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PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF
SDR 321.4 MILLION
(US$500 MILLION EQUIVALENT)

AND A

PROPOSED GRANT FROM THE
GLOBAL ENVIRONMENT FACILITY TRUST FUND
IN THE AMOUNT OF US$3.96 MILLION

AND A

PROPOSED GRANT FROM THE
SPECIAL CLIMATE CHANGE FUND
IN THE AMOUNT OF US$4.63 MILLION

TO THE

FEDERAL REPUBLIC OF NIGERIA

FOR THE

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT

12 APRIL 2012

Environment and Natural Resources Management Unit (AFTEN)
Sustainable Development Department
Western Africa Country Department-2 (AFCW2)
Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective February 29, 2012)

Currency Unit	=	Nigeria Naira
₦150	=	US$1
US$1.55	=	SDR 1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ARAP	Abbreviated Resettlement Action Plan
AWP	Annual Work Plan
CDD	Community Driven Development
CPS	Country Partnership Strategy
DEA	Department of Environmental Assessment
DEFCZM	Department of Erosion, Flood and Coastal Zone Management
ECN	Energy Commission of Nigeria
EASP	Expert Advisory Services Pool
EIA	Environmental Impact Assessment
ESMF	Environment and Social Management Framework
EOI	Expression of Interest
FAO	Food and Agriculture Organization of the United Nations
FCPF	Forest Carbon Partnership Facility
FGN	Federal Government of Nigeria
FMARD	Federal Ministry of Agriculture and Rural Development
FME	Federal Ministry of the Environment
FMF	Federal Ministry of Finance
FMHUD	Federal Ministry of Housing and Urban Development
FMP	Federal Ministry of Power
FMPR	Federal Ministry of Petroleum Resources
FMST	Federal Ministry of Science and Technology
FMT	Federal Ministry of Transport
FMW	Federal Ministry of Works
FMWR	Federal Ministry of Water Resources
FPC	Federal Project Coordinator
FPFMP	Federal Project Financial Management Division
FPMU	Federal Project Management Unit
FPC	Federal Project Coordinator
FSC	Federal Steering Committee
FTC	Federal Technical Committee
GCM	Global Climatic Model
GEF	Global Environment Facility
GIS	Geographic Information System
GRASS	Gully Rapid Action and Slope Stabilization
IE	Impact evaluation

ISP	Implementation Support Plan
NIWRMC	Nigeria Integrated Water Resources Management Commission
LGA	Local Government Area
LiDAR	Light Detection and Ranging
LULC	Land Use and Land Cover
MDA	Ministries, Departments and Agencies
M&E	Monitoring and Evaluation
MOU	Memorandum of Understanding
MTR	Mid-Term Review
NAPA	National Adaptation Programme of Action
NASRDA	Nigeria Space Research and Development Agency
NEMA	National Emergency Management Agency
NESREA	National Environmental Standards and Regulation Agency
NEWMAP	Nigeria Erosion and Watershed Management Project
NIHSA	Nigeria Hydrological Services Agency
NIMET	Nigeria Meteorological Agency
NPC	National Planning Commission
NWRI	National Water Resources Institute
OAGF	Office of the Accountant General of the Federation
PFMU	Project Financial Management Unit (state level)
PS	Permanent Secretary
RPF	Resettlement Policy Framework
RAP	Resettlement Action Plan
RBDA	River Basin Development Authority
SCCF	Special Climate Change Fund
SCCU	Special Climate Change Unit (of FME)
SEMA	State Emergency Management Agencies
SLM	Sustainable Land Management
SME	State Ministry of Environment
SPMU	State Project Management Unit
SPC	State Project Coordinator
SSC	State Steering Committee
STC	State Technical Committee
TOR	Terms of Reference
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change

Regional Vice President:	Obiageli Katryn Ezekwesili
Country Director:	Marie Francoise Marie-Nelly
Sector Director:	Jamal Saghir
Sector Manager:	Idah Z. Pswarayi-Riddihough
Task Team Leaders:	Amos Abu / Stephen Danyo

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PAD DATA SHEET

Nigeria

Nigeria Erosion and Watershed Management Project

PROJECT APPRAISAL DOCUMENT

Africa

AFTEN

Basic Information

Date:	April 12, 2012	Sectors:	Water, sanitation & flood protection (40%), Forestry (30%), Irrigation and drainage (20%); General Agriculture, Fishing, and Forestry (10%)
Country Director:	Marie Francoise Marie-Nelly	Themes:	Land administration and management (40%), Water resource management (30%), Other environment and natural resources management (20%); Biodiversity (10%), Climate change (10%)
Sector Manager/Director:	Idah Z. Pswarayi-Riddihough / Jamal Saghir	EA Category:	A, Full Assessment
Project ID:	P124905		
Lending Instrument::	SIL		
Team Leader(s):	Amos Abu/Stephen Danyo		

Does the project include any CDD component? Yes

Global Supplemental ID: P126549 Lending Instrument: SIL Focal Area: Special Climate Change Fund, Biodiversity, Land Degradation, Sustainable Forest Management Environmental Assessment: Full Assessment Supplement Fully Blended?: Yes	Team Leader: Amos Abu/Stephen Danyo Sectors: General agriculture, fishing and forestry sector (60%); Forestry (30%); Flood protection (10%) Themes: Biodiversity (40%); Climate change (30%); Other environment and natural resources management (30%)

