU</td>
<td>To be included in the total RAP cost</td>
<td>No. of public complaints recorded; Level of awareness and understanding of community members; No of community members that attend trainings; Level of satisfaction among PAPs; No of women gainfully employed by project; No of other businesses induced by project</td>
</tr>
<tr>
<td>Impacts on Community and PAP Management (Loss of physical assets; Loss of means of livelihood; Displacement of persons (temporary))</td>
<td>All those impact sources that are indicated in Table 7.1, Item 1, Column 3</td>
<td>To restore persons affected by the project to a condition equivalent to or better than the pre-project situation</td>
<td>A Resettlement Action Plan (RAP) has been prepared as a stand-alone document; All those impact mitigation measures that are indicated in Table 7.1, Item 1, Column 4</td>
<td>SMEnv &amp; SPMU</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>E&amp;S Impact Category</th>
<th>Source of Impact</th>
<th>Objective</th>
<th>Impact Mitigation</th>
<th>Performance &amp; Impact Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Cultural Heritage</td>
<td>All those impact sources that are indicated in Table 7.1, Item 2, Column 3</td>
<td>Ensure that community’s historical, archeological, and cultural treasures are not destroyed during project execution</td>
<td>All those impact mitigation measures that are indicated in Table 7.1, Item 2; Column 4 Develop and submit for SPMU approval a Cultural Heritage Management Plan; Possibility of chance archeological findings</td>
<td>SMEnv &amp; SPMU</td>
</tr>
<tr>
<td>Public/Stakeholders Participation</td>
<td>All those impact sources that are indicated in Table 7.1, Item 3, Column 3</td>
<td>Ensure effective community and stakeholder involvement in the project decision process</td>
<td>Develop and submit for SPMU approval a Stakeholders Engagement Plan; All those impact mitigation measures that are indicated in Table 7.1, Item 3, Column 4</td>
<td>Contractor</td>
</tr>
<tr>
<td>Vegetation and Biomass Removal Management</td>
<td>All those impact sources that are indicated in Table 7.1, Item 4, Column 3</td>
<td>Prevent damage to critical ecosystems and habitats and destruction of flora and fauna</td>
<td>Develop and submit for SPMU approval a Vegetation and Biomass Removal Management Plan; All those impact mitigation measures that are indicated in Table 7.1, Item 4, Column 4</td>
<td>Contractor</td>
</tr>
</tbody>
</table>

