



Final Report

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)
GOMBE STATE NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT
(GOMBE-NEWMAP)



GOMBE STATE UNIVERSITY GULLY EROSION SITE GOMBE
STATE, NIGERIA

2021

FINAL REPORT

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

FOR

**THE GOMBE STATE UNIVERSITY GULLY EROSION CONTROL
AND REHABILITATION
GOMBE STATE**

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Submitted To:

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LIST OF ACRONYMS

ARAP	Abbreviated Resettlement Action Plan
CBOs	Community Based Organizations
CDAs	Community Development Associations
CSOs	Civil Society Organizations
Db	Decibel
EAs	Environmental Assessments
EIA	Environmental Impact Assessment
ESIAs	Environmental and Social Impact Assessments
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESO	Environmental Safeguards Officer
FAO	Food and Agricultural Organisation
FBO	Faith Based Organisations
FEPA	Federal Environmental Protection Agency
FERMA	Federal Road Maintenance Agency
FGN	Federal Government of Nigeria
FGD	Focus Group Discussion
FMEnv	Federal Ministry of Environment
FRSC	Federal Road Safety Corps
FSLC	First School Leaving Certificate
GDP	Gross Domestic Product
GEF	Global Environment Fund
GHE	Green House Effect
GM	Gender Mainstreaming
GMSEPA	Gombe State Environmental Protection Agency
GMSPMU	Gombe State Project Management Unit
GRC	Grievance Redress Committee
GSU	Gombe State University
HRH	His Royal Highness
ICCF	International Climate Change Fund
IDA	International Development Association
LGAs	Local Government Areas
LM	Line Ministries
MDAs	Ministries, Departments and Agencies
MoH	Ministry of Health
NCDC	National Center for Disease Control

NEWMAP	Nigeria Erosion and Watershed Management Project
NGOs	Non-Governmental Organizations
PAD	Project Appraisal Document
PAHs	Project Affected Households
PAPs	Project Affected Persons
PDO	Project Development Objective
PIM	Project Implementation Manual
PPE	Personal Protective Equipment
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SCCF	Special Climate Change Fund
SMENV	State Ministry of Environment
SMW	State Ministry of Works
SPMU	State Project Management Unit
SSC	State Steering Committee
STC	State Technical Committee
TBD	To Be Determined
UBRBDA	Upper Benue River Basin Development Authority
WB	World Bank
WHO	World Health Organization

EXECUTIVE SUMMARY

ES. 1 Project Background

The Government of Nigeria is implementing the multi-sectoral Nigeria Erosion and Watershed Management Project (NEWMAP), financed by the World Bank, Global Environment Facility, the Special Climate Change Fund, and the Government of Nigeria. The Project Development Objective (PDO) of NEWMAP is to reduce vulnerability to soil erosion in targeted sub watersheds.

NEWMAP Objectives

The Nigeria Erosion and Watershed Management Project (NEWMAP) is a multi-sectoral, state-led eight-year project designed to support Nigeria's transformation agenda to achieve greater environmental and economic security. It will primarily support State-led investments to enhance resilience to soil erosion, floods, and associated climate variability and change in specific sub-watersheds while raising capacities to promote long-term climate resilient, low carbon development. NEWMAP takes an **integrated watershed management approach** to erosion that is informed by lessons learned on the interlinked challenges of poverty, ecosystem services, climate change, disaster risk management, biodiversity, institutional performance and governance.

This report focuses on the Environmental and Social Management Plan (ESMP) developed for the intervention and Rehabilitation works at the Gombe State University Gully Erosion Site, in Gombe State, Nigeria.

ES 2: Description of the Proposed Intervention/Activities

The proposed rehabilitation and construction intervention at the GSU Gully Erosion site will include the following;

- Construction of rectangular concrete stepped channel (Drop structure)
- Construction of rectangular concrete collector channels
- Construction of flexible structure
- Construction of reinforced concrete structures
- Earth work and excavation
- Construction of weeping holes
- Filing and compaction of roads
- Bioremediation works will be carried out where necessary within the project corridor.

The ESMP is an essential safeguard element for "Category A" projects, such as the planned gully erosion rehabilitation works in Gombe State University(GSU), Gombe State.

This Environmental and Social Management Plan (ESMP) is therefore an important project management strategy that will manage the proposed GSU gully erosion site rehabilitation project activities such that the potential environmental and social impacts arising from the project implementation will be mitigated, avoided or eliminated.

The ESMP exhibits the Gombe State NEWMAP Project Management Unit's corporate commitment to managing the project implementations in a sustainable manner. The ESMP will also ensure compliance with applicable environmental standards all through the life span of the project. The Bank will disclose the ESMP document publicly, in Nigeria and at the World Bank website before project implementation.

ES 3: Rational for the NEWMAP Intervention

A project's environmental and social management plan (ESMP) consists of a set of mitigation, monitoring, and institutional measures to be adopted during project implementation and operation in order to eliminate possible adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also include actions needed to implement those measures. The ESMP is an essential safeguard element for “Category A” projects, such as the planned gully erosion rehabilitation works in Gombe State University (GSU), Gombe State.

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ES 4: Rationale for the Environmental and Social Management Plan (ESMP)

The objective of the Environmental and Social Management Plan (ESMP) is to set out measures to be taken in addressing the identified adverse impacts of the various components and activities of the project. In addition, the ESMP is meant to develop procedures and plans to ensure that the mitigation measures will be implemented throughout the phases of the Remediation work of the GSU Gully Erosion site.

The specific objectives of this ESMP as indicated in the **Terme of Reference (TOR)** document (**Annex 2**), which formed the contractual basis for the project; out lined the objectives as follows:

- 1) The site specific ESMP is meant to document the set of mitigation, monitoring, and institutional actions to be taken before and during implementation of the project to eliminate adverse environmental and social impacts.
- 2) Develop measures needed to implement recommended actions, including addressing adequacy of the monitoring and institutional arrangement for the upper and lower watersheds in the intervention site.
- 3) Working in collaboration with the design firm and the SPMU in sequencing the technical/feasibility for the ESMP studies, where outcomes are considered in the design phase of the proposed activities to ensure that potential environmental and social constraints on the ground are addressed.
- 4) To asses the natural resources and infrastructure that may likely be affected during project implementation and operation, and identify management strategies that would be required to mitigate the anticipated environmental risks.

ES 5: Scope of Work

The consultant’s scope of work for the ESMP encompasses 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);
- i. 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;
 - ii. Develop a time-bound plan for mitigating environmental and social risks associated with sub-watershed management in consultation with the relevant public and government agencies; Identify feasible and cost-effective measures that may reduce potentially significant adverse environmental and social impacts to acceptable levels;
 - iii. Identify monitoring objectives and specify the type of monitoring, with linkages to the impacts assessed and the mitigation measures described above (in a-e);
 - iv. 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;
 - v. Define technical assistance programs that could strengthen environmental management capability in the agencies responsible for implementation;
 - vi. 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
 - vii. Provide the expected capital and recurrent cost estimates and sources of funds for implementing the ESMP and inform accordingly the design consultants so that these costs are duly taken into consideration in the designs.

Socio-Economic Issues

The following socio-economic issues were addressed in the ESMP:

- A summary of the impacted communities for the project: location, access, population (number, demographic and social characteristics); economy (employment rate, income distribution); services (types, capacity, and adequacy) and housing. Concern is the ability to provide work force, service new development and absorb and adjust to growth (worker/family).
- A summary of the views of the population including vulnerable groups, determined through thoroughly documented discussions with local communities. These meetings and discussions must be documented and should show how issues and problems raised are or will be resolved (note that a Resettlement Action Plan (RAP) could be developed for the Site, and this is covered under separate TORs).
- Cultural: Summarize the possible effects of the project on historical/archaeological sites, heritage/artefacts, native religious or harvest sites of the affected communities and identification or development of mechanisms for handling chance findings.

ES 6: Policy, Legal, Regulatory and Institutional Framework

The Nigerian, Gombe State World Bank Safeguards Policies and other relevant International guidelines applicable to the sub-project intervention were examined in respect of the proposed intervention at the GSU Gully Erosion site.

The World Bank Safeguards Policies that would be triggered as a result of the intervention and rehabilitation works at the GSU Gully Erosion site includes;

- Environmental Assessment (OP/BP 4.01),
- Physical Cultural Resources (OP/BP 4.11),
- Involuntary Resettlement (OP/BP 4.12)

ES 7: Institutional Framework

NEWMAP involves many federal and state ministries, departments and agencies (MDAs), local governments, communities, Community-based organisations (CBOs), NGOs, and the public. The investments for GSU Erosion Gully site and flooding rehabilitation works is being made through the Gombe NEWMAP.

The Federal Ministry of Environment (FMEnv) is the lead implementing agency for NEWMAP. The Federal Project Management Unit (FPMU) hosted by the FMEnv is responsible for the overall coordination. The Gombe State Project Management Unit (Gombe-SPMU) hosted by the Gombe State Ministry of Environment and Forest Resources is responsible for coordination of NEWMAP in Gombe State, thus, Gombe NEWMAP is directly responsible for coordinating the activities of the GSU Erosion Gully Site intervention, including the implementation of this ESMP.

The Gombe State NEWMAP will have a direct supervisory and overarching responsibility in ensuring that the ESMP as documented herewith are fully carried out. It will ensure that the Contractor, its personnel and other critical stakeholders involved in project implementation fully comply with and implement all environmental, social, safety and health responsibilities as to assure best practices in carrying out works throughout the project execution at the project site and off-site work areas.

The Gombe State Ministry of Environment and Forest Resources, Gombe State Environmental Protection Agency (GOSEPA), and National Environmental Standards and Regulation Enforcement Agency (State) will undertake compliance monitoring and periodic inspection of work sites and surrounding work areas in the communities and also, ensure overall implementation of all measures that are necessary for environmental protection.

ES 8: Biophysical Environment

The project area is categorized as part of the semi-arid zone with hot tropical climatic and humid conditions in some months. The area is in the sudan-sahelian zone in the northeastern part of Nigeria where maximum temperatures could reach over 44°C during the dry season. The climate is influenced by the inter-tropical convergence zone, characterized by the presence of two distinct seasons ie dry and wet seasons. The wet season begin in April/May and end in September/October while the dry period is from November to April. The other characteristics of the state is as follows;

- The average annual rainfall from 2009 -2019 ranges from 87.23 mm to 102.19 mm. Intense rainfall starts in April and most of the rains are received between June and September, an important time period in the crop growing calendar.

- Temperature: The maximum air temperatures vary from 32.07⁰C (2012) to 37.15⁰C (2019) while the minimum ranges from 20.33⁰C (2009) to 21.82⁰C (2010)
- Wind speed and direction: The project area has calm weather with wind speed ranging between 3.4 knots (corresponding to light breezes on the Beaufort scale) and 5 knots and the wind direction during the sampling fluctuated in four main directions, east, south, southwest and west.
- The Particulate Matter (PM) in the ambient air sampled during the field data were PM 0.3, 0.5, 1.0, 2.5, 5.0, 10. The concentrations of the PM ranged from 0.09 - 0.35 (0.3µm), 0.24 - 0.58 (0.5µm), (1.43-5.21) 1.0µm for PM 2.5(6.20-38.67), PM 5 (6.68-62.43), 2.09- 38.99 for PM 10;
- Noise Level: The noise levels recorded ranged from 36.4 –69.1 dB/A
- Laboratory Analysis of Ground water: The ground water sample colours are all clear with pH range of 6.50 to 7.80, TDS ranges between 1.38mg/l – 6.80 mg/l mg/l while conductivity values are between 2.01 µS/cm -7.81 µS/cm. The Dissolved Oxygen values ranges from 2.25mg/l to 5.02mg/l. The in-situ temperature was found to range from 29.70 ⁰C to 31.80⁰C

ES 9: Social Economics Characteristics

The project area is in Gombe Local Government Area which is bordered by Kwami, Yamaltu/Deba and Akko Local Government areas; and covers an area of about 52 square kilometres with a 2006 National Population Commission (NPC) Census figure of 261,536.

About 65.70% respondents are males while females are 34.3% as depicted in Figure 4. 2. 65% of the populace are either students or Gombe state University staff. The younger population are predominant around the residential areas or Gombe State University and schools while the more elderly are visible in and around the villages within the project area.

89% of the respondents are married and breadwinners of their various families and they are predominantly Muslims and Christians with Fridays and Sundays observed as the holy days.

Most of them have some form of education (95.68%). The highest number of Respondents (38.95%) Indicated that their lowest level of academic qualification is First School Leaving Certificate FSLC (Figure 4. 5). About 6.32% of the Respondents don't have any form of formal education

56.7% of the communities get domestic water from commercial boreholes while 34.8% of Gombe State University are private boreholes, 5.6 % public pipe borne water while 2.6% from perennial well and 0.3% from pond water.

93.3% of the respondents mostly from the communities use Pit toilet while 6.1% mostly from GSU make use of Water closet and 0.6% others make do into the river or bush as shown in the figure below.

(82.9%) of the respondents in the area dispose their household waste in an open dump especially along the erosion gully trench indiscriminately, 11.4% within the GSU operates a vendor system of waste collection while 4.7% burn their refuse, 1.1% accounts for drainage refuse dumping

94.70% make use of firewood for cooking, 2.8% kerosene and 1.6% sawdust with the remaining 0.9% making use of gas. The survey also showed that electricity is obtained from the national grid within the project communities, of which 97.10% and alternating it with generator and hurricane lamps.

(28.9%) run small sized households. 67.3% medium sized, while 3.8% have large families.

ES 10: Public Consultation and the Stakeholders' Concern

The Consultations involved independent and frequent meetings between the Consultant team, the Gombe-NEWMAP officials, the Engineering Design Consultant and Traditional and Administrative

leaderships of Gombe State University Community, Malan Inna, Malan Inna (Sabon Fegi), Idi quarters, Kagarawal communities which includes the Village heads.

The key stakeholders identified and consulted in the area include:

- i. Director of works for the Gombe State University.
- ii. Public Relation Officers of the affected communities
- iii. Village heads of all the villages affected by the project
- iv. School Principals of schools to be affected by the project
- v. Other Stakeholders and individuals who owns properties that will be directly or indirectly affected by the project, Community Associations, Business Owners etc.

Summary of Stakeholders' consultation and concerns

The stakeholders' consultation meetings, started with an enlightenment of NEWMAP overview by the Environmental Safeguard Officer, Dr Shittu Whanda which was preceeded by the description of the Proposed intervention at the GSU gully erosion site, World Bank safeguard policies as it affects the intervention, rehabilitation and civil works, as well as the challenges that could impede the implementation of the project. Further emphasis was placed on the support needed from all stakeholders to ensure effective and successful project implementation.

- They pledged their support to the Gombe NEWMAP and the intervention and rehabilitation of GSU gully erosion site
- Provision of alternative transport route during construction
- Fear of the project being abandoned half way
- The fate of the petty women traders along the roads within the project area
- They pointed out the need to complete the project during the next dry season
- They suggested the need for NEWMAP liaison officer to be posted to the community
- The youth leader wants the contractors to employ their youths during construction phase.

Conversely, the community heads of the villages within the project corridor, emphasized the need for the contractors to keep to the community local laws and desists from behavior such as abuse of minors, fighting, local disturbances, sexual immorality, extortion and robbery. Annex 3 show the minutes of the meeting during stakeholder's consultation.

ES 11: Summary of Impacts of the rehabilitation works at Gombe State University Gully Erosion Site

Impact Identification and Evaluation Methodology

The anticipated impacts were determined based on the interaction between project activities and the environmental sensitivities. The identified potential impacts were grouped into the following four categories namely; Positive or Negative, Short-term or long-term, Reversible or Irreversible and Direct or indirect. Each category was measured against the activities of land acquisition, site preparation, Excavation for underground drainage route, back filling, desilting etc. using severity scale (high, medium and low) for preconstruction, construction and operational phase. The impacts of the most of the proposed activities were found to be medium.

Potential Positive impacts

- Repair of the watershed gullies

- Rehabilitation of the flood plain in the community
- Connection and restoration of access to houses that are being affected by active flooding
- Provision of employment opportunities for both skilled and unskilled workers.
- Improved road network within Gombe Metropolis
- Community development programs.
- Reintegration of community and diversification of sources of livelihood.
- Reduction of mortality rate.
- Promotion of afforestation programs (with all its benefits)
- Minimization of flooding and control of overflow
- Reduced fear perception of loss of property, inhabitation and ancestral origins of the communities.
- Control and Reduction of water body sedimentation rates due to erosion.
- Increase in social interactions
- Promotion of goodwill and community appreciation of the NEWMAP intervention in Gombe State and FGN at large.
- Improved livelihood enhancing activities
- Gender Issues: Construction activities will encourage economic activities, especially for women. Since there would be a large workforce, petty traders and food-spots owners will benefit immensely from the demand on site.
- Initiation/ kick-off of rapid production systems and agricultural practices

Potential Adverse Impacts

- ***Disturbance of flora and fauna:*** Movement of personnel and vehicles may result in trampling of flora and disturbance of fauna.
- ***Injuries and accidents:*** Workers may be exposed to injury from machines and equipment.
- ***Loss of vegetation and impacts on flora and fauna:*** Rehabilitation work will involve clearing of vegetation in and around the canals and drains. This may result in a potential disturbance and/or loss of fauna at the project site.
- ***Soil erosion and soil pollution:*** Excavation, vegetation clearance, leveling and other land preparation works will expose and loosen the soil making it susceptible to both wind and water erosion and subsequent loss of top soil. There is potential for compaction of soil from the use of heavy machinery and contamination of soil from fuels, oils and waste.
- ***Air quality deterioration:*** Loose soils exposed during land preparation work and movement of vehicles/trucks (including haulage trucks) to and from the project site on the untarred surfaces may result in the increase of airborne particulates.
- ***Vibration and noise nuisance:*** Movement and operation of machines/equipment, trucks during construction is likely to increase noise levels intermittently in communities; May also experience temporary increase in noise levels from construction activities.
- ***Occupational accidents and risk of injury to workers:*** Workers' exposure to noise, dust and vibrations and risk of accidents and injury from the use of machinery and equipment, materials management at the construction yards/workplace are concerns that need to be addressed.
- ***Risk of accidents and injury to the public:*** The movement of trucks and other vehicles and machinery to and from offsite sources to the project site will pose safety risks for the communities along and around the project site. Communities near the project site may also be at risk from unsecured excavations.

- **Influx of workers and migrants:** Migrants who move into the project area for job opportunities may not conform to the societal norms and cultural practices and may upset the social structure of these communities.
- **Obstruction of access ways to communities:** Construction works at the project site may render portions of access roads and existing foot paths inaccessible to users and/or temporarily closed. This may create inconvenience and increase travel time to and from the affected communities.
- **Risk of spread of diseases:** Poorly managed construction sites, site camps, indiscriminate disposal of waste and open defecation will create unsightly conditions and may result in the spread of disease (e.g. malaria, typhoid).
- **HIV/AIDS and STIs Risks:** Construction workers camp give rise to health risks associated with poor sexual practices and prostitution.

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

ES 12: Some of the Occupational Health Issues/Hazards and Mitigation Measures

S/N	Occupational Health and Safety Issues	Mitigation Measures	Responsible party
1	The exclusion of occupational health and safety issues in contract documents	Occupational health issues shall be noted and included in contract documents to make them obligatory/mandatory.	SPMU FPMU Contractor
2	Use of defective, damaged or inappropriate tools for a particular and specific task.	Provide workers the appropriate and quality hand tools as are necessary for the execution of specific activities or tasks.	SPMU Contractor
3	Engagement of workers to use machines and tools for which they have not been trained.	Provide on-the-job training to workers on how to handle and use available tools and machinery before engaging them.	SPMU Contractor
4	Involvement of workers in activities without the provision of the appropriate protective wear.	Appropriate protective wear to workers for specific activities/tasks. (Gumboots, gloves, overalls, helmets, etc.)	SPMU Contractor
5	Non provision of First Aid Kits (FAKs),	FAKs and trained personnel in administering first-aid must always be available on the site for purposes of minor injuries.	SPMU Contractor
6	The exposure of workers to dust during implementation of works.	Workers must wear the right protective gear. Watering of dusty areas must be done with a water at least three times a day to reduce dust levels to the barest minimum.	SPMU Contractor
7	Lack of informatory signposts indicating that work is in progress.	During execution of work especially at a site open to traffic, informatory signposts must be posted so as to lessen the risks of accidents to workers.	SPMU Contractor
8	Accidents involving plants/equipment	Only properly trained men for operation.	Contractor
9	Safety of and from traffic	Providing adequate traffic signs and protection at locations where works are taking place. Where necessary, traffic should be stopped during the placement or removal of temporary signs.	SPMU Contractor

ES 13: Analysis of Project Alternatives

Option 1

Provision of Concrete Structures throughout the Sections of the Gullies and its Fingers” concept. This approach negates the possibility of rejuvenation of the gully and possible reclamation over time, within the University Campus. The gully locations are strategically located at or near the heart of campus and serves several key functions including a newly constructed pedestrian bridge and federal railway which is a major intersection and link to the campus pedestrian network.

Option 2

The second being the “Provision of Flexible Structures (in the form of Gabion walls, check dams (counter dams) and Meshes throughout the Sections of the Gullies and its Fingers” concept. This approach is not cost effective but gives opportunity for the possibility of rejuvenation of the gully and possible reclamation over time, within the University Campus. However, this option is not sustainable at the gully heads, and middle gully, as the connections between the existing and new concrete structures (such as culverts and channels) may pose a challenge during service or use. Also, the area is built-up with poor solid waste management.

Option 3 (preferred option)

The third option, which is the Partial Use of Concrete and Flexible Structures at Strategic Sections is best suited for the site and environs and should be developed as such, while ensuring rejuvenation or self – healing or reclamation of gully by mechanical processes (soil solid movement occurring upstream and beyond the project area

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

ES 14: Environmental and Social Mitigation Measures

Item No	Impacts	Receptor(s)	Proposed Mitigation Measures	Responsibility Party
Pre-construction Phase				
1.	Grievances and negative community perception about the project	Social (Project Affected Persons)	Continuous sensitization and awareness creation	SPMU
2.	Soil erosion and soil pollution: Excavation, vegetation clearance, leveling and other land preparation works will expose and loosen the soil making it susceptible to both wind and water erosion and subsequent loss of top soil. There is potential for compaction of soil from the use of heavy machinery and contamination of soil from fuels, oils and waste.	Environment (Soil)	There should be constant checks and look out for soil pollution and erosion tendencies	Contractor ESO(SPMU)
3.	Disturbance of flora and fauna: Movement of personnel and	Environment (Vegetation)	Restriction and marking of	Contractor

Item No	Impacts	Receptor(s)	Proposed Mitigation Measures	Responsibility Party
	vehicles may result in trampling of flora and disturbance of fauna.		walk/vehicle path and revegetation after construction	
4.	Influx of workers and migrants: Migrants who move into the project area for job opportunities may not conform to the societal norms and cultural practices and may upset the social structure of these communities.	Labour (Migrant workers, culture)	Awareness creation and sensitization need to be carried out among migrant workers	SPMU Contractor
5.	Increase in fugitive dust emission from burning of waste and preconstruction activities	Environment (air)	No burning of waste adherence within the project environment	SPMU Contractor, GMSEPA
6.	Waste generation especially from camp and site setting activities	Environment	Strict adherence to the prepared Waste Management Plan	SPMU Contractor, GMSEPA
7.	Site clearing will lead to loss of species diversity and abundance, including soil organisms, fungi, invertebrates, and bacteria.	Environment (Biodiversity)	Revegetation and use of bioremediation method where necessary.	SPMU
8.	Noise and vibration from bringing in the heavy-duty project vehicles and equipment into the GSU project area	Environment	Use of heavy duty project vehicles and equipment during recommended time (9.am – 5pm, when people must have gone to their places of business).	SPMU, Contractor
9.	Disruption of vehicular movement	Social	Provision of alternative route, Use of a traffic control personnel and proper traffic signages	Contractor
Construction Phase				
10.	Increase in fugitive dust emission during construction phases of the rehabilitation	Environment (Air)	Regular watering of the surface to reduce fugitive dust	Contractor
11.	Disruption of vehicular movement	Social	Provision of alternative route, Use of a traffic control personnel and proper traffic signages	Contractor
12.	Waste generation especially construction wastes.	Environment	Strict adherence to the prepared Waste Management Plan	GMSEPA Contractor
13.	The frequency and incidence of occupational hazards may rise during construction activities.	Labour (Occupational, Health and Safety)	Proper signage within the project area and regular occupational, health and safety training and awareness to be carried out.	Contractor

Item No	Impacts	Receptor(s)	Proposed Mitigation Measures	Responsibility Party
14.	Possibility of seepage of fuel from machineries and effluent discharge into the watershed, thus impacting on the water quality	Environment (Ground water)	Proper, regular and timely maintenance of vehicles and machines.	Contractor
15.	Noise and vibration from the use of heavy-duty project vehicles and equipment into the GSU project area	Environment	Use of heavy duty project vehicles and equipment during recommended time (9.am – 5pm, when people must have gone to their places of business).	Contractor
16.	Blocked drainage channel	Environment	Regular Inspection of drainage channel and desilt when necessary	Contractor
Operation Phase				
17.	Loss of employment for laborer's after the completion of the rehabilitation works,	Labour (Migrant and Local Workers)	Commensurate fee should be given to the workers	Contractor
18.	Conflict owing to unresolved land acquisition and involuntary displacement during the construction	Social (Project Affect Persons)	Proper and timely resolution of land disputes before the commencement of construction	SPMU
19.	Increase of road users on access road which might lead to increase in number of road accidents along the rehabilitated road		Awareness creation and sensitization need to be carried out Proper signage within the project area	SPMU, Contractor

Institutional Arrangement for ESMP Implementation

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

The Federal Ministry of Environment, National Environmental Standards Regulatory Enforcement Agency (NESREA), and Gombe State Environmental Protection Agency (GOSEPA) will monitor, evaluate and audit the implementation of the ESMP to ensure that the rehabilitation works and project operations meet “best environmental practices”.

Gombe SPMU will organize awareness exercises on GBV/SEA, environmental protection and personal hygiene and sanitation shall also be undertaken for contractors, personnel and all stakeholders involved in project implementation. The GMSPMU Safeguard Officers will be directly responsible for the awareness creation exercise.

The NEWMAP FPMU will also provide an oversight function through its Environmental and Social Safeguard Officers to the GMSPMU during the project implementation. The World bank will also perform some supervisory role during its mission activities and use of consultants

ES 15: Grievance Redress Mechanism

In case of disputes arising between the RAP implementation committee and project affected persons, the preferred way of settlement is through amicable means to save time and resources as opposed to taking the matter to court.

To ensure that the PAP have avenues for redressing grievances related to any aspect of land acquisition and resettlement, procedure for the redress of grievances should be established for the project. The objective is to respond to the complaints of the PAP speedily and in a transparent manner. The mechanism is designed to be easily accessible, transparent and fair.

As far as possible, the objective will be to avoid the need to resort to complicated formal channels to redress grievances. It is considered that by resolving grievances within the projects administrative structures, not only will the process be more effective and efficient but also the progress of the project implementation is less likely to be affected.

ES 16: Gender-Based Violence (GBV)

GBV risks in the project target areas might include Intimate Partner Violence (IPV), public harassment including harassment in the form of; verbal insults, physical abuse, rape, harmful widowhood practices and women and child trafficking. Targeted support to women under the program could likely exacerbate risk opportunities. Development and implementation of specific GBV risk prevention and mitigation strategies, tailored to local contexts, will be critical. Guidelines for situation analysis of GBV and safe reporting guidelines in line with international best practices will be implemented. Further, all risks related to labor influx will have to be mitigated by participation of project beneficiaries/communities, and involvement of project contractors and contractors' workers and consultant employees, in identifying mitigation and implementing measures, including developing mitigation instruments such as "Labor Influx Management Plan" and "Workers Camp Site Management Plan".

ES 17: Labour Influx and Child Labour

The Gombe State University Gully Erosion Site intervention Project may face an influx of non-local labor and working condition issues as skilled laborers might not be available in some of the project sites. The project will take concrete measures to mitigate potential labor influx-related risks such as workers' sexual relations with minors and resulting pregnancies, presence of sex workers in the community, the spread of HIV/AIDS, sexual harassment of female employees, child labor and abuse, increased dropout rates from school, inadequate resettlement practices, and fear of retaliation, failure to ensure community participation, poor labor practice, and lack of road safety. These risks require careful consideration to improve social and environmental sustainability, resilience and social cohesion

ES 18: Community Security, Health and Safety

Community Security, Health and Safety Management would be established to manage the environmental and social risks and impacts identified. The implementation of the actions necessary to meet the community security, health and safety would be managed by the Gombe state NEWMAP's Environmental and Social safeguards officers.

It is necessary that trainings is delivered to the Community, Contractors and the SPMU with regards to Health and Safety issues consistent with the project activities. The SPMU should engage a consultant that will carry out these trainings before the contractors are mobilized to site. This will help prepare the SPMU and Communities in handling HSE issues that may arise during project implementation.

ES 19: Waste management plan

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

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

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

ES 20: Capacity Building Plan

Some capacity building and trainings are recommended before, during and after implementing the Gombe – State University Gully Erosion Rehabilitation Intervention Project. Some of the capacity building and trainings necessary are listed in Table 6.5 and Table 6.6 on pages 108 and 109, as summarised below.

- Sensitization and Induction
- Training on Environmental and Social Management Plan Implementation
- Training on Construction HSE
- Integrated Watershed Management Approach in NEWMAP Intervention
- Basic Environmental Awareness Training:
- Training on GSU NEWMAP rehabilitation Environmental and Social Management Plan and its implementation
- Safety induction course;
- Emergency and spill response preparedness and drill;
- Social responsibility during the construction phase and the modalities for community communication, interaction and relations;
- Basic First Aid Training and In-depth Training for selected personnel;
- The importance of Personal Protection Equipment (PPE) as a safety measure in occupational safety;
- Environmental and Safety Awareness Training
- Construction Safety
- Fleet Safety
- Hazard Communication
- Job Hazard Analysis
- Disaster management
- Accident Investigation

ES 21: Environmental and Social Management Plan and Monitoring Plan Budget

The environmental and social obligation of the contractor is explained in the following tables below, indicating the institutional responsibilities in terms of mitigation and monitoring, as well as the frequency during the pre-construction (Table 6 1), construction (Table 6 2) and operational (Table 6 3)

phases of the project. The associated budget estimates is 3,300 USD for the pre-construction phase, 6,000 USD for the construction phase and 6,500 USD for the operational phase, making a total of 15,800 USD

Summary of ESMP and Monitoring Budget

<i>Item</i>	<i>Responsibility for implementation and Monitoring</i>	<i>Cost Breakdown</i>	<i>Cost Estimate in Nigerian Naira (₦)</i>	<i>Cost Estimate in US Dollars (USD)</i>
<i>Enhancement of +ve impacts and Mitigation of -ve impacts</i>	<i>Contractor, PMU, SMEnvr, GOSEPA, FRSC</i>	<i>sum of direct monitoring amount</i>	<i>5,688,000.00</i>	<i>15,800</i>
<i>Management of ESMP Implementation</i>	<i>PMU, SMEnvr, GOSEPA</i>	<i>5% of Mitigation Cost</i>	<i>284,400</i>	<i>790</i>
<i>Monitoring, Evaluation & Audit</i>	<i>PMU, SMEnvr, GOSEPA, FERMA, SMW</i>	<i>25% of Mitigation Cost</i>	<i>1,422,000</i>	<i>3,950</i>
<i>SUB- TOTAL</i>			<i>7,394,400</i>	<i>20,540</i>
<i>Contingency</i>		<i>10% of Sub-Total</i>	<i>739,440</i>	<i>2,054</i>
<i>TOTAL</i>			<i>8,133,840</i>	<i>22,594</i>

The total cost for Implementing the ESMP and Monitoring Plan for the GSU Flood Site Rehabilitation Works is estimated at Eight Million, One Hundred and Thirty-Three Thousand, Eight Hundred and Forty Naira, only (₦8,133,840); that correspond to Twenty-Two Thousand, Five Hundred and Ninety-Four US. Dollars [USD22,594].

The ESMP matrix for the implementation is highlighted from Table 5 8 - Table 5 12. NB: \$1 = ₦360

The ESMP included various impacts discussed according to the respective phases during project implementation. The impacts have been described, as they will impact on the different environmental and social sensitivities. The mitigation measures, mitigation costs and institutional responsibilities were also highlighted in the ESMP matrix. The total cost for the ESMP implementation is estimated at ₦8,133,840.00,

ES 22: Disclosure

This document will be disclosed at designated public places such as the Federal Offices of the Federal and State Ministry of Environment, within the project area and the Gombe LGA headquarters for easy access, reaction and comments by the various concerned stakeholders and opinion makers. It will be displayed for 21 working days. The final copy(version) will also be displayed at the world bank info-shop

CHAPTER ONE: INTRODUCTION

1 Introduction

The Nigeria Erosion and Watershed Management Project (NEWMAP) aims to reduce vulnerability to soil erosion in targeted sub-catchments. This innovative, multi-sectoral project finances State-led interventions to prevent and reverse land degradation on a demand-driven basis with focus on gully erosion sites that threaten infrastructure and livelihoods. Investments are a strategic combination of civil engineering, vegetative land management and other watershed protection measures, plus complementary community-led livelihood enhancements. The sustainability of these investments is being reinforced by strengthening institutions and information services across sectors in the country's three tiers of government, including support to improve governance, regulatory compliance, environmental monitoring, watershed and land use planning, and strengthening the country capacity to promote and implement climate resilient, low carbon development.

It creates channels of various sizes through concentrated runoff on definite routes, which result in systematic removal of soil particles, including plant nutrients, from one location to another, and even in worse cases destruction of lives and properties. In view of this, the Government of Nigeria is implementing the multi-sectoral Nigeria Erosion and Watershed Management Project (NEWMAP), financed by the World Bank, Global Environment Facility, the Special Climate Change Fund, and the Government of Nigeria. The NEWMAP is aimed at reducing vulnerability to soil erosion in targeted sub-catchments. The project is currently being implemented in about 21 states in the country.

1.2 NEWMAP Overview

The Nigeria Erosion and Watershed Management Project (NEWMAP) is an eight-year innovative, multi-sectoral project, which finances State-led interventions to prevent and reverse land degradation, initially focusing on gully erosion sites that threaten infrastructure and livelihoods in about 21 States which started with Abia, Anambra, Cross River, Ebonyi, Edo, Enugu and Imo and subsequently scaled out to other states nationwide which include Gombe State.

Integrated investments: Investments include a strategic combination of civil engineering, vegetative land management and other catchment protection measures, and community-led adaptive livelihood initiatives. The sustainability of these investments will be reinforced by strengthening institutions and information services across sectors and States, including support to improve governance, regulatory compliance, environmental monitoring, impact evaluation, catchment and land use planning, and to strengthen Nigeria's capacity to promote and implement climate-resilient, low-carbon development.

Multi-sectoral agencies: NEWMAP involves many Federal and State Ministries, Departments and Agencies (MDAs), local governments, communities, and civil society organisations. Effective implementation requires inter-ministerial and inter-state coordination, collaboration, and information sharing. Each component, sub-component and activity will be implemented through relevant Federal and State MDAs. The various MDAs include those responsible for planning, economy and finance, works, agriculture, water resources, forests, transport, power, emergency response, as well as those focused on climate and hydrological information or catchment/ basin regulation. Most of NEWMAP's investments will be made at the State level, as States have primary responsibility for land management and land allocations.