CONSTRUCTION PHASE
<table>
<thead>
<tr>
<th>E&amp;S Impact Category</th>
<th>Source of Impact</th>
<th>Objective</th>
<th>Impact Mitigation</th>
<th>Performance &amp; Impact Monitoring</th>
<th>Cost (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dust and Air Quality Management</td>
<td>All those impact sources that are indicated in Table 7.1, Item 5, Column 3</td>
<td>To minimize emission of hydrocarbons and generation of dust at the work site and access roads</td>
<td>Develop and submit for SPMU approval an Air Quality Management Plan;</td>
<td>To be included in the overall project construction cost</td>
<td>350,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All those impact mitigation measures that are indicated in Table 7.1, Item 5, Column 4</td>
<td>Contractor</td>
<td>• No. of public complaints;</td>
<td>Two daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contractor</td>
<td>• Level of particulates;</td>
<td>Continuous as necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Level of air pollutants;</td>
<td>Continuous as necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Vegetation surfaces free of dusts;</td>
<td>Two month intervals or as required</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Ambient air monitoring using standard methods</td>
<td></td>
</tr>
<tr>
<td>Water Resources, Erosion &amp; Sedimentation</td>
<td>All those impact sources that are indicated in Table 7.1, Item 6, Column 3</td>
<td>Ensure that project area is adequately protected from development of erosion and sedimentation</td>
<td>Develop and submit for SPMU approval a Water Management Plan and an Erosion and</td>
<td>To be included in the overall project construction cost</td>
<td>350,000.00</td>
</tr>
<tr>
<td>Control Management</td>
<td></td>
<td>hazards</td>
<td>Sedimentation Management Plan;</td>
<td>• No of complaints from community members;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>All those impact mitigation measures that are indicated in Table 7.1, Item 6,</td>
<td>• Absence of sediment build up;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Column 4</td>
<td>• Absence of flooding in construction areas;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• No of spills &amp; repairs made;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Use of standard monitoring methods</td>
<td>Three month intervals</td>
</tr>
<tr>
<td>Noise and Vibration Exposure Exposure</td>
<td>All those impact sources that are indicated in Table 7.1, Item 7, Column 3</td>
<td>Ensure adequate protection of the workforce and community members from effects of noise and</td>
<td>• All those impact mitigation measures that are indicated in Table 7.1, Item 7,</td>
<td>To be included in the overall project construction cost</td>
<td>250,000.00</td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td>vibrations</td>
<td>Column 4</td>
<td>• No of complaints from community members;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Absence of structural failures;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Absence of debris accumulation;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• No of debris removals &amp; repairs made;</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Sensor measurements around workplace</td>
<td>Daily</td>
</tr>
<tr>
<td>E&amp;S Impact Category</td>
<td>Source of Impact</td>
<td>Objective</td>
<td>Impact Mitigation</td>
<td>Performance &amp; Impact Monitoring</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------------</td>
<td>---------------------------------</td>
<td></td>
</tr>
<tr>
<td>Occupational &amp; Public Health and Safety Management</td>
<td>All those impact sources that are indicated in Table 7.1, Item 8, Column 3</td>
<td>Ensure that identified occupational &amp; public health, safety and security impacts are addressed and mitigation measures are executed properly</td>
<td>Develop and submit for SPMU approval an Occupational and Public Health, Safety and Security Management Plan; All those impact mitigation measures that are indicated in Table 7.1, Item 8, Column 4</td>
<td>Contractor to implement To be included in the overall project construction cost • No. of sanitary facilities provided at start of project; • Adherence to stipulated speed limit • Record of incidents; • Use of PPEs by workers; • Records of appropriate workers’ training; • Record of reinstatement plan for burrow pits; • Record of health and safety meetings • Record of first aid exercises • Hazards assessment Monitoring Indicator Monitoring Frequency Responsible to Monitor Monitoring Cost (N) Contractor Contractor; SPMU-ESO; Focal NGO; SMOH; Community Leaders; Site Committee; 350,000.00</td>
<td></td>
</tr>
<tr>
<td>HIV/AIDS and STIs Management</td>
<td>All those impact sources that are indicated in Table 7.1, Item 9, Column 3</td>
<td>Ensure effective HIV/AIDS and STI awareness among community members</td>
<td>• All those impact mitigation measures that are indicated in Table 7.1, Item 9, Column 4</td>
<td>SPMU Safeguard Officers; MOH; NGO; Contractor- Health &amp; Safety Personnel To be included in the overall project construction cost • No. of HIV/AIDS workshops held; • Level of awareness of workers &amp; others; • Records of peer educators’ training; • Records of condoms distributed Monitoring Indicator Monitoring Frequency Responsible to Monitor Monitoring Cost (N) Quarterly Continuous Bi-monthly Focal NGO; SPMU-ESO; SMOH; Community Leaders; Site Committee; Contractor 350,000.00</td>
<td></td>
</tr>
<tr>
<td>E&amp;S Impact Category</td>
<td>Source of Impact</td>
<td>Objective</td>
<td>Impact Mitigation</td>
<td>Performance &amp; Impact Monitoring</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>------------------</td>
<td>---------------------------------</td>
<td></td>
</tr>
<tr>
<td>Construction Operations &amp; Slope Stabilization</td>
<td>All those impact sources that are indicated in Table 7.1, Item 10, Column 3</td>
<td>To ensure that construction activities are carried out without risks to health and safety of the workforce and the community</td>
<td>Develop and submit for SPMU approval an Emergency Response and Incident Plan; All those impact mitigation measures that are indicated in Table 7.1, Item 10, Column 4</td>
<td>Contractor</td>
<td>To be included in the overall project construction cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Contractor</td>
<td>Monitoring Indicator:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• No. of accidents/incidents; • No. of visible warning signs; • Level of public awareness; • Record of safety meetings held;</td>
</tr>
<tr>
<td>Traffic and Transportation Hazards</td>
<td>All those impact sources that are indicated in Table 7.1, Item 11, Column 3</td>
<td>To ensure that traffic within the project area is managed so as to assure the workplace and community are without risks to health and safety</td>
<td>Develop and submit for SPMU approval a Traffic and Vehicle Management Plan; All those impact mitigation measures that are indicated in Table 7.1, Item 11, Column 4</td>
<td>Contractor</td>
<td>To be included in the overall project construction cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Contractor</td>
<td>Monitoring Indicator:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Effective traffic flow with vehicular &amp; worker safety; • Appropriate positioning of road signs, reflectors, speed ramps, control limits, traffic wardens; • Records of accidents and near misses</td>
</tr>
<tr>
<td>Waste Management (Solid and Liquid Wastes)</td>
<td>All those impact sources that are indicated in Table 7.1, Item 12, Column 3</td>
<td>To protect the community and the workforce from health hazards of indiscriminate waste disposal by proper collection and disposal of liquid and solid wastes generated on-site during the project.</td>
<td>Develop and submit for SPMU approval a Waste Management Plan; All those impact mitigation measures that are indicated in Table 7.1, Item 12, Column 4,</td>
<td>Contractor</td>
<td>To be included in the overall project construction cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Contractor</td>
<td>Monitoring Indicator:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Waste segregation and littering; • Emptying of bins at waste dump sites; • Waste composting; • Indiscriminate defecation; • Toilets decommissioning</td>
</tr>
<tr>
<td>E&amp;S Impact Category</td>
<td>Source of Impact</td>
<td>Objective</td>
<td>Impact Mitigation</td>
<td>Performance &amp; Impact Monitoring</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>-------------------</td>
<td>---------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Proposed Mitigation Measures</td>
<td>Responsible to Implement</td>
<td>Mitigation Cost (N)</td>
</tr>
<tr>
<td>OPERATION AND MAINTENANCE (POST CONSTRUCTION) PHASE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land Use Restriction</td>
<td>All those impact sources that are indicated in Table 7.1, Item 13, Column 3</td>
<td>To ensure that required project areas under restricted use remains as designated</td>
<td>All those impact mitigation measures that are indicated in Table 7.1, Item 13, Column 4</td>
<td>SPMU; SMEnv; Community Leaders; Site Committee</td>
<td>Sustained treated gully healing process</td>
</tr>
<tr>
<td>Closure of Temporary Office, Staging Areas and Decommissioning of Project</td>
<td>All those impact sources that are indicated in Table 7.1, Item 14, Column 3</td>
<td>Ensure that agreements with the community and landowners on post construction hand-over are kept.</td>
<td>All those impact mitigation measures that are indicated in Table 7.1, Item 14, Column 4</td>
<td>Contractor</td>
<td>To be included in the overall project construction cost</td>
</tr>
<tr>
<td>System Control Failures Management</td>
<td>All those impact sources that are indicated in Table 7.1, Item 15, Column 3</td>
<td>Ensure sustainable maintenance of erosion prevention and control structures</td>
<td>All those impact mitigation measures that are indicated in Table 7.1, Item 15, Column 4</td>
<td>SPMU; Community Leaders; Site Committee</td>
<td>Sustained gully healing process</td>
</tr>
</tbody>
</table>
### 7.8 ESMP Management Plan