1.3 Implementation Arrangements

The Federal Ministry of Environment (FMEnv) is the lead implementing agency for NEWMAP. A Federal Project Management Unit (FPMU) headed by a Federal Coordinator hosted by FMEnv is responsible for overall coordination. There is a State Project Management Unit (SPMU) in each State, headed by a State Coordinator and hosted by each State's Ministry of Environment. The participating states must qualify to benefit from NEWMAP investment activities. All participating states will be eligible to participate in institutional capacity building and technical assistance activities, as these will contribute to meeting qualification criteria to participate in investment activities.

Though NEWMAP is expected to have highly positive environmental impacts, the World Bank (WB) has nevertheless classified it as an Environmental Category A project. This is in view of its scale, the types of problems it addresses, the possibilities of significant adverse impacts if interventions are not correctly designed and implemented, and the challenges of bringing Federal, State and Local environment agencies up to a suitable level.

1.3.1 Approach- Strategic Approach to Northern Intervention Sites

NEWMAP's strategic approach to northern intervention sites contributes to securing ecosystem function from erosion and watershed management issues. The project emphasis in these states will be more on broader soil erosion issues which compromise the natural resource base and associated livelihoods. For example, land degradation and drought threaten productive lands and the catchments of important multi-purpose reservoirs (reducing reservoir lifespan). Natural regeneration of vegetation cover could be a low-cost and effective community-driven approach for the northern states. This will be achieved by promoting rangeland and woodland management with the participation of local communities, and setting up plans for communities to execute.

1.4 Environmental and Social Safeguard Concerns

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

1. **Environmental and Social Management Framework (ESMF):** In general, the ESMF specifies the procedures to be used for preparing, approving and implementing
 - a) **Environmental/Social Assessments** (ESAs, or alternately both an SA or an EA) and/or
 - b) **Environmental/Social Management Plans** (ESMPs, or alternately both an EMP and SMP) for individual civil works packages developed for each project. ESMPs are essential elements for Category B projects. The ESMF will serve as a guide for the preparation of this ESMP for GSU gully Erosion site since the World Bank OP/BP 4.01-Environmental Assessment is triggered as a result of the civil works.
2. **Resettlement Policy Framework (RPF):** The RPF applies when land acquisition leads to the temporary or permanent physical displacement of persons, and/or loss of shelter, and /or loss of livelihoods and/or loss, denial or restriction of access to economic resources due to project activities. It sets out the resettlement and compensation principles, organizational arrangements and design criteria to be applied to meet the needs of project-affected people, and specifies the contents of a Resettlement Action Plan (RAP) for each package of investments. A Resettlement Policy Framework (RPF), which serves as a practical tool during the programme formulation, design, implementation and monitoring, was prepared for NEWMAP, which serves as a guide for the present terms of reference. The activities of Component 1 will involve civil works in specific intervention sites – that is, construction of drainage works and/or rehabilitation of gullies. This

could result in the acquisition of land or displacement of families, business or public infrastructure, thus triggering the World Bank OP/BP 4.12 – Involuntary Resettlement.

The World Bank Environmental and Social Safeguards concerns for the NEWMAP are addressed by the policies that provide guidelines for the identification, preparation, and implementation of projects. These policies are used to address environmental and social safeguards concerns for projects, these include but not limited to EA (OP/BP 4.01), Natural Habitats (OP/BP 4.04), and Forests (OP4.36) etc.

Other documents already prepared under the project include an Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF), the Project Appraisal Document (PAD) and the Project Implementation Manual (PIM). Specifically engineering designs are also prepared for the site-specific gully sites.

1.5 Detailed Description of Intervention Work

This report therefore focuses on the Environmental and Social Management Plan (ESMP) for the GSU Gully Erosion Site in Gombe Local Government Area of Gombe State. The NEWMAP intends to reclaim and rehabilitate the gully erosion site so as to reduce the environmental impacts created by flood and removal of topsoil in the targeted area. The proposed activities will employ some civil works such as channelization using flexible and solid structures to line the gully for a stretch of about 3.8km through densely populated area and bio-remediation works of the gully site. Other specific activities to be carried out include; construction of rectangular concrete stepped channel (Drop structure), collector channels, earth work and excavation, weeping holes, filing and compaction of roads etc. These are further discussed in detail in the following sub-sections.

1.5.1 Vegetative Cover Provision Requirement

The three options would attract relative equal cost in terms of vegetative cover requirement. However, in options 2 and the 3, the cost would vary a bit lower unlike in option 1. This is because, the 3m lined gabion wall placed at both sides of the gully banks (whether excavated trench or not) work not require vegetative cover, whereas, the Option 1 having maximum concrete thickness of 0.5 m would require the 2.5 m remaining width to be protected by vegetative cover on both sides of the gully corridor. Hence, there would be minimal vegetative cover area along the gully corridor and attendant minimal cost requirement for using either option 2 or 3.

1.5.2 Key Proposed Roads for Pavement

Table 1.2 : Key roads proposed for pavement

Road for pavement	Length of Road (m)
Road 1	558.27
Road 21	386.57
Emir Palace Road	308.51
Road 15	302.32
Road 24	337.7
INT 4	171.87
Total Length of Road	2,065.24

1.5.3 Proposed Wood Work

The major variations for cost comparison between rigid elements (reinforced concrete channels or water - way) and flexible structures (Gabion Channels or water – way) occur in the cost of formwork, reinforcement, cost of workmanship, and concrete in channels. In constructing cast-in-place channels requires formwork for the four vertical sides of the channels, formwork for counterfort structure (for high walled channels), laying reinforcement, pouring, vibrating concrete, and tamping concrete in place, and all these activities also require workforce and level of precision. But the use of gabion structure will not require all these.

1.5.4 Weep Holes Requirement Provision

When water accumulates behind a drainage channel wall, the lateral forces acting on the wall increase. The more water that has collected behind the channel, the greater the hydrostatic pressure on the wall will be. If the overturning moment (caused by the total lateral forces) exceeds the resisting moment (caused by the total vertical forces), the wall will fail.

Weep hole application on the walls is one the several ways to prevent water from building up behind any retaining wall. In this approach, a drainage pipe behind the wall is installed. The pipe is inclined to an angle. The pipe can be located just above the footing, or can be located at a higher elevation. Taller walls may require more than one drain pipe to sufficiently relieve the hydrostatic pressure.

Weep holes allow water to escape from behind the wall. These holes should be regularly spaced in the horizontal direction. Retaining walls with a height greater than a few feet have weep holes that are regularly spaced in the vertical direction, forming a grid pattern.

A cohesionless, granular soil should be used as backfill to allow water to penetrate the soil to reach the drains or weep holes mentioned above. If a cohesive soil is used, such as clay, it will be difficult for the water to reach a depth where it can enter a pipe or weep hole. Granular materials allow for water to permeate through the backfill, rather than being trapped within it. As gravity pulls the water downward, the granular backfill lets the water freely pass until it reaches weep holes or pipes.

1.5.5 Earthwork Excavation Requirement

Earthworks cost is a function of hauled amount x hauled distance. The goal of mass haul planning is to determine these amounts and the goal of mass haul optimization is to minimize either or both.

In flexible structure application, earthwork excavation requirement may be huge because of its massive nature, unlike its counterpart, the rigid structures made of concrete.

1.5.6 Compact Fill Material Requirement per meter run (Water – Way)

Fills include conventional compacted fills; hydraulic fills; and uncontrolled fills of soils or industrial and domestic wastes, such as ashes, slag, chemical wastes, building rubble, and refuse. Properly placed compacted fill will be more rigid and uniform and have greater strength than most natural soils. Hydraulic fills may be compacted or uncompacted and are an economical means of providing fill over large areas. Except when cohesionless materials, i.e., clean sands and gravels, are placed under controlled conditions

so silty pockets are avoided and are compacted as they are placed, hydraulic fills will generally require some type of stabilization to ensure adequate foundations.

1.5.7 Check Dam Requirement Provision (Water – Way)

The choice of check dams along the main gully is to stabilize its longitudinal profile and avoid any scouring actions on the gully bed. The location of the check dams are determined using the longitudinal profile of the gully bed established by the topographic survey. The location of the check dams along the main gully are designed using the following approach: the crest of a check dam weir must be at the same elevation as the toe of the precedent one, so the slope between two successive check dams is practically horizontal and guarantees gully bed stabilization.

This ESMP is prepared in accordance with standard procedures for environmental assessment including the applicable World Bank (WB) Environmental and Social Safeguard policies and Nigerian environmental assessment guidelines

1.6 Rational for the NEWMAP Intervention

A project's environmental and social management plan (ESMP) consists of a set of mitigation, monitoring, and institutional measures to be adopted during project implementation and operation in order to eliminate possible adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan also include actions needed to implement those measures. The ESMP is an essential safeguard element for “Category A” projects, such as the planned gully erosion rehabilitation works in Gombe State University(GSU), Gombe State.

This Environmental and Social Management Plan (ESMP) is therefore an important project management strategy that will manage the proposed GSU gully erosion site rehabilitation project activities such that the potential environmental and social impacts arising from the project implementation will be mitigated, avoided or eliminated.

The ESMP exhibits the Gombe State NEWMAP Project Management Unit’s corporate commitment to managing the project implementations in a sustainable manner. The ESMP will also ensure compliance with applicable environmental standards all through the life span of the project. The Bank will disclose the ESMP document publicly, in Nigeria and at the World Bank website before project implementation.

1.7 Objectives/Rational for the Environmental and Social Management Plan

The objective of the Environmental and Social Management Plan (ESMP) is to set out measures to be taken in addressing the identified adverse impacts of the various components and activities of the project. In addition, the ESMP is meant to develop procedures and plans to ensure that the mitigation measures will be implemented throughout the phases of the Remediation work of the GSU Gully Erosion site.

The specific objectives of this ESMP as indicated in the **Terme of Reference (TOR)** document (**Annex 2**), which formed the contractual basis for the project; out lined the objectives as follows:

- 5) The site specific ESMP is meant to document the set of mitigation, monitoring, and institutional actions to be taken before and during implementation of the project to eliminate adverse environmental and social impacts.

- 6) Develop measures needed to implement recommended actions, including addressing adequacy of the monitoring and institutional arrangement for the upper and lower watersheds in the intervention site.
- 7) Working in collaboration with the design firm and the SPMU in sequencing the technical/feasibility for the ESMP studies, where outcomes are considered in the design phase of the proposed activities to ensure that potential environmental and social constraints on the ground are addressed.
- 8) To assess the natural resources and infrastructure that may likely be affected during project implementation and operation, and identify management strategies that would be required to mitigate the anticipated environmental risks.

1.8 Methodology for the ESMP Preparation

The main process for preparing the report is categorised into i) reconnaissance survey, ii) focal group discussion and consultation, iii) field work to administer questionnaires, collect soil and water samples, iv) in-situ air quality and noise level assessment, v) data analysis and interpretation, vi) impact identification and mitigation, and vii) report documentation in the following phases ie first draft report, draft report and final report (both of which underwent independent stages of reviews from the SPMU/FPMU/WB).

Basically the approach to the study began with a general reconnaissance survey of the intervention site and its environs. to ascertain the extent of work. These was followed with series of FGD and consultations with the identified communities/ members/ groups, the authorities of the State Ministry of Environment, the Gombe State University management, the SPMU and the traditional institutions in the affected area. Questionnaires were administered to collect information on the socio-economic attribute of the people in the project area, these data was analysed and results presented in charts, tables and graphs for discussion. The technical approach is explained in detail in section 1.7.1.

1.8.1 Methodology and Technical Approach

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

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

1.8.1.1 Preliminary Site Visit/Scoping and Reconnaissance Exercise

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

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

1.8.1.2 Impact Identification

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

1.8.1.3 Impact Identification and Assessment Tool

For the identification of the potential impacts, the most appropriate tools in identifying, assessing, and managing the impacts was used so that critical social and environmental issues associated with the rehabilitation project are fully identified, and positive impacts optimized, while the negative impacts were proposed for mitigation.

During the reconnaissance visit to the GSU gully site, a number of potential and associated impacts were revealed and carefully noted with the use of Checklist. The checklist used for the evaluation of potential impacts was based on its comprehensiveness, selectivity, mutual exclusivity, objectivity, confidence limit and ability to deduce and predict interactions.

1.8.1.4 Beneficial Impacts Associated with the Rehabilitation of the GSU Gully Erosion Complex

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

Some of the benefits impacts associated with the project include:

- Rehabilitation of the erosion menace in the community
- Repair of the watershed gullies
- Connection and restoration of access to houses and villages already cut off by the erosion
- Provision of employment opportunities for both skilled and unskilled workers.
- Improved agricultural productivity within the community and the state at large.
- Community development programs.
- Reintegration of community and diversification of sources of livelihood.
- Reduction of mortality rate.
- Promotion of afforestation programs (with all its benefits)
- Minimization of flooding and control overflow.
- Reduced fear, perception of loss of properties, inhabitation and ancestral origins of the communities.
- Control and Reduction of water body sedimentation rates due to erosion.
- Reduction in mortality/morbidity from landslides.
- Increase in social interactions
- Improved livelihood enhancing activities
- Gender Issues: Construction activities will encourage economic activities, especially for women. Since there would be a large workforce, petty traders and food-spots owners will benefit immensely from the demand on site.

- Promotion of goodwill and community appreciation of the NEWMAP intervention in Gombe State and Nigeria at large.

1.8.1.5 Adverse Impacts associated with the Rehabilitation of the Gully Erosion Complex

Some adverse impacts that may be associated with the rehabilitation of the gully site are highlighted in this subsection. Notwithstanding, the ESMP is prepared to ensure that all negative impacts are reduced to the barest minimum and the positive impacts enhanced.

- Construction machinery moving around the area can create soil compaction, which may harm the soil's future potential as farmland, impair drainage and increase the risk of flooding.
- Waste Generation: Construction crews may generate solid and liquid wastes (sewages). Uncontrolled and untreated, these wastes are major sources of pollution, disrupting the ecosystem and contributing to local (and sometimes much broader) health problems.
- Restricted Access to Business owners: During the rehabilitation works there are bound to be restriction in movement, which will affect transport of good and services.
- Pressure on the available water for domestic purpose and other uses
- Noise and Vibration Nuisance: The project area is a built-up area with residential houses, schools, and market. The civil works will generate noise and vibrations on site and surrounding environment. Most civil work projects starting from the pre-construction phase to the decommissioning phase would generate relatively high levels of noise and would be mainly from heavy equipment. The noise levels generated by construction equipment would vary significantly, depending on such factors as type, model, size, and condition of the equipment, operation schedule, and condition of the area being worked. Accordingly, potential impacts of site monitoring and testing activities on ambient noise level are predicted to be temporary and intermittent in nature.
- Emission of Green House Gases, Dust and Particulates: Emissions from exhaust fumes will originate from mobile sources including vehicles, trucks and heavy equipment during mobilization.
- Attack by Poisonous Insects, Reptiles and other Dangerous Wild Animals: Field workers engaged in site clearing, geotechnical investigations and construction may be exposed to attack by animals. These attacks could result in injuries, poisoning or even death.
- Interference with Land Transport: The equipment and personnel will be transported by road. Additional traffic during transport of equipment and personnel for the proposed project will likely create traffic issues on the road. There is high likelihood that when moving these equipment and personnel along these roads, the transport activities of the community could be disrupted and this could have impact on the socio-economic activities of the community.
- Alteration of Habitat and Biodiversity: Disturbance on the natural habitat due to human activity can result to likelihood that some amount of flora and fauna would be destroyed. Site clearing will lead to loss of species diversity and abundance, including soil organisms, fungi, invertebrates, and bacteria. It will also lead to loss of food sources, fauna habitat, breeding grounds and nesting sites.
- Work Site Accidents: The frequency and incidence of occupational hazards rise with increasing activities. Site clearing is typically done using both heavy and light equipment such as graders, and bulldozers. In the process of clearing there could be injuries and possibly fatalities among the workforce.
- Loss of Jobs: At the end of the project lifetime the project workforce will be demobilized. This will bring about loss of jobs for the project workers. This will translate to loss in income and business

opportunities. Most of the small scale businesses that provided goods and services to the road crew members will either windup or experience significant reduction in the volume of business with the demobilization of the project and this too will translate to loss of income.

- a) Further beneficial and adverse impacts were identified in the course of the field work and mitigation measures were developed and presented in the Report. Questionnaires were designed and also used for data gathering from Stakeholders and PAPs along the project site corridors.

1.9 Deliverables

The deliverable will include the preparation of Inceptions, draft and final ESMP Report, which will be acceptable to the Gombe –NEWMAP SPMU Gombe State, and to the World Bank.

CHAPTER TWO: POLICY, LEGAL AND REGULATORY FRAMEWORK

2.0 Introduction

This chapter seeks to provide an overview of Nigerian national environmental legislations and policies linking these with other institutional framework policies (agriculture and water) of Gombe and highlighting the World Bank operational policies that apply to the rehabilitation works of the GSU erosion site.

2.1 World Bank Safeguard Policies

The World Bank Environmental and Social Safeguard Policies are cornerstones of the Bank’s support to sustainable poverty reduction. The main objective of these policies is to prevent and mitigate undue harms to people and their respective environment in the developmental processes. These policies also provide guidelines for the Bank and borrower staffs in the identification, preparation, and implementation of programs and projects. Table 2. 1 provides the World Bank policies triggered by NEWMAP and those triggered by the specific project site.

2.1.1 World Bank Safeguard Triggered by NEWMAP Project

The World Bank Safeguard Policies that are likely to be triggered by thr project as proposed for the Gombe State University gully erosion intervention can be identified in the Table below.

Table 2. 1: World Bank Safeguard Policies Triggered by Gombe State University Erosion Gully Site Intervention Project.

S/N	Safeguard Policies	Triggered by GSU Erosion Gully Site		Applicability to project duration	How Project Address Policy Requirements
		Yes	No		
1	Environmental Assessment (OP/BP 4.01)	[X]	[]	Civil works with site-specific impacts; Construction of inlet channel, precast concrete, fence, road and Underground box culverts to reduce the peak flow rates and flooding. It also applies to the acquisition of land and resources for these activities which will lead to economic and potentially physical displacement.	ESMF prepared for NEWMAP and site-specific mitigation measures developed in the ESMP.
2	Physical Cultural Resources (OP/BP 4.11)	[X]	[]	Civil works, including excavations construction of open and underground drainage will most likely not be able to avoid all cultural	ESMF prepared for NEWMAP and site-specific mitigation measures developed in the ESMP.

S/N	Safeguard Policies	Triggered by GSU Erosion Gully Site		Applicability to project duration	How Project Address Policy Requirements
		Yes	No		
				heritage sites as well as presently unknown sites that can be expected to be found in highly cultured environment like GSU	
3	Involuntary Resettlement (OP/BP 4.12)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Restriction of access to sources of livelihood. The demolition of structures. The proposed activities will take place in farming areas.	RPF prepared for NEWMAP and a standalone RAP spells out site specific issues to be addressed and how
4	Indigenous Peoples (OP/BP 4.10)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The people in the area are by the World Bank not considered as indigenous peoples.	NA
5	Natural Habitats (OP/BP 4.04)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The activities require significant conversion of significant areas of natural habitats along the downstream,	ESMF prepared for NEWMAP and site-specific mitigation measures developed in the ESMP.
6	Pest Management (OP/BP 4.09)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The area is dry land and does not affect pests.	
7	Safety of Dams (op/bp 4.37)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The gully channel does not have direct impact of the Dadin kowa Dam	
8	Projects on International Waterways (OP/BP 7.50)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The about 3.9km channel drain runoff into the Gongola river and does not fall into the category of an international river	
9	Projects in Disputed Areas (OP/BP 7.60)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The.re is no evidence of communal dispute in the area	
10	Forest (OP/BP 4.36)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Applicable to the upper catchment within the university campus. Project should ensure replacement of adequate vegetation cover after completion	ESMF prepared for NEWMAP and site-specific mitigation measures developed in the ESMP.

NB: Where there is a gap of conflict between the National Law and World Bank OP 4.12, the higher standard shall prevail which in this case is the World Bank Policy

2.2 International Conventions and Agreements

Several international regulations, protocols, treaties and conventions have been signed by countries of the World which are aimed at halting environmental degradation and thus protecting human health against possible adverse effects. Nigeria subscribes to a number of these International Regulations and Conventions relating to Environmental Protection. Table 2. 2 shows some of the international conventions, agreements and protocols to which Nigeria is signatory and applicable to the Gombe State NEWMAP in the Gombe State University Erosion Gully Site.

Table 2. 2: International Conventions, Agreements and Protocols to which Nigeria is Signatory and Applicable to the Gombe State NEWMAP in the Gombe State University Erosion Gully Site

International conventions, agreements and protocols	Applicable to NEWMAP		Applicable to GSU Erosion Gully Site		Applicability to project due to	How project address issues raised
	Yes	No	Yes	No		
Both the Vienna convention for the protection of the Ozone Layer and the Montreal protocol for Control of Substances that deplete the ozone layer.	[X]	[]	[X]	[]	Civil works will extend to forest area. There will be reduction in tree taxonomy and biomass leading to reduction in carbon sink and release of ODS gasses.	ESMF prepared for NEWMAP and site specific mitigation measures developed in the ESMP. Provision of vegetation measures following construction of the engineering measures.
Basel convention on the prevention of trans-boundary movement of hazardous wastes and their disposal.	[]	[X]	[]	[X]	ESMF and ESMP do not identify the use and or generation of hazardous wastes in the project lifecycle.	NA
Convention on the prevention of the international trade in endangered species (CITES).	[X]	[]	[X]	[]	No endangered species(s) of any kind was identified in the project area.	NA
Convention on Biodiversity.	[X]	[]	[]	[X]	Civil works may be carried out on the GSU which might affect the biodiversity life.	ESMF prepared for NEWMAP and site-specific mitigation measures developed in the ESMP. Bioremediation measures incorporated into the design of project.
Convention on climate change.	[X]	[]	[X]	[]	Proposed activities will results in both systemic and	ESMF prepared for NEWMAP and site-specific

International conventions, agreements and protocols	Applicable to NEWMAP		Applicable to GSU Erosion Gully Site		Applicability to project due to	How project address issues raised
	Yes	No	Yes	No		
					cumulative environmental change thereby contributing to sustained increase in temperature.	mitigation measures developed in the ESMP. Bioremediation measures incorporated into the design of project
Convention on Desertification.	[X]	[]	[X]	[]	Proposed activities will not reduce forest biomass	NA
Convention on Persistent Organic Pollutants.	[]	[X]	[]	[X]	No organic pollutant will be used or produced from activities design for the proposed project during its lifecycle.	NA
World Health Organization (WHO) Health and Safety Component of EIA, 1987.	[X]	[]	[X]	[]	Proposed activities may be injurious to man and the environment	ESMF prepared for NEWMAP and site-specific mitigation measures developed in the ESMP.

Table 2. 3:Gap between National Legislations, Policies and Regulations and the World Bank Policies

Category	Nigerian Law	World Bank OP 4.12	Measures to Fill the Gaps
Minimization of resettlement	No requirement to consider all options of project design in order to minimize the need for resettlement or displacement	Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs	Design of footprints of project-related activities, will be undertaken so as to minimize resettlement.
Information and Consultation	It is lawful to revoke or acquire land by the governor after issuance of notice. No consultation is required.	PAPs are required to be meaningfully consulted and participate in the resettlement process	PAPs shall be meaningfully consulted and engaged in the resettlement process
Timing of Compensation	The law is silent on timing of payment	This requires that compensation implementation will take precedence before construction or displacement	Compensation and resettlement implementation to take place before construction or displacement
Livelihood restoration	Makes no proscription on livelihood restoration measures	It requires that vulnerable PAPs have to be rehabilitated	Livelihood restoration measures will be put in place for vulnerable PAPs

Category	Nigerian Law	World Bank OP 4.12	Measures to Fill the Gaps
Grievance Process	The land use and allocation committee appointed by the Governor is vested with the responsibility of resolving all disputes/grievances and compensation matters	This requires that a grievance redress mechanism be set early constituting the representative of PAPs and, prefers local redress mechanism. The law court is the last resort when available mechanism or outcome is unsatisfactory to PAP	A grievance redress committee (GRC) shall be established early and existing local redress process shall be considered to address issues of project induced grievances. PAPs or their representatives shall be members of the GRC.
Community land with customary right	Compensation in cash to the community, chief or leader of the community for the benefit of the community	Land for land compensation or any other in-kind compensation agreed to with the community	Land for land compensation or any other in-kind compensation agreed to with the community
Agricultural land	Entitled to alternative agricultural land ¹	Land for land compensation	Land for land compensation
Fallow land	No compensation	Land for land compensation	Land for land compensation
Statutory and customary right Land Owners	Cash compensation equal to the rent paid by the occupier during the year in which the right of occupancy was revoked	Recommends land-for-land compensation or other form of compensation at full replacement cost.	Recommends land-for-land compensation or other form of compensation at full replacement cost.
Land Tenants	They are entitled to compensation based upon the amount of rights they hold upon land.	Are entitled to some form of compensation whatever the legal recognition of their occupancy.	Are entitled to some form of compensation whatever the legal recognition of their occupancy.
Squatters	These are not entitled to compensation for land but are entitled to compensation for crops.	These are to be provided with resettlement assistance in addition to compensation for affected assets; but no compensation for land	Are to be provided resettlement assistance in addition to compensation for affected assets; but no compensation for land
Owners of “Non-permanent” Buildings	Cash compensation based on market value of the building (that means depreciation is allowed)	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.

¹ Nigerian Land Use Act 1978, (2004 LFN)

Category	Nigerian Law	World Bank OP 4.12	Measures to Fill the Gaps
Owners of “Permanent” buildings, installations	Resettlement in any other place by way of reasonable alternative accommodation or Cash Compensation based on market value.	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.	They are entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, prior to displacement.

2.3 Institutional Framework

NEWMAP involves many federal and state ministries, departments and agencies (MDAs), local governments, communities, Community-based organisations (CBOs), NGOs, and the public. The investments for GSU Erosion Gully site and flooding rehabilitation works is being made through the Gombe NEWMAP.

The Federal Ministry of Environment (FMEnv) is the lead implementing agency for NEWMAP. The Federal Project Management Unit (FPMU) hosted by the FMEnv is responsible for the overall coordination. The Gombe State Project Management Unit (Gombe-SPMU hosted by the Gombe State Ministry of Environment and Forest Resources is responsible for coordination of NEWMAP in Gombe State, thus, Gombe NEWMAP is directly responsible for coordinating the activities of the GSU Erosion Gully Site intervention, including the implementation of this ESMP.

The Gombe State NEWMAP will have a direct supervisory and overarching responsibility in ensuring that the ESMP as documented herewith are fully carried out. It will ensure that the Contractor, its personnel and other critical stakeholders involved in project implementation fully comply with and implement all environmental, social, safety and health responsibilities as to assure best practices in carrying out works throughout the project execution at the project site and off-site work areas.

The Gombe State Ministry of Environment and Forest Resources, Gombe State Environmental Protection Agency (GOSEPA), and National Environmental Standards and Regulation Enforcement Agency (State) will undertake compliance monitoring and periodic inspection of work sites and surrounding work areas in the communities and also, ensure overall implementation of all measures that are necessary for environmental protection.

A Project Site Committee should be formed for project implementation supervision. Members of the Site Committee will be from members appointed by the GSU and adjoining Communities, and other critical stakeholders involved in the direct implementation and supervision of the rehabilitation works (one personnel each from Gombe State NEWMAP Office, SMEnv, Consultant, Contractor). They will be responsible in ensuring that all aspects of the rehabilitation work implementation are being carried out as per designs and agreed criteria. Their supervisory role will include ensuring that the ESMP is fully implemented.

The Contractor will be responsible for tasks-specific mitigations. Independent Safeguards Consultants will be responsible for the development of management plans as described in the ESMP (e.g. site-specific safety management plans, site-specific waste management plans, workers' respiratory protection program, etc.). Public Health departments from Gombe Local Government Authority in conjunction with NEWMAP Officers will be responsible for monitoring availability and distribution of Personnel Protective Equipment (PPE) such as safety boots, hard hats, face masks, etc. to work personnel and site visitors, and ensuring that they are appropriately used.

The Federal Road Safety Corps (FRSC), Nigeria Police Force and the Civil Defense Corp will ensure that mitigation measures for impacts on traffic and safety of citizens are implemented. All the mitigation measures specified in this plan shall be included in the bid documents for the successful contractor to implement.

2.4 Federal Policy/Legislation

2.4.1 National Legal Instruments on Environment

Environmental Impact Assessment Act No. 86, 1992 (*FMEnv*) (Environment, 1992) This Act provides the guidelines for activities of development projects for which EIA is mandatory in Nigeria. The Act also stipulates the minimum content of an EIA and is intended to inform and assist proponents in conducting EIA studies as well as a schedule of projects, which require mandatory EIAs. The EIA Decree No. 86 of 1992 lists drainage and irrigation as a Mandatory Study Activity, thus prescribing that an EIA is to be carried out for irrigation projects.

According to these guidelines:

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

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

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

2.4.2 Federal Ministry of Environment

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

Procedurally in Nigeria, it is worthy to note that before commencement of an EIA, the FMEnv issues a letter of intent on notification by the proponent, approves the terms of reference, ensures public

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

Table 2. 4: Other National Environmental Instrument

S/N	Policy Instrument	Year	Provision
1	National Policy on the Environment	1989 revised 1991	This describes both the conceptual and theoretical framework and strategies for archiving sustainable development in Nigeria
2	National Erosion and Flood Control Policy	2005	This addresses the need to combat erosion in the country through the procedure outline in the National Action Plan for Flood and Erosion and Technical Guidelines.
S/N	Legal/Regulatory Instrument	Year	Provision
1	Environmental Impact Assessment Act No. 86,	1992 (FMEnv)	This provides guidelines for regulating the activities of development projects for which EIA is mandatory in Nigeria. The Act also stipulates the minimum content of an EIA as well as a schedule of projects that require mandatory EIAs
2	The National Guidelines and Standards for Environmental Pollution Control in Nigeria	1991	These represent the basic instrument for monitoring and controlling pollution in Nigeria
3	National Guidelines on Environmental Management Systems	(1999)	This establishes the requirements for an Environmental Management System (EMS) in all organizations/facilities in Nigeria
4	National Air Quality Standard Decree No. 59	1991	This defines the levels of air pollutants that should not be exceeded in order to protect public health.
5	The National Environmental Standards and Regulations Enforcement Agency Act (NESREA Act)	2007	This makes provision for solid waste management and its administration and prescribes sanctions for offences or acts, which run contrary to proper and adequate waste disposal procedures and practices
6	Land Use Act	1978 Modified 1990	This is the primary legal means to acquire land in the country. The Act vests all land in the territory of each state in the federation in the governor of the State and requires that such land shall be held in trust and administered for the use and common benefit of all Nigerians in accordance with the provisions of this Act
7	Endangered Species Act	1985	This provides for conservation and management of wild life in Nigeria and the protection of some of her endangered species from extinction as a result of over exploitation.

S/N	Policy Instrument	Year	Provision
8	FEPA/ FMEEnv. EIA Procedural guidelines	1995	These indicate the steps to be followed in the EIA process through project life cycle.
9	S.1.15 National Environmental Protection (The Management of Solid and Hazardous Wastes Regulations)	1991	Regulate the collection, treatment, and disposal of solid and hazardous waste for municipal and industrial sources and give the comprehensive list of chemicals and chemical waste by toxicity categories
10	S.1.9 National Environmental Protection (The NEP (Pollution Abatement in Industries and Facilities Generating Waste) Regulations)	1991	These are imposed restrictions on the release of toxic substances and requirements of Stipulated Monitoring of pollution to ensure that permissible limits are not exceeded during and after the project.
11	S.1.8 National Environmental Protection (National Effluents Limitations Regulation)	1991	This makes it mandatory for industrial facilities to install anti-pollution equipment. It also makes provision for further effluent treatment, prescribe maximum limit of effluent parameters allowed for discharge, and spells out penalties for contravention.
12	Public Health Law		This deals with public health matters
13	Environmental Sanitation Edits, Law and Enforcements		This deal with the general environmental health and sanitation. Implementation and enforcement in the state.
14	Workmen Component Act	1987 Revised 2010	This provides for occupational health and safety

2.4.3 Nigeria EIA Guidelines and World Bank EA Guidelines

The Nigerian Environmental Impact Assessment Act (No. 86 of 1992) requires that all development projects be screened for potential impacts. Accordingly, a project after undergoing screening, may require a full EIA, partial EIA, or no EIA. The guidelines of 1995 direct the following issues after the screening process/outcome into the following categories.

According to the guidelines:

- Category I addresses projects that require full EIA. Such projects include large-scale activities like agriculture development on 500 or more hectares, land reclamation of 50 or more hectares, fisheries established on land-based aquaculture of 50 or more hectares, forestry projects on more than 50 hectares, etc.
- Category II are for projects requiring partial EIA, this focuses on mitigation and environmental planning measures, unless the project is located near an environmentally sensitive area, in which case a full EIA would be required.

- Category III are for projects considered to have beneficial impacts on the environment and for which an Environmental Impact Statement is prepared, without need for an EIA.

In comparison with the EA, the World Bank categorized projects into:

- **Category A:** These are projects whose impact are sensitive, diverse, and unprecedentedly, felt beyond the immediate project environment and are potentially irreversible over a long term. Such projects require full EA.
- **Category B:** These are projects that involve site specific and immediate project environment interactions. Specifically, they do not significantly affect human populations, alter natural systems and resources, consume much natural resources (e.g., ground water) or have adverse impacts that are not sensitive, diverse, unprecedented and are mostly reversible. Category B projects will require partial EA, and environmental and social action plans.
- **Category C:** These are projects that are mostly benign in nature and are likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required, although some may require environmental and social action plans.
- **Category FI:** A proposed project is classified as Category FI, if it provides funds through a financial intermediary to subprojects that may result in adverse environmental impacts. Here the financial intermediary is responsible for setting up an Environmental and Social Management Framework that supervises the establishment of EIAs in line with the World Bank System.
- The World Bank Categorization (A, B, & C) corresponds in principle with the Nigeria EIA requirements of Category I, II and III as both use the level of impacts associated with a given project as triggers for the required environmental assessment. However, in the event of divergence between the two with regard to the proposed intervention on the GSU Gully Erosion Site, the more stringent safeguard policy shall take precedence. Therefore, the GSU Gully Erosion Site intervention by NEWMAP in Gombe State, the Nigeria's *EIA* requirements and World Bank operational procedures both apply, thus requiring:
 - Early consideration of environmental and social issues (starting at the screening stage);
 - Identification and early consultation with stakeholders;
 - Prevention of adverse impacts through the consideration of feasible alternatives; and
 - Incorporation of mitigation measures into planning, especially in the engineering design.

2.5 Other Acts and Legislations

2.5.1 Land Use Act of 1978

The land-use Act of 1978 states that "...It is also in the public interest that the rights of all Nigerians to use and enjoy land in Nigeria and the natural fruits thereof in sufficient quality to enable them to provide for the sustenance of themselves and their families should be assured, protected and preserved'. This implies that acts that could result in the pollution of the land, air, and waters of Nigeria negates this decree, and is therefore unacceptable.