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

#### Table 7-7: Summary of ESMP Management Costs

<table>
<thead>
<tr>
<th>Institutional Category</th>
<th>Roles &amp; Responsibilities</th>
<th>Associated Management Costs (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre-Construction</td>
</tr>
<tr>
<td>Anambra State Ministry of Environment (SMEnv)</td>
<td>Overall oversight, assessment and monitoring of specific and general project implementation;</td>
<td>200,000.00</td>
</tr>
<tr>
<td>SPMU (Safeguard Officers, Proj. Engineer)</td>
<td>Oversight of all specific activities associated with the ESMP implementation</td>
<td>500,000.00</td>
</tr>
<tr>
<td>FPMU</td>
<td>Project assessment and monitoring of this ESMP implementation and the construction activities.</td>
<td>N/A</td>
</tr>
<tr>
<td>World Bank</td>
<td>Overall assessment and monitoring of specific and general project implementation;</td>
<td>N/A</td>
</tr>
<tr>
<td>State Ministry of Works</td>
<td>Provide necessary preconstruction and construction support to the SPMU</td>
<td>100,000.00</td>
</tr>
<tr>
<td>State Ministry of Lands &amp; Survey (SMLS)</td>
<td>Provide necessary support to the SPMU on matters of land acquisition, compensation and other resettlement issues</td>
<td>100,000.00</td>
</tr>
<tr>
<td>Other MDAs</td>
<td>Intervene in areas under their jurisdiction as and when project demands</td>
<td>50,000.00</td>
</tr>
<tr>
<td>Contractor (Site Engineers/ Supervisors)</td>
<td>Provide oversight function during decommissioning to ensure adherence to good practice and the ESMP</td>
<td>N/A</td>
</tr>
<tr>
<td>Site Committee</td>
<td>Monitor and ensure compliance with ESMP, BEME and implementation quality</td>
<td>100,000.00</td>
</tr>
<tr>
<td>Local government</td>
<td>Provide support in monitoring project execution within their domains to ensure compliance with this ESMP and other relevant requirements</td>
<td>N/A</td>
</tr>
<tr>
<td>Local Community</td>
<td>Support and promote environmental awareness</td>
<td>100,000.00</td>
</tr>
<tr>
<td>CDOs/CBOs</td>
<td>Ensure community participation by mobilizing, sensitizing community members;</td>
<td>N/A</td>
</tr>
<tr>
<td>NGOs</td>
<td>Assist to ensure effective response actions, to evolve and devise sustainable environmental strategies and rehabilitation techniques, organize, coordinate and ensure safe use of volunteers in a response action, &amp; provide wide support in management planning, institutional/governance issues and other livelihood related matter, awareness campaigns</td>
<td>150,000.00</td>
</tr>
<tr>
<td>General Public</td>
<td>Identify issues that could derail the project and support project impacts and mitigation measures as well as awareness campaigns</td>
<td>N/A</td>
</tr>
<tr>
<td>TOTALs</td>
<td></td>
<td>N1,300,000.00</td>
</tr>
</tbody>
</table>

### 7.9 Budget to Implement ESMP

Cost projections for implementation of the various measures, monitoring plan and capacity building are given in Table 7.8. The projected implementation budget will enable the ESMP to be an integral part of financing for the rehabilitation/maintenance works in the project.
An indicative budget of ₦10,972,500.00 (Ten Million Nine Hundred and Seventy Two Thousand Five Hundred Naira) only, is shown for the implementation of the ESMP bearing in mind the elements that make up the implementation process. The budget covers:
1. Routine E & S duties of the SPMU;
2. Capacity Building for the SPMU and other stakeholders;
3. Engagement of Environmental and Social Specialists
4. Environmental and Social Due Diligence investigations and/or Audits;
5. Monitoring and evaluation activities of the SPMU

Table 7-8: Breakdown of Cost Estimates

<table>
<thead>
<tr>
<th>S/No</th>
<th>ITEM</th>
<th>RESPONSIBILITY</th>
<th>COST BREAKDOWN IN (₦)</th>
<th>COST ESTIMATE IN NAIRA (₦)</th>
<th>COST ESTIMATE IN (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Pre-Construction Phase</td>
<td>Construction Phase</td>
<td>Post-Construction Phase</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>MITIGATION</td>
<td>SPMU/Contractor</td>
<td>To be built into Contractor costs</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>MANAGEMENT</td>
<td>SPMU/SMEnv</td>
<td>1,300,000.00</td>
<td>900,000.00</td>
<td>1,500,000.00</td>
</tr>
<tr>
<td>3</td>
<td>MONITORING</td>
<td>SPMU/FPMU/SMEnv/Environmental Consultants/Contractor</td>
<td>1,150,000.00</td>
<td>2,550,000.00</td>
<td>1,100,000.00</td>
</tr>
<tr>
<td>4</td>
<td>CAPACITY BUILDING &amp; TRAININGS</td>
<td>SPMU/MOH/Consultants/Contractor</td>
<td>1,500,000.00</td>
<td>450,000.00</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CONTINGENCY (5%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GRAND TOTAL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 8: SUMMARY AND RECOMMENDATIONS