Furthermore, the Land Use Act of 1978 (modified in 1990) remains the primary legal means to acquire land in the country. The Act vests all land comprised in the territory of each state of the Federation in the Governor of the state and requires that such land shall be held in trust and administered for the use and common benefit of all Nigerians in accordance with the provisions of this Act.

According to the Act, administration of land area is divided into urban land which will be directly under the control and management of the Governor of each State; and non-urban land, which will be under the control and management of the Local Government Chairman. State Governors are given the right to grant statutory rights of occupancy to any person or any purpose; and the Local Government Chairman has the right to grant customary rights of occupancy to any person or organization for agricultural, residential and other purposes. (Housing, 1978).

2.5.2 State Legislation

Gombe State Ministry of Environment and Forest Resources: The Gombe State ministry of environment and forest resources is saddled with the responsible of protecting, preserving and improving the state environment and forest areas. This Ministry is responsible for designing and executing programs that will help in the control of environmental disasters such as flooding, erosion, desertification and management of forests Resources.

Gombe State Environmental Sanitation and Protection Agency (GOSEPA). The agency is under the GSME&FR responsible for all environmental related issues in the state. Responsibilities include planning and development of urban centers, provision of amenities, infrastructures and other functions necessary for healthy and orderly urban growth.

Gombe State Ministry of Agriculture and Natural Resources: The Ministry of agriculture in Gombe state is largely responsible in formulating and implementing agricultural policies in the state. However, the ministry enlighten and coordinate farmers' activities in the state.

CHAPTER THREE: DESCRIPTION OF THE AREA OF INFLUENCE AND ENVIRONMENTAL BASELINE CONDITIONS

3.1 General Project Area

Gombe State is one of the 36 states in Nigeria located in the north east geopolitical zone, between latitude 9°32'– 11°18'N and longitude 10°28'– 11°52'E in the sudan and northern guinea savanna region of the country. Gombe State shares boundaries with Yobe State to the north, Adamawa and Taraba States to the south, Borno State to the east, and Bauchi State to the west. Gombe state covers an area of 18,768 km², with population of about 2,365,040 (according to the 2006 national census) distributed across the 11 local governments in the state. The state has two very distinct seasons that are controlled by the movement of the Intertropical Convergence Zone (ITCZ), the wet season usually last between April to October with an average rainfall of 850mm and the dry season from November to March.

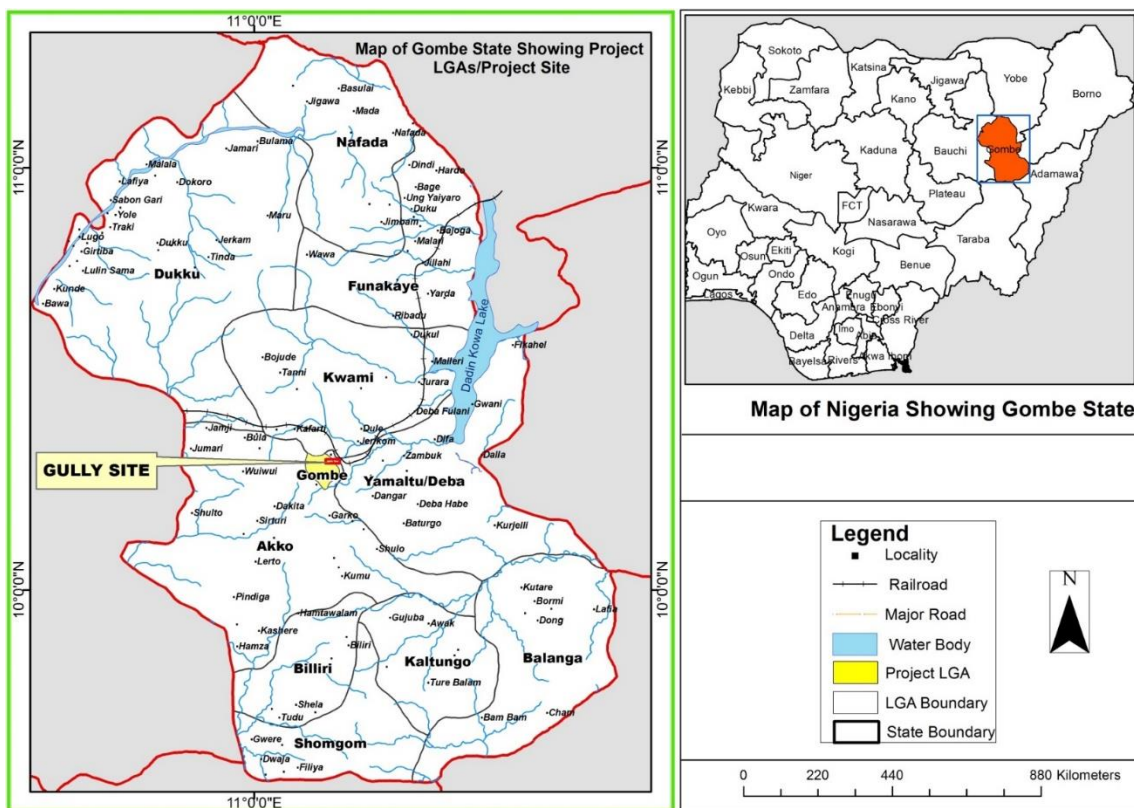


Figure 3 1: General Map of the Project Area

3.2 Overview of the Project Area

The proposed intervention site starts within the university campus on Latitude 10°18'02.68''N and Longitude 11°10'13.83''E and terminates on Latitude 10°18'14.92''N and Longitude 11°12'00.15''E as in Figure 3 1. The Gombe State University erosion site is located in Gombe metropolis (the state capital), dissecting through the university to the eastern out-skirt of the metropolis. As a benefiting site, an ESMP is required because of the potentials to trigger WB safeguard policies. The gully has two major fingers; one in the university campus and another immediately outside the university campus, the stretch of the main gully is about 3.8km, with maximum width of 15m and depth of more than 5m at some points.

Because the gully cut across the university campus, it has effectively disconnected the student’s hostels from other parts of the university (although the university has constructed a makeshift pedestrians crossing; it is inadequate as may fall due to the active slop/bank erosion going in the gully channel) and residents outside the university community. Another issue is the security threat at the eastern border of the university, where the perimeter fencing has been breached (destroyed) and has left the place porous and unsecured.

3.2.1 Climate

The project area is categorized to be part of the semi-arid and hot tropical climatic conditions with some humid months. The area is in the sudano-sahelian zone in the northeastern part of Nigeria where maximum temperatures could reach over 44⁰C during the dry season. The climate of the study area is described to be influenced by the inter-tropical convergence zone, characterized by the presence of two distinct seasons, dry and wet seasons. The wet season begins in April/May and ends in September/October while from November to April is the dry period.

3.2.2 Rainfall

The average annual rainfall from 2009 -2019 ranges from 87.23 mm to 102.19 mm. Intense rainfall starts in April and most of the rains are received between June and September, an important time period in the crop growing calendar. Peak rainfall is in June, July, August, and partially September, time when evapotranspiration does not exceed rainfall and no moisture stress is expected. As a result, most annual and short season crops could be successfully grown in the project areas without much stress if efforts are made to adjust to cropping calendars that are considerate of the time periods when most of the rains are received, Figure 3 2 depicts this.

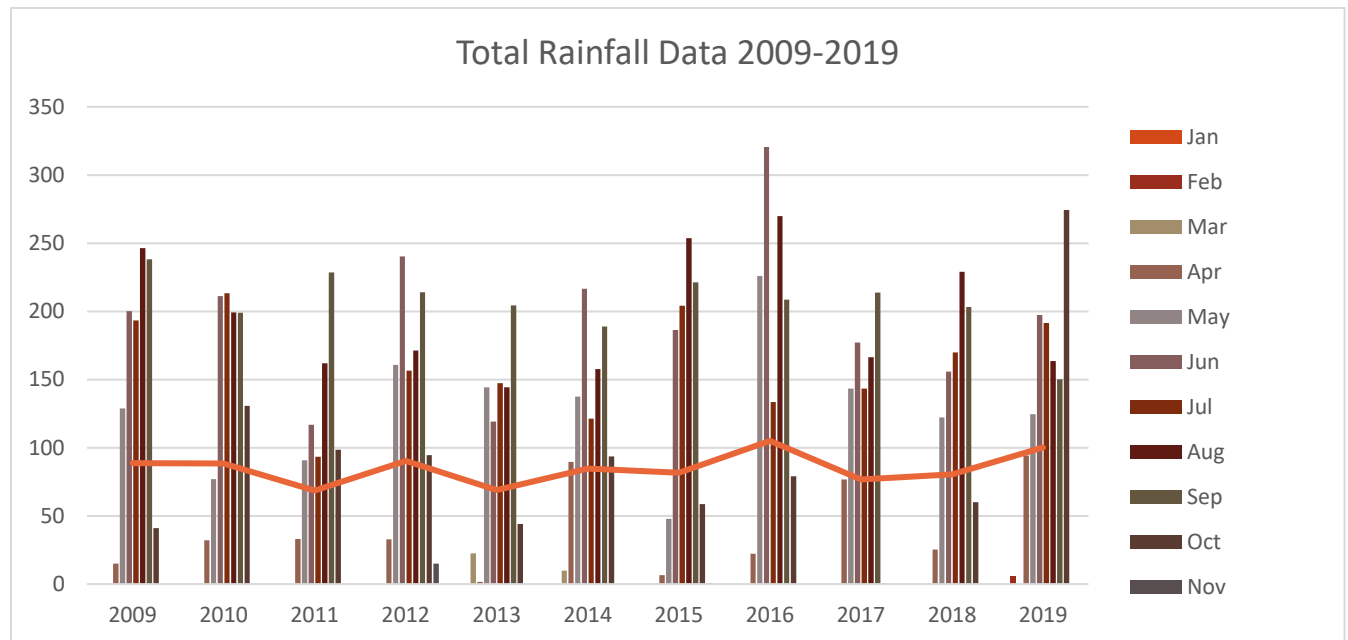


Figure 3 2: Total Rainfal data 2009-2019 (Source UBRBDA)

3.2.3 Temperature

Minimum temperature

Minimum mean air temperature ranges 20.33⁰C (2012) to 21.82⁰C (2010). From December to January the temperature drops to the lowest of 16 ⁰C. Temperatures drop down considerably with onset of the rainy seasons. The minimum temperature (Figure 3 3) is in December which favours crops such as wheat and some vegetables.

Maximum Temperature

The maximum temperature of the project area is 44⁰ C and it was observed in the month of June 2017. The Average maximum temperature ranges from 32.07⁰C (2012) to 37.15⁰C (2019)(Figure 3 4). The mean maximum temperature is 21.91 ⁰C.

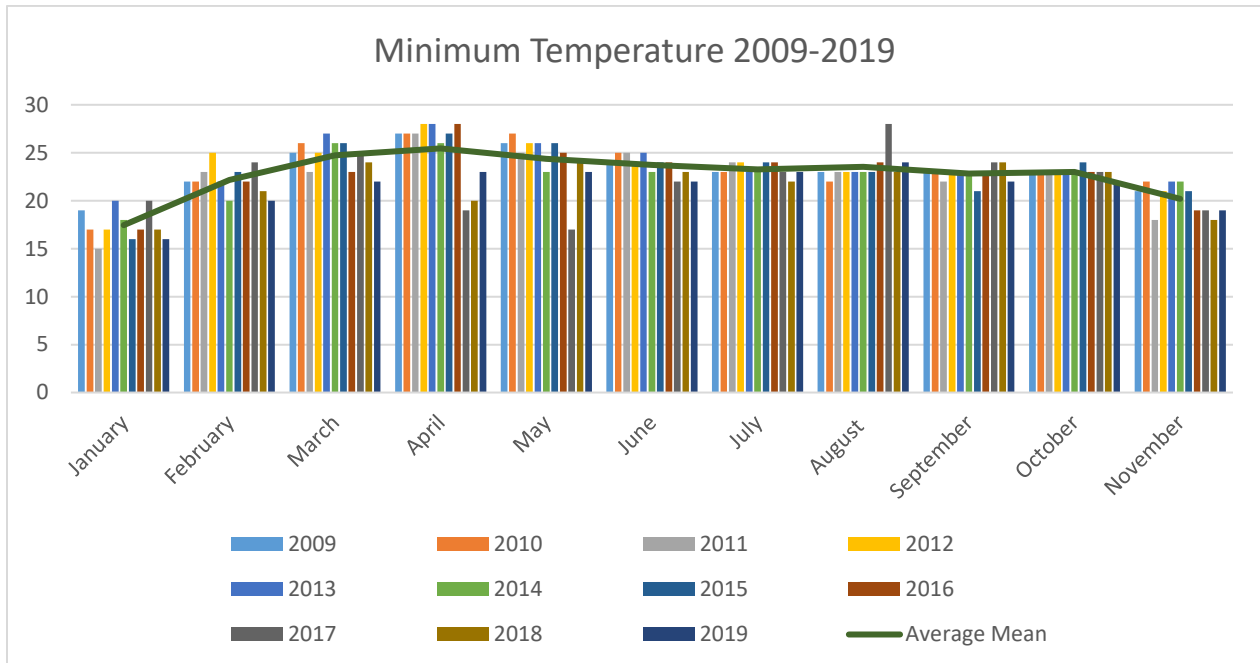


Figure 3 3: Minimum Temperature Data 2009-2019 (Source UBRBDA).

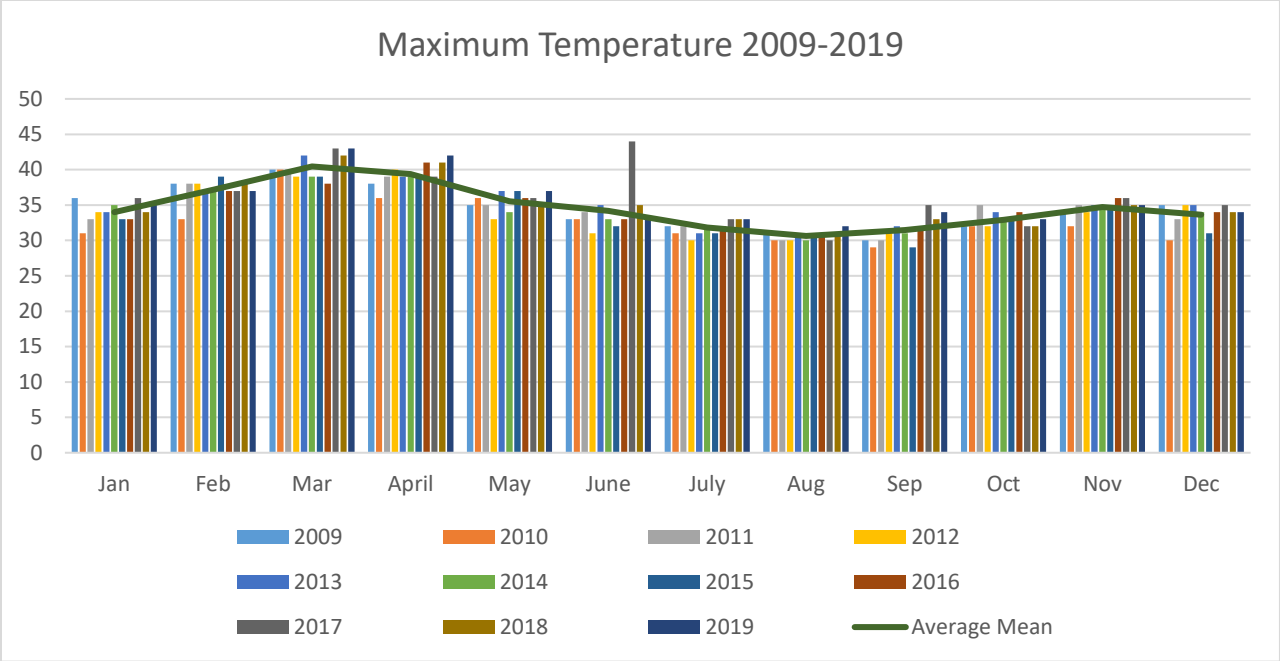


Figure 3 4: Maximum Temperature Data 2009-2019 (Source UBRBDA).

3.2.4 Evapotranspiration and Humidity

Highest rate of Evapotranspiration is recorded during the months of March, April, and May while the lowest is in December. Comparison of mean monthly rainfall and evapotranspiration indicates that rainfall in July and August can fully meet evapotranspiration requirements but potential for moisture stress exists in the rest of the growing period. Mean evapotranspiration vary from 114.8 mm in December to 168.0mm in April and interestingly evapotranspiration experienced in the dry season when irrigation is extensively practiced are no different than the amounts experienced during the rainy season.

The Humidity rates increased around June, July, August and September period while November to February experiences the lowest rate of humidity. November 2019 accounts for the highest humidity rate of 82 gram per cubic meter.

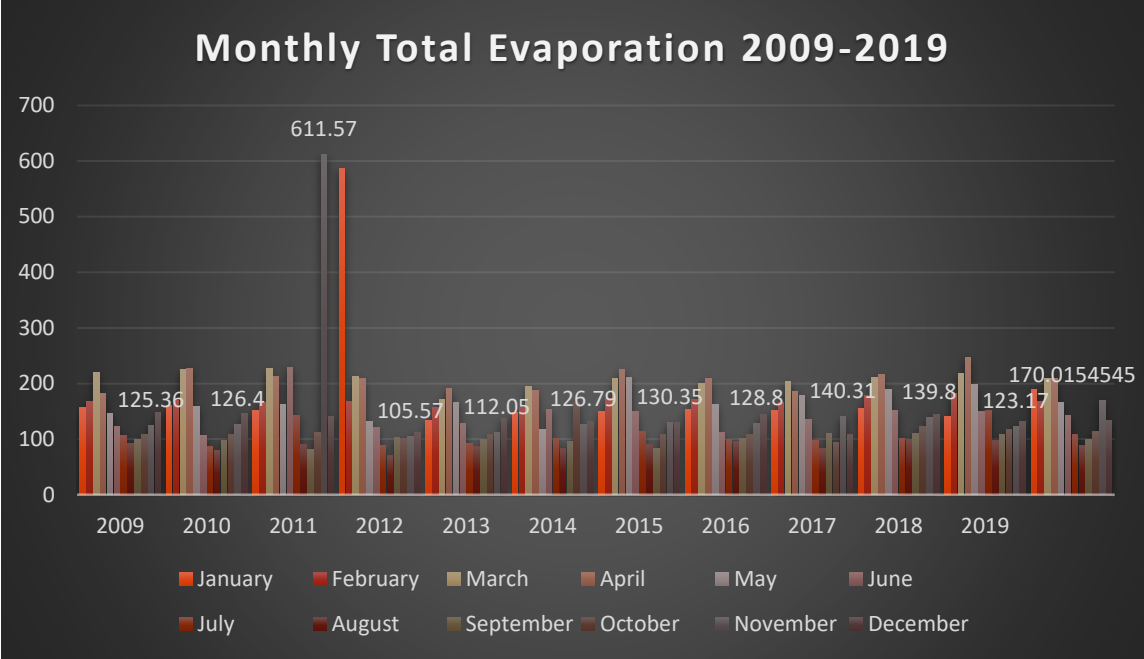


Figure 3 5: Monthly Total Evaporation 2009-2019 (Source UBRBDA).

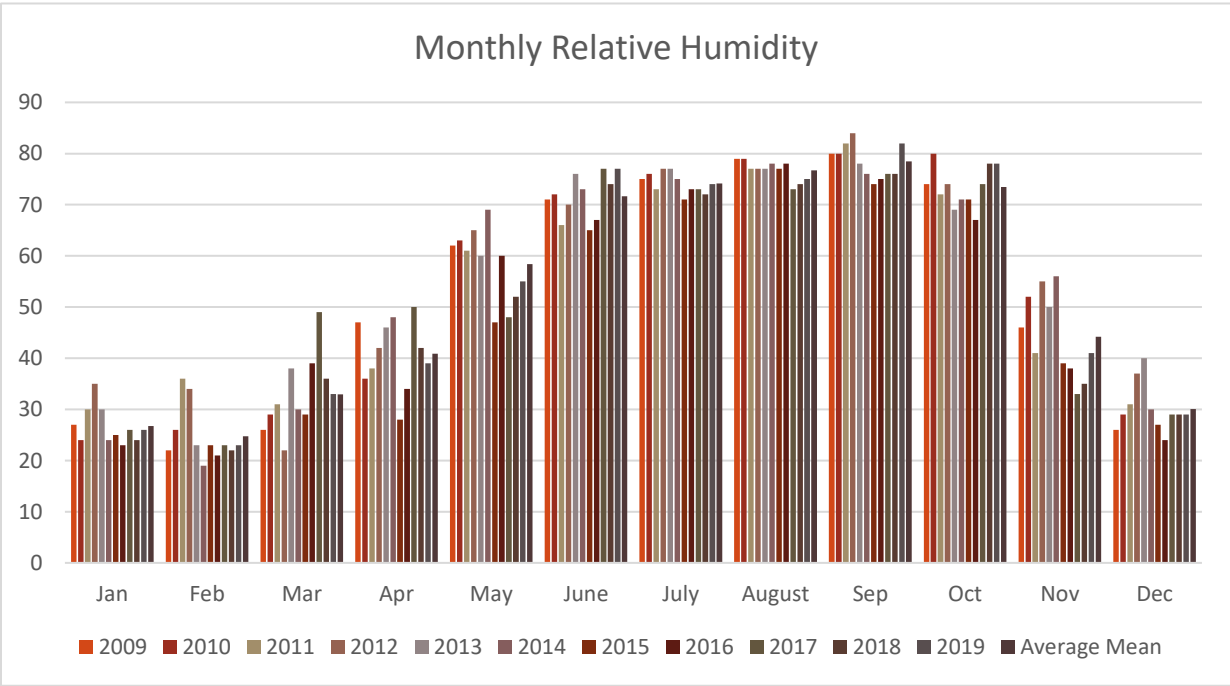


Figure 3 6: Total Relative Humidity 2009-2019 (Source UBRBDA).

3.2.5 Geological Setting

Gombe area is underlain by three sedimentary formations, viz; The Bima, Yolde and Pindiga Formations (Kanawa Member). The Yolde Formation lies conformably on the Bima Formation. The Yolde Formation was deposited under a transitional/coastal marine environment and is made up of sandstones, limestone, shales, clays and claystones. This formation outcrops within the area of study. The Pindiga Formation directly overlies the Yolde Formation. The lower Kanawa Member outcrops within the area occupying a narrow belt, because of its marine nature it usually weathers to produce a highly fertile soil suitable for the cultivation of vegetables, cotton and other crops, Figure 3 7 depicts the geology map of the project area.

3.2.6 Vegetation

The area belongs to the sub-Sudan agro-ecological zone, a transitional belt between the savannahs of northern Guinea and Sudan. The area is covered by various types of savannah shrubs and woodlands, open tree savannah, and grasses of the floodplains and savannah. Some of the vegetations seen within the project area are listed below,

Table 3 1: List of Vegetation (plant) found within the Project area.

S/N	Scientific Name	Common Name	Habit	Uses
1.	<i>Anogeissus leicarpa</i>	Marike (Hausa)	Tree	Fuel wood and medicinal
2.	<i>Aristodo sp</i>		Grass	Livestock feed
3.	<i>Azadirachta indica</i>	Neem	Tree	Fuel wood, medicinal
4.	<i>Balanite aegyptiaca</i>	Aduwa (Hausa)	Tree	Edible fruits
5.	<i>Bombax costatum</i>			
6.	<i>Borassus eathiopum</i>	Giginya ((Hausa)	Tree	Edible fruits

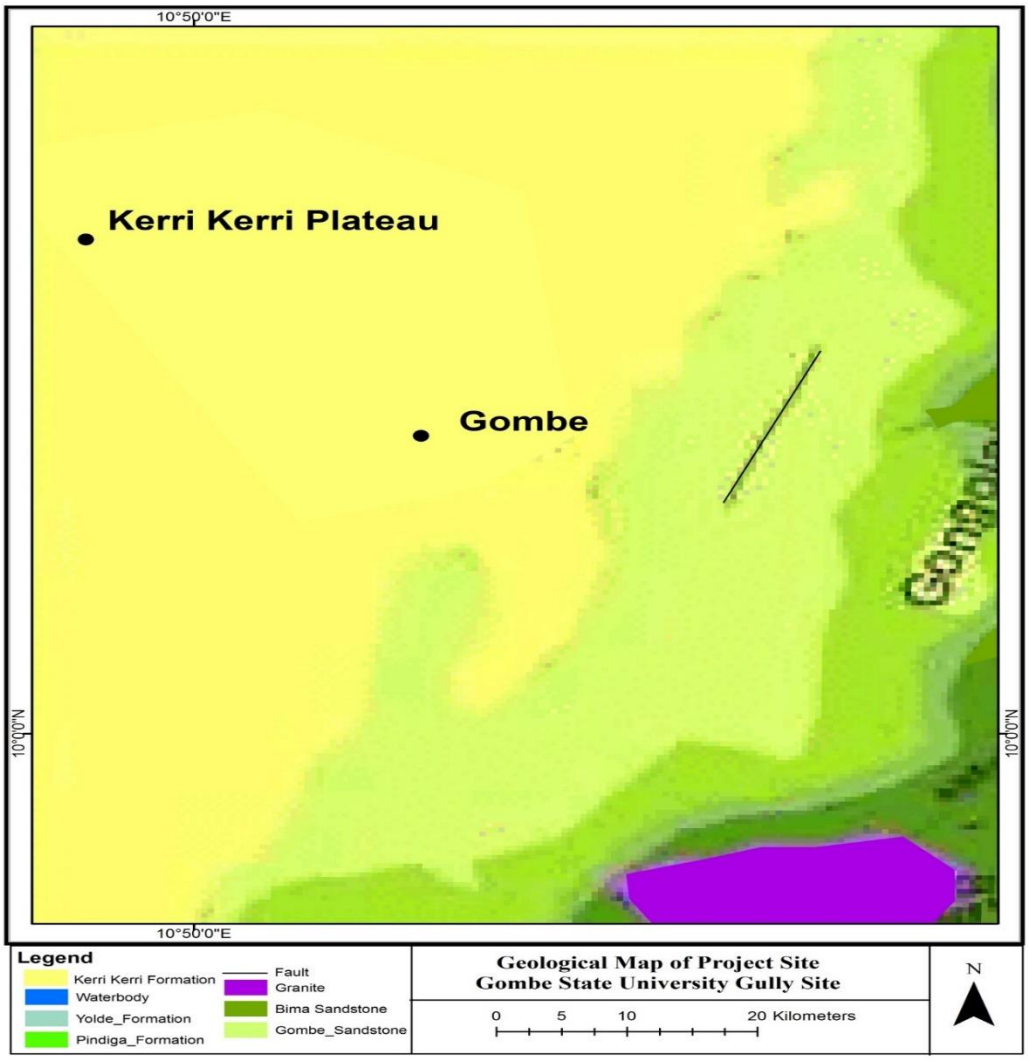


Figure 3 7: Geology Map of the Project Area.



Figure 3 8: Director of works GSU with the ESMP Consultant and Communication Specialist Gombe-NEWMAP having a work tour round the GSU Erosion site.

3.2.7 Noise Levels /Air Quality Characteristics

Air quality sampling was carried out using Aeroqual Series 500 gas sampling meter and Aerocet 531 Particle Counter. Measurements were made at each of the pre-determined sampling points in the field for gaseous pollutants and the particulate matters. Noise level measurements were made with Tecpel 330 sound level meter.

The assessment of the air quality/noise level of the project area was necessary in order to determine the ambient air quality and noise level of the area. The air quality parameters determined were mainly those of public health concern and they include particulate matters (PM 1, 2.5, 7 and 10), Volatile organic compounds (VOC), Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), Hydrogen Chloride (HCl), Carbon monoxide (CO) and Carbon dioxide (CO₂).

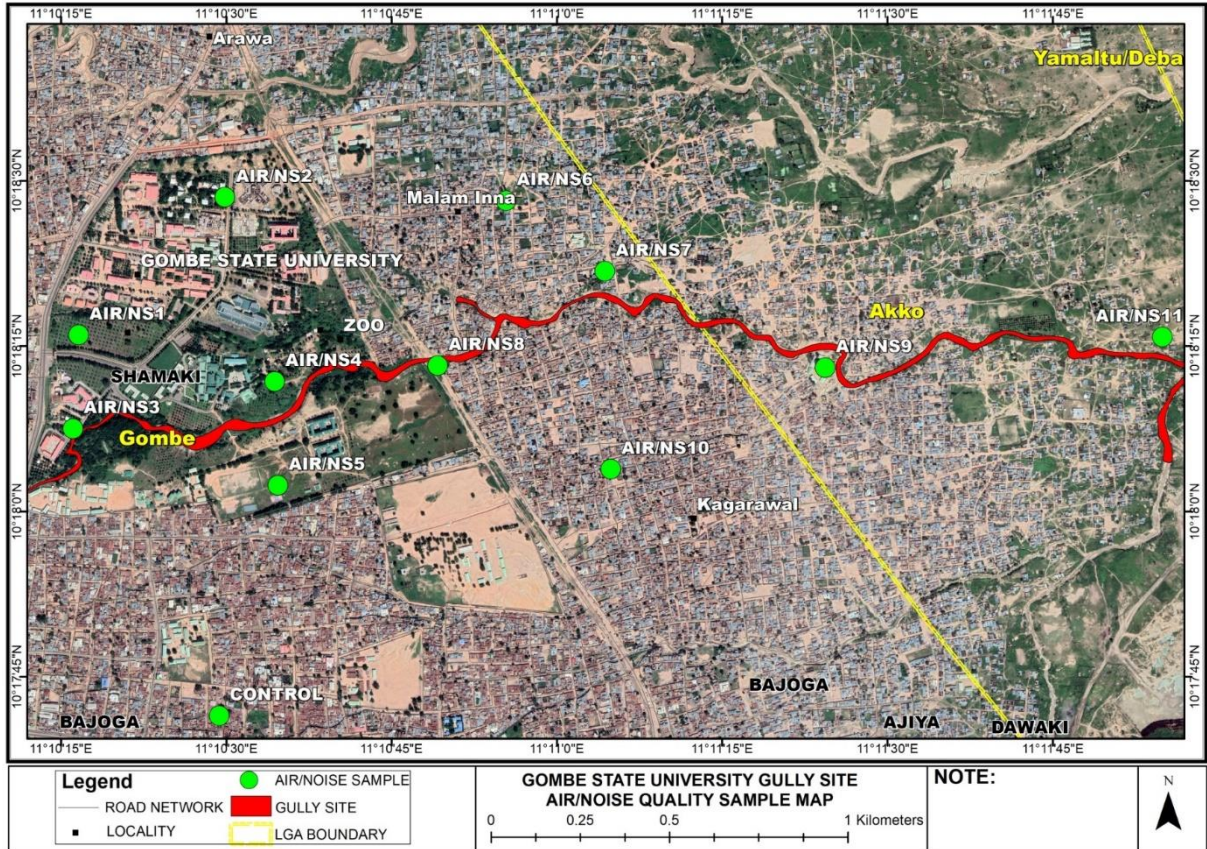


Figure 3 .9: Noise Level/ Air quality Sampling Map.

3.2.8 Noise Level Pattern

The noise level of the project area is 36.4 decibels -69.1 decibels (Minimum) and 41.6 decibels – 76.4 decibels (Maximum)

Table 3 2: Noise Level Readings

Location	Lat.	Long.	Noise Level	
			Min	Max
A1	11.17128	10.30444	59.3	63.3
A2	11.17497	10.30791	46.5	50.7
A3	11.17114	10.30208	47.4	50.9
A4	11.17622	10.30327	39.6	41.2
A5	11.17622	10.30327	36.4	41.6
A6	11.1779	1030739	56.4	65.5
A7	11.18085	10.30599	45.6	55.1
A8	11.18033	10.30367	52.8	56.2
A9	11.1901	10.30362	57.6	58.3
A10	11.18039	10.2921	69.1	76.4
A11	11.20145	10.30457	46.8	62.8
Control Point	11.1569	10.25703	57.7	64.2

Particulate matter and other gases are constantly released into the atmosphere due to natural activities such as decay of plant and animal remains, winds and sand storms. These gases also enter into the atmosphere through anthropogenic processes initiated by man due to industrialization and urbanization, for instance in GSU project axis, air from exhaust pipes of cars and other emissions causes distortion in air quality. The level of atmospheric pollutants that will be released into the air due to the activities of the civil works during the project intervention may be high so there may be need for regulation in order to save people living along the project corridor from associated health hazards.



Figure 3 10: Expert taking measurement of Air quality and Noise level on site.

3.3 Particulate Matter

The Particulate Matter (PM) in the ambient air sampled during the field data were PM 0.3, 0.5, 1.0, 2.5, 5.0, 10. The concentrations of the PM ranged from 0.09 - 0.35 ($0.3\mu\text{m}$), 0.24 - 0.58 ($0.5\mu\text{m}$), (1.43-5.21) $1.0\mu\text{m}$ for PM 2.5(6.20-38.67), PM 5 (6.68-62.43), 2.09- 38.99 for PM 10;

The recorded values would not result in adverse health effects on operational personnel. However, the Particulate Matter Constituents (PM) level may rise during the construction and operational phase of the proposed project, especially if it is carried out in the dry season.

Particulate matter with size fractions less than 0.01 mg could be inhaled and thus get into the alveoli of the lungs to create health problems. Fine particulates may cause cancer and aggravate morbidity and mortality from respiratory dysfunctions (Curtis, 1996). Dust coatings on leaf of plants reduce the rate of photosynthesis and thereby reduce plants growth. It is also known that animals or humans that eat plants

coated with SPM containing fluorides, arsenic, or lead may suffer some ill effects. The soil in the project area is not known to contain any recordable levels of these elements and the ill health associated with them does not have the potential to occur. Exposure to these particles may result in respiratory disorders and susceptibility to respiratory infections (NLNG, 1997).

3.3.1 Total Volatile Organic Compounds (TVOCs)

The VOCs concentrations in the project area ranged from 85-97 ppm. The reason for the high VOC was observed to be as a result of anthropogenic human activities bush burning and tyre burning within the project area. Exposure to VOCs can cause health problems ranging from minor symptoms felt only by chemically sensitive individuals to more severe effects such as illness or even death, depending on the degree of exposure. The project however has no potential of raising the VOC level above the permissible limit.

3.3.2 Sulphur Dioxide (SO₂)

Sulphur dioxide in the project area ranges from 0.00 – 0.05 ppm. These values obtained were within the FMEnv limit of 0.10 ppm. These gases are known to be harsh irritants and are capable of aggravating asthma, bronchitis and emphysema. They can also cause coughing and promote impaired functions in the human system.

3.3.3 Hydrogen chloride (HCl)

Hydrogen Chloride concentration in the project area ranges from 0.1-0.3 ppm indicating absence of the pollutant gas. Hydrogen Chloride is both an irritant and a chemical asphyxia with effects on oxygen utilisation and the central nervous system. Repeated exposure can result in health effects occurring at levels that were previously tolerated without any effects.

3.3.4 Carbon Monoxide (CO)

Carbon monoxide concentration within the project area was recorded as within the range of 0.8-2.8 ppm. Vehicular movements around the project area are minimal and there are no other known sources of carbon monoxide in the area.

3.4 Surface Water Studies

No surface water was located within the project area as of the time of the field work and non is known to the locals within the project area.

3.5 GroundWater Studies

The Groundwater sample colours are all clear with pH range of 6.50 to 7.80, TDS ranges between 1.38mg/l – 6.80 mg/l while conductivity values are between 2.01 μ S/cm -7.81 μ S/cm. The Dissolved Oxygen values ranges from 2.25mg/l to 5.02mg/l. The insitu temperature was found to range from 29.70 $^{\circ}$ C to 31.80 $^{\circ}$ C

Table 3 3: Values for Ground Water Analysis

Sample	GW1	GW2	GW3	GW4	GW5	GW6 (control)	FMEnv Limit	WHO Limit
Colour	Clear	Clear	Clear	Clear	Clear	Clear		
Odour	odorless	odorless	odorless	Odorless	Odorless	Odorless	Not mentioned	Not mentioned
pH	6.50	7.80	6.80	6.70	6.70	6.80	6-9	6.5–8.5
Conductivity (μS/cm)	6.32	7.81	2.01	4.42	6.78	3.58		Not mentioned
TDS	5.01	6.80	1.38	3.78	5.47	2.69		
Salinity	3.36	4.25	0.99	2.60	3.60	1.72		Not mentioned
Dissolved Oxygen(DO)	2.96	2.17	2.25	2.57	3.45	5.02	>2	200 mg/l
Temperature $^{\circ}$C	29.70	31.80	30.60	30.30	31.10	30.20		2

3.6 Soil Studies

Soil Sample Collection: Core samples were obtained for the analysis of bulk density and hydraulic conductivity.

Soil samples were collected using stainless steel hand auger. The auger used was made up of a semi-cylindrical bore of uniform cross-section. Sampling was carried out by augering to a depth of 0 – 15 cm for the surface samples. The samples were analyzed for particle size, pH and porosity.

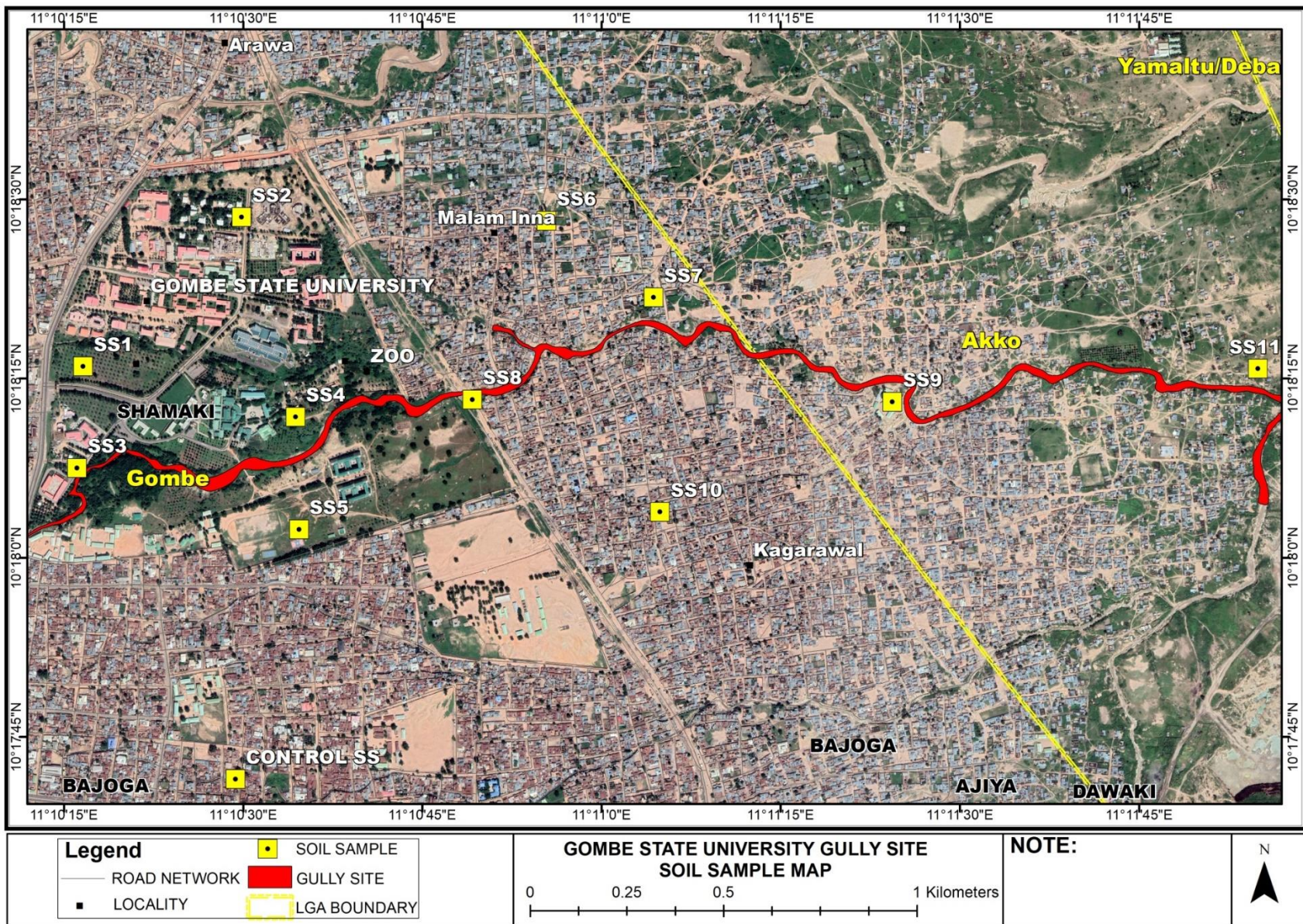


Figure 3 11: Map of the Soil Sampling Points within the Project Area

3.6.1 Profile Pit

Soil sampling procedure

Two profile Pits were sunk out of the four profile pits proposed mainly according to variation in relief or topographical units (valley bottom, flat plain) and at distance of 2.5 km interval between the pedons and coring points. The two other profile pits were not sunk because the built up residential houses along roads and the present land use at waterside which are against the outline procedure in soil survey manual for soil sampling, however only core samples were collected. The profiles measured 2 m long, 1 m wide and 2 m depth except shallower water table is trucked (the morphological characteristics of each profile was described according to procedures outlined in soil survey manual (soil survey staff 2010). This included identifying various genetic horizon based on colour changes with the aid of munsell soil colour chart. The morphological properties include: colour, texture, structure, consistence, drainage and inclusions (roots, soil boundary, clay skins etc. Undisturbed core samples were collected from top soil for bulk density analysis. A core sampler was used for the above purpose.

3.6.2 Findings

In the profiles studied, the colour of the surface horizons ranged from weak red (10R5/2) to olive (5Y4/4) colour, while in the sub-surface horizons they ranged from pinkish grey (7.5YR6/2) to black (5Y2.5/2). However, core samples were collected. Detailed Morphological descriptions of the profile studied are presented in Table 3 4.

Table 3 4: Morphological Characteristics of the Soils

Horizon	Depth (cm)	Colour	Mottles	Texture	Structure	Consist	Damage	Bound	Roof
GSU		clayey							
Bt ₂	0--15	2.5/1 5y 2.5/1 (black)	7.5YR 6/6 brownish yellow	C	Sabk	s, p	MD	cl, s	-
Bw	15-30	7.5YR 2/0 2/0 (black)	7.5YR 6/6/6 (brownish yellow)	C	Sabk	s	PD	cl, s	-

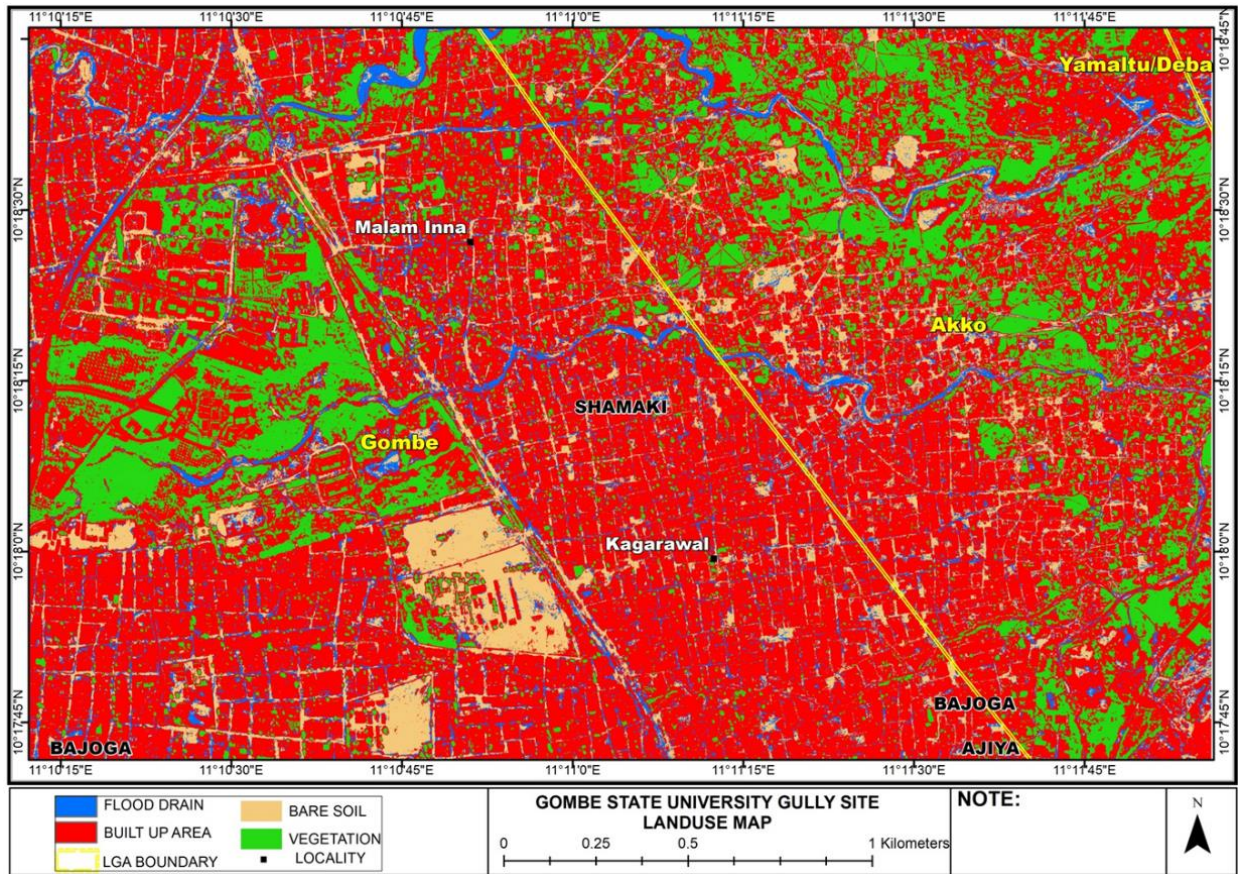
Legend: P= Plough, t= eluvial accumulation of clays; h= eluvial humus, w= alteration in situ as reflected by clay content, Texture: S=sand, SC= sandy clay, Sl = Sandy loam; structure: c= crumb, sabk = subangular blocky, g = granular, abk = angular blocky, Consistency: fr= friable, np=non plastic, ns=non sticky, ss = slight sticky, p=plastic, Drainage: =, moderately drained: PD= Poorly Drained; Boundaries: cl= clear, w= weavy; s=smooth; Roofs: f = few

The soil texture determined in field was predominantly sand and clay with little variation between horizons

3.7 Land Use/Tenure

While majority of the land use is for residential settlement, some family use theirs for farming while others are market places and public reserve for future development uses. A combination of traditional land ownership system and government ownership of land is observed in the area. The communities practice the traditional land ownership system. From time immemorial, land in this area is owned by families. Figure 3 12 shows Land-use Map of the project area.

Figure 3 12: Land use land cover characteristics of the project are



CHAPTER FOUR: SOCIO-ECONOMIC CHARACTERISTICS AND STAKEHOLDERS CONSULTATION

4.1 Introduction:

This chapter presents an overview of the social and economic attributes of the people living within the catchment. The outcome is based on data collected during the field work exercise. The information covers aspects ranging from gender and age distribution, marital status and literacy levels of the respondent. The chapter also gives a brief glance into the household water and sanitation behavior, and stakeholder's awareness on NEWMAP interventions.

4.1.1 Socio-economic survey

The socio-economic assessment studies were aimed at examining the socio-economic conditions of the people living around the project environment. This was to ensure that the potential impacts of the proposed works at the GSU Gully Erosion in Gombe, Gombe State is captured and described while proffering solutions to possible negative impacts to human habitat, health and livelihoods.



Figure 4. 1: Pictures showing enumerators administering questionnaires

4.2 Review of available literature;

Field data acquisition including questionnaire administration and Focused Group Discussion (FGD) was conducted. However, questionnaires which represent about 2% of the population of the project area were administered and retrieved while 3 FGD with different interest groups including women group and youth were conducted.

Application of professional knowledge and experience. Various field observations were made using the ground trotting method. It provided the avenue to cross check information given by community members against existing situations, particularly with respect to the status and functionality of available social infrastructure. The observable physical features in the community were recorded. Where appropriate and permitted by the community, photographs of physical features were taken.

The socio-economic and health environment of the people were assessed through interaction with people from the different social strata in the community. The project transcends five communities namely Gombe State University Community, Malan Inna, Malan Inna (Sabon Fegi), Idi quarters, Kagarawal communities.

4.2.1 Population

The project area is in Gombe Local Government Area which is bordered by Kwami, Yamaltu/Deba and Akko Local Government areas; and covers an area of about 52 square kilometres with a 2006 National Population Commission (NPC) Census figure of 261,536.

4.2.2 Gender Distribution of Respondents

Majority of the Respondents (about 65.70%) are males while females are 34.3% as depicted in Figure 4.2 below. Secondary data of population within the local government shows a different picture. This may be attributed to the willingness of the respondents to fill the questionnaires.

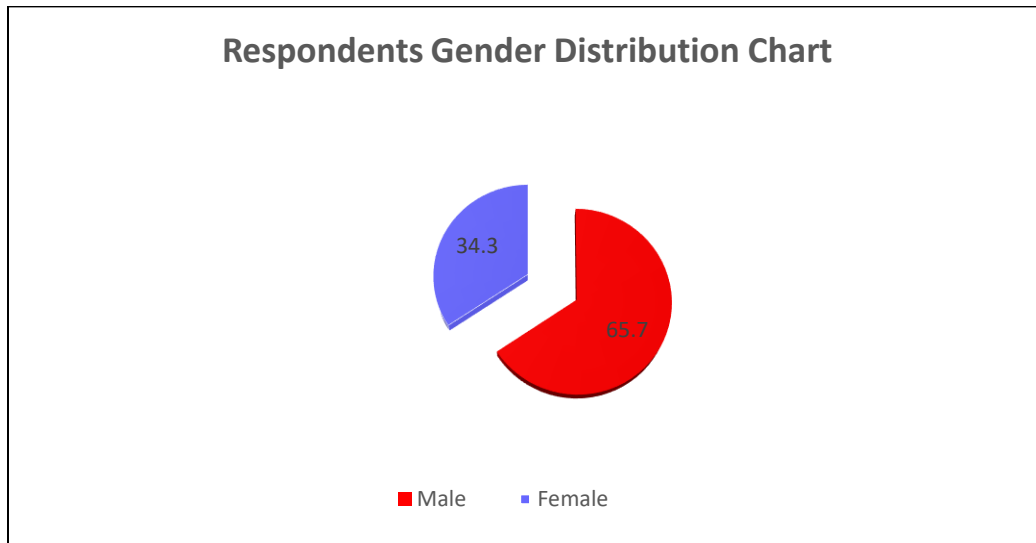


Figure 4.2: Respondents Gender Distribution Chart

4.2.3 Age Distribution of Respondents

The respondents range from 23 to above 75 years. The chart shows that those between ages 26-60 years and those above 60 years constitute the dominant population of Respondents with a combined proportion of about 70.66%. The least age group among Respondents belongs to those from 0-15 with a population of 0.35%. The highest population of Respondents (39.86%) were within 45 years and above. The younger population are predominant around the residential areas or Gombe State University and schools while the more elderly is visible in and around the villages of Idi quarters, Kagarawal and Malan Inna which are communities within the project area.

4.2.4 Marital status of Respondents

Respondents are predominantly married people (about 89.86%). Singles and the other marital status are respectively captured among the Respondents. The significance of this result is that Respondents are majorly men and women who are the breadwinners and help mates in their respective households. Sampling

was performed within the project environment of GSU, Malan Inna, Kagarawal and Idi Quarters, all within the project area.

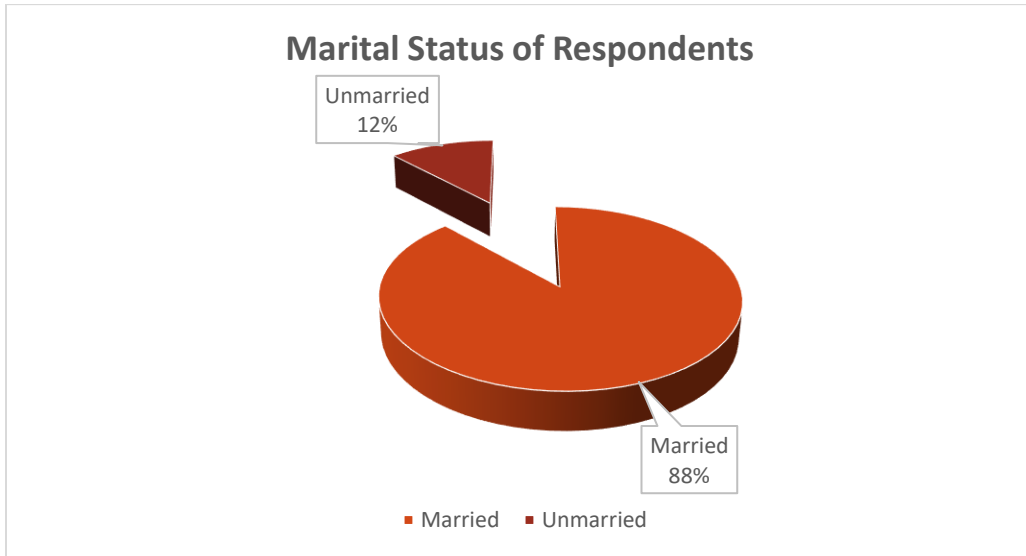


Figure 4. 3: Marital Status of Respondents

4.2.5 Religious practice of Respondents

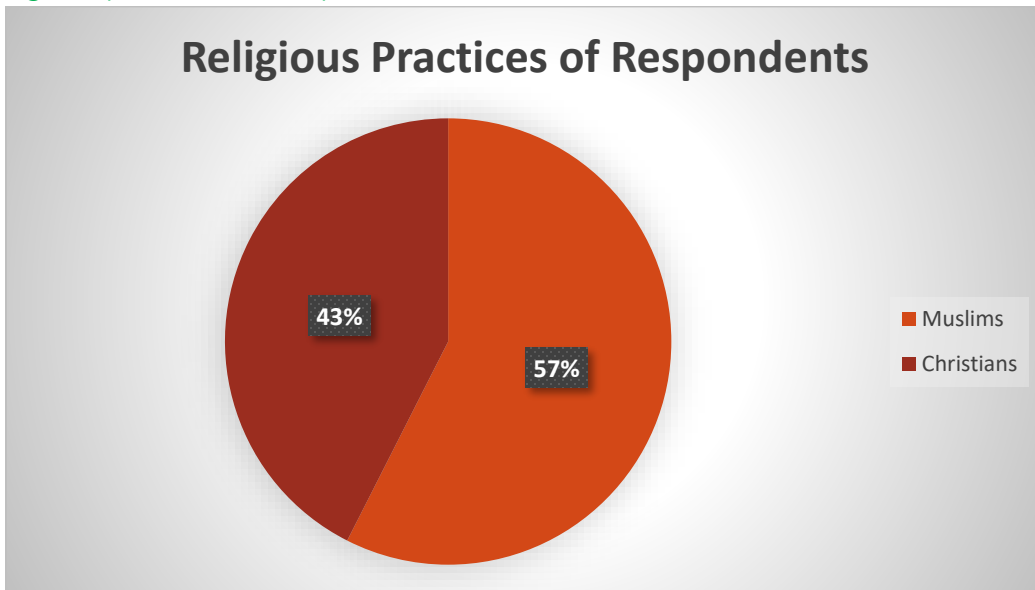


Figure 4. 4: Religious Practice of the Respondents

Most of the respondents interviewed are either Muslims or Christians, indicating the observance of Fridays and Sundays as holy days in the week within the Project Area.

4.2.6 Literacy Level of the Respondents

Most people or Respondents have some form of education (95.68%). The highest number of Respondents (38.95%) Indicated that their lowest level of academic qualification is First School Leaving Certificate FSLC(Figure 4. 5). About 6.32% of the Respondents don't have any form of formal education. This shows that majority of Respondents have the minimum level of education that might help them in making informed decision or participate meaningfully during discussions as it affects the project implementation.

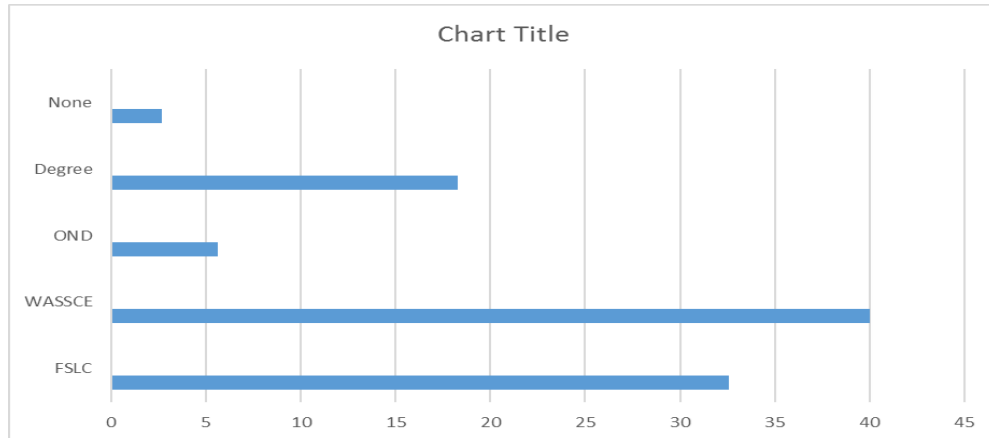


Figure 4. 5: Educational Qualification of Respondents

4.2.7 Water and Sanitation

56.7% of respondents mostly from the communities within Malan Inna, Idi quarters and Kagarawal get domestic water from commercial boreholes while 34.8% of the respondents mostly from Gombe State University get their water from Private Boreholes, and 5.6 % get theirs from public pipe borne water while 2.6% get theirs from perennial well and 0.3% from pond water.

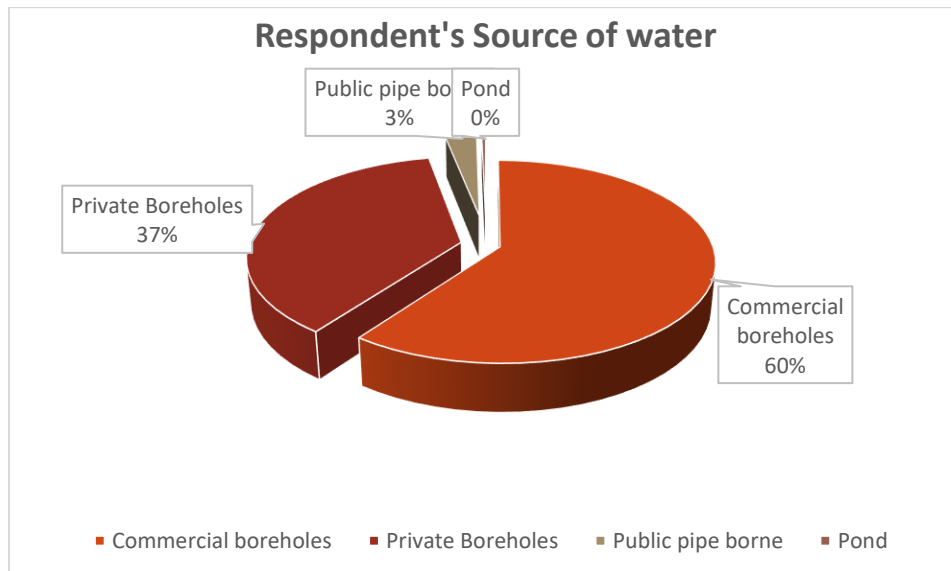


Figure 4. 6: Source of Water for Domestic Use.

It was also deduced from the field work that about 93.3% of the respondents mostly from the communities use Pit toilet while 6.1% mostly from GSU make use of Water closet and 0.6% others make do into the river or bush as shown in the figure below.

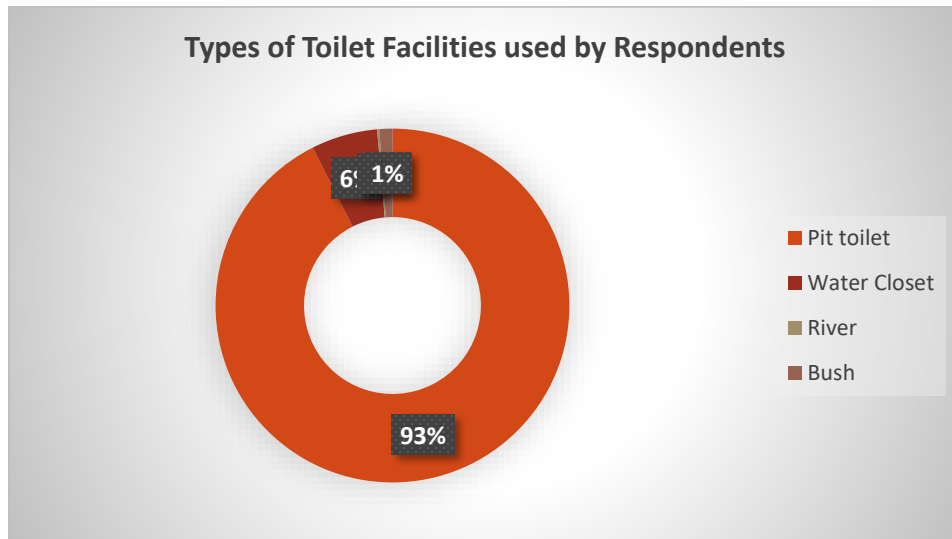


Figure 4. 7: Types of Toilet Facilities Used by Respondents.

4.2.8 Household Waste Disposal, Cooking Fuel and Electricity

Majority (82.9%) of the respondents in the area dispose their household waste in an open dump especially along the erosion gully trench indiscriminately, 11.4% within the GSU operates a vendor system of waste collection while 4.7% burn their refuse, 1.1% accounts for drainage refuse dumping (Figure 4. 8).

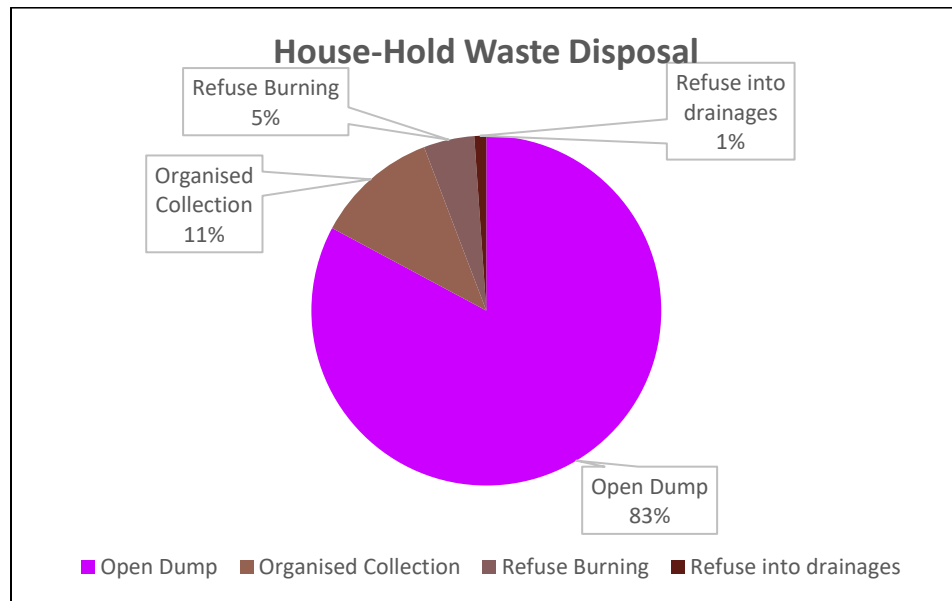


Figure 4. 8: House- hold Water Disposal Method of the Respondents

About 94.70% of the respondents make use of firewood for cooking while 2.8% make use of kerosene and 1.6% make use of sawdust with the remaining 0.9% make use of gas. The survey also showed that electricity is obtained from the national grid within the project communities, of which 97.10% of respondents are connected to it. However, their services are epileptic. As an alternative source of electricity, few people alternate with generator and hurricane lamps.

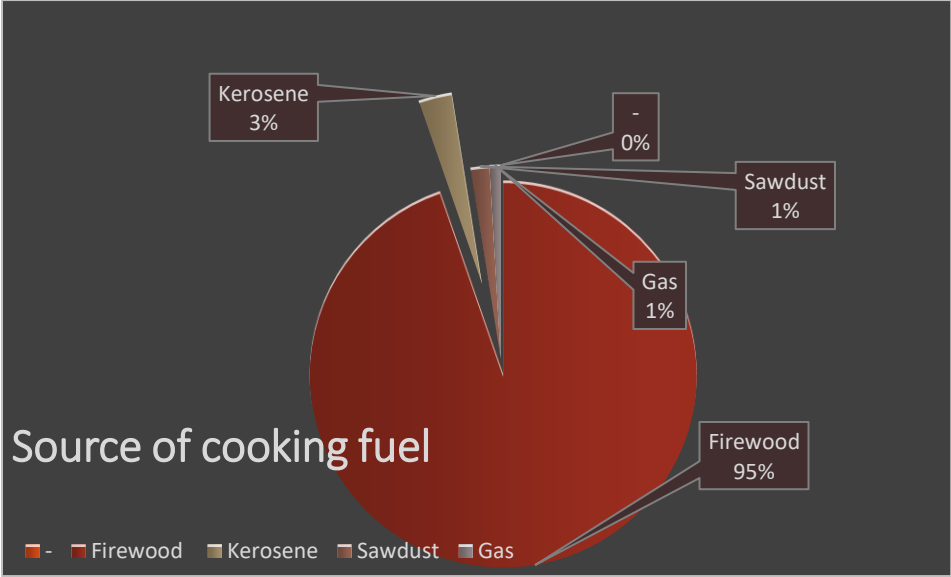


Figure 4. 9: Source of Cooking Fuel used by Respondents

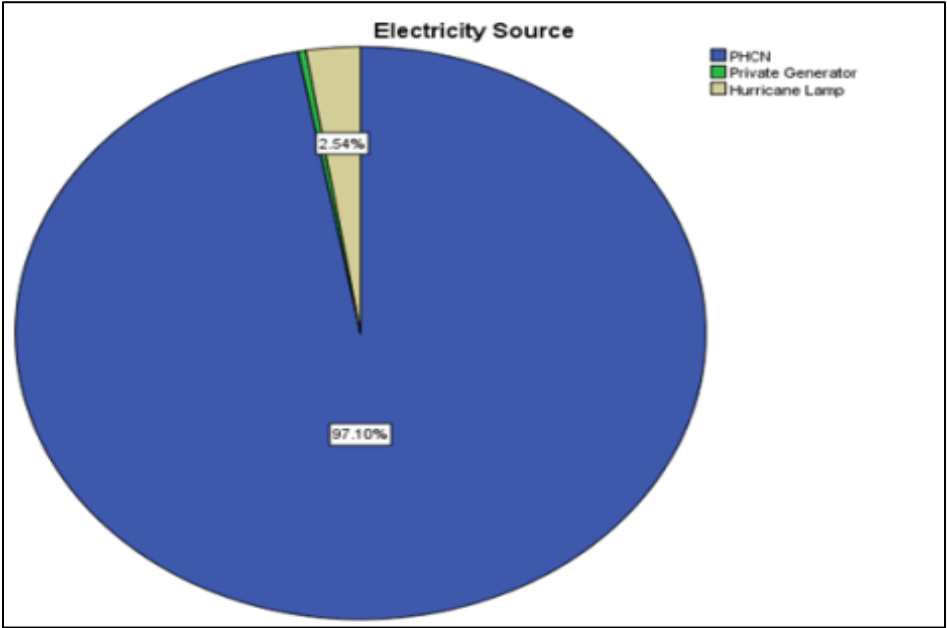


Figure 4. 10: Source of Power used by Respondents

4.2.9 Average household size of Respondents

The survey shows that most of the Respondents (28.9%) run small sized households. 67.3% of the Respondents have medium sized households while 3.8% have large families. Here the family size categorization is based on the number of the member of the family, Small (2-4), Medium (5-7), Large (above 7).

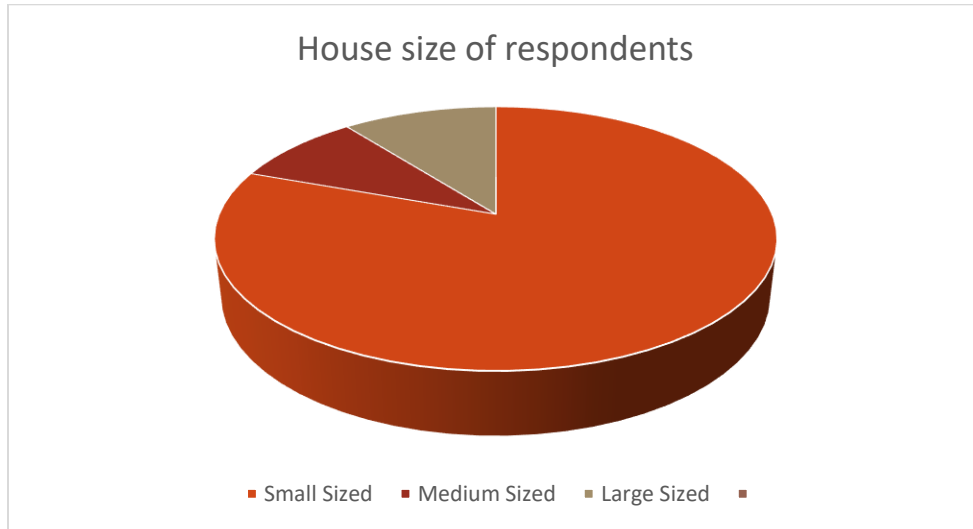


Figure 4. 11: House-hold size of the Respondents

4.2.10 Occupation

Figure 4. 12 below shows that majority (69.5%) of the Respondents in this community are into businesses, 24.9% are civil servants mostly with the GSU and 5.6 and self-employed (with 60% of this self-employed being artisans and 40% are farmers.)