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

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

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

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

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

The proposed gully erosion intervention project is designed to improve erosion and flood management which will result in:
- Reduced loss of infrastructure including roads, houses, etc.
- Reduced loss of agricultural land and productivity from soil loss caused by surface erosion and floods.
- Progressively restore vegetative cover, improve environmental conditions and more humid local microclimates expected to result in increased vegetation cover for wildlife and carbon sequestration.
- Environmental improvements due to land stabilization measures which preserve the landscape and biodiversity.
The construction of the gully erosion control infrastructure and the site rehabilitation activities, as designed, will require the use of two existing degraded/damaged access roadways to reach project locations. One of the access roadways, the Lawrence Onwuteaka Road (Access Road No.2) and associated drainages will need to be rehabilitated. The need for the rehabilitation of the access roads is heightened by the level of destruction that will arise from movement of heavy duty vehicles and equipment for project construction activities.

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


Federal Ministry of Agriculture and Water Resources (2003): Third National Fadama Development Project (Fadama III), Rural Infrastructure, Manual No. 4, August


ANNEX 1: TERMS OF REFERENCE

FOR THE PREPARATION OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) UNDER THE NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT (NEWMAP), ANAMBRA STATE

BACKGROUND:

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

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

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

ESMF: In general, the ESMF specifies the procedures to be used for preparing, approving and implementing (i) Environmental/Social Assessments (ESA’s or alternately both SA or EA) and/or (ii) Environmental and Social Management Plans (ESMP’s or alternately both an EMP and SMP) for individual civil works packages developed for each project. ESMP’s are essential for category B projects.
RPF: Resettlement Policy Framework (RPF) applies when land acquisition leads to the temporary or permanent physical displacement of persons and/or loss of shelter and/or loss of livelihoods and/or loss denial or restriction of access to economic resources due to project activities. It sets out the resettlement and compensation principles, organizational arrangements and design criteria to be applied to meet the needs of project-affected people and specifies the contents of a Resettlement Action Plan (RAP) for each package of investments.

Objective and Scope of the Consultancy

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

LOT 2: NDIAGU IKENGA, OGIDI & UGAMUMA, OBOSI

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

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

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

Tasks of the Consultant include the following:

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

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

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

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

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

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

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

i. Provide an implementation schedule for measures that must be carried out as part of the project showing phasing and coordination with overall project implementation plans; and

j. Provide the expected capital and recurrent cost estimates and sources of the funds for implementing the ESMP and inform accordingly the design consultants so that these costs are duly taken into consideration in the designs.

RATIONALE FOR THE STUDY

Anambra State is situated in high rainfall area and is prone to high-intensity surface run-offs which lead to the formation of gully erosion. Studies have shown that road construction and poorly-terminated drains/culverts contribute immensely to the acceleration and formation of active gully erosion sites in rural and semi-urban areas. Gully sites can be heavily or lightly populate 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.

<table>
<thead>
<tr>
<th>Professional Specialization</th>
<th>Minimum Years of Expertise Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team leader:</strong> Environmental Expert - A minimum of Post-graduate qualification in irrelevant field with at least 8 years’ experience in environmental and social management plan, impact assessment plan, resettlement plan, safety and health management plan and disaster and risk management, flood control and management, e.t.c.</td>
<td>10</td>
</tr>
<tr>
<td><strong>Monitoring and Evaluation Specialist:</strong> A minimum of Post-graduate qualification in irrelevant field with at least 8 years’ experience in environmental and social management plan, impact assessment plan, resettlement plan, safety and health management plan and disaster and risk management, flood control and management, e.t.c.</td>
<td>8</td>
</tr>
<tr>
<td><strong>Geotechnical Specialist:</strong> A graduate civil engineer, geology, GIS or in any relevant field with at least 8 years of professional experience in the field of assignment</td>
<td>8</td>
</tr>
<tr>
<td><strong>Social Management Specialist:</strong> A graduate of sociology or equivalent with at least 8 years of professional experience in the field of the assignment.</td>
<td>8</td>
</tr>
</tbody>
</table>

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 4: References
Annex 5: Summary of the database of information collected for ESMP
Annex 6: Maps
Annex 7: Photos/Videos
**ANNEX 2: LIST OF CONTACTED STAKEHOLDERS**

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

Table AN-1: List of Contacted Stakeholders

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>CONTACTED STAKEHOLDER</th>
<th>MODE OF CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-1</td>
<td>Individuals or group of persons whose daily activities (including farming) bring them in close proximity to the project area OR whose day-to-day lives/livelihoods may be directly affected by project activities.</td>
<td>General meetings, phones and personal contacts using a facilitator.</td>
</tr>
<tr>
<td>Group-2</td>
<td>Office of the Chairman – Ndiagu Quarters</td>
<td>Phone and personal contacts</td>
</tr>
<tr>
<td></td>
<td>Office of the Chairman – Ikenga Village</td>
<td>Phone and personal contacts</td>
</tr>
<tr>
<td></td>
<td>Office of the President General (PG) – Ogidi Town</td>
<td>Phone and personal contacts</td>
</tr>
<tr>
<td>Group-3</td>
<td>Office of the Chairman – Idemili North LGA</td>
<td>Phone contacts</td>
</tr>
<tr>
<td></td>
<td>Office of the Hon. Member – Anambra State House of Assembly</td>
<td>Phone contacts</td>
</tr>
<tr>
<td></td>
<td>Office of the Hon. Member – Idemili North &amp; South Federal Constituency</td>
<td>Phone contacts</td>
</tr>
</tbody>
</table>
ANNEX 3: SUMMARY OF WORLD BANK SAFEGUARD POLICIES