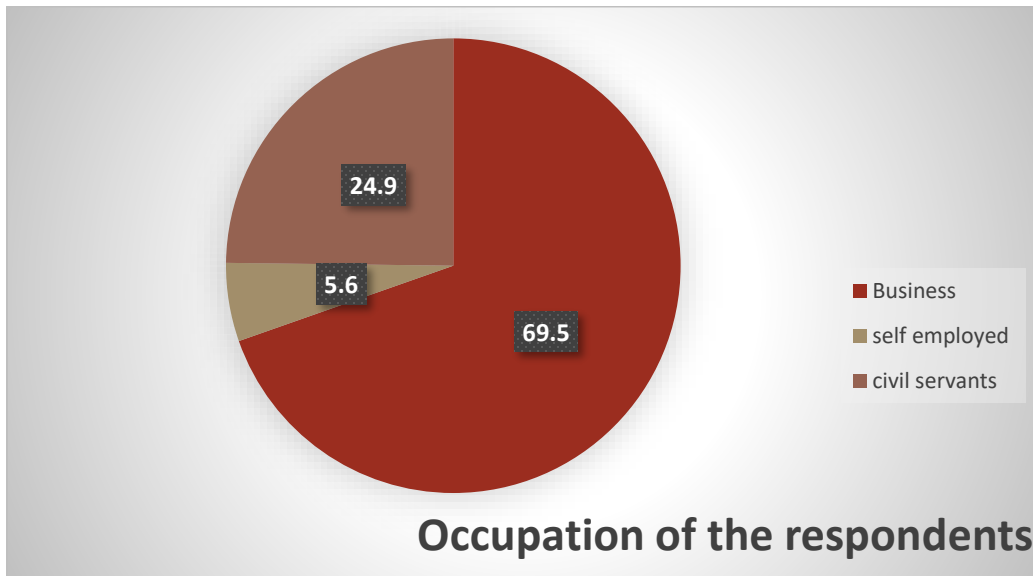


Figure 4. 12: Occupation of the Respondents

4.2.11 Average Monthly Income status of Respondents

Field survey (depicted in Figure 4. 13) shows that dominant income groups amongst Respondents fall within ₦0--17,900 per Month. The survey also shows that about 19.93% fall within the income of ₦18,000-₦30,000 per month while about 9.42% of Respondents earn ₦31,000 to ₦60,000 per month.

Average income of Respondents in the project area were measured at two levels; the overall average which indicates an aggregation of middle- and low-level-income earning Respondents and the low-income groups with lowest limit of N500 per day. The outcome is that on the overall aggregation, Respondents mean income is ₦3,600 or \$10 per day (for middle and low income combined) and ₦1200 or \$3 per day for lower income group using an exchange rate of ₦360/1\$.

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

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

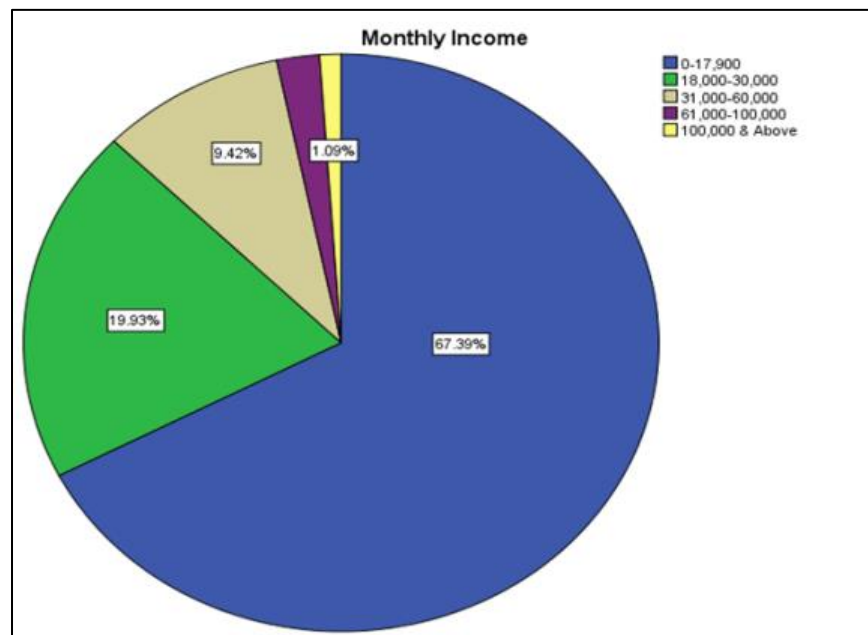


Figure 4. 13: Monthly Income of the Respondents

4.2.12 Power Supply

Jos Electricity Distribution Company (JED) is responsible for the supply of power in the project area. The supply of power from this source is often not regular and homes supplement the power with power generating sets.

4.3 Stakeholders Consultation

4.3.1 Awareness/Perception of Stakeholders on NEWMAP Intervention

Stakeholders' consultation is an engagement exercise, which aims to create an atmosphere of understanding among members of the Erosion affected communities, with regards to the project implementation. Informing them of the project and its components, and essentially documenting their concerns and opinions for further decision making. This consultancy is meant to identify with the project affected communities and other stakeholders who may be directly or indirectly affected during the rehabilitation works for the GSU Gully Erosion Site. These include:

- Individuals or group of persons living in close proximity to the GSU and the adjoining communities/ area
- Individuals or group of persons who may have cumulative impacts during development
- Individuals or group of persons who may be temporarily relocated as a result of the project
- Individuals or group of persons who occasionally utilize the land on which the project is located
- Traditional and Administrative Classes involved in developmental activities or policy changes in the project area.

The consultation process with the Gombe State University Community, Malan Inna, Malan Inna (Sabon Fegi), Idi quarters, Kagarawal community was essential in order to encourage active and sustained participation of the community members' where there is active erosion and flooding. The consultation tends to promote community ownership of the project and in addition enhanced sustainability. Involved in the consultation process were the administration of pre-defined socio-economic questionnaires at the household level for subsequent data collection.

Stakeholders' involvement is expected to continue in a manner that gives the communities the opportunity to make contributions aimed at strengthening the development project while avoiding negative impacts as well as reducing possible conflicts. In addition, the consultations will remain active (ie on-going exercise) throughout the duration of the entire project.

4.3.2 Identification of Stakeholders

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

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

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

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

4.3.3 Identified Stakeholder Groups

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

Table 4 1: Identified Stakeholder Groups

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

The identified groups include:

- i. Gombe State NEWMAP SPMU
- ii. GSU school authority
- iii. Village Chiefs
- iv. Religious leaders
- v. Youth group leaders
- vi. Women group Leaders
- vii. Community Based Organization Leaders.

4.3.4 Community Consultations

All consultations in the period of the consultancy were initiated by the Gombe- NEWMAP (SPMU) and carried out by the Consultant. The direct involvement and active participation of relevant stakeholders and

the local level people in the planning and management processes of the project, guarantees that any potential disharmonious issues will be resolved swiftly. Also, there will be maximization of resource use, increased benefits and expanded opportunities for the communities in the project area. Community participation will certainly help improve understanding of the project and communication between the SPMU, the contractors and the community. The decision-making process for the project will be enhanced by actively involving relevant stakeholders, especially those directly or indirectly affected by the project, and other organizations with stakes in the project.

4.3.5 Objective of Community Consultation

The aims of the community consultation process are:

- Provide opportunity for members of Gombe State University Community, Malan Inna, Malan Inna (Sabon Fegi), Idi quarters, Kagarawal community to be carried along in the project, informing them of the components of the project and essentially, document their concerns for further use in decision making.
- Sensitizes the stakeholders in the project command area while benefiting from local knowledge which forms basis for project designs and implementation.
- Enable consideration of options, modification measures and trade-offs and ensure that important impacts are not overlooked, and benefits are maximized;
- Mitigate conflict through early identification of contentious issues and increase public confidence in the project.
- Provide opportunity for the public to influence the designs and implementation in a positive manner and improve transparency and accountability in decision-making;

4.3.6 The Stakeholders Consulted

The consultations involved independent and frequent meetings between the Consultant team, the Gombe-NEWMAP officials, the Engineering Design Consultant and Traditional and Administrative leaderships of Gombe State University Community, Malan Inna, Malan Inna (Sabon Fegi), Idi quarters, Kagarawal communities which includes the Village heads.

The key stakeholders identified and consulted in the area include:

- i. Director of works for Gombe State University.
- ii. Public Relation Officers of the affected communities.
- iii. Village heads of all the villages affected by the project,
- iv. School Principals of schools to be affected by the project, and
- v. Other Stakeholders and individuals who own properties that will be directly or indirectly affected by the project, Community Associations, Business Owners etc.

4.3.7 Summary of Meetings with Stakeholders Stakeholders Perception and Sensitivity

The stakeholders' consultation meetings, started with an enlightenment of NEWMAP overview by the Environmental Safeguard Officer, Dr Shittu Whanda which was preceded by the description of the Proposed intervention at the GSU gully erosion site, World Bank safeguard policies as it affects the intervention, rehabilitation and civil works, as well as the challenges that could impede the implementation of the project. Further emphasis was placed on the support needed from all stakeholders to ensure effective and successful project implementation.

The summary of stakeholders' meeting;

- They pledged their support to the Gombe NEWMAP and the intervention and rehabilitation of GSU gully erosion site
- Provision of alternative transport route during construction
- Fear of the project being abandoned half way
- The fate of the petty women traders along the roads within the project area
- They pointed out the need to complete the project during the next dry season
- They suggested the need for NEWMAP liaison officer to be posted to the community
- The youth leader wants the contractors to employ their youths during construction phase.

Conversely, the community heads of the villages within the project corridor, emphasized the need for the contractors to keep to the community local laws and desists from behavior such as abuse of minors, fighting, local disturbances, sexual immorality, extortion and robbery. Annex 3 show the minutes of the meeting during stakeholder's consultation.



Figure 4. 14: Cross section of Women during consultation at the Stakeholders' meeting



Figure 4. 15: ESMP Consultant in company of Gombe State NEWMAP Environmental Safeguard Officer during an interactive session with Engr Abdusalam, Director of works, Gombe State University, Gombe



Figure 4. 16: Cross Section of Traditional Rulers and Men during the Stakeholders' meeting

CHAPTER FIVE: ASSESSMENT OF ASSOCIATED POTENTIAL IMPACTS/ANALYSIS OF ALTERNATIVES

5.1 Project Intervention Approach

The approach to control of gullies is in accordance with International best practice guides. This approach uses a combination of structural and vegetative means for control of gullies.

Based on the identified philosophy in the rehabilitation of the erosion problem at the Gombe State University, the adopted scope for complete solution to the problem is presented herein as follows:

5.1.1 Engineering Design Consideration

For sustainable engineering design of gully mitigation works which will take into consideration the best approach in order to minimize cost and maximize performance, it is always necessary to put into consideration certain design requirements for achieving expected or desired outcome having carefully carried out preliminary field investigations. In line with the objective of the project to completely eradicate erosion and flooding problems as well as ensure proper management of watersheds, the engineering design process involves different substantial considerations and conceptualization that controls the final output, functionality and sustainability of the entire project.

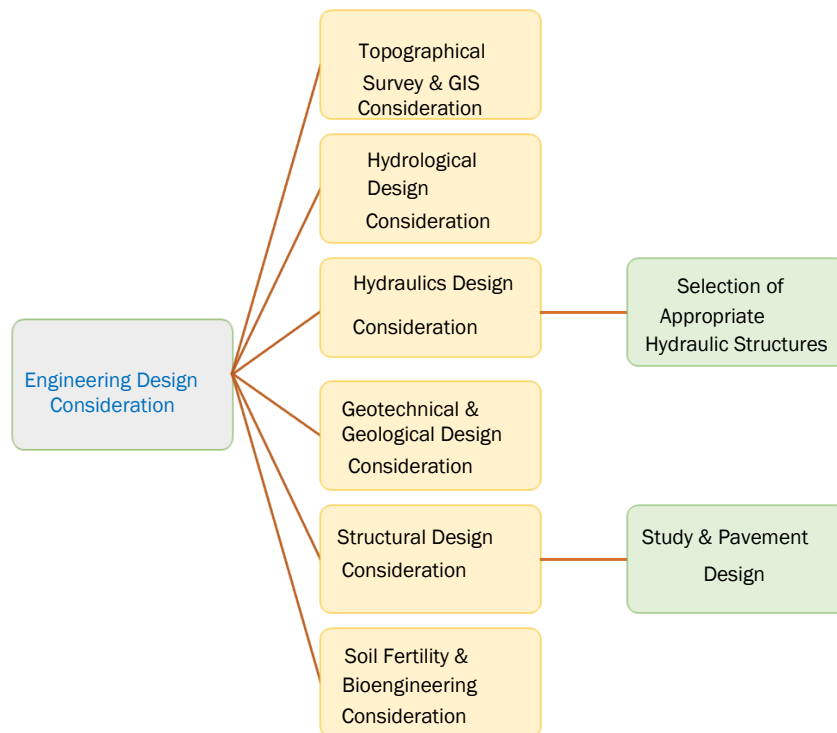


Figure 5. 1: Engineering design consideration Schematics

The engineering design consideration therefore, is significantly important to bridge gap between design conception and detailed design, particularly in cases where the level of conceptualization achieved during preliminary field investigation and concept generation may not be sufficient for full evaluation.

5.1.2 Hydraulics Design Consideration

In the provision of hydraulic structural elements, importance was paid to the specific conditions of the project site in accordance with the project objectives. Considering the type of mitigation intended for the problem area, the design approach adopted was such that significant features crucial for holistic remediation as presented in the schematics of Figure 5. 2 was adopted.

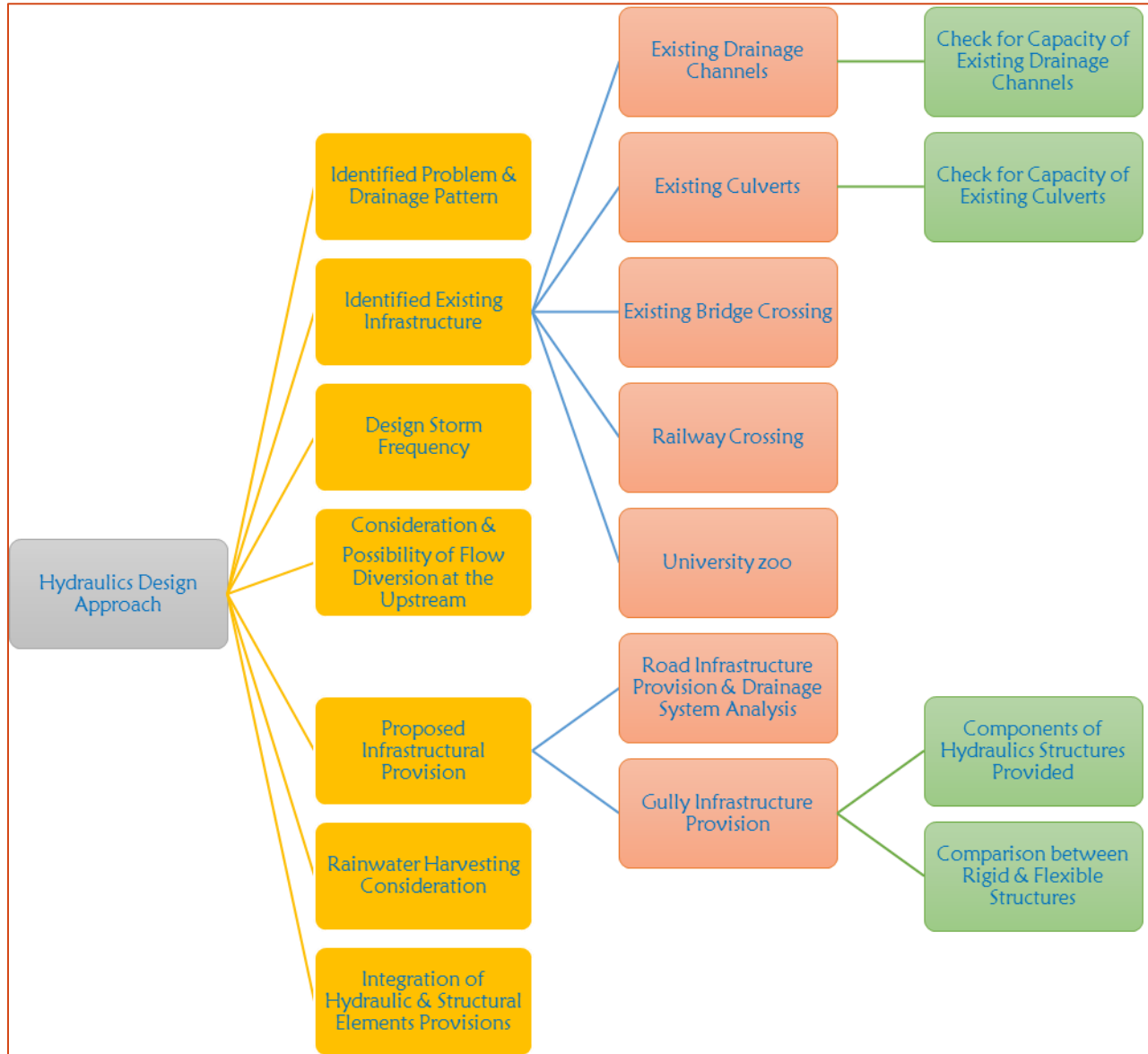


Figure 5. 2: Schematics of hydraulic consideration

5.1.3 Bioengineering Consideration

Mixed vegetation such as carpet grasses, Neem tree, and few natural vegetation were observed in all gully positions except at downstream position and some parts of upstream position due to desert encroachment. However, the nature and distribution of the vegetation types have obvious pedogenic implication on soils of Gombe formations. Vegetation as observed in the studied site were mainly xerophytic plants and plants of low moisture requirements. Soil fertility and perceptible macromorphological features as illustrated in the “Concept design report” August 2018 by *Loraj Consult and innovation concept Ltd* of the GSU project area shows that the soils present at the project site was also considered for purposes of making recommendations for suitable vegetation required for the gully remedial measures (*Identified perceptible macro-morphological characteristics of investigated soil*).

5.1.4 Irrigation Consideration and Recommendation

Gombe State University, in which the project site is located is a characteristic arid region where agricultural production mainly depends upon efficient irrigation. With increasing global warming, temperature of the region will continue to rise, thus the need for an efficient irrigation to ensure growth of plants to be implemented along the gully slopes and other proposed areas as deemed necessarily important.

Thus, irrigation is necessary as the total rain in the region is inadequate and not evenly distributed over time. Due to inadequate and uneven distribution of rainfall during the growth period of plants, it becomes essential to supply additional water in form of irrigation to the soil for plant use since water is a carrier of large amount of nutrients required for satisfactory plant growth.

5.1.4.1 Consideration of Possibility of Flow Diversion at Upstream

To handle or manage the runoff contributing directly to the gully head, the design concept considered: “option of diverting the harnessed runoff directly into a nearby flood plain while bearing in mind the prevention of further expansion of the gully” and “possibility of harnessing the flow generated upstream, and safely discharging the runoff onto the gully bed where its flow energy and velocity would be dissipated by adequately sized energy dissipators and its outwash emptied onto a nearby flood plain.

Careful consideration of the entire upstream phase where the gully head had formed clearly showed the area is highly built-up. The consideration of diverting flows upstream is highly not feasible as it would result in the demolition of infrastructures especially within the University campus and neighbouring communities affected by the gully. Also, there are no nearby stream or river. The available discharge point is a flood plain located at about 3.5 km from the gully head. In addition, the available river i.e. River Gongola, according to Gombe State SPMU, is located at about 40 km from the flood plain. Thus, the only feasible option is to harness the generated flow upstream and safely convey same onto the gully bed using adequately sized drop and energy dissipating structures while bearing in mind the realignment of parts of the gully system as may be necessary, to ensure easy connectivity of provided structural elements, thereby preventing water hammer on the gully walls and slip failure due to scouring and undercutting actions.

5.1.4.2 Upstream Structural Provisions

As it is the objective of NEWMAP to produce socio-economic and technically sound designs, alternative design options that considered a holistic watershed management approach, stand the test of time, and ensured the entire runoff generated upstream be properly harnessed and safely transmitted onto the flood plain were considered and compared. It is worthy to note that the main cause of erosion in an area is high

runoff velocity generated within the area. In areas of institution of learning and human habitation devastated by gully erosion, which is the case of Gombe State University, it is always important that the runoff generated be safely conveyed through adequately design hydraulic structures which dissipates flow energy and reduces the critical velocity of flow to laminar one, while bearing in mind the importance of rejuvenation of the natural ecology.

The following structures were considered at the upstream:

1. Rectangular Concrete Collector Channels

Rectangular concrete collector drains were proposed to harness the runoff generated overland from the upstream of the watershed and discharge them into major drains. This is necessary to guide against sheet flow erosion that is associated with overland flow. In order to avoid scouring of soils associated with sheet flow, it is necessary to prevent any runoff concentration along roads, therefore necessitating the provision of collector drains to harness the overland flow and to guide against future development of gully at the upstream of the watershed. Alternative to this is to provide an earth drain which may not be sustainable, considering the large runoff volume generated within the watershed. Gabion channels may also serve as alternative, but it may fail due to clogging of its interstices by debris or vandalization of the mesh as the upstream is highly built-up.

2. Rectangular Concrete Stepped Channel (Drop Structure)

Safety was made priority in the design and as such, drop structures were considered along the stretch of proposed channels to decelerate the flow velocity and ensure that the velocity flowing is within permissible velocity for open channel in concrete drain. The provision of these steps in the designed channels also ensured flow velocity within the channels is subcritical. This flow condition is harmless and can be permitted even in highly residential areas. The length of stretch of the step structure proposed was determined according to Chanson (1994).

According to Chanson (1994), the trajectory of flow down the step is first determined, using the general drop number method, subsequently, the length of roller provided to regulate the flow transition before the next drop. The summation of the trajectory of flow and the length of roller gives the minimum length of stretch as provided. This gives the minimum length that can be provided for each stretch. Hence, the stretch must be greater or equal to this minimum calculated. Thus, the stretches to be provided will be according to the longitudinal profile of the road after ensuring that the aforementioned condition is satisfied.

Alternative to the stepped channel provided is a sloping channel but analysis showed that the velocity of flow within this sloping channel especially in residential areas with relatively steep topography, is greater than permissible velocity recommended for open concrete channels. Also, Froude number >1 , shows a supercritical flow. If such channel is sustained within these road profiles, there is high risk of the concrete drain being eroded and possibility of livestock and humans been carried off by the high runoff which characterizes the project area.

Considering the recommended choice and the long-term durability of the project, the choice of concrete collector drains and stepped channels are the most suitable to handle the runoff generated at the upstream of the area.

It is important to categorically state herein that the best approach to be adopted to harness runoff along important roads that directly affects the project success both at the upstream and downstream especially in highly built-up areas is the use of concrete channels. Where necessary as may be required, new channels will be provided to ensure proper watershed management and prevent the formation of other gullies in future while considering the construction of roads affected by the gullies and future settlement that may affect the runoff regime within the watershed.

5.2 Impact Identification

There are number of approaches for the prediction and evaluation of impacts. For this study, ‘the four-point method’ was used. This method was used because it is simple to apply, provides high level of details and also relies on limited data unlike the other methods that require the availability of large historical data and they include;

- i. Impact Identification
- ii. Impact qualification
- iii. Impact Rating
- iv. Impact description

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

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

5.3 Impact Qualification

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

- a. Positive or Negative
- b. Short-term or long-term
- c. Reversible or Irreversible
- d. Direct or indirect

Negative impacts are those that impact negatively on the bio-physical, health, and social environments, while positive impacts are those which enhance the quality of the environment. For this study, short term means a period of time less than 3 months while any period greater than three months is considered long term. By reversible/irreversible, is meant whether the environment can either revert to previous conditions or remain permanent when the activity causing the impact is terminated. The outcome of the qualification of the identified impacts is shown in Table 5 8 - Table 5 11.

5.4 Impact Rating

This stage involves evaluation of the impact to determine whether or not it is significant. The quantification scale of 0, 1, 3 and 5 was used. This is a modification of the arbitrary scale proposed by Vesilind, et al. (1994). The ratings are as described below and are adapted from the criteria and weighting scale used in evaluating significance and are as follows:

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

5.4.1 Legal /Regulatory Requirements (L)

This asks the question ‘is there a legal/regulatory requirement or a permit required?’ The scoring is as follows:

- 0= There is no legal/regulatory requirement
- 3= There is legal/regulatory requirement
- 5= There is a legal/regulatory requirement and permit required

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

5.4.2 Risk (R)

This classification uses a matrix based interaction of the probability of occurrence of the impact (Table 5 1) against consequences (Table 5 2)

The Risk Assessment Matrix (RAM) Table 5 3. Five probability categories are interacted against three groups of consequences. The resultant outcomes are given scores with colour-coding. High-risk categories are red; intermediate risks, yellow and low risks, green as follows:

- 1=Low risk (green)
- 3=Intermediate risk (yellow)
- 5=High risk (red)

Table 5 1:Probability of Occurrence.

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

Table 5 2:Consequence Categories

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

Table 5 3:Risk Assessment Matrix (see color code overleaf)

Likelihood	Severity		
	Low adverse social or environmental impacts	Medium Measurable adverse environmental or social impact. Will result in annoyance or nuisance to the public	High Significant damage or impact on environmental systems & public. Widespread impact on the public resulting injury or illness
Low Event could occur occasionally	low	low	medium
Medium Event will occur about 50% of the time	low	Medium	High
High Event will almost certainly occur Medium High Critical	Medium	high	critical

	A	B	C	D	E
I					
II					
III					
IV					

Low	Medium	High	Positive
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5.4.3 Frequency of Impact (F)

This refers to the number of occurrence of impact. The frequency of impact was determined using historical records of occurrence of impacts, and consultation with experts and similar local communities. The criteria for rating the frequency of impacts are outlined in Table 5 4.

Table 5 4: Frequency Rating and Criteria.

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

5.5 Importance of Affected Environmental Component (I)

The importance of the affected environmental components was determined through consultation and consensus of opinions. This was further facilitated by information on experiences on the impacts of already existing facilities in the proposed project area. The rating of the importance of impacts is shown in Table 5 5.

Table 5 5: Importance Criteria.

Importance	Rating	Criteria
High	5	Highly undesirable outcome (e.g., impairment of endangered, protected habitat, species). Detrimental, extended animal behavioural change (breeding, spawning, moulting). Major reduction or disruption in value, function or service of impacted valued ecosystem resource. Impact during environmentally sensitive period. Continuous non-compliance with existing status.

Medium	3	Negative outcome. Measurable reduction or disruption in value, function or service of impacted resource. Potential for non-compliance.
Low	1	Imperceptible outcome. Insignificant alteration in value, function or service of impacted resource Within compliance, no controls required.

5.5.1 Public Perception (P)

The consensus of opinions among the project stakeholders were used to determine the public perception on the potential impacts and the following criteria were applied (Table 5 6):

Table 5 6: Public Perception Criteria

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

The combinations of the five impact rating weights form the basis for judging the level of significance of each impact. A matrix displaying the combination of criteria is shown in Table 5 6 above

Table 5 7: Impact Value and Rating Color Code

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

Positive	Positive
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The ratings of the identified impacts are presented in Table 5 8 - Table 5 12. In this report, medium and high significant negative impacts were judged to require mitigation, and all positive impacts required enhancement.

Table 5 8: Impact Assessment (Pre-Construction Phase)

Project Activity	Description of Impact	Impact Qualification								Impact Quantification							
		Positive	Negative	Direct	Indirect	Short term	Long term	Reversible	Irreversible	L	R	F	I	P	Total	F+I	Impact Rating
Land acquisition	Reduction of access to land and its resources		√	√			√	√		3	1	1	1	1	7	2	L
	Third party agitations		√		√		√	√		3	1	1	1	1	7	2	L
	Opportunity for income generation	√			√	√		√		-	-	-	-	-	-	-	P
	Improved health status/quality of life	√			√	√		√		-	-	-	-	-	-	-	P
Site Preparation (vegetation clearing)	Destruction of vegetation		√	√		√		√		0	3	3	3	3	13	6	M
	Increase in erosion of the cleared area		√	√			√		√	0	3	3	3	3	12	6	M
	Waste generation		√	√		√		√		3	1	1	1	1	7	2	L

Table 5 9: Impact Assessment (Construction Phase)

Project Activity	Description of Impact	Impact Qualification								Impact Quantification							
		Positive	Negative	Direct	Indirect	Short term	Long term	Reversible	Irreversible	L	R	F	I	P	Total	F+I	Impact Rating
Excavation for underground drainage route	Employment and income generating opportunity	√		√		√		√		-	-	-	-	-	-	-	P
	Third party agitation		√	√		√		√		3	1	1	1	1	7	2	L
	Damage to archeological artifacts		√	√			√		√	3	1	1	3	3	11	4	M
	Change in local topography of the area		√	√		√		√		3	1	3	3	1	8	6	M
	Increase in surface water turbidity		√	√		√		√		3	1	1	1	1	7	2	L
	Alteration of natural drainage pattern		√	√		√		√		0	1	3	1	1	6	4	L
	Acceleration of erosion		√	√			√	√		0	1	3	3	3	10	6	M
	Noise and vibration from heavy machinery		√	√		√		√		3	1	1	1	1	7	2	L
	Alteration of soil profile		√	√			√		√	0	1	3	3	1	8	6	M
	Reduction in air quality		√	√		√		√		3	3	3	3	1	13	6	M

	<i>Incidence arising from accidental contact with power cables and other underground infrastructure</i>		✓	✓		✓		✓		0	3	1	3	1	8	4	M
	<i>Noise and vibrations from heavy machinery</i>		✓	✓		✓		✓		3	3	3	3	3	15	6	M
	<i>Injuries/trauma and deaths</i>		✓	✓			✓		✓	3	1	1	1	1	7	2	L
	<i>Improved health status/quality of life</i>	✓			✓	✓		✓		-	-	-	-	-	-	-	P
	<i>loss</i>		✓		✓	✓		✓		3	1	3	3	1	12	5	L
<i>Ring laying</i>	<i>Interference with traffic</i>		✓	✓		✓		✓		3	3	3	1	3	13	4	M
<i>Backfilling</i>	<i>Impairment of air quality</i>		✓	✓		✓		✓		3	3	3	3	1	13	6	M
	<i>Noise/vibration nuisance from machinery</i>		✓	✓		✓		✓		3	1	1	1	1	7	2	L
	<i>Alteration of soil profile/river bathymetry</i>		✓	✓			✓		✓	0	1	1	3	1	6	4	L

Table 5 10: Impact Assessment (Operations and Maintenance Phase)

Project Activity	Description of Impact	Impact Qualification								Impact Quantification							
		Positive	Negative	Direct	Indirect	Short term	Long term	Reversible	Irreversible	L	R	F	I	P	Total	F+I	Impact Rating
Flow of storm water	Possibility of flooding		✓	✓			✓	✓		3	1	1	1	1	7	2	L
De-silting	Prevention of flooding	✓		✓		✓		✓		-	-	-	-	-	-	-	P
	Exposure to odour	✓		✓		✓		✓		3	1	1	1	1	7	2	L
	Waste nuisance	✓			✓	✓		✓		3	1	1	1	1	7	2	L
	Traffic obstruction		✓	✓			✓		✓	3	1	1	1	1	7	2	L

Table 5 11: Impact Assessment (Decommissioning Phase)

Project Activity	Description of Impact	Impact Qualification							Impact Quantification								
		Positive	Negative	Direct	Indirect	Short term	Long term	Reversible	Irreversible	L	R	F	I	P	Total	F+I	Impact Rating
Demolition	Impairment of air quality		√	√		√		√		3	3	1	1	1	9	2	M
	Noise and vibration		√	√		√		√		3	1	1	1	1	7	2	L
	Restoration of aesthetic value of the environment	√		√		√		√		-	-	-	-	-	-	-	P

5.6 Description of Impacts

The high and medium negative impacts for the project are described below:

5.6.1 Pre-Construction Phase

5.6.1.1 Land Acquisition

The potential impacts of the land in-take are:

- **Third party agitations** There are usually community agitations over compensations paid for acquired land in Nigeria. The execution of this project is unlikely to be different.
- **Opportunity for income generation** Monetary compensation shall be paid for every land acquired for this project. This is an opportunity for communities to enhance their income. This is a windfall income and there are chances that the money will be used for other income generating ventures.
- **Improved health status/quality of life** Proceeds from the land take would constitute an increase in household income for the landowners, which would result to an improvement in the quality of life and health status of members of those households. This impact was considered positive.

5.6.1.2 Site Preparation (Vegetation Clearing)

- **Destruction of vegetation** the land has already been cleared for road construction and thus very minimal vegetation will be removed.
- **Increase in erosion of the cleared area** When the vegetation is cleared, and the top soil is exposed it might be washed into rivers when it rains, and then out to sea. This destroys the ability for the land to regenerate because it has lost its topsoil.
- **Waste generation** Solid wastes particularly wood/vegetation wastes and spoils would be generated during site preparation.

5.6.2 Construction Phase

- **Increase in Employment, Services and Income:** The project could offer employment for the indigenes at various stages. This could improve the income of those employed in particular and the average earning of the community in general.
- **Pressure on existing infrastructure, health, recreational, housing:** Pressure on existing infrastructure such as healthcare, housing, recreational and other social amenities could arise due to migrant job seeker and camp followers to project locations.
- **Increase in Social vices:** The increase in population arising from influx of migrant workers and camp followers could lead to social vices like violence, alcoholism, attraction of commercial sex workers (CSW), substance abuse, teenage pregnancies etc. This could lead to increase in sexually transmitted diseases (HIV/AIDS, syphilis, etc).
- **Third Party Agitation:** Labour issues are always a source of friction between companies and project communities. Agitation could be either due to requests for a certain percentage of labour force that could not be met or sharing the employment opportunities in the community. The impact was described as direct, negative, short term, local and reversible.

- **Damage to archeological artifacts:** Archeological chance-finds could occur during drainage route excavation. The impact was described as direct, negative, long-term, local, reversible and rated medium.
- **Change in topography of the area:** The excavated soil from the trenching will be dumped along the trench and this could alter the local topography of the area, thus affecting the hydrology of the area.
- **Occurrence of erosion:** Excavation destroys the soil structure and loosens the compacted soil and therefore enhances erosion. Erosion could occur as a result of change in local soil topography
- **Noise and vibration from heavy machinery:** Noise and vibration arising from the use of heavy equipment for site excavation such as bulldozers, excavators, etc. could affect the workers and project community. The smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 90 dB (during the day) and 60 dB at (night).
- **Alteration of soil profile:** Excavation and backfilling could result in the alteration of soil profile, thus negatively affecting soil microbes and fauna. The impact was described as negative, direct, long-term, and irreversible.
- **Reduction in air quality:** Reduction in air quality could arise from the emission of pollutant gases from construction equipment during excavation activities. The impact was described as negative, direct, short-term, and reversible.
- **Incidents arising from accidental contact with power cables and other underground infrastructure:** Excavation equipment could make some accidental contact with power cables and other underground infrastructure. Such cables or other infrastructures could be destroyed or the contact may cause electric shock in the case of electrical cable.
- **Improved health status and quality of life:** The general well-being of community members would improve as an indirect result of the increased household income from the various economic opportunities and employment brought about by the project. This is a positive impact.
- **Blockage of waterways:** This could arise if rings are not aligned with the natural flow of water or inlets not placed properly.
- **Soil Contamination from cement:** The mixing of the cement could lead to soil contamination.
- **Impairment of air quality:** Reduction in air quality could arise as a result of the continued operation of heavy duty construction equipment from backfilling activities. The impact was described as negative, direct, short-term, and reversible.
- **Noise and vibration:** Noise arising from the use of heavy equipment for backfilling such as construction equipment could affect the workers and project communities.
- **Alteration of soil profile/river bathymetry:** Backfilling could result in the alteration of soil profile and river bathymetry.