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

**Environmental Assessment (EA) (OP 4.01):**

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

**Natural Habitats (OP 4.04):**

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

**Pest Management (OP 4.09).**

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

**Indigenous People (OP 4.10):**

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

**Physical Cultural Resources (OP 4.11):**

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

**Involuntary Resettlement (OP 4.12):**

Key objectives of the World Bank’s policy on involuntary land acquisition are to avoid or minimize involuntary resettlement where feasible, exploring all viable alternative project designs; assist displaced persons in improving their former living standards, income earning capacity and production level, or at least in restoring them; encourage community participation in planning and implementing resettlement; and provide assistance to affected people regardless of the legality of land tenure. The policy covers not only physical relocation, but any loss of land or other assets...
resulting in relocation, or loss of shelter; loss of assets or access to assets; loss of income sources or means of livelihood whether or not the affected people must move to another location. When the policy is triggered, a Resettlement Action Plan (RAP), must be prepared. An abbreviated plan may be developed when less than 200 people are affected by the project. In situations, where all the precise impacts cannot be assessed during project preparation, provisions are made for preparing a Resettlement Policy Framework (RPF). The RAP/RPF must ensure that all Bank’s policy provisions detailed in OP 4.12 are addressed particularly the payment of compensation for affected assets at their replacement cost.

**Forestry (OP 4.36):**

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

**Safety of Dams (OP 4.37).**

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

**Projects on International Waterways (OP 7.50).**

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

**Disputed Areas (OP 7.60).**

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

**Disclosure Policy (OP 17.50).**

This policy supports decision making by the Borrower and Bank by allowing the public access to information on environmental and social aspects of projects. Mandated by six safeguard policies that has specific requirements for disclosure in country (Before project appraisal in local language and in English) and World Bank INFO-Shop (Before project appraisal in English). Documents can be in draft but must meet WB standards.
ANNEX 4: GENERAL ENVIRONMENTAL MANAGEMENT CONDITIONS FOR CONSTRUCTION CONTRACTS/CIVIL WORKS.

Contract Specifications for Contractor

1.0 General

a. All Environmental and Social (E&S) safeguards associated with the contract shall be complied with by the contractor. The Contractor shall also update himself about such issue in the ESMP, and prepare his work strategy and plan to fully take into account relevant provisions of the ESMP.

b. The Contractor shall develop a plan of work indicating all Environmental and Social safeguards at the various stages and indicate the period within which site will be maintained to its original state after completion of works to ensure that significant E&S safeguards have been addressed appropriately.

c. The Contractor shall adhere to the proposed plan implementation schedule and the monitoring plan to ensure effective feedback of monitoring information to the SPMU Project Engineer (PE).

d. The Contractor shall implement all measures to avoid undesirable adverse environmental and social impacts wherever possible, restore site offices to acceptable standards, and abide by all environmental performance requirements specified in the ESMP

2.0 Dust Mitigation Measures

a. The contractor shall minimize the effect of dust on the surrounding environment resulting from site clearing, vibrating equipment and temporary access roads.

b. During the rehabilitation project, the contractor shall carry out proper and efficient measures, such as water dousing, whenever necessary to reduce the dust nuisance, and to prevent dust originating from the operations.

3.0 Noise Due to Construction Activities

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

4.0 Waste Management

a) Construction waste shall not be left in stockpiles along the road, but removed and disposed of/or reused where needed.

b) All waste shall be segregated into organic waste and plastic and glass. The organic waste will be composted near the site office to enrich the soil while plastics and glass will be taken to the district dump sites.

c) All sanitary facilities (e.g. garbage collection and disposal, drinking water facilities, etc.) shall be provided by the contractor in site offices or project sites.

5.0 Water Resource Management
a) No construction water containing spoils or site effluent, especially cement, oil and fuel, shall be allowed to flow into natural water drainage courses.

b) The contractor shall take all possible steps to prevent pollution of streams and other water supplies.

c) Entry of runoff water to the site shall be restricted by constructing diversion channels or culverts to reduce the potential of soil erosion and water pollution.

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

6.0 Material Excavation and Deposit

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

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

a) Within 6 weeks of signing the Contract, the Contractor shall prepare a work plan to ensure the adequate management of E&S aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an E&S safeguards for the works. The Contractor's work plan will serve two main purposes:

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

ii. For the Client, supported where necessary by SE, to ensure that the Contractor is fully prepared for the adequate management of all E&S safeguards issues.

b) The Contractor's E&S document shall provide at least:

- A description of procedures and methods for complying with these general environmental and social conditions, and any specific conditions specified in the ESMP;
- A description of specific mitigation measures that will be implemented in order to minimize adverse impacts;
- A description of all planned monitoring activities and the reporting thereof; and
- The internal organizational, management and reporting mechanisms put in place.

8.0 Health and Safety

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

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

9.0 Reporting

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

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

10.0 Cost of Compliance

It is expected that compliance with these conditions is already part of standard of good workmanship and state-of-the-art as generally required under this Contract. The item "Compliance with Environmental and Social Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable E&S impact.
ANNEX 5: MINUTES OF COMMUNITY CONSULTATION MEETINGS

MINUTES OF INCEPTION MEETING WITH SPMU AND LIST OF ATTENDEES
Attendance: See list of Attendees

The meeting was held on Tuesday 19 April, 2016 at 11:00 a.m. at the office of the project coordinator (PC).

The PC welcomed the attendees and yielded the floor to Dr. Odili Ojukwu, the lead consultant in OTG Enviroengineering Nig Ltd - the consulting firm for the ESMP and ARAP. Dr Ojukwu conveyed the appreciation of OTG for being considered qualified for the ESMP and RAP consultancy. He requested for a detailed copy of the engineering design and the relevant officers of the SPMU that would be interfacing with OTG in the course of their assignment. He also wanted to know the extent of sensitization of the affected communities by the focal NGO.

Responding, Mr. Yance Silver, the team leader of SMEC International (Pty) Ltd, West African Region-the consulting firm that prepared the Engineering design, promised to make available a PDF copy of the design to OTG.

Prof. Peter Nnabude, the team leader of CRIMSSI/ACERDEN, the focal NGO, hinted that the communities involved have not been sensitized as appropriate. But the NGO would take necessary steps to fill the gaps.

The PC introduced the following SPMU staff that would work with OTG. They are as follows: Mr. Emeka Achebe (Communication Officer), Mrs. Blessing Okafor (Livelihood Officer) and Mr. Echezona Oluchukwu (Environmental Officer). The PC urged the attending teams to cooperate with one another in the best interest of the project, even as he promised the cooperation of the SPMU.

Dr. Ojukwu of OTG promised the PC that OTG will deliver all the deliverables on time and target, having done similar jobs with excellent results and testimonials in various parts of the country and even beyond. To confirm this, he announced to the meeting that OTG was commencing work immediately that same day with physical inspection of the sites.

The meeting was attended by 18 persons comprising of staff of OTG, SPMU, SMEC and CRIMSSI/ACERDEN.

The meeting rose at about 1.00pm.
## ATTENDANCE AT KICK-OFF MEETING BETWEEN ANS-NEWMAP AND THE CONSULTANTS
### April 19, 2016

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SENSITIZATION MEETING WITH NDIAGU IKENGA COMMUNITY

Minutes of Stakeholders’ Meeting Held on April 20, 2016 at the Ndiagu Village Square.

Attendance: See list of Attendees

The meeting was a necessary follow-up action after a physical inspection of the gully corridors by the core team of OTG Enviroengineering Nigeria Limited, the firm charged with the consultancy for the ESMP/ARAP. The inspection was done on Tuesday 19 March 2016 and was facilitated by Mr. Ifeanyi Agina and Chief Chris Agulefo from the village.

The sensitization exercise kicked off with the traditional welcome and kola-nut ceremonies courtesy of the community. Thereafter the consulting firm was introduced by Mr. Emeka Achebe, the Communication Officer of the SPMU.

Remarks by the Lead Consultant; Dr Odili Ojukwu:

He explained to the people that the consultancy is aimed at finding out the impacts of the proposed engineering works on the physical and socio-economic environments of the gully corridors; and to recommend appropriate remediation and compensation package in line with World Bank social safeguards polices.

This will entail conducting among other activities a socio-economic survey of the project area. He encouraged all community members who may be potentially affected by the project to make themselves available for necessary documentation. A census cut-off date of April 28, 2016 was to allow for speedy conclusion of the ARAP consultancy. The assessment will be comprehensive and socially-inclusive involving all categories of persons and issues likely to affected by the engineering works and any other intervention works.

All claims, data and information collected during the census will be physically verified using relevant technologies to ascertain their correctness. The ESMP/ARAP must be fully prepared and implemented before construction works would commence. He therefore sought the cooperation of the village members in terms of full participation in the census exercise and giving out correct information and data to the consultants.

He enjoined the community to take full ownership of their environment, take care of it and avoid all sorts of environmental degradation. The community should mobilize and sensitize her members including women, youths and elders on these issues and should be part of the monitoring and evaluation arrangement for the construction activities which also includes land reclamation/bio-remediation components.

Finally he thanked the community for their huge turn-out and audience, and promised that focus-group discussion with women, youths and elders would be held for better effects.

Mrs. Blessing Okafor, the Livelihood Officer of the SPMU, also sought the full cooperation of the community especially as it concerns giving out correct and truthful information and making sacrifices where necessary. She also advised the community to put in place a site committee for the project with the assistance of CRIMSSI/ACERDEN - the focal NGO appointed by the SPMU.

Response of The Community:
The chief spokesperson for the community was Chief Chuks Onubogu - the President General of Ogidi Town Union. He expressed the appreciation and gratitude of the community for the proposed intervention works. He promised full cooperation and security for all persons that would work for the projects, and to devise their own mechanism to eliminate chances of giving wrong and false information to the consulting firm. He finally requested that the construction firm to be assigned to Ndiagu site should ensure employments for their unemployed and skilled youths.

The meeting was attended by 54 persons.