5.6.3 Operations and Maintenance Phase

- **Possibility of flooding:** Possible impediments to the flow of water through the concrete rings can lead to flooding. This is a negative, direct, short-term, and reversible impact.
- **Prevention of flooding:** The drainage will channel water into the ponding points and natural drainage. This will help prevent flooding.
- **Exposure to odour:** De-silting would be carried out to remove silt and blockage from the drainage channel. During the cause of de-silting the drainage would have to be opened, exposing the environment to unpleasant odour.

- **Waste nuisance:** Evacuation of waste from the drainage will lead to waste nuisance if not properly managed.
- **Traffic obstruction:** Waste from the drainage may take up space on the road thus impeding the flow of traffic.

5.6.4 Decommissioning Phase

- **Impairment of air quality:** Reduction in air quality could arise as a result of demolition and transportation of demobilization wastes.
- **Noise and vibration:** Noise arising from the use of heavy equipment for demobilization, could affect the workers and project communities. The impact was described as negative, direct, short-term, and reversible.
- **Obstruction of vehicular movement:** Transportation of demolition debris from site can result in obstruction of vehicular movement.

5.6 Mitigation Measures

5.6.1 Criteria for Mitigation

The actions and measures that the proponent intend to take to reduce (or eliminate) negative impacts and promote positive bio-physical environmental, social and health impacts of the proposed drainage Project are presented in this chapter. In these mitigation measures, emphases are placed on those negative impacts rated as medium and high. These measures aim at reducing the impacts to *As Low As Reasonably Practicable* (ALARP). The residual impacts that could arise despite these mitigation measures were also noted. Impacts shall be mitigated through effective implementation of the Environmental Management Plan (EMP) articulated for this project. The mitigation measures proposed are in keeping with the following:

- Environmental laws in Nigeria, with emphasis on permissible limits for waste streams FMEnv (formerly FEPA, 1991)
- Gombe State Ministry of Environment Policies
- Best Available Technology for Sustainable Development
- Social wellbeing and
- Concerns of stakeholder

5.6.2 Selected Control Measures

A summary of the mitigation measures is presented in Table 5 12 - Table 5 14. These measures are recommended to ameliorate the potential high and medium impacts identified for the proposed project.

Table 5 12: Impact Mitigation (Pre-Construction Phase)

Project Activity	Impact Description	Impact Rating before Mitigation	Mitigation Measures	Impact Rating after Mitigation
Land acquisition	<i>Reduction of access to land and its resources</i>		<i>As captured in the Resettlement Action Plan</i>	<i>L</i>
	<i>Third party agitations</i>		<i>As captured in the Resettlement Action Plan</i>	<i>L</i>
	<i>Opportunity for income generation</i>		<i>As captured in the Resettlement Action Plan</i>	<i>L</i>
	<i>Improved health status/quality of life</i>		<i>As captured in the Resettlement Action Plan</i>	<i>L</i>
Site Preparation (vegetation clearing)	<i>Destruction of vegetation</i>	<i>M</i>	<i>NEWMAP shall ensure: Minimum land clearing. re-planting of area outside the RoW</i>	<i>L</i>
	<i>Increase in erosion of the cleared area if the cleared land is left bare and not revegetated</i>	<i>M</i>	<i>NEWMAP shall re-vegetate cleared areas outside the RoW with erosion control plants NEWMAP shall limit de-stumping</i>	<i>L</i>

Table 5 13: Impact Mitigation (Construction Phase)

Project Activity	Impact Description	Impact Rating before Mitigation	Mitigation Measures	Impact Rating after Mitigation
Excavation of underground drainage route	<i>Damage to archaeological artefacts</i>	<i>M</i>	<i>NEWMAP shall recover and preserve all archaeological chance finds</i>	<i>L</i>
	<i>Change in local topography of the area</i>	<i>M</i>	<i>NEWMAP shall spread the dredge spoil in a manner that will not alter the topography of the area.</i>	<i>L</i>
	<i>Incidence arising from accidental contact with power cables and other underground infrastructures</i>	<i>M</i>	<i>NEWMAP shall obtain all information about underground cables before excavations.</i>	
	<i>Alteration of soil profile</i>	<i>M</i>	<i>NEWMAP shall backfill the land trenches with the excavated soil in the reserved order of excavation</i>	<i>L</i>
	<i>Traffic re-routing</i>	<i>M</i>	<i>NEWMAP should ensure that the vehicles plying the road before rehabilitation are rerouted to another road.</i>	
	<i>Reduction in air quality</i>	<i>M</i>	<i>NEWMAP shall use only pre-mobbed equipment. NEWMAP shall ensure that there is controlled use of all equipment and that equipment engines are turned off when not in use.</i>	<i>L</i>
Ring laying	<i>Interference with traffic</i>	<i>M</i>	<i>NEWMAP shall ensure that all concrete rings are aligned outside traffic routes</i>	<i>L</i>
Backfilling	<i>Impairment of air quality</i>	<i>M</i>	<i>NEWMAP shall use only pre-mobbed equipment. NEWMAP shall ensure that d that equipment engines are turned off when not in use.</i>	<i>L</i>

Table 5 14: Impact Mitigation (Decommissioning Phase)

Project Activity	Impact Description	Impact Rating before Mitigation	Mitigation Measures	Impact Rating after Mitigation
Demolition	Reduction in air quality	M	<p>NEWMAP shall use only pre-mobbed equipment.</p> <p>NEWMAP shall ensure that there is controlled use of all equipment and that equipment engines are turned off when not in use.</p>	L
	Noise and vibration	M	<p>NEWMAP shall ensure:</p> <ul style="list-style-type: none"> ✓ machines are turned off when not in use ✓ Combustion engines are fitted with effective silencers. ✓ Regular maintenance of machines and equipment. ✓ machinery covers and panels are closed and well fitted at all times ✓ equipment with low noise level are used ✓ appropriate PPEs are provided 	L

5.7 Managing the risks

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

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

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

5.7.1 Transfer of risk

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

5.7.2 Acceptance of risk

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

5.7.3 Avoidance of risk

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

5.7.4 Insuring against risk

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

5.7.5 Doing nothing about risk

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

5.7.6 Allocating risk through methods of payment

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

- i. Fixed price: items paid for based on the contractor's predetermined estimate

ii. Cost reimbursement: items paid for, based on what the contractor spends in executing the work. However, there will be need to balance the envisaged risk. This can be achieved through one of the following contractual approach

5.7.7 Design and build

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

5.7.8 Traditional contract

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

5.7.9 Management contracting

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

5.8 Analysis of Alternatives

Option 1

Provision of Concrete Structures throughout the Sections of the Gullies and its Fingers” concept. This approach negates the possibility of rejuvenation of the gully and possible reclamation over time, within the University Campus. The gully locations are strategically located at or near the heart of campus and serves several key functions including a newly constructed pedestrian bridge and federal railway which is a major intersection and link to the campus pedestrian network.

Option 2

The second being the “Provision of Flexible Structures (in the form of Gabion walls, check dams (counter dams) and Meshes throughout the Sections of the Gullies and its Fingers” concept. This approach is not cost effective but gives opportunity for the possibility of rejuvenation of the gully and possible reclamation over time, within the University Campus. However, this option is not sustainable at the gully heads, and middle gully, as the connections between the existing and new concrete structures (such as culverts and channels) may pose a challenge during service or use. Also, the area is built-up with poor solid waste management.

Option 3 (preferred option)

The third option, which is the Partial Use of Concrete and Flexible Structures at Strategic Sections is best suited for the site and environs and should be developed as such, while ensuring rejuvenation or self –

healing or reclamation of gully by mechanical processes (soil solid movement occurring upstream and beyond the project area.

The Delay Project Option

The preferred alternative would be to implement the current project proposal, however with a combination of suitable alternatives to enable the project achieves its objectives. This is mainly based on cost benefit analysis, prompt saving of lives and properties, halting of the spread of the erosion menace, to check loss of livelihood and displacement as well as sustainability.

CHAPTER SIX – ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.1 Overview

The range of environmental, social and occupational health and safety issues associated with the reclamation and construction works for the GSU Gully Erosion site will be described in a matrix table format for the environmental and social management plan (ESMP). The table (6.1 – 6.3) also includes columns for Monitoring Indicators, monitoring parameters, monitoring instruments, monitoring locations, Monitoring Frequencies, monitoring responsibilities and costs.

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

6.2 Mitigation Measures

The mitigation measures suggested for this project are enumerated in Table 6.1 to Table 6.3. The measures are phase specific, detailing activity related possible impacts, their mitigation measures, indicators and method of monitoring. The project activities have been categorized into three phases ie pre-construction, construction and operational phases. Their main components being the environment and sub-components are air, soil, noise, water, vegetation, traffic climate change, people etc.

6.3 Institutional Arrangement for ESMP Implementation and Monitoring Plan

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

Overall sub-project coordination will be housed in the State Project Management Unit (PMU), of Gombe State NEWMAP Office. They will oversee the day-to-day project management and ensure that environmental and socio-economic concerns and management as elucidated in the ESMP are integrated into all aspects of project implementation. The GMSPMU as the overall supervising organ will ensure that employing an environmental safeguard specialist is a mandatory requirement for the contractors during the bidding process and documentation, and its compliance enforced during project implementation. Also, the supervising consulting firm will be mandated to have an Environmental Safeguard Specialist who will work hand in hand with the contractor to ensure compliance. The Gombe State Ministry of Environment; herein referred to as State Ministry of Environment (SMEnv); The Federal Ministry of Environment, National Environmental Standards Regulatory Enforcement Agency (NESREA), and Gombe State Environmental Protection Agency (GOSEPA) will monitor, evaluate and audit the implementation of the ESMP to ensure that the rehabilitation works and project operations meet “best environmental practices”.

Gombe SPMU will organize awareness exercises on GBV/SEA, environmental protection and personal hygiene and sanitation shall also be undertaken for contractors, personnel and all stakeholders involved in project implementation. The SPMU Safeguard Officers will be directly responsible for the awareness creation exercise.

The NEWMAP FPMU will also provide an oversight function through its Environmental and Social Safeguard Officers to the SPMU during the project implementation. The World bank will also perform some supervisory role during its mission activities and use of consultants.

The line of communication in the implementation of this ESMP will be; Contractor environmental safeguards officers to the Contractors Project Manager, who will report the matter to the SPMU Environmental Safeguard Officers. The SPMU Environmental Officer will advise the Project Coordinator SPMU on the line of action to be taken. If the issue can't be resolved at the SPMU level, the matter is referred to the FPMU through the federal Environmental Safeguard Specialist, who will also advise the National Project Coordinator on the next line of action. If the matter can't be resolved at the federal level, the matter will then be referred to the World Bank.

6.4 Environmental and Social Obligation of the Construction Contractor

The environmental and social obligation of the contractor is explained in the following tables below, indicating the institutional responsibilities in terms of mitigation and monitoring, as well as the frequency during the pre-construction (Table 6 1), construction (Table 6 2) and operational (Table 6 3) phases of the project. The associated budget estimates is 3,300 USD for the pre-construction phase, 6,000 USD for the construction phase and 6,500 USD for the operational phase, making a total of 15,800 USD.

Table 6 1: ESMP - Pre-Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation) implementation	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Air	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Increase in amounts of fugitive dusts and exhaust fumes from movement of heavy-duty vehicles and equipment into work areas.	Sprinkling of water via spraying devices to limit dusts.	Air quality parameters are within permissible Limits	2-3km Radius of project area	Air quality test	Twice monthly	Mitigation: Contractor	Monitoring: SMENV, PMU, ESO, Contractor	No additional costs to BOQ
				Ensure that vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES) as laid down in the NESREA guidelines.	Ensure that vehicles are serviced; undergo vehicle emission testing (VET) and vehicle exhaust screening (VES) as laid down in the NESREA guidelines.	2-3km Radius of project area	Air quality test	Every two months			
	Soil	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Loss of top soil and soil compaction due to movement of vehicles to site and stacking of heavy-duty equipment	Limit zone of vehicle and equipment weight impacts (designate an area for parking and stacking equipment).	Visible demarcation of vehicles and equipment limit zone Warning signs, flags will be utilized to alert users, so as to reduce risks associated with the rehabilitation of the project	Project camp sites and equipment packing zones	Visual observation, Soil Compaction test	Weekly	Mitigation: PMU and Contractors	ESO	No additional costs to BOQ
				Leakages from stacked equipment and subsequent intrusion of oil and chemical substances into soil.	Ensure fastening of loose parts (bolts, nuts); Install impermeable surface at the limit zone to contain	Installation of impermeable platform at limit zone.	Project camp sites and equipment packing zones	Soil quality test			

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation) implementation	Institutional Responsibility (Monitoring)	Costs (USD)
				potential leakages							
	Noise	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Increase above permissible noise level, (90dB) during movement of vehicles, equipment and machines (site-specific and widespread).A Logarithmic scale in decibels (ie Decibel Sound Pressure Level) was used.	The effective control of noise from vehicles and equipment during this phase may be achieved by considering the following techniques: Alternative design options; Mitigation at the source; Mitigation along the path; and Mitigation at the receiver For minimal disturbance it will be advised that equipment is transported when it will cause least disturbance	Options for noise impact mitigation are being implemented	2-3Km Radius of project site	Noise level testing	Weekly	Mitigation: PMU, Contractor	Monitoring: ESO,SMEnv, GSEPA	
	Vegetation	Vegetation clearing	Displacement of soil fauna and damage to flora.	Contractors should limit vegetation clearing to minimum areas required particularly areas with indigenous vegetation	Vegetation clearing is limited to precise areas	Project Community especially access routes flood plains corridors	For a and fauna studies in selected areas	Monthly	Mitigation: Contractors	Monitoring: ESO, NRO, PMU	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation) implementation	Institutional Responsibility (Monitoring)	Costs (USD)
			Predisposing of soils to erosion	Cleared areas should be re-vegetated with beneficial local species known to mitigate against erosion	Re-vegetation is ongoing where appropriate.	Community especially access routes to gully	Ground trotting	Monthly		ESO, NRO	
	Traffic	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Traffic congestion/travel delay along some major roads	Apply lane configuration changes to affected roads and streets.	Lane configuration changes are being made where applicable	Project routes within community	Site visits and observation	Daily	Mitigation: Contractors, FRSC (Federal Road Safety Corps)	Monitoring: ESO, FRSC;	
	Noise	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Nuisance to nearby residential areas	Retrofit with suitable cost effective vehicle sound proofing materials/ technologies	Retrofitting with vehicle sound proof materials is being performed	Project community	Inspect Contractors equipment	Daily	Mitigation: Contractors	Monitoring: ESO, SMENV, GSEPA	No additional cost
	Air	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Exposure to health risks from fugitive dusts and exhausts fumes.	Restrict access of non-project personnel to work areas where dusts and emissions exist/persist from project works.	Provision of face masks and appropriate PPEs are being provided. Restriction barrier are being installed.	Project area Project site	Site visits and inspections Site visits and inspection	Weekly	Mitigation: SMENV, PMU, Public Health depts. Gombe LGA	Monitoring: ESO, GSEPA	No additional costs to BOQ

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation) implementation	Institutional Responsibility (Monitoring)	Costs (USD)
	Land	Land Acquisition	Conflict owing to unresolved land acquisition and involuntary displacement during the construction	The PMU will carry out an extensive enlightenment program to inform farmers and communities on the aim, scope and nature of the work	Documented evidence of enlightenment carried out showing method, coverage and dates of programs	Project community	Examine grievance redress reports	Monthly for 6months before and during construction/rehabilitation phase	Mitigation: PMU	Monitoring: PMU, SLO, Independent Consultant, Contractors	No additional costs, To be covered under RAP
	Construction camping	Transportation and movement of heavy equipment	Public Safety and Traffic congestion	Transportation of heavy equipment will be carried out during off pick hours when it will not disturb public movement Where movement cannot be avoided during work hour, the contractor must attach a warning signal	Evidence of warning signal Log record of time of lorry arrival/discharge of equipment	Project communities and transport routes	Site visits and inspections	Weekly during pre-construction phase	Mitigation: Contractor PMU	Monitoring: PMU most importantly, ESO),	
	Others	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Disruption of vehicle and pedestrian access to where rehabilitation works will be conducted	Adequate and timely sensitization of identified Respondents; Lane configuration	Adequate and timely sensitization program is being conducted Lane configuration change have been made	Project communities and transport routes	Site visits and inspections	Monthly	Mitigation: Contractor, PMU	Monitoring: PMU (most importantly, ESO), SLO, FoNGO	No additional cost

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation) implementation	Institutional Responsibility (Monitoring)	Costs (USD)	
			Grievances and negative community perception about the project.	Adequate and timely sensitization of identified Respondents	Sensitization exercise are conducted	Project communities and transport routes	Examine Awareness reports, site visits and consultations			Monitoring: PMU most importantly, SLO, ESO)	2,200	
SUB TOTAL: 2,200												
Occupational Health and Safety	Air	Mobilization of workers, equipment and other materials into GSU Gully Erosion site	Respiratory disease risks from exposure to exhaust fumes of equipment and vehicles	Institute Workers Respiratory Protection Program (WRPP)	Institution of WRPP	Contractors project camp/office	Examine contractors WRPP	Weekly	Mitigation: Independent Consultant, Contractors	Monitoring: ESO, GSEPA, PMU	No additional cost	
	Noise	Mobilization of workers, equipment and other materials into the Gully Erosion site	Noise pollution	Institute noise control plan	Institution of noise control plan	Contractors project camp/office	Examine Contractors Noise control plan	Weekly	Mitigation: Independent Consultant, Contractor	Monitoring: ESO, GSEPA, PMU	No additional cost	
	Accidents		Mobilization of workers, equipment and other materials into the Gully Erosion site	Accidents involving pedestrians	Education and training of Respondents about the project and accident occurrence	Education and training has been conducted	Contractors project camp/office	Examine Contractors Accident prevention plan	One-off	PMU, Contractor, Independent Consultant	PMU	1,000
					Contractor(s) education and training on pedestrian safety	Training has been conducted	Contractors project camp/office	Examine Contractors Accident prevention plan	One-off	PMU	PMU	1,000
					Install safety signage	Safety signage have been installed	Project site	Site visits and inspection	Weekly	PMU, Contractor	PMU(ESO, etc.)	No additional cost
				Collapse of heavy equipment etc. being conveyed	Conduct haulage safety training	Training has been conducted	Contractors project camp/office	Inspection and consultation with workers	One-off	Contractor	PMU most importantly, ESO)	No additional cost

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to Monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation) implementation	Institutional Responsibility (Monitoring)	Costs (USD)
			to rehabilitation work area								
				Enhanced fastening of equipment to carriage section of vehicles.	Contractor(s) Compliance	Contractors project camp/office	Site visits and inspection	Weekly	Contractor	PMU most importantly, ESO)	800
	Personnel Safety		Attack from dangerous animals during de-vegetation activities	Conduct safety and first aid training	Training has been conducted	Contractors project camp/office	Inspection and consultation with workers	One-off	Contractor	PMU most importantly, ESO)	500
SUB-TOTAL: 3,300											
PRE-CONSTRUCTION PHASE TOTAL: 3,300											

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Climate Change	Operation of equipment used during the construction phase	GHG Emissions	<p>Fuel switching- Fuel switching from high- to low-carbon content fuels (where available) can be a relatively cost effective means to mitigate GHG emissions during this phase. Transition to renewable energy sources i.e. solar energy (where applicable)</p> <p>Energy efficiency- Machines e.g. generator plants could be turned off when not in use, in order to reduce carbon emissions.</p> <p>Multiple trips reduction: In order to reduce vehicular movement and subsequent increased carbon emissions. Hire vehicles, plants and equipment that are in good condition (current models) generally less than 3 yrs. old.</p>	Compliance to proffered mitigation measures.	2-3km Radius of project area Project site	Air quality test Site visits and inspection	Weekly	Mitigation: PMU, Contractors	Monitoring: ESO, GSEPA, PMU	No additional cost

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Air	Operation of equipment used during the construction phase.	Fugitive and cement dusts	Routine watering of the rehabilitation site	Contractors Compliance	2-3km Radius of project area	Air quality test	Daily	Mitigation: Contractors	Monitoring : GMSEPA, PMU (most importantly, ESO)	-
		Rehabilitation works – including excavation, desilting, filling and compaction activities, construction of side drains, culverts and other hydraulic structures						Daily	Mitigation: Contractors	Monitoring : GMSEPA, PMU(most importantly, ESO)	-
		Heavy equipment operations during construction	Exhaust fumes, hazardous gases (NOx, CO, SOx, SPM,), Oxides from welding activities.	Wet Right-of-Way to reduce dust production	QC and QA are in practice	Project site	Site Visit and inspection	Monthly	Mitigation: PMU, Contractors	Monitoring :PMU most importantly, ESO), Contractor s	800
				Test Procedures – Routine measuring of HC and CO concentrations during rehabilitation works should be employed for PMS powered vehicles. Diesel (AGO) vehicles should be tested for exhaust opacity during unloaded engine free acceleration periods.	Contractors Compliance			Monthly		Monitoring :PMU (most importantly, ESO), SMe nv	1,000
				Quality Control – Routine equipment efficiency audits Quality	Contractors Compliance	Project site	Site visits, inspection and consultatio	Monthly	Mitigation: Contractors	Monitoring :PMU (most importantl	-

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				Assurance – Continuous training of contractor(s) personnel on air quality management			n with workers			y, ESO), SMEnv	
	Water quality/Hydrology	All rehabilitation works	Contamination of surface water (discharge of sediment laden run-off into drainages, waterways etc)	Attempts to dispose of sediment-laden run-off into surface water should be discouraged and prevented. Implement site-specific waste management plans	Contractors Compliance	Surface water within project area	Water quality test	Daily	Mitigation: Contractors	Monitoring :PMU (most importantly, ESO), SMEnv	-
		Defecation near the Gully Erosion site	Generation of sewage overtime (from use of temporary mobile toilets by personnel involved in civil works)	Liaise with the municipal sewage collection authorities for collection and treatment of waste with GSEPA	PMU Compliance	Surface water within project area	Water quality test, consultation with monitoring agency	Monthly	Mitigation: Contractor	Monitoring :PMU (most importantly, ESO) SMENV, GMSEPA	800
	Soil/geology	Movement of heavy vehicles/Stationary vehicles and equipment	Surface soil compaction	Creation of limit zones Minimize compaction during stockpiling by working the soil in the dry state. Rip compacted areas to reduce runoff and re-vegetate where necessary All topsoil and other soil profiles	PMU, and Contractor's Compliance	Project site and routes	Site visits and inspection, soil testing	Monthly	PMU, Contractor s	Monitoring :SMENV, PMU (most importantly, ESO)	No additional cost

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				must be managed strictly							
		Contamination by oil spills, lubricants and other chemicals	Pollution of soil and groundwater	All oil and lubricants should be sited on an impervious base and should have drip pans The storage area should be far from water course All containers should be clearly labelled	Contractor Compliance	Project site and routes	Site visits and inspection, soil and groundwater testing	Periodically	Mitigation: Contractor	Monitoring : SMENV, PMU (most importantly, ESO)	No additional costs to BOQ
		Filling and Compaction activities	Loss of top soil ; possible minor to moderate soil instability	Ensure excavation is limited to desired areas Filling and compaction in layers must range between 150-200mm thicknesses as recommended.	Contractor Compliance	Project site and routes	Site visits and inspection	Monthly	Contractor	Monitoring :PMU (most importantly, ESO) Project Engineer	No additional cost
		Flood and Erosion management	Flood and Erosion management	The contractor must implement appropriate erosion control measures to avoid further flooding and erosion within the Gully Erosion site Construct soil conservation measures at appropriate locations	Contractor Compliance	Project site and routes	Site visits and inspection	Weekly	Contractor	Monitoring : SMENV, PMU (most importantly, ESO)	No additional cost

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				Execution of major works that would impact on soil structure should be carried out during the dry season. If done during the wet season, temporal drain should precede the permanent drain so that run-off from rain can be managed properly.							
	Noise	Construction of all hydraulic structures	Extensive noise site-specific pollution as a result of on-going construction works.	Mitigation at source (for all activities) A noise barrier or acoustic shield will reduce noise by interrupting the propagation of sound waves.	Contractors Compliance	Project site and routes	Site visits and inspection, of equipment	Weekly	Mitigation: PMU, Contractors	Monitoring :ESO, SMENV,	No additional costs to BOQ
		Rehabilitation and excavation and desilting								Monitoring :ESO, SMENV,	
	Waste	All rehabilitation/construction works	Increase in waste generated	Implement site-specific waste management plan Liaise with GMSEPA for effective waste management	Contractors Compliance	Project site	Site visits, inspection, and consultation with monitoring agencies	Weekly	Mitigation: Contractor	Monitoring :ESO, SMENV, GMSEPA,	No Additional cost
	Sanitary Concerns	Increased human faecal waste	Increased human faecal waste	Provision of on-site sanitary facilities	Contractors Compliance	Project community	Site visits and inspection	One-off	Mitigation: Contractor	Monitoring : ESO, SMENV, GMSEPA,	900

	Design	All Rehabilitation Works	Interference with the physical setting	<p>The design shall in no way propose to implement developments that will hinder drainage, change the topography or introduce physical changes that are not in harmony with the physical setting of the Project area.</p> <p>The structures to be developed should be aesthetically acceptable to blend in with the surrounding.</p> <p>These structures should not form or end up being used by the resident population as access or bridges. No residential facilities shall be erected on site and the proponent shall as much as possible complete the works in such a way that natural aesthetics shall be retained at the locations.</p> <p>Restoration shall be undertaken to ensure that the original setting is as much as possible retained.</p>	Contractors Compliance	Project site	Site visit and inspection	During Design	Monitoring : Contractor	PMU	No additional costs to BOQ
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Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Sub-total: 3,500											
Social	Livelihood Impacts	Rehabilitation/ Construction of drainage network	Disruptions to residents activities – (e.g. blocked access to residents)	Conduct survey to identify best alternatives to prevent disruptions to livelihood within on & off-site work areas before commencement of rehabilitation works.	Independent Consultants Compliance	Project community	Examine Community Livelihood enhancement plan	One-off	Mitigation: PMU, Independent Consultant	Monitoring :PMU (most importantly, SLO)	No additional cost
	Traffic	Mobilization of equipment and other materials	Loss of travel time due to heavy concentration of construction/project vehicles on and off the project site	Lane configuration changes	Contractors Compliance	Project area	Site visits and inspection	Weekly	Mitigation: FRSC	Monitoring :PMU (most importantly, ESO),	-
			Grievances and negative perception among residents and commercial establishments about the project	Involve Respondents at certain levels of decision making and implementation of activities	PMU Compliance	Project community	Site visit and consultation with community	Monthly	Mitigation: PMU, Contractors	Mitigation: PMU, (most importantly, ESO)	
	Education	Extensive civil work/rehabilitation activities	Noise disturbances to the serene environments for the residence	Mitigation at source Inform residents prior to commencement of works	Compliance	Academic institutions within project area	Visits , inspection and consultation with institutions	Monthly	Mitigation: PMU, Contractors	Monitoring :ESO, Gombe LGA	No additional cost
	Health	Continuous civil work activities and steady influx of workforce	Increase in sexual activities leading to possible spread of STIs	Awareness campaign on sexual diseases, and distribution of male and female condoms.	Conduct awareness campaigns	Project community, contractors camp	Consultations,	Quarterly	Mitigation: MWR, Public Health dept. of the Gombe LGA.	Monitoring :ESO, SMH	1,000

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
			Incidence of respiratory diseases due to air contamination by fugitive dusts and exhaust fumes	Distribute facemasks to residents as a means to reduce allergic reactions and respiratory disease occurrence. Regular sprinkling of water in during construction works.	Facemasks are being distributed	Project community	Site visits and inspection	Monthly	Mitigation: PMU, Contractors	Monitoring :ESO, SMH, Public Health dept. of the Gombe LGA,	-
		Blocked drainage channel	Possible spread of water borne diseases	Creation of temporary channels to collect flood water	Compliance	Project community	Site visits and inspection		Mitigation: Contractors	Monitoring : ESO, SMENV, SMH	
	Environmental hygiene and aesthetics	Waste management	Increase in waste generated from construction works	Ensure that all construction wastes are gathered on-site and disposed off according through the available waste disposal operation in the project area.	Contractors Compliance	Project community	Site visits and inspection	Weekly	Contractors	Monitoring : ESO, SMENV, GSEPA	-
	Behaviour	Implementation of civil works and Rest periods	Occurrence of on-site/off-site social vices (Fights, rape, harassments, theft, vandalism, drug use etc.	Enforce and ensure proper orientation on acceptable behaviours for construction personnel on/off-site.	Compliance	Project community	Site visits and inspection and consultations	Monthly	Contractors	PMU, FoNGO	-
Project performance	Implementation of all construction phase activities	Conflicts between contractors, communities etc. may disrupt	Good work enforcement program Conflict resolution	Compliance	Project community	Site visits and consultations	Monthly	Contractors	PMU, PE, M&E	1,500	

Table 6 2: ESMP Construction Phase

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

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Personnel safety	All construction activities	Fugitive dust and fumes from grinding, welding, cutting, or brazing surfaces coated with lead-based paint; Silica dust from cutting concrete; solvent vapours from adhesives, paints, strippers, cleaning solvents, and spray coatings; and isocyanate vapours from spray foam insulation and certain spray paints or coatings.	Develop and implement on-site occupational health and safety management plan; Routine OHS training and education; Conduct routine JHA/PHA; Use of PPE; Establish electrical safety program; Establish fall protection program; Establish fleet safety management program; Establish and implement HazCom; Conduct hazard identification, control and analysis; Establish fire prevention program; Use material safety data sheets (MSDS); Employ hierarchy of controls procedure; Conduct OHSRA, Cost Benefit Analysis(CBA), Return on Investment(ROI)/ pay-back period analysis	Independent Consultants/Contractors Compliance	Project community	Inspection and consultation with contractor, examining contractors health and Safety management plan and consultants report	Monthly	Independent Consultant, Contractors	Monitoring : PMU, ESO	No Additional cost

Table 6 2: ESMP Construction Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
				Contractors should prepare and implement a Community Affairs, Safety, Health, Environment and Security (CASHES) manual, to coordinate OHS issues during the construction phase.				Monthly	Contractors	Monitoring : PMU	-
SUB-TOTAL: 2,500											
CONSTRUCTION PHASE TOTAL: 6,000											

Table 6 3: ESMP-Operational Phase

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Environment	Air	Increased Vehicle movement	Increase of road users on Access Road	Air sampling and monitoring	Compliance	Project community	Air quality testing	Monthly	Monitoring: SMENV	Monitoring: ESO, SMENV, (state), GSEPA	-
	Soil	Change of topography	Change in soil profile	Training on Sustainable Land Management (SLM) practices	Trainings are conducted	Project community	Soil quality testing	Monthly	Mitigation: PMU, SMENV	Monitoring: ESO, SMENV, (state), GSEPA	-
			Increase in soil salinity								
			Change in land use								
	Noise	Increase of road users on Access Road	Noise nuisance to local residents	Noise sampling and monitoring		Project community	Noise level testing	One-off	Mitigation: PMU, SMENV	Monitoring: ESO, SMENV, (state), GSEPA	-
	Water Quality	Roadway runoff	Potential surface water pollution	Water sampling and monitoring	Compliance	Project community, surface water	Water quality testing	Bi-Annual	Mitigation: PMU, SMENV	Monitoring: ESO, SMENV, (state), GSEPA	-
Waste	Waste generation	Social and health concerns arising due to poor waste management practices	Dispose waste streams through the municipal waste management system in the project area.	Proper waste management	Project community	Visits and Inspections	Monthly	Mitigation: PMU, SMENV	Monitoring: ESO, SMENV, (state), GSEPA	-	
		Blocked drainage due to poor waste disposal	Flooding on roads								

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Others	Negligence of rehabilitated GSU Flood Gully Erosion site	Negligence of rehabilitated GSU Flood Gully Erosion site	Regular maintenance and dredging of sediments in drainage channels and chute	PMU Compliance	Project community	Visits and Inspections	Monthly	PMU	Monitoring: ESO, SMENV	3,500
SUB-TOTAL: 3,500											
Social	Employment	Closure of civil works	Loss of employment	Inform personnel that employment is short-term prior to their engagement.	Proper engagement of service documentation	Project community	Consultations	One-off	Contractors	Monitoring: PMU, SLO	1,000
	Health	Operation of rehabilitated Gully Erosion site	Blocked drainage structure Breeding site for disease vectors Possible increase of malaria cases due to stagnant water in drainage structures	Regular maintenance of drainage structures	Compliance	Project community	Visits and Inspections and consultation with health institutions and community members	Weekly	Independent consultant, PMU	Monitoring: ESO, SMH	-
		Increase in number of vehicles using roads	Increase in respiratory problems amongst local residents	Regular sampling and monitoring	Regular monitoring	Project community	Visits and Inspections and tests	Weekly		Monitoring: ESO, SMH	

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
	Land use conflicts	Land use conflicts	Land use conflict	Control land use conflicts through Land use planning that should be participatory to designate areas for ecological, grazing and farming	Inspections are conducted	Project community	Visits and Inspections and consultations	Monthly	Contractors	Monitoring: PMU, SLO	TBD by RAP
	Safety	Increase in number of road users	Increase in vehicular accidents	Use of road safety signage	Compliance	Project community	Visits and Inspections	One-off		Monitoring: ESO, FRSC	-
		Operation of rehabilitated road	Seepage or flow back action Collapse of rehabilitate road	Re-vegetation activities using approved plant/tree species to establish green belt along the sides of the road to prevent erosion	Compliance	Project site	Visits and Inspections	One-off		Monitoring: PMU	2,000
Sub-total: 3,000											

Component	Sub-component	Activities	Potential Impact	Mitigation Measures	Monitoring Indicators	Where to monitor	How to monitor	Monitoring Frequency	Institutional Responsibility (Mitigation)	Institutional Responsibility (Monitoring)	Costs (USD)
Occupational Health and Safety	Personnel safety	Tasks implementation	Injuries, accidents, deaths	Implement on-site occupational health and safety management plan; Routine OHS training and education; Conduct routine JHA/PHA; Use of PPE; Establish electrical safety program; Implement fall protection program; fleet safety management program; Implement HazCom; Conduct hazard identification, control and analysis; Implement fire prevention program; Use material safety data sheets (MSDS); Implement hierarchy of controls procedure; Conduct OHSRA, Cost Benefit Analysis(CBA), Return on Investment (ROI)/pay-back period analysis	Independent Consultants, Contractors Compliance.	Project community	Site Inspections	Monthly	SMEnv	PMU, ESO	TBD
	OPERATIONAL PHASE TOTAL: 6,500										

6.4 ESMP and Monitoring Budget

Table 6 4: Summary of ESMP and Monitoring Budget

<i>Item</i>	<i>Responsibility for implementation and Monitoring</i>	<i>Cost Breakdown</i>	<i>Cost Estimate in Nigerian Naira (₦)</i>	<i>Cost Estimate in US Dollars (USD)</i>
<i>Enhancement of +ve impacts and Mitigation of -ve impacts</i>	<i>Contractor, PMU, SMEnvr, GOSEPA, FRSC</i>	<i>sum of direct monitoring amount</i>	<i>5,688,000.00</i>	<i>15,800</i>
<i>Management of ESMP Implementation</i>	<i>PMU, SMEnvr, GOSEPA</i>	<i>5% of Mitigation Cost</i>	<i>284,400</i>	<i>790</i>
<i>Monitoring, Evaluation & Audit</i>	<i>PMU, SMEnvr, GOSEPA, FERMA, SMW</i>	<i>25% of Mitigation Cost</i>	<i>1,422,000</i>	<i>3,950</i>
<i>SUB- TOTAL</i>			<i>7,394,400</i>	<i>20,540</i>
<i>Contingency</i>		<i>10% of Sub-Total</i>	<i>739,440</i>	<i>2,054</i>
<i>TOTAL</i>			<i>8,133,840</i>	<i>22,594</i>

The total cost for Implementing the ESMP and Monitoring Plan for the GSU Flood Site Rehabilitation Works is estimated at Eight Million, One Hundred and Thirty-Three Thousand, Eight Hundred and Forty Naira, only (₦8,133,840); that correspond to Twenty-Two Thousand, Five Hundred and Ninety-Four US. Dollars [USD22,594].