Notable attendees were:

Dr. Odili Ojukwu leading the OTG team
Chief Chuks Onubogu - President General, Ogidi Union
Hon. Dr. Amaechi Ekumoh – Chairman, Ikenga Village
Onwuteaka Emmanucl - Chairman, Ndiagu Quarters
Chief Chris Agulefo - former Chairman, Ikenga Village
Nwankwo Onwuteaka - Oldest man in Ndiagu Quarters
Chief Sir Rex Ezegbo - Elder
Emeka Achebe - Communication Officer/SPMU
Blessing Okafor - Livelihood Officer/SPMU
Echezona Ejikeme Elozona Onuchukwu – Environmental Officer/SPMU

The meeting came to a close at about 2.00pm
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ESMP/ARAP FOR NDIAGU-IKENGA –OGIDI GULLY EROSION PROJECT: 
WOMEN FOCUS GROUP DISCUSSION

The discussion was an all-women affair held at Ndiagu centre (Ilo Ndiagu) on 28 April, 2016. The discussion was at the instance of OTG; and the purposes were to specially sensitize the women folk on the physical and social implications of the up-coming civil engineering works and ascertain their perspectives on the intervention activities.

PHYSICAL ENVIRONMENT IMPACTS
- Dusts and fumes from vehicle operations;
- Loss of top soil and vegetation due to site clearing and vehicle operations;
- Noise pollution from construction equipment;
- Carbon emission from vehicles and heavy equipment;
- Soil and groundwater contamination from oil spills and other wastes.

SOCIAL IMPACTS
- Health risks from dusts and emission of fumes;
- Traffic disruptions, accidents and public safety from movement of construction vehicles and equipment;
- Disruptions to community livelihoods due to blocked access;
- Increased sexual activities due to new workforce.
- The consultant assured the attendees that necessary mitigation measures would be implemented against the expected adverse effects of the civil works, and that is the key ToR of consultancy.

Ownership Of Assets around Gully Fingers:
4 of the women have land along the corridors, 3- have residential structures and 5 have various crops including palm- trees, mango, banana, orange, coconut, bread-fruit etc.

Effects of the Erosion on The Community: According to the attendees, these include:
Emotional distress especially during the rains;
Disruption of school attendance for their children;
Disruption of economic activities including trading and homestead farming;
Disruption of church attendance;
Flooding of homesteads and loss of domestic utensils;
An illustrative case is that of Mrs. Charity Mefor who narrated how she lost a full pot of soup and other food items to a flooding incident.

Expected Benefits From The Intervention Works:
- Emotional relief and improved health;
- Increased economic activities;
- Relocation to ancestral homes for those currently displaced;
- Regular attendance at school and churches;
- Enhanced movements and interaction within the community.

Role In Implementation Activities
- Monitoring and reporting on implementation activities;
- Sales of food, water and sundries to construction workers;
- Supply of materials and labour;
- Security of materials and personnel.

Occupational Distribution of Attendees:
The women occupational distribution of the attendees is as follows:
Caterers – 3, petty traders – 2, farmers -6, teachers -1

Questions and Sessions:
Mrs Mercy Obi
Question: Is there any resettlement plan for those whose residence might be affected?
Answer: Yes, this is a major justification for the consultancy and depends on the nature of the impact resulting from the project.

Attendance & Closing:
13 women attended the forum which closed at about 2.00pm.
ESMP/ARAP FOR NDIAGU IKENGA OGIDI GULLY EROSION PROJECT:
ELDERS FOCUS GROUP DISCUSSION

The discussion which started at 2.15pm was held at Ilo Ndiagu (the village square) on Thursday 28 April 2016. It was an opportunity for the elders of the village to bring to bear their view on the
ESMP/ARAP study and for them to be further sensitized on the physical and social impacts of the
up-coming civil engineering works.

PHYSICAL ENVIRONMENT IMPACTS
- Dusts and fumes from vehicle operations;
- Loss of top soil and vegetation due to site clearing and vehicle operations;
- Noise pollution from construction equipment;
- Carbon emission from vehicles and heavy equipment;
- Soil and ground water contamination from oil spills and other wastes.

SOCIAL IMPACTS
- Health risks from dusts and emission of fumes;
- Traffic disruptions, accidents and public safety from movement of construction vehicles
  and equipment;
- Disruptions to community livelihoods due to blocked access;
- Increased sexual activities due to new workforce.
- The consultant assured the attendees that necessary mitigation measures would be
  implemented against the expected adverse effects of the civil works, and that is the key
  ToR of consultancy.

Ownership Of Assets Around the Gully Fingers:
5 of the elders have land property close to the gully corridors, 4 have residential structures and
another 4 have crops including palm-trees, cowpea, bread-fruit, plantain and cassava.

Effects Of The Erosion On The Community: These include
- Emotional distress/high blood pressure;
- Destruction/disruption of community road networks;
- Restriction of movements and social relations;
- Mosquitoes infestation and attendant endemic malaria illness;
- Destruction of homesteads and commercial structures;
- Disruption of attendance at the community schools and churches
- Stalling of housing developments.

Expected Benefits from the Intervention Works:
- Increased housing developments;
- Migration to the community leading to a more diverse and vibrant population;
- Improved social relations and interactions;
- Land reclamation;
- Emotional relief/improved health.

Roles in Intervention Works:
- Ensuring security of lives and property
- Monitoring and reporting on progress of works
- Supply of work materials, skilled and unskilled labour
- Full cooperation and support for all intervention activities.

Occupational Distribution:
Farmers – 9, traders -1, traditional medicine practitioner -1, pastors -1.

Questions and Answers Session:

   Gabriel Okafor
   Question: When will the civil engineering work start?
   Answer: We do not know precisely. But it is expected that as soon as the ESMP and ARAP studies are completed and implemented, the civil works would start.

The Community strongly requested that connecting culverts be included in the engineering design for ease of movements between neighbours in the community. Also all drainages within human settlements should be covered with concrete slab.
Answer: The requests were noted and will be included in the report to the SPMU.

Attendants: 10 elders attended the forum which closed at about 3.05pm.
ESMP/ARAP FOR NDIAGU-IKENGA-OGIDI GULLY EROSION PROJECT:
YOUTHS FOCUS GROUP DISCUSSION

The meeting started at about 3:30pm at Ilo Ndiagu (the village centre) on 28 April, 2016. It was designed to draw the attention of the village youths to the likely physical and social impacts of proposed civil engineering intervention works, and also get their views on the erosion menace and intervention works.

PHYSICAL ENVIRONMENT IMPACTS
- Dusts and fumes from vehicle operations;
- Loss of top soil and vegetation due to site clearing and vehicle operations;
- Noise pollution from construction equipment;
- Carbon emission from vehicles and heavy equipment;
- Soil and ground water contamination from oil spills and other wastes.

SOCIAL IMPACTS
- Health risks from dusts and emission of fumes;
- Traffic disruptions, accidents and public safety from movement of construction vehicles and equipment;
- Disruptions to community livelihoods due to blocked access;
- Increased sexual activities due to new workforce.
- The consultant assured the attendees that necessary mitigation measures would be implemented against the expected adverse effects of the civil works, and that is the key ToR of consultancy.

Ownership Of Assets Around the Gully Fingers: 9 of the attendees have land property around erosion corridors, 2 have residential structures and 7 have crops of various types including yam, cassava, vegetables, coco-yam and maize.

Effects of Erosion on the Community: The youths said that the erosion was caused and aggravated by wrong channelization done on Enugu – Onitsha Express Road by CCC construction company and Micmera Industry- a manufacturing firm on the Express Way, with devastating effects on the community. These include:
- Destruction/disruption of community road networks;
- Destruction of public utilities (electricity lines and transformers);
- Poisoning and siltation of water streams in the community (Ododo, Nkissa and Ogene Streams);
- Loss of aquatic lives;
- Destruction of homesteads and family graves;
- Poor attendance at community schools and churches (Ndiagu – Ikenga- Ogidi Primary School and St. John’s Anglican Church are examples).
- Destruction of community playing field;
- Mosquitoes infestation/malaria illness.

Expected Benefits from Intervention Works:
- Improved housing development;
- More economic investment and employments;
- Restoration of public utilities;
- Increased attendance at schools and churches;
- Migration to the village and diverse population.

Roles in Implementation Works:
• Security of lives and properties;
• Supply of work materials and skilled and unskilled labour;
• Monitoring and reporting on implementation activities.

Age and Educational Status:
• The age range of the youths is 29 – 44 years, while educational attainment range is between first school leaving certificate and university degrees.

Occupational Distribution: This is as follows:
Traders – 4, printers – 1, roofing technician -1, farmers -4, suppliers of sand and stone – 1, casual labourers -3, land speculator -1, drivers -1.

Questions and Answers Session
1. Agina Ifeanyi
Question: Can an absentee claimant be represented during the physical verification exercise
Answer: Yes, that could be considered.
2. Obinna Ezechukwu
Question: How will the issues of affected structures be resolved?
Answer: Adequate compensation including resettlement plan where necessary will be implemented.

Attendants: 12 youths attended the forum. The forum closed at about 4:20pm

Ndiagu Ikenga Ogidi
Focal Group Discussions in Photo Session
ANNEX 6: COMPLETE LISTING OF DOMINANT PLANT SPECIES OBSERVED AT THE PROJECT AREAS

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

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</tr>
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<td>Paw-paw</td>
</tr>
<tr>
<td>5</td>
<td>Newbouldialaevis</td>
<td></td>
<td>Tree</td>
<td>Ogiris/ boundary tree</td>
</tr>
<tr>
<td>6</td>
<td>Ficuscapensis</td>
<td>Moraceae</td>
<td>Tree</td>
<td>Ugbor</td>
</tr>
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<td>7</td>
<td>Dacryodesedulis</td>
<td>Burseraceae</td>
<td>Tree</td>
<td>Ubeigbo/local pear</td>
</tr>
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<td>Tree</td>
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<td>Euphorbiaceae</td>
<td>Shrub</td>
<td>Akpu</td>
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<td>Palmae</td>
<td>Tree</td>
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</tr>
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<td>11</td>
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<td>Fabaceae</td>
<td>Herb</td>
<td>Efiaobubu/butterfly pea</td>
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<tr>
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<td>Rubiaceae</td>
<td>Herb</td>
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<td>Asteraceae</td>
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<td>Ekperima/Spear grass</td>
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<td>Sidastipulate</td>
<td>Malvaaceae</td>
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<td>Eshioku</td>
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<td>Herb</td>
<td>Uke/ touch and die</td>
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<td>Loganiceae</td>
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<td>Species</td>
<td>Family</td>
<td>Life Form</td>
<td>Local/ Common Name</td>
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<td>Tree</td>
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<td><em>Phytolaccaceae</em></td>
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<td><em>Anacardiaceae</em></td>
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<td>Bamboo</td>
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<td>Herb</td>
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<td><em>Fabaceae</em></td>
<td>Herb</td>
<td>Air plant/odaaopuo</td>
</tr>
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</table>

*Source*: Field Survey, Nov. 2015