The ESMP matrix for the implementation is highlighted from Table 5 8 - Table 5 12. NB: \$1 = ₦360

Some specific Management plans such as waste management, grievance redress mechanism, community security health and safety management have been included in the Environment and Social Management Plan sections below.

6.5 Waste Management Plan

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

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

6.5.1 Recommended Measures for Waste Management

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

- Identify and classify the type of waste generated. Proper procedures must be taken regarding their storage, collection, transportation and disposal

- ii. Identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each.
- iii. Dispose all wastes in authorized areas, metals, used oils, etc.
- iv. Identify and demarcate equipment maintenance areas on a land (greater than >15m from rivers, streams, lakes or wetlands).
- v. Identify, demarcate and enforce the use of within-site access routes to limit impact to farm.
- vi. Erect erosion control barriers around perimeter of cuts, disposal pits, and roadways.
- vii. Spray water on dirt roads and stockpiled soil to reduce wind-induced erosion and particulates dispersal, as needed.
- viii. Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for construction debris.

6.5.2 The Management Per Kind Of Waste That Will Be Generated From The Rehabilitation Works Is Highlighted Below:

a) General Waste

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

b) Oil waste

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

iii. Equipment should be well maintained so as to avoid any leakages.

c) Vegetative waste

The land clearing of the vegetation will be performed in such a manner that it does not pose threat to the health of the community.

d) Silts

Silt collection from the underground drainage should be managed and treated by the relevant authority before disposing or the environment.

6.6 Emergency Response and Incident Management

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

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

As much as possible ERIM procedures should address:

- Community security and public safety actions to be taken in the case of an emergency
- Effective spill containment and management
- Effective fire-fighting
- Effective response to emergencies and critical incidents
- Incident Prevention
- Accident/incidence register to be opened and maintained by the Contractor at the site

Incident preparedness procedures for potential incidents and emergencies include:

- Ongoing training for project personnel;
- Periodic Desktop and field exercises to uncover work place risks and hazards;
- Regular auditing of construction activities;
- Ongoing liaison with Emergency Service providers
- Identifying key roles and responsibilities and effective methods of communication;
- Monitoring of activities and documentation and ongoing compliance checks with statutory Occupational Health and Safety (OHS) and Environmental requirements.

Stages of Activation

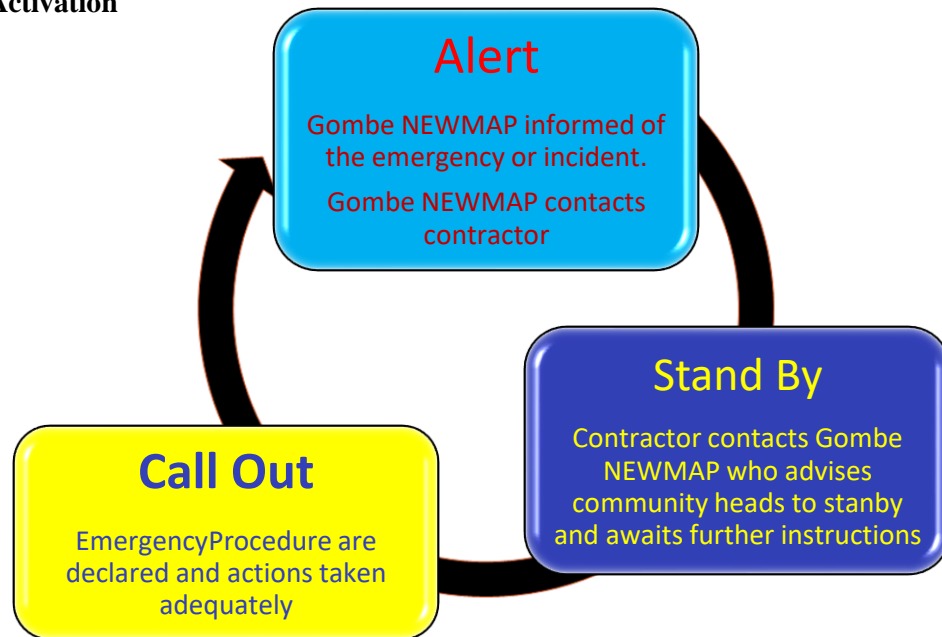


Figure 6. 1: Stages of Emergency and Incidence Management Activation

6.8 Traffic and Vehicle Management Plan

In order to safeguard the lives and properties of the public and contractor staff, a traffic and vehicle management plan is designed to mitigate the effect of the increased traffic as a result of increase in vehicular movement.

The plan ensures that:

- i. The training of vehicular and equipment operators on highway codes and traffic rules is made mandatory.
- ii. Vehicular and equipment routes are pre-defined and followed strictly.
- iii. Since construction activities are very likely to impede traffic flow, a diversion should be constructed. Where necessary a single lane traffic should be created to serve users before completion of works.
- iv. A traffic warden should be stationed to control traffic at the entry and exit points of the site.
- v. When used, traffic signs must conform to national and international standard.
- vi. Traffic signs should be placed on or about critical points along the project site.
- vii. Barricades and other movable barriers should be placed or erected for safety of pedestrians, vehicles and workers where necessary.
- viii. Longitudinal barriers fitted with night visibility enhancing markings should be used to warn traffic of potential dangers.
- ix. Traffic signs indicating speed limits should be placed after consultation with the Federal Road Safety Commission.
- x. Drivers or operators of construction vehicles should possess valid Nigerian driver's license.
- xi. Drivers should have their schedule designed in a manner that eliminate fatigue and unnecessary speeding.

The contractor and the SPMU safeguard team shall review the Traffic Management Plan (TMP) with the appropriate authorities (FRSC, VIO etc) before implementation.

6.8.1 Incident Report sheet.

This shall be maintained at the site. Although the effect of traffic on public projects outside the site are often beyond the control of contractors, efforts should be made in taking appropriate steps to reduce the effects of traffic that are directly related to the proposed project. These effects could be associated with noise, dust, safety and congestion.

6.8.2 Temporary Approaches, Traffic Control and Public Safety

Where the situation is such that it does not fully interfere with the traffic, methods should be devised to ensure that there is safe and expeditious movement of traffic, motorized and non-motorised through the construction zone and to the safety of the work force performing the operations. In addition, constant surveillance should be provided to ensure obedience to the traffic regulations. The traffic control should include such things as signing, methods and devices for delineation and channelization and others such as maintenance devices, roadway lighting, barricades, reflectorized signs, flag persons, etc, which will be designed in such a manner as to convey a clear meaning. However, for all traffic deviation, construction sign plan and scheduling will be submitted to the engineer for approval.

6.8.3 Traffic Objective

To minimize the adverse effects of traffic, directly generated by construction activities, on the environment, where practicable.

6.8.3.1 Explanation of the Traffic Objective:

The objective is an intention to avoid, remedy or mitigate the adverse effects associated with construction traffic. The performance standards associated with achieving this traffic objective area inclusive in those standards dealing with the specific effects of noise and dust. The traffic objective is an assurance to the community that the effects of traffic within the site and where practicable outside the construction sites will be controlled.

The objective strives to;

- To avoid incidents and accidents while vehicles are being driven to transport personnel, materials, and equipment to and from project sites;
- To raise safety training, education and awareness in collaboration with the Federal Road Safety Commission to each driver and operator, so as to ensure compliance with the safe driving provisions and respect for traffic regulations and legislation of the government and on site traffic signs;
- The personnel should be equipped with personal protective equipment and enforce its appropriate usage (high visibility clothing, helmet, gloves, boots, goggles, ear protectors, when and where necessary). The protective clothing shall be checked periodically to guarantee fit for purpose.
- Avoidance of pollution and deterioration of access road.

6.8.3.2 Measure to Implement The Traffic Objective.

1. Construction activities should take place during the day time. This means every operational activities associated with product dispatch will occur at the site during day time hours. These day time operations are a critical component of the construction activities.
2. Vehicle should be regularly maintained and checked to ensure that appropriate noise suppression devices are installed and operating effectively.

3. Customers whose vehicles is noted to be emitting excessive emission due to lack of maintenance will be requested to rectify the problem or warned that they may not be allowed entry into the site/premises if the problem persists.
4. Loader drivers should be trained to ensure that trucks are loaded securely. All trucks leaving the site with loads of materials will be checked for insecure loads. This will also help reduce the risk of material spill on public properties or in transit. The truck driver would be made to understand that it is the driver's responsibility to ensure that the load they carry are properly secured before driving away.
5. Where applicable, a wheel wash should be installed to spray truck wheels as they leave the site, this will reduce the risk of dust being carried around or dirty the road with mud.

6.8.4 Communication

Communication is an integral part of any traffic and transport management plan, as such, the project office should be constantly briefed on the status of any trip. Doing so would keep the management informed on the event of any eventuality.

6.8.5 Consignation

The project site should ensure trucks coming into the facility are well parked to avoid project traffic. Also, trucks with chippings leaving the facility should be mandated to be covered so as to avoid stones flying about along the road.

6.8.6 Journey management plan

Pre-checks for vehicles, this should be done for all vehicles especially those conveying personnel and equipment. These checks should be performed by the HSE coordinator and vehicle maintenance officer to ensure the worthiness and fit for purpose of all vehicles.

6.8.6.1 Journey plan

During movement of project site vehicles / trucks, the responsible driver shall produce a journey management plan for approval by the HSE coordinator. The plan shall include the following details; mobilization date and route, cargo description and details of the job hazard analysis conducted for the trip. The HSE coordinator may approve the trip if satisfied that all necessary precautions have been taken to forestall transport accidents/incidents.

As a minimum, movement of heavy equipment should as much as possible be limited to night hours in order to reduce traffic on projects, while speed limits shall be complied with. In addition all high way codes should be strictly complied with at all times.

6.9 Recommended Measures for Chance Find/Cultural Heritage Management

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

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

The following procedures are to be executed in the event that archaeological materials are discovered:

- i. All construction activity in the vicinity of the find/feature/site will cease immediately.
- ii. Discovered find/ feature/ site should be delineated.
- iii. Record the find location and all remains are to be left in place.

- iv. Secure the area to prevent any damage or loss of removable objects.
- v. The on-site archaeologist will assess, record and photograph the find/feature/ site.
- vi. The on-site archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.
- vii. In consultation with the statutory authorities the on-site and Project Archaeologist will determine the appropriate course of action to take.

6.10 Gombe State University (GSU) Sustainable Flood Control Management

The ESMP seeks to recommend certain planning and management measures which can be employed to mitigate flooding.

Governments should continuously monitor on annual basis of flood areas through:

- i. Satellite mapping of the potential floodplain in order to enable the identification of long term historical record of flood prone areas for prediction and development planning purposes.
- ii. Gombe State Government through the relevant Ministries should ensure an up-to-date large scale topographical maps in analog and digital form.
- iii. Governments should establish appropriate number of rainfall stations within each hydrological basin in order to enable the quantification of, not only the effective rainfall intensity and duration within the drainage area, but also the spatial and temporal distribution within the catchment area.
- iv. Development of extensive public awareness programmes by the Gombe State Ministry of Information to educate the public about flood hazards measures such as:
 - Maintain proper disposal of solid waste and avoid erecting structures on drainages.
 - Avoid known flood plains or green wedges for housing projects.
 - Establishment of restrictive development regulations to ensure that any development meets stipulated standards that take flood hazards into consideration.
 - Timely evacuation of materials scooped from the drains will help instead of allowing the refuse stay unattended to which results in pushing back into the drains when it rains.

6.11 Grievance Redress Mechanism

In case disputes arise between the RAP implementation committee and project affected persons, the preferred way of settlement is through amicable means to save time and resources as opposed to taking the matter to court.

To ensure that the PAP have avenues for redressing grievances related to any aspect of land acquisition and resettlement, procedure for the redress of grievances should be established for the project. The objective is to respond to the complaints of the PAP speedily and in a transparent manner. The mechanism is designed to be easily accessible, transparent and fair.

As far as possible, the objective will be to avoid the need to resort to complicated formal channels to redress grievances. It is considered that by resolving grievances within the projects administrative structures, not only will the process be more effective and efficient but also the progress of the project implementation is less likely to be affected. The four GRM resolution stages recommended by the GSU ESMP Report includes;

- i. Grievance resolution by the Traditional ruler/District head or Director of Works for GSU

- ii. Grievance resolution by the Grievance redress committee set up by the GOMBE SPMU
- iii. Grievance resolution by The Project Management Unit – Grievance Redress Committee (PMU-GRC)
- iv. Grievance resolution by Gombe NEWMAP Steering and Technical Committee

6.11.1 Establishment of a RAP Implementation/ Resettlement Committee

The NEWMAP SPMU shall establish an implementation/ resettlement committee to coordinate and facilitate the RAP implementation. The function of this committee shall include:

- To hold meetings with PAPs, site committee and community associations on the processes for carrying out resettlement and compensation;
- Engage with stakeholders and ensure successful land acquisition, residential construction and assistances required for livelihood restoration of PAPs according to the entitlement listed in the RAP report;
- Provide assistances required for livelihood restoration of PAPs according to the entitlement listed in the RAP report;
- Implement, monitor and review the progress of the implementation of the RAP and
- Carry out the post implementation audit and reporting.

The composition of this committee shall include:

- Representative of PAPs
- Representative of the Site Committee
- Representative of the Community Association
- Representative of the Ministry of Environment
- Representative of Focal NGO
- Social and Livelihood Officer from the PMU
- Project Accountant from the PMU

The Committee shall be headed by the representative from the Ministry of Environment while the Social and Livelihood Officer shall be the secretary of the resettlement committee.

6.11.2 Establishment of a Grievance Redress Committee (GRC)

The NEWMAP SPMU shall establish a Grievance Redress Committee (GRC) overseen by NEWMAP to address complaints from RAP implementation. The committee will be coordinated by NEWMAP Focal NGO to be appointed/ engaged by NEWMAP. The GRC shall be made up of the following parties;

- 1 Representative from each of the Community Associations
- 1 Representative from the Community head of the Area
- 1 Representative of the Local Government Area
- 1 Representative of the Ministry of Lands and Survey
- 1 Representative of PAPs
- Social and Livelihood Officer from the PMU as the Secretary
- 1 Representative of Focal NGO as coordinator

This committee shall be the place of first recourse for anyone who has a grievance matter related to the site. The timeline for addressing/ resolving the issues raised by a complainant by the GRC shall be at most 10 days from the last day allowable for grievance and complaints submission following the end of RAP disclosure.

6.11.3 The Project Management Unit – Grievance Redress Committee (PMU-GRC):

Where the Grievance Redress Committee is unable to resolve the matter at this level, the Complainant may seek redress from the Project Management Unit- Grievance Redress Committee (PMU- GRC). This

Committee shall be coordinated by the Project Coordinator of the PMU and made up of the following parties:

- 1 Representative from the department of Flood and Erosion Control in the Ministry of Environment
- 1 Representative from the Ministry of Land and Survey
- 1 Representative of the Project Affected Persons (PAPs)
- 1 Representative from the Focal NGO
- Social and Livelihood Officer in the SPMU
- Project Accountant in the SPMU
- Project Coordinator of the SPMU as the Chairman

This Committee shall be the place of second place of recourse for anyone who has a grievance matter related to the site. The timeline for the addressing/ resolution of the issues raised by a complainant by this PMU-GRC shall be at most 10 days from the last day allowable for grievance and complainant submission following the inability of the GRC to resolve the matter.

6.11.4 NEWMAP Steering and Technical Committee:

Where the PMU-GRC is unable to resolve the matter at this level, the complainant may seek redress from the NEWMAP Steering and Technical Committee. This Committee will be coordinated by the Chairman of the Steering Committee, who is the honourable Commissioner of the Ministry of Environment. The timeline for addressing /resolution of the issues raised by the complainant by this NEWMAP Steering and Technical Committee shall be at most 10days from the last day allowable for the grievance and complaints submission following the inability of the PMU-GRC to resolve the matter. For the purposes of addressing the grievances, the following parties shall be part of this committee to give guidance and support to the Committee:

- The Federal Social Livelihoods Specialist
- Representative of the Umbrella NGO
- Social and Livelihood Officer of the SPMU
- Social and Livelihood Officer from 1 neighbouring NEWMAP states who have experience in handling grievance matters
- Project Coordinator of the SPMU as the secretary
- Chairman of the Steering Committee or his/ her Representative as the chairman

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

6.12 Community Security, Health and Safety Management

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

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

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

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

6.12.1 Trainings and Capacity Development

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

Table 6 5: List of important HSE training by contractors before and during construction phase

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

Table 6 6: Capacity Building Training Program Proposed for the GSU Gully Erosion Intervention

S/N	Training Module	Course Content	Participants	Duration
1	Sensitization and Induction	<p>Basic Environmental Awareness Training:</p> <p>(a) Definition of key terms like Environment, Environmental Management, Protection and Conservation; Environmental Awareness; Environmental and Social Management Plan; NEWMAP Gully Erosion Site Remediation; Integrated Watershed Management; etc.</p> <p>(b) The Potential Impacts and hazards of the interaction of gully erosion site rehabilitation project activities with bio-physical and social components of the environment;</p> <p>(c) Need for impact mitigation for protection of the environment and livelihood of the host communities;</p> <p>(d) Training on GSU NEWMAP rehabilitation Environmental and Social Management Plan and its implementation</p> <p>(e) Safety induction course;</p> <p>(f) Emergency and spill response preparedness and drill;</p> <p>(g) Social responsibility during the construction phase and the modalities for community communication, interaction and relations;</p> <p>(h) Basic First Aid Training and In-depth Training for selected personnel;</p> <p>(i) The importance of Personal Protection Equipment (PPE) as a safety measure in occupational safety;</p> <p>(j) The Permit to Work System</p> <p>(k) Environmental and Safety Awareness Training</p>	<ul style="list-style-type: none"> • Gombe state NEWMAP Staff; • The Principal Contractor; • Site Personnel of the Principal Contractor; • Host Community Representatives and the General Public 	3 days
2	Module Two: Training on Environmental and Social Management Plan Implementation	<p>Environmental and Social Impact Assessment Process in Nigeria</p> <p>a) The NEWMAP Project Environmental and Social Impacts</p> <p>b) The Impact Control and Mitigation Measures for the GSU NEWMAP Intervention;</p> <p>c) GSU NEWMAP ESMP;</p> <p>d) GSU ESMP Implementation Approach,</p> <p>e) Environmental Impact Monitoring</p> <p>f) Mitigation Measures Compliance Monitoring</p> <p>g) ESMP Communications and Reporting</p>	<p>GMSPMU Officials;</p> <p>Edo State Ministry of Environment; Officials of relevant line MDAs;</p> <p>Local Government Officers;</p> <p>NGOs and CBOs;</p> <p>Principal Contractor</p> <ul style="list-style-type: none"> • Personnel; 	2 days

S/N	Training Module	Course Content	Participants	Duration
3	Module Three: Training on Construction HSE	a) Primer on Construction Best Management Practices and HSE b) Health and Safety Hazards in Gully Erosion Drainage Infrastructure Construction Works c) Incidence, Causation, Investigation and Reporting d) Excavation Safety e) Construction Site Inspection f) Personal Protective Equipment	GMSPMU, State Ministry of Environment; Officials of relevant line MDAs; Local Government Officers; NGOs and CBOs; Principal Contractor Personnel;	2 day
4	Module Four: Integrated Watershed Management Approach in NEWMAP Intervention	Integrated Watershed Management in Gully Erosion Site Rehabilitation: a) Integrated watershed management concepts b) Watershed Delineation using GIS tools c) Gully erosion drainage infrastructure in NEWMAP intervention, d) Gully Erosion Slope Stabilization and Erosion Control Using Vegetation e) Erosion and Sediment Control - A Field Guide for Construction Site Managers, f) Dispute resolution mechanism □	GMSPMU, State Ministry of Environment; Officials of relevant line MDAs; Local Government Officers; NGOs and CBOs; Principal Contractor Personnel;	3 days

6.13 Stakeholders Engagement Plan

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

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

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

- Reducing conflict between stakeholders, project proponents and PAPs.

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

Envisaged Benefits

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

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

6.13.1 Fundamentals of Stakeholder Engagement Approach

viii. Consultations

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

Consultations with key stakeholders, including Project Affected People (PAP) and Civil Society Organisations (CSOs) are mandatory in development projects so as to satisfy “best practices”. Consultation methods include public hearings or meetings, focus group discussions, household surveys and interviews, electronic consultations, and advisory/expert groups. In addition, consultations can include informal structures at the local level, such as village councils and women’s groups. Good practice approaches to consultation, including closing the feedback loop, need to be applied more systematically.

ix. Collaboration

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

x. Collecting, Recording, and Reporting on Inputs from Stakeholder

Stakeholder feedback can be collected periodically on various dimensions of public services provided, such as effectiveness, inclusiveness, quality, delivery time, transaction costs, and targeting, as well as on resource utilization or engagement processes. Tools include satisfaction

surveys, focus group discussions, hotlines, community scorecards, stakeholder report cards, or SMS/online feedback.

6.14 Labour Influx and Gender Based Violence (GBV)

6.14.1 Labour Influx

The project may face an influx of non-local labor and working conditions issues as skilled laborers might not be available in some of the project sites. The project will take concrete measures to mitigate potential labor influx-related risks such as workers' sexual relations with minors and resulting pregnancies, presence of sex workers in the community, the spread of HIV/AIDS, sexual harassment of female employees, child labor and abuse, increased dropout rates from school, inadequate resettlement practices, and fear of retaliation, failure to ensure community participation, poor labor practice, and lack of road safety. These risks require careful consideration to improve social and environmental sustainability, resilience and social cohesion. Therefore, the project will include mitigation measures such as:

- a) assessing living conditions of workers' camps and ensuring appropriate living conditions;
- b) establishing and enforcing a mandatory Code of Conduct for the company, managers and workers, and an Action Plan for implementation;
- c) ensuring appropriate location for these camps;
- d) taking countermeasures - indicated in the Social Management Plan - to reduce the impact of the labor influx on the public services; and,
- e) devising and implementing a strategy for maximizing employment opportunities for local population, including women.

The following guidelines lay out the principles that are key to properly assessing and managing the risks of adverse impacts on project area communities that may result from temporary NEWMAP induced labor influx.

- The Contractor will have to hire, to the maximum extent, skilled and unskilled workers from affected communities in the project area. The SPMU will adopt or implement all possible measures to avoid if not minimize labor influx into the project area.
- The SPMU will assess and manage labor influx risk based on appropriate instruments such as those based on risks identified in the ESIA and the Bank's sector-specific experience in the country.
- Depending on the risk factors and their level, appropriate mitigation instruments need to be developed including the ESMP, Site-specific Labor Influx Management Plan and/or a Workers' Camp Management Plan².
- Risk factors to the SPMU that should be considered, include,
 - weak institutional capacity of the implementing agency;
 - predominant presence of contractors without strong worker management and health and safety policies;
 - anticipated high volumes of labor influx;
 - pre-existing social conflicts or tensions;

²A Labor Influx Management Plan addresses specific activities that will be undertaken to minimize the impact on the local community, including elements such as worker codes of conduct, training programs on HIV/AIDS, etc. A Workers' Camp Management Plan addresses specific aspects of the establishment and operation of workers' camps.

- weak local law enforcement;
 - prevalence of gender-based violence and social norms towards it in the community (acceptance of gender based violence);
 - prevalence of transactional sex;
 - local prevalence of child and forced labor;
 - existing conflict situation between communities;
 - absorption capacity of workers to the community
- The SPMU will be required to incorporate social and environmental mitigation measures into the civil works contract and responsibilities for managing these adverse impacts. This will be a binding contractual obligation on the SPMU, with appropriate mechanisms for addressing non-compliance.

The Supervision Consultant shall be responsible for monitoring the contractor performance and adherence to the labor influx guideline and that of its Sexual Exploitation and Abuse (SEA) obligations, with a protocol in place for immediate, timely, mandatory and confidential reporting in case of incidents to project community.

This allows the SPMU to enforce the implementation of such mitigation measures, which are required to ensure the consultant's own compliance with Bank policy requirements. While the Bank reviews and clears project-level safeguard instruments such as the ESIA/ESMP, it is the SPMU's responsibility to: (i) ensure the safeguard instruments are reflected in the contractor's ESMP (CESMP), and (ii) ensure the project is implemented in accordance with the CESMP, safeguard instruments and other relevant contractual provisions.

6.14.2 Gender Based Violence

Nigeria has ratified or acceded to the core international human rights treaties and is a party to the major regional human rights instrument which obliged States to respect, protect and fulfill human rights of all persons within the territory and subject to the jurisdiction of the State, without discrimination. Rape may violate several human rights obligations enshrined in the instruments ratified by Nigeria and is also a form of gender-based violence and a brutal manifestation of violence against women. As a State party to the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) and the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (the "Maputo Protocol"), Nigeria has made legally binding commitments to exercise due diligence to combat gender-based violence and discrimination.

Accordingly, Nigeria has an obligation to take all appropriate measures to prevent rape, ensure that there are adequate sanctions for rape in law and in practice, and ensure access to reparation for the victims.³ Furthermore, several human rights instruments⁴ require Nigeria to take special measures to protect the rights of individuals who are vulnerable to sexual violence, namely women, children, and persons with disabilities.

The United Nations Special Rapporteur on violence against women has provided guidance on States' due diligence obligations in combating sexual violence, noting that it must be implemented at both individual and systemic levels. Individual due diligence focuses on the needs of individual survivors and

³ CEDAW art. 2(c), for example, provides that States must "establish legal protection of the rights of women on an equal basis with men and ensure through competent national tribunals and other public institutions the effective protection of women against any act of discrimination." The Maputo Protocol, art. 4, paras. 2(a) and (e), explicitly provides that laws prohibiting violence against women must be enforced and perpetrators held accountable; See also CEDAW general recommendation N.19 (n).

⁴ CRC, CEDAW, CRPD, ACRWC, and the Maputo Protocol.

“places an obligation on the State to assist victims in rebuilding their lives and moving forward,” for instance through the provision of psychosocial services. Individual due diligence “requires States to punish not just the perpetrators, but also those who fail in their duty to respond to the violation.”⁵ As for systemic due diligence, it includes ensuring “a holistic and sustained model of prevention, protection, punishment and reparations for acts of violence against women.

International Treaties

- The International Covenant on Civil and Political Rights (ICCPR) (2004)
- The International Covenant on Economic, Social and Cultural Rights (ICESCR) (2004)
- The Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (CAT) (1993)
- The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) (1984)
- The Convention on the Rights of the Child (CRC) (1990), and the Convention on the Rights of Persons with Disabilities (CRPD) (2012)
- International Convention on the Elimination of All Forms of Racial Discrimination (1976)

Regional Treaties

- The African Charter on Human and Peoples’ Rights (ACHPR) (1982)
- The African Charter on the Rights and Welfare of the Child (ACRWC) (2007)
- The Protocol to the ACHPR on the Rights of Women in Africa (the “Maputo Protocol”) (2007)

National policies

- The National Action Plan for the Implementation of United Nations Security Council Resolution 1325 (2009);
- The National Gender Policy (2010)

Nigeria is among the 10 percent of countries worldwide that exhibit the highest levels of gender discrimination according to the OECD’s Social Institutions and Gender Index (see figure 6.2), with an assessment of “high” or “very high” in all of the evaluated categories (discriminatory family code, restricted physical integrity, son bias, restricted resources and assets, restricted civil liberties). It also falls into the group of countries with highest gender inequality in human development outcomes (UNDP 2016).

Gender-Based Violence (GBV) remains pervasive and underreported in the country, largely constraining women’s autonomy and life chances. The 2013 Demographic Health Survey (DHS) indicates that nationally 38 percent of women between the ages of 15-49 have experienced some form of physical or sexual violence from the age of 15, and 11 percent experienced physical violence within the 12 months prior to the survey. 45 percent of women who experienced violence never sought help or never told anyone about the violence. Besides interpersonal and sexual violence, child marriage and Female Genital Mutilation are the other culturally harmful practices prevalent across Nigeria. Conflict in the North East has further contributed to a steep rise in targeted violence against women and children by Boko Haram increasingly for abduction and violence. Women are increasingly being used as instruments of war, making them vulnerable to stigmatization and rejection from their families and communities.

⁵ Report of the Special Rapporteur on violence against women, its causes and consequences, para. 70, UN Doc. A/HRC/23/49 (14 May 2013).

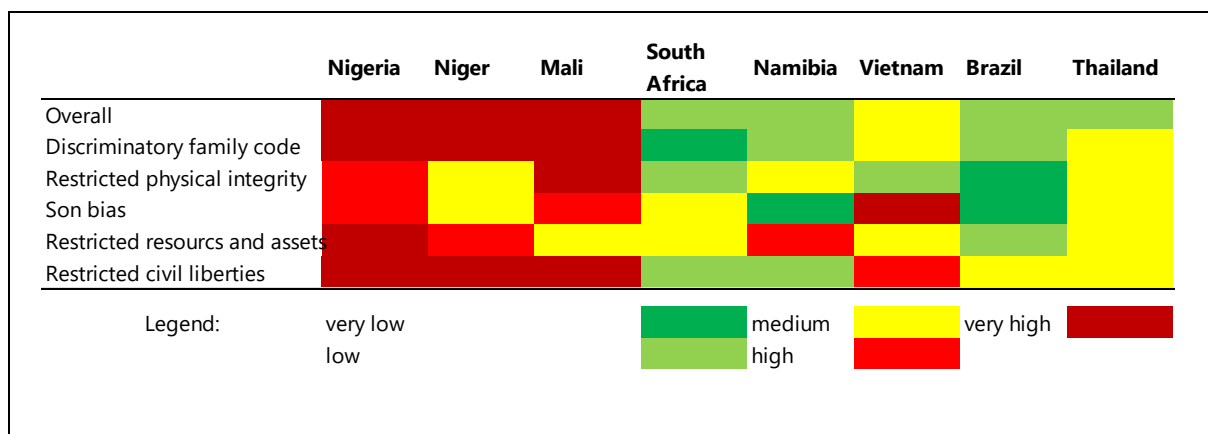


Figure 6.2: Nigeria Degree of Gender Inequality according to the Social Institutions and Gender Index

6.14.3 GBV Risk Management Mechanisms

A GBV workshop was conducted to sensitize the SPMU staff on the key principle and specific requirements to address GBV/SEA have been included in the bidding documents ('pre-qualification' and 'employers' requirements'). As such specific measures to reduce and mitigate the risk of GBV/SEA in the project. Such measures will include:

- i) GBV/SEA assessment of project;
- ii) mandatory contractors' code of conduct on sexual harassment;
- iii) appointment of NGO to monitor GBV/SEA in NEWMAP-AF;
- iv) community and workers' sensitization on GBV/SEA;
- v) provision of referral units for survivors of GBV/SEA;
- vi) provisions in contracts for dedicated payments to contractors for GBV/SEA prevention activities against evidence of completion;
- vii) contractor and SPMU requirement to ensure a minimum target of female employment with incremental rewards of the obtainment of this target.

The following actions are recommended for immediate implementation:

- Hiring a dedicated GBV/SEA specialist or retraining SLOs for the project,
- Including in the focal NGO's ToR services for managing social risks associated with GBV/SEA in the project,
- Building and improving FPMU/SPMUs, local communities and other relevant stakeholders' capacities to address risks of GBV/SEA by developing and providing guidance, training, awareness, and dissemination of relevant GBV/SEA materials to communities,
- Developing a clear NEWMAP specific internal "Reporting and Response Protocol" to guide relevant stakeholders in case of GBV/SEA incidents,
- Strengthening operational processes of NEWMAP states project area on GBV/SEA,
- Identifying development partners and cultivating pragmatic partnership on GBV/SEA prevention measures and referral services,
- Developing Codes of Conduct for civil works contractors with prohibitions against GBV/SEA,
- Strengthening consultations and operationalizing GBV/SEA specific grievance redress mechanisms,
- Providing financial support implementation of the GBV/SEA actions described herein, including training and awareness building for various stakeholders,
- Establishing inter-ministerial committee to advance GBV/SEA actions described above.

Overall, GBV risks in the project target areas might include Intimate Partner Violence (IPV), public harassment including harassment, verbal insults, physical abuse, rape, harmful widowhood practices and women and child trafficking. Targeted support to women under the program could likely exacerbate these risks. Development and implementation of specific GBV risk prevention and mitigation strategies, tailored to local contexts, will be critical. Guidelines for situation analysis of GBV and safe reporting guidelines in line with international best practices will be implemented. Further, all risks related to labor influx will have to be mitigated by participation of project beneficiaries/communities, and involvement of project contractors and contractors' workers and consultant employees, in identifying mitigation and implementing measures, including developing mitigation instruments such as "Labor Influx Management Plan" and "Workers Camp Site Management Plan".

6.15 Social Investment Plan

Social investment refers to philanthropy, charitable giving, corporate social responsibility, community programs and social contributions to contribute to society that is not primarily motivated by generating a direct financial return. NEWMAP should employ a 3-phase approach strategy which includes community investment, social investment and philanthropy.

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

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

6.16 Covid-19 Pandemic

Gombe state like other states in the country, is battling to prevent the spread of the COVID-19 virus. Thus the SPMU and the contractor should ensure greater awareness on the spread of the virus, this should be done by working in tandem with the NCDC and the relevant state task force on COVID-19; to develop or promote adoptable methods for preventing the spread of the virus. Intensive campaign and enlightenment is needed to minimize the risk of exposure to the virus. Workers should therefore be provided with the necessary preventive gadgets like face masks, hand sanitizers, surface disinfectants etc free of charge. An appropriate protocol should be established for spotting, tracing, reporting and attending to infected patients in line with approved procedure/protocol to prevent community spreading on site. Discrimination and stigmatization against covid-19 patients should be discouraged

CHAPTER SEVEN –SUMMARY, CONCLUSION AND RECOMMENDATION

7.1 Summary

The Nigeria Erosion and Watershed Management Project (NEWMAP) interventions in participating states provide succor to project affected persons in terms of eliminating the threat of gully erosion and land degradation in affected communities. The project interventions often involve heavy engineering constructions that is capable of causing impact on the social and environmental condition of a place, to prevent this, ESMP studies becomes mandatory before any work can be embarked on. It is also necessary inline with the legal, regulatory, policy and institutional frameworks for safeguarding the environment from the impact of human activities. The ESMP study is in line with the World Bank’s safeguard policy, designed with the principal objective of identifying the potential impact of a project activity and developing mitigation measures that would avert negative impact or environmental risks likely to ensue from the project activity.

The Gombe State NEWMAP commissioned the study for the Gombe State University gully erosion intervention site, to examine and determine the potential site specific social and environmental impacts likely to arise from the project intervention. The impacts were identified, analysed and corresponding mitigation measures are recommended for the contractor and regulatory agencies (specifically the SPMU, the State Ministry of Environmen and other relevant bodies) to use during project implementation. A number of matrixes and risk models are developed to aid monitoring, evaluation and documentation during the implementation and operational phases of the project. Suffice to say that, if the mitigation measures are followed very meticulously, the likeliness of an adverse environemental and social risks would be averted.

Community participation and inclusiveness is very paramount for the sustainability of the project, this includes awareness on gender base violence (GBV) and sexual exploitation and abuse (SEA), and child labour. To address these issues, some trainings, whose modules cover areas of construction safety, disaster management, GBV/SEA, ESMP implementation, onsite and offsite HSE issues etc have been suggested to be carried out during the ESMP implementation. The contractor’s obligation in the ESMP implementation are provided with baseline estimates in their respective budgets; the contractor shall in collaboration with the SPMU ensure the appropriate implementation and satisfactory reporting and documentation to World Bank standard.

The ESMP has provide an effective strategy for implementyng the said intervention at the Gomve State Unioversity and environs. The Report also enumerated action plans to safeguard the environment, social and other biophysical attributes in the area.

7.2 Conclusion

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

- i. Waste management is also a serious issue in the area as residents tend to dump refuse into the drainage system. This should be discouraged and programs designed to enlighten them on the best practices for refuse disposal.
- ii. Improvement of capacity of the Project site committee members is important to ensure that they deliver their duties as expected.
- iii. Also, there should be adequate awareness creation in the area of water harvesting as this will reduce surface run-off especially during the rainy season, thereby preventing flooding and subsequent erosion.

- iv. Residents should be enlightened on the anthropogenic causes of flooding and erosion and ways to prevent them, especially, in alternative ways of doing things.
- v. There is need to enlighten the residents of the community on Sustainable Land Management (SLM) practices that will maintain or improve a balanced soil organic material-nutrient cycle, as well as reduce vulnerability to erosion.
- vi. There is also a need to create more awareness on the anthropogenic causes of soil erosion and flooding with a bid to preventing future occurrence after the rehabilitation/ reconstruction works.
- vii. Ensure the engagement of relevant professionals for effective and efficient solid waste management in Gombe metropolis.

The Environmental and Social Management Plan (ESMP) consists of a set of mitigation, management and monitoring measures to be taken during implementation of the project to avoid, reduce, mitigate, or compensate or offset any adverse social and environmental impacts analyzed. ESMP defines procedures to ensure that the management of environmental and social issues during the different project phases are undertaken in accordance with WB policies and best practice procedures. The Environmental and Social Management Plan (ESMP) presented in this report reflects the implementation procedures and mechanisms for the mitigation measures and monitoring activities of the expected impacts previously discussed and should therefore be adhered strictly by contractors that will be procured and monitored by the Gombe SPMU and other relevant regulatory agencies.

7.3 Recommendations

Furtherance to the foregone, the following safety and environmental considerations are recommended during the implementation phase of the proposed project intervention at the GSU gully erosion site.

1. To avert further damage to properties and life in the project site, inhabitants living along the gully reach should be relocated in accordance with the Resettlement Action Plan. Doing so must ensure that the Project Affected Persons are adequately compensated and their livelihood options guaranteed.
2. The contractor should engage the local youths in both skilled and unskilled labour irrespective of gender. Doing this would engender community support for the project and by extension empower them economically during the construction phase of the project.
3. Encourage local sourcing of goods and services in the community provided such meets the required standard. This would improve economic activities in the area and further create greater support for the project.
4. There would be significant increase in traffic density into and out of the community during the construction stage, for instance along roads leading into and out of the gully site. Thus adequate traffic planning and management must be enforced in order to reduce chances of road traffic accidents. The use of appropriate traffic warning and caution signs, speed control measures should be enforced. The project drivers should be conversant on defensive, safe and cautious driving to avoid accidents; additional or refresher training may be considered.
5. A competent and certified Health, Safety and Environmental (HSE) manager should always be on hand, to ensure the safety of workmen, project's sub-contractors and visitors to the project site at all time. The manager should keep and maintain the log of project's workers on daily basis, keeping record of injury, near-misses, man-hour utilization for the project, maintenance of First Aid Box on site,
6. The project site should be well cordoned off with conspicuous caution tape to warn non-project workers and prevent intruders. This is necessary to reduce work site accidents and related hazards. In addition the project site should be secured with gate and a security personnel to prevent unauthorised persons from gaining entry into the camp site.

7. Preferable construction works should be done only in daylight in order not to disturb the people around through increase in ambient noise and vibration levels. If otherwise, appropriate approval must be sought from the regulatory agencies. If work must be done at night, the area should be well lite, and noise and vibration levels reduced to the minimum. This is very important since the project site is located within built up area.
8. There should be a manual with instructions of the “Does and Doesn’t” places within both the camp site and construction site. This manual should be readily available and readable in English and hausa to all the project workers, sub-contractors and visitors.
9. There should be a Mustering Point and its use should be made known to all the project workers.
10. The contractor and SPMU should work in tenden with both the NCDC and the state governemnt’s task force on COVID-19, to ensure total compliance with all the COVID-19 prevention protocols during implementation of this ESMP and construction activities, until such a time when the pandemic is cleared.

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ANNEX 1: OUTLINE AND SUBSTANCE OF THE ESMP REPORT

The ESMP Report shall be presented in a concise format containing all studies, processes, analyses, tests and recommendations for the proposed intervention site. The report shall focus on the findings, conclusions and any recommended actions, supported by summaries of the data collected and citations for any references used. The ESMP report will include the following topics, organized in a suggested outline that can be adjusted for local needs:

Executive Summary

Chapter 1: Introduction

- NEWMAP Overview
- Environmental and social Safeguards Concerns
- Rationale for the ESMP
- Objectives of the ESMP
- Deliverables
- Map

Chapter 2: Institutional and Legal Framework for Environmental Management

- Discussion of the World Bank safeguard policies triggered by NEWMAP and the proposed activity
- Summary of relevant Local, State and Federal policies, legal, regulatory, and administrative frameworks

Chapter 3: Biophysical Environment

- Description of the area of influence and environmental baseline conditions

Chapter 4: Socio-Economic Characteristics and Consultation with Stakeholders

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

Chapter 5: Assessment of Potential 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/beneficial environmental and social impacts of the proposed project

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

- Discussion of the proposed mitigation measures
- 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
- Costs of implementing the ESMP

Chapter 7: Summary, Recommendations and Conclusion**References****Annexes**

ANNEX 2: TERMS OF REFERENCE FOR THE PREPARATION OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

1.0 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 seven (7) pioneering states of Abia, Anambra, Cross River, Ebonyi, Edo, Enugu, and Imo and additional twelve (12) states of Delta, Gombe, Kano, Kogi, Oyo, Plateau, Sokoto, Niger, Nasarawa, Katsina, Akwa Ibom and Borno have joined the project.

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

The development objective of NEWMAP is **to reduce vulnerability to soil erosion in targeted 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.

Environment and Social Management Framework: In general, the ESMF specifies the procedures to be used for preparing, approving and implementing (i) **Environmental/ Social Assessments** (ESAs, or alternately both an SA or an EA) and/or (ii) **Environmental / Social Management Plans** (ESMPs, or alternately both an EMP and SMP) for individual civil works packages developed for each project. ESMPs are essential elements for Category B projects.

Resettlement Policy Framework (RPF). The RPF applies when land acquisition leads to the temporary or permanent physical displacement of persons, and/or loss of shelter, and /or loss of livelihoods and/or loss, denial or restriction of access to economic resources due to project activities. It sets out the resettlement and compensation principles, organizational arrangements and design criteria to be applied to meet the needs of project-affected people, and specifies the contents of a Resettlement Action Plan (RAP) for each package of investments.

2.0 OBJECTIVE AND SCOPE OF THE CONSULTANCY

The objective of the consulting services is to prepare an environmental and social management plan (ESMP) for the Gombe State University (GSU) gully erosion intervention site in Gombe town.

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

In each intervention site, the consultant will visit the full sub-watershed as delimited in the given gully stabilization design. 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 infrastructures potentially affected during project implementation and operation and select the management strategies needed to ensure that environmental risks are appropriately mitigated.

3.0 DESCRIPTION OF INTERVENTION SITES

3.1 GENERAL PROJECT AREA

Gombe State is one of the 36 states in Nigeria located in the north east geopolitical zone, between latitude 9°32'– 11°18'N and longitude 10°28'– 11°52'E in the Sudan and northern Guinea savanna region of the country. Gombe State shares boundaries with Yobe State to the north, Adamawa and Taraba States to the south, Borno State to the east, and Bauchi State to the west. Gombe state covers an area of 18,768 km², with population of about 2,365,040 (according to the 2006 national census) distributed across the 11 local governments in the state. The state has two very distinct seasons that is controlled by the movement of the Intertropical Convergence Zone (ITCZ), the wet season usually lasts between April to October with an average rainfall of 850mm and the dry season from November to March.

The proposed intervention site starts within the university campus on Latitude 10°18'02.68''N and Longitude 11°10'13.83''E and terminates on Latitude 10°18'14.92''N and Longitude 11°12'00.15''E as in Figure 1. The Gombe State University erosion site is located in Gombe metropolis (the state capital), dissecting through the university to the eastern out-skirt of the metropolis. As a benefiting site, an ESMP is required because of the potentials to trigger WB safeguard policies and environmental and social framework. The gully has two major fingers; one in the university campus and another immediately outside the university campus, the stretch of the main gully is about 3.8km, with maximum width of 15m and depth of 5m.

Because the gully cut across the university campus, it has effectively disconnected the student's hostels from other parts of the university (although the university has constructed a makeshift pedestrian crossing; it is inadequate as it may fall due to the active slope/bank erosion going in the gully channel) and residents outside the university community. Another issue is the security threat at the eastern border of the university, where the perimeter fencing has been breached (destroyed) and has left the place porous and unsecured (see Plate 1).



Plate 1: Eastern perimeter (cutoff) fence of the Gombe state university



Plate 2: Gully channel in Gombe State University (left) termination of the gully project at the inlet (right).

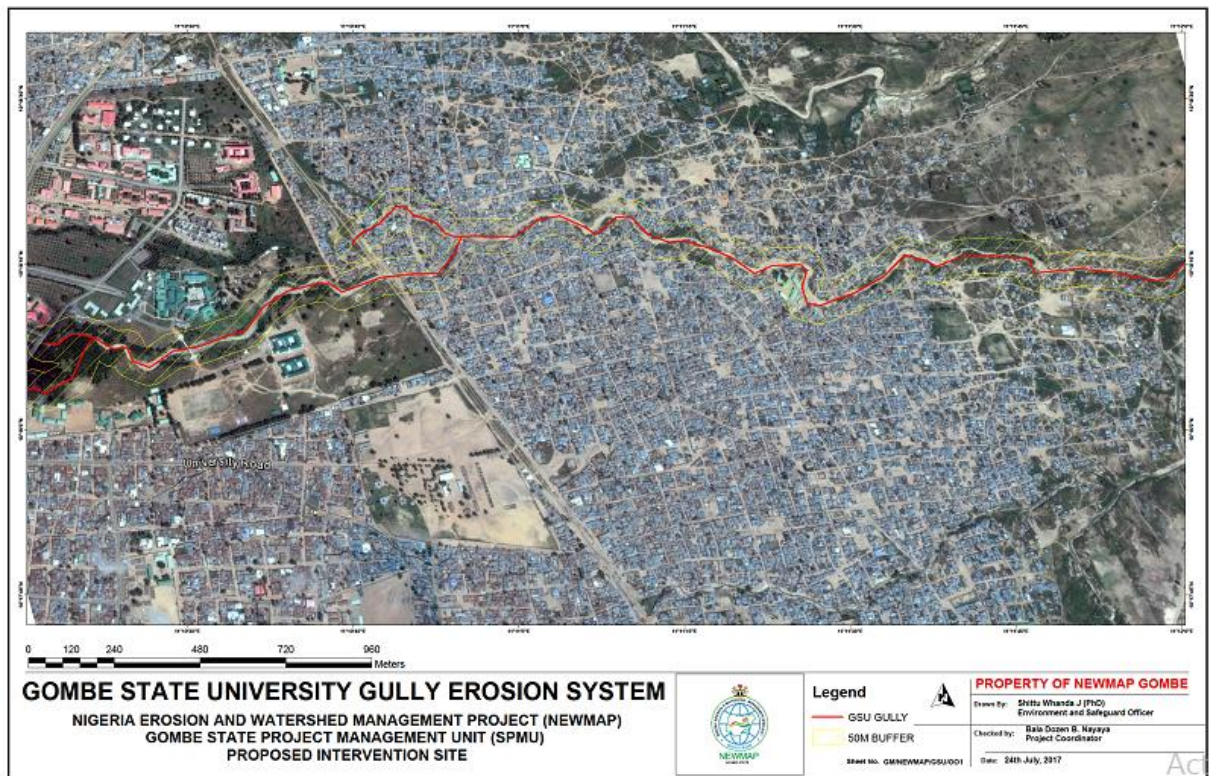


Figure 1: Gombe State University gully erosion site (Source: Google Earth Image)

The geologic formation in this area is of two types; in the university is the Bima (basement complex) sandstone, which is responsible for massive bank erosion and sediment transport due to low resistance to erosion and bank retreat. Outside the university is the Pindiga formation made mostly of limestone and reasonably resistant to erosion (see Plate 3).



Plate 3: Gully channel outside the university campus (pindiga formation)

The width of some channel sections can be as wide as 70 meters or more while the reach is characterized by intermittent meandering with series of sediment build-up along the gully bank.

4.0 MONITORING & EVALUATION (M&E) BASELINE DATA COLLECTION

The Monitoring and Evaluation baseline data collection will be done along the stretch of the Gombe State University Gully Erosion site as marked in the Figure 1.

5.0 ENGINEERING DESIGNS FOR THE INTERVENTION SITE

The preparation of the ESMP requires that an engineering design for the site be available. It is also strongly recommended that high resolution digital imagery be acquired for the proposed intervention site (preferably a UAV-drone captured detailed image). Detailed Engineering Designs for the NEWMAP intervention site will be presented to the Consultant on request.

6.0 TASKS OF THE CONSULTANT

The consultant will be expected to:

- a) Describe the existing status of the sub-watershed and gullies;
- b) Identify the environmental and social issues/risks associated with the existing conditions;
- c) Select and measure appropriate baseline indicators (for example, m³/sec of runoff collected in the sub-watershed during a heavy hour-long rainfall);

- xi. 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;
- xii. Develop a time-bound plan for mitigating environmental and social risks associated with sub-watershed management in consultation with the relevant public and government agencies; Identify feasible and cost-effective measures that may reduce potentially significant adverse environmental and social impacts to acceptable levels;
- xiii. Identify monitoring objectives and specify the type of monitoring, with linkages to the impacts assessed and the mitigation measures described above (in a-e);
- xiv. 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;
- xv. Define technical assistance programs that could strengthen environmental management capability in the agencies responsible for implementation;
- xvi. 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
- xvii. Provide the expected capital and recurrent cost estimates and sources of funds for implementing the ESMP and inform accordingly the design consultants so that these costs are duly taken into consideration in the designs.

6.1 Socio-economic Issues

The following socio-economic issues shall be addressed in the ESMP:

- A summary of the impacted communities for the project: location, access, population (number, demographic and social characteristics); economy (employment rate, income distribution); services (types, capacity, and adequacy) and housing. Concern is the ability to provide work force, service new development and absorb and adjust to growth (worker/family).
- A summary of the views of the population including vulnerable groups, determined through thoroughly documented discussions with local communities. These meetings and discussions must be documented and should show how issues and problems raised are or will be resolved (note that a Resettlement Action Plan (RAP) could be developed for the Site, and this is covered under separate TORs).
- Cultural: Summarize the possible effects of the project on historical/archaeological sites, heritage/artefacts, native religious or harvest sites of the affected communities and identification or development of mechanisms for handling chance findings.

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

6.2 Other Tasks

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

7.0 QUALIFICATIONS

- ✓ The consultant(s) must have expertise and advanced degrees earned in relevant fields including but not limited to: civil/environmental engineering, environmental sciences, or related social sciences.
- ✓ Minimum experience should be eight (8) years with a minimum specific experience of four (4) years on environmental management planning related to infrastructure development or disaster response.
- ✓ The consultant(s) must have experience in design and preparation of an Environmental and Social Management Plan (ESMP) for infrastructure projects. The consultant(s) must have competency and documented experience in social and environmental scientific analysis and development of operational action plans.
- ✓ The consultant(s) must have a working knowledge of World Bank operational safeguards policies and environmental and social framework gained through hands-on experience in the preparation and implementation of environmental and social management plans in an urban area.

8.0 Deliverables and timing

This consultancy assignment is expected to last 12 weeks (three months), and the Consultant is expected to submit to the SPMU the following deliverables:

- **Inception report:** Describing the procedures, methodology and timetable for completion of the ESMP preparation process. This shall be submitted one (1) week after signing of contract. The SPMU shall crosscheck and ensure that the consultant has actually commenced work and that the consultant understands the tasks
- **Draft Report:** A draft ESMP report will be submitted for comments six (6) weeks from the date of signing the contract. It will identify all the areas, the mitigation measures, and the environmental and social issues associated with the site intervention sub-projects, as well as the adequacy of the monitoring and institutional arrangements for the upper and lower watersheds in the intervention site.
- The draft final ESMP Report will take into account all comments and will be submitted to the SPMU 10 weeks after commencement of contract.
- **Final Report:** The Final ESMP report will be submitted to the SPMU twelve (12) weeks after commencement of the consultancy.

8.1 Number of Copies

a) The Consultant who will undertake the assignment shall submit five copies of draft reports for each of the above mentioned deliverables.

b) For the purpose of enhancing timely and expedient completion of the services, the client shall endeavour to respond to the consultant's draft reports within one (1) week of their submission.

c) Within two (2) weeks of receipt of comments on the draft reports the consultant shall deliver five (5) bound hard copies to the SPMU, shall also transmit same electronically via e-mail or through a suitable file-sharing service, and shall submit same on CD-ROM (2 copies).

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

9.0 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/ Environmental and Social Standards
- Intervention design

10.0 Payment Schedule

10% of contract sum after signing if contract

20% of Contract sum on submission of Inception Report

30% of Contract sum on submission of draft report

30% of Contract sum on submission of final Draft Report

10% of Contract sum on submission and Acceptance of Final Report

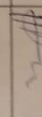
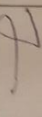
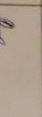
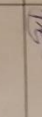
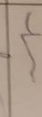
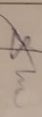
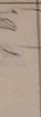
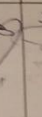

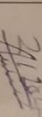
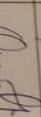
ANNEX 3: ATTENDANCE SHEET FOR THE STAKEHOLDERS CONSULTATION MEETING

MALIB

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT - NEWMAP
STATE PROJECT MANAGEMENT UNIT (SPMU)

COMMUNITY CONSULTATION/STAKEHOLDERS MEETING ON ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR COMBE STATE UNIVERSITY GULLY SITE, HELD ON 28TH JANUARY 2020 AT CSU.

Attendance Sheet:

S/No	NAME	DESIGNATION	COMMUNITY/ORG	PHONE NO	SIGN
1	Muhammed Adedade		Mumu OPPS Forum	08057121071	
2	Dominic Akoluchin		Mumu OPPS Forum	08063815282	
3	Idris Yusuf		Mumu OPPS Forum	08136067928	
4	Yakubu Muhammed		...	08137955518	
5	Usman M. Ahmed		M. Mum Forum	08063332492	
6	Ahmed Sakin Sadiq		Kagaron	08082803568	
7	BAPPAT MHL BOS		Malam Inna	07082490870	
8	Abubakar Usman		Malam Inna	08034791622	
9	ABDULLAH YAHAYA		Malam Inna	07065800435	
10	Usman Muhammad Zico		Kambai Intercession	07069677535	
11	MOTER K. Grace	Security C.S.U.	G S U	07064148550	

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT - NEWMAP
STATE PROJECT MANAGEMENT UNIT (SPMU)

FE MALES

COMMUNITY CONSULTATION/STAKEHOLDERS MEETING ON ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR
GOMBE STATE UNIVERSITY GULLY SITE, HELD ON 28TH JANUARY 2020 AT GSU.

Attendance Sheet:

S/No	NAME	DESIGNATION	COMMUNITY/ORG	PHONE NO	SIGN
1	Rifatatu Bako	Salomon leader	Saban Pagi mallam Inna	09063700072	
2	Salamatu Tijun	Salqa. Member	Saban Pagi mallam Inna	09066627488	
3	Arshiq Mai'ayun Amadi	adu, ser Member	Saban Pagi mallam Inna	08105529635	
4	Faizah Usman	Staff GSU	GSU	08035797299	
5	Muhammud Abdalahi	Member	kagaraawal	08060793814	
6	Hegara Jonathan	Treasurer	kagaraawal	081694405106	
7	Ruth Amed	Member	kagaraawal		
8	HAFSAH ISMAILI	Member	kagaraawal	08104834628	
9	Alyu Giber Tusa	Member	kagaraawal	070674812055	
10	Amira Atubakar	Member	kagaraawal	09039099957	
11	Zina K Gusa	Member	kagaraawal	07017429521	

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT - NEWMAP
STATE PROJECT MANAGEMENT UNIT (SPMU)

ATLAS

COMMUNITY CONSULTATION/STAKEHOLDERS MEETING ON ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR
COMBE STATE UNIVERSITY GULLY SITE, HELD ON 28TH JANUARY 2020 AT GSU.

Attendance Sheet:

S/No	NAME	DESIGNATION	COMMUNITY/ORG	PHONE NO	SIGN
1	Aliyu Umar		Newmap	07036048836	
2	Abubakar Bulama	SECRETARY KAGANAWA	Lefferranac Comms	08185724046	Ans.
3	HUSSAIN ABULLATH SUGAMBU	MP	NEWMAP	08124375547	
4	KARIRU ADIBU	MP	11	08038294589	
5	Usman A. ALKARI	ADMIN OFFICER	Newmap Comms	08027913761	
6	Karimu Muthamad	MEMBER	11	09032105958	
7					
8					
9					
10					
11					

FEMALES

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT - NEWMAP
STATE PROJECT MANAGEMENT UNIT (SPMU)

COMMUNITY CONSULTATION/STAKEHOLDERS MEETING ON ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR
COMBE STATE UNIVERSITY GULLY SITE, HELD ON 28TH JANUARY 2020 AT GSU.

Attendance Sheet:

S/No	NAME	DESIGNATION	COMMUNITY/ORG	PHONE NO	SIGN
1	Amma Hussami Chior	NEWMAP	NEWMAP	08162606935	
2	Calochs Joseph Kasari	NEWMAP I-T	NEWMAP	08163351959	
3	Adejo HOPE Ometi	NEWMAP CORPER	NEWMAP	081143311310	
4	Patience Made Thompson	NEWMAP I-T Student	NEWMAP	08186890886	
5	Ummat sakina Sakki ALI	NEWMAP I-T Student	NEWMAP	08169823991	
6	AlimPHYS NITTE BEN	NEWMAP I-T S	NEWMAP	07036364331	
7	Deborah Kings TSS	women leader	Kagawad	08164434665	
8					
9					
10					
11					

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT - NEWMAP
STATE PROJECT MANAGEMENT UNIT (SPMU)

Emmanuel

COMMUNITY CONSULTATION/STAKEHOLDERS MEETING ON ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR
GOMBE STATE UNIVERSITY GULLY SITE, HELD ON 28TH JANUARY 2020 AT GSU.

Attendance Sheet:

S/No	NAME	DESIGNATION	COMMUNITY/ORG	PHONE NO	SIGN
1	Atshatu Hejara Haruna	Women leader	Mallam Inn	081682510	
2	Reuel Ishaku	Member	Mallam Inn	07085332610	
3	Zalika Jibrin	Youth leader	Mallam Inn	08431004467	
4	Atshatu Ibrahim	Member	Mallam Inn	08143769931	
5	Maita Bulus	Women leader	Mallam Inn	08064915367	
6	Dorcas Abdullo	Member	Mallam Inn	07068428940	
7	Fatma Muhammad	Organising Seci.	Saban Pagi Mallam Inn	08061278387	
8	Ashatu Abulalali	Member	Saban Pagi Mallam Inn	08161672796	
9	Sadiya Sulaiman	Member	Saban Pagi Mallam Inn	08050573042	
10	Fatma Daudu	Fin. Secretary	Saban Pagi Mallam Inn	07065489447	
11	Limnu Isma'ili	P.R.O	Saban Pagi Mallam Inn	08063882215	

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT - NEWMAP
STATE PROJECT MANAGEMENT UNIT (SPMU)

MALES

COMMUNITY CONSULTATION/STAKEHOLDERS MEETING ON ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FOR
GOMBE STATE UNIVERSITY GULLY SITE, HELD ON 28TH JANUARY 2020 AT GSU.

Attendance Sheet:

S/No	NAME	DESIGNATION	COMMUNITY/ORG	PHONE NO	SIGN
1	MURITA SALSU	DIRECTOR WORKS	GOMBE STATE UNIV	08063906728	
2	MASIR BAPPA	ARCHITECT I	Gombe State University	070849245626	
3	Eng. Abdulrazek Kawa Malala	Senior Civil Engineer		08035335851	
4	KENUTTA ANTA	MATHE. OFFICER	<input checked="" type="checkbox"/>	080822334666	
5	SHURBU USMAN	E. O. OFFICER (MGR)	MAJAM INDIRA	07035957261	
6	HASSAN MOHAMMED	BANQUER PRIVATE	MAJAM INDIRA	09039812501	
7	ABDULLATI AHMED	Members	MAJAM INDIRA	07066651158	
8	YUSUF YAKUBU	Member	Kudungwa	07071055704	
9	SAMUEL MUBENARD	Member	Kudungwa	08165777465	
10	Abdullahi Abdullahi	Member	Kudungwa	0813282-3444	
11	Abdulkadir Yakubu	Member	Kudungwa	07038266768	

ANNEX 4: SUMMARY OF THE GENERAL CONSULTATION MEETINGS WITH ALL STAKEHOLDERS

Date	28 TH January 2020
Time	10:30am
Venue	Gombe State University Multipurpose Hall , Gombe State Nigeria
Opening Prayers	Mal. Mohammed Adamu Goni and Madam Rifkatu Bako
Introduction	<p>Introduction and welcome remarks was done by the chairman of the occasion Dr. Shittu Whanda J. (ESO) who represented the Project Coordinator, Engr. Mohammed Garba. He said, the meeting was convened as part of requirements for Environmental and Social Management Plan (ESMP) in order to address issues surrounding implementation of civil work at the intervention sites. It will address PAP's concerns based on religious, socio-economic and cultural perspectives. He further extended his gratitude to the traditional rulers, leaders of thought, the youths and the women for making themselves available for the consultation process. He also thanked them for welcoming the enumerators during the enumeration exercise within the project area.</p> <p>He explained the need to have a balanced gender representation in every World Bank project, stressing the importance of carrying the women along in decision making as it regards to the ESMP. He described the women as the binding force in the family and anything that concerns them, concern the whole family and promised to incorporate all their concerns in the ESMP.</p>
ESMP presentation	<p>Presentation: The Consultant, Mr. Edebeatu Cheta told the participants that the essence of the meeting was to:</p> <ul style="list-style-type: none"> a. Interact with the PAPs and seek their opinion on the civil work activities. b. Ensure that the sustainability of the project by incorporating the opinions and inputs of the stakeholders to ensure project ownership c. Educate the stakeholders on their rights and obligations regarding the project d. Ask for the guidance and assistance of the traditional leaders for peaceful and smooth project implementation <p>The Consultant also talked briefly on the following subjects</p>

- a. **Compensation:** It is the PAP's right to be compensated where their asset will be affected.
- b. **Labour Influx:** He said, the World Bank projects are always open to contractors from all over the world which could lead to influx of laborers into the communities where works will be carried out. So he asked that the community should accommodate them during the project implementation.
- c. **Job Opportunity for the Local:** The civil works present an opportunity for the local people to participate. Thus, communities should demand to be recruited for menial jobs where they have available skills.
- d. **GVB/SEA/Minors:** Communities should report to NEWMAP any noticed case of Gender-Based Violence/Sexual Exploitation and Abuse (GBV/SEA) or use of minors for labour perpetrated by either contractors or labourer.
- e. **Noise Pollution and Dust:** Communities should report where noise either for heavy duty machines or any other source becomes unbearable. They should also voice out where they affected by dust.

Don'ts:

- a. **Ignite Civil Unrest:** The consultant noted that Gombe State has invest a lot in the NEWMAP Project. However, World Bank can stop work as soon as there is civil unrest at the project site. He advised community members to desist from any form of conflict or risk losing the project in their area. Therefore, it is imperative for traditional leaders to be involved to forestall or resolve any conflict in the project benefiting communities.
- b. **Engage in social vices:** community members should guard against all form of social vices like theft of workers or contractors' properties, drug abuse and harassment by miscreants in the community.
- c. **Trade Fake news:** The consultant pointed out that baseless stories or unconfirmed rumour especially on social media has the tendency to misguide or misinform people and possibly bring about conflict. Therefore, community members should always the sources of information or story before taking any action.

COMMENTS, CONCERNS RAISED BY THE STAKEHOLDER AND THE RESPONSES FROM THE CONSULTANT AND ENVIRONMENTAL SAFEGUARD OFFICER			
S/N	NAME	QUESTION/COMMENT	RESPONSE
1.	Haruna Mohammed Bose, Village Head of MalanInna Sabon-Fegi	<ul style="list-style-type: none"> • Will our people be recruited to work with contactors? • What is the chance of a minor that physically looks mature, can he be allowed to work on site? 	<ul style="list-style-type: none"> • ESO: NEWMAP will recommend to contractors to recruit local people to work where they have available labour and the skills • Consultant: The standard of the World Bank is that a minor is child below 18 years of age and should treated so regardless of their physical development.
2.	Alh. Usman A. Bello, Village Head of Kagarawal	<ul style="list-style-type: none"> • Is the need for bridges covered in the civil work? • Where will the civil work end? • When and what will be the recruitment requirements of workers during construction? 	<ul style="list-style-type: none"> • Consultant: The consultant explained that the detailed engineering design has taken into consideration of all the issues and a good work will be done and if there is any need for bridges, that it will be built. • ESO: The civil work will terminate appropriately at the downstream of the gully as indicated in the design. • ESO: Recruitment will start as soon as the civil work commences. All communities will be duly considered.
3.	Usman Magaji and Martha Bulus	<ul style="list-style-type: none"> • Will everybody affected be compensated and are they all captured under RAP? 	<ul style="list-style-type: none"> • ESO: The Gombe NEWMAP will make sure that everybody is carried along during the RAP. He however, told the people that they should bear in mind that only those whose asset fall within the barrier zone will be compensated.

4.	Musa Abubakar	Observation and Advice: The root causes for agitation among people is the expectation for compensation. NEWMAP should therefore deemphasize the issue of compensation and focus more on the benefit of the project for the communities	Good advice and it well noted.
Closing/Vote of thanks:		Alh. Mohammed Bose (Village Head Malan-Inna Sabon Fegj: He commended NEWMAP for carrying the project affected communities along in all the implementation processes. He advised community members to support NEWMAP and make sacrifices for the success of the work. He also advised them against any untoward attitude that would hinder the work.	
CLOSING TIME = 2:30pm			

ANNEX 5: SAMPLE SOCIO-ECONOMIC DATA COLLECTION FORM

IDENTIFICATION

Community: _____ Date _____
 Name of Interviewer _____
 Name of the Respondent: _____
 Phone No _____
 Relationship to Household head _____
 Age ___ Sex ___
 Address: _____
 Nationality _____ Nativity _____
 Length of stay within the community _____



GENERAL INFORMATION

Religious Group: Christians ___ Muslim ___ ATR ___ Others (specify) ___
 Social Group: Vulnerable ___ General ___
 Family Pattern: Joint ___ Nuclear ___ Individual ___
 Size of Family: Small (2-4) ___ Medium (5-7) ___ Large (Above7) ___

FAMILY PARTICULARS (Start from head of the household)

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

Household's Main Occupation _____ and Monthly income (₦) _____ Secondary Source _____ and Monthly Income (₦) _____ No. of Adult earning members: _____ No. of dependents: _____ Family annual expenditure: (₦) _____

COMMERCIAL/SELF EMPLOYMENT ACTIVITIES

Type of Shop/Business Enterprises (SBEs)

Hotel _____ Provision store _____ Repair & Workshop _____ Other Shops (Specify) _____ Other Enterprise (Specify) _____ No. of Partners: _____

Employment Pattern

Owner/Operator _____ Employed 1 to 5 persons _____ Employed above 5 _____

VULNERABILITY

HH becoming BPL as a result of loss of livelihood/asset _____ Female headed household _____

PUBLIC UTILITIES

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

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

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

(i)River _____ (ii)Borehole (commercial) _____ (iii)Borehole (private) _____ (iv)Public pipe-borne water _____ (v)Pond _____ (vi)Water Vendor _____ (vii)Well water _____

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

What is your primary source of electricity?

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

What is your secondary source of electricity?

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

What is the main fuel you use for cooking?

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

HEALTH AND SANITATION

What type of toilet facility do you use?

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

How do you dispose of your household refuse?

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

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

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

PROJECT PERCEPTION

Are you aware of the proposed Erosion Rehabilitation Project? Yes___No___

If Yes, Source of information_____

What is your opinion about the project? Good___ Bad___ Can't say___

If good, what positive impacts do you perceive? _____

If bad, what negative impacts do you perceive? _____

INFORMATION ON AFFECTED PROPERTY

GPS Coordinates: _____

Name of PAP_____

Phone No_____

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

Type of document possessed to certify ownership type _____

If not owned, state name and Address of owner _____

If informal use right, state type of agreement _____

Number of years used _____ Rent paid/month (R) _____

Details of the structure

Type of Use: Residential___ Commercial___ Residential/Commercial___ Other (Specify) ___

Construction Type: Mud___ Brick___ Mud/Thatched roof___ Brick/Zinc roof___

No. of Rooms/Storey___ Impacted Area (m²) _____ Total Impacted Area (m²) _____

Utility Connection: Electricity___ Water___ Phone___ (P-Partially F-Fully)

Other Affected Assets

Compound wall/fence___ Tree___ Farmland___ Borehole/well___ Others (Specify) _____

Replacement Value (R) _____

Assets distance to the wall edge _____

Agricultural Products

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

Average yearly household income from agriculture (R) _____

Trees

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

RESETTLEMENT AND REHABILITATION

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

Within the area ___ Outside the area ___ Place name _____ Distance ___ (km)

Which is your preferred replacement Option?

Land for land lost ___ Cash Assistance ___ House in Resettlement Site ___ Shop in Resettlement Site ___ Other (Specify)

Factors to be considered in providing alternate place

Access to family/friends ___ Income from friends ___ Income from Business activity ___ Daily Job ___ Close to Market ___ Other (Specify) ___