Joint IFC: n/a

Borrower: Federal Republic of Nigeria

Responsible Agency: Federal Ministry of Environment

Contact:	Mrs. Ibukun Odusote	Title:	Permanent Secretary
Telephone:	+234 9 5233611	Email:	info@environment.gov.ng

Project Implementation Period: 8 years	Start Date: May 8, 2012	End Date: June 30, 2020

Expected Effectiveness Date:	November 6, 2012
Expected Closing Date:	June 30, 2020

Project Financing Data (US$M)

[ ] Loan	[X] Grant	[ ] Other
[X] Credit	[ ] Guarantee	

For Loans/Credits/Others

Total Project Cost:	US$658.59M	Total Bank Financing :	US$508.59M
Total Cofinancing:	US$158.59M	Financing Gap:	0

Financing Source	Amount (US$M)
BORROWER/RECIPIENT	150.00
Beneficiaries	0
IDA: New	500.00
GEF	8.59
Financing Gap	0
Total	658.59

IDA Expected Disbursements (in US$ Million)

Fiscal Year	13	14	15	16	17	18	19	20	
Annual	10	43	88	102	110	70	54	23	
Cumulative	10	53	141	243	353	423	477	500	

GEF Expected Disbursements (in US$ Million)

Fiscal Year	13	14	15	16	17	18			
Annual	0.0	0.3	1.5	3.2	3.0	0.59			
Cumulative	0.0	0.3	1.8	5.0	8.0	8.59			

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Project Development Objective(s)

Project Development Objective: to reduce vulnerability to soil erosion in targeted sub-watersheds.

Components

Component Name	Cost (USD Millions IDA, GEF)
Component 1: Erosion and Watershed Management Infrastructure Investments	405.97
Component 2: Erosion and Watershed Management Institutions and Information Services	39.70
Component 3: Climate Change Response	30.00
Component 4: Project Management	32.92

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ]	No [x]
Does the project require any exceptions from Bank policies?	Yes [ ]	No [x]
Have these been approved by Bank management?	Yes [ ]	No [ ]
Is approval for any policy exception sought from the Board?	Yes [ ]	No [x]
Does the project meet the Regional criteria for readiness for implementation?	Yes [x]	No [ ]

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	x	
Natural Habitats OP/BP 4.04	x	

Forests OP/BP 4.36	x	
Pest Management OP 4.09	x	
Physical Cultural Resources OP/BP 4.11	x	
Indigenous Peoples OP/BP 4.10		x
Involuntary Resettlement OP/BP 4.12	x	
Safety of Dams OP/BP 4.37	x	
Projects on International Waters OP/BP 7.50	x	
Projects in Disputed Areas OP/BP 7.60		x

Legal Covenants

Name	Recurrent	Due Date	Frequency
Effectiveness Conditions Financing Agreement: Sections 4.01 & 4.03	No	Additional conditions of effectiveness, with effectiveness deadline 180 days after signing of the legal agreements	-

Description of Covenant

At least one subsidiary agreement with a participating state executed; provision for cross-effectiveness of IDA Financing Agreement and GEF & SCCF Grant Agreements; adoption of satisfactory Project Implementation Manual; and establishment of a procurement tracking and filing system by the Borrower

Name	Recurrent	Due Date	Frequency
Institutional Arrangements Financing Agreement: Section I.A, Schedule 2	No	Throughout Project implementation	-

Description of Covenant

Provisions requiring the maintenance of relevant Project management structures at federal, state, LGA and community level, i.e. federal and state steering committees and technical committees, project management units within the federal and state ministries of environment, federal and state financial management divisions, local government authorities and site committees

Name	Recurrent	Due Date	Frequency
Subsidiary Agreements Financing Agreement: Section I.C, Schedule 2	No	Throughout Project implementation	-

Description of Covenant

Obligation to execute subsidiary agreements between the Borrower and the participating states, on terms and conditions satisfactory to the Bank

Name	Recurrent	Due Date	Frequency
Computerized Financial Management System Financing Agreement: Section II.B.4, Schedule 2	No	9 months after the effective date, and, for each participating state, 9 months after the respective subsidiary agreement	-

Description of Covenant

Obligation of the Borrower to install - and to cause each participating state to install – a computerized financial management system

Name	Recurrent	Due Date	Frequency
Independent FM Auditor Financing Agreement: Section II.B.5	No	3 months after the effective date	-

Description of Covenant

Appointment of independent auditors for FM

Name	Recurrent	Due Date	Frequency
Procurement Complaints Management System Financing Agreement: Section III.E, Schedule 2	No	3 months after the effective date, and, for each participating state, 3 months after the respective subsidiary agreement	-

Description of Covenant

Establishment of a procurement complaints management system at federal and state levels

Name	Recurrent	Due Date	Frequency
State Procurement Filing and Tracking System Financing Agreement: Section III.E, Schedule 2	No	1 month after the date of the respective subsidiary agreement	-

Description of Covenant

Establishment of a procurement filing and tracking system for each participating state

Name	Recurrent	Due Date	Frequency
Independent Procurement and Technical Auditors Financing Agreement: Section III.F.1	No	18 months after the effective date	-

Description of Covenant

Appointment of independent procurement and technical auditors

Name	Recurrent	Due Date	Frequency
Procurement Audits Financing Agreement: Section III.F, Schedule 2	Yes	Not later than 6 months after conducting the audit	Within 18 months after effectiveness and once every two fiscal years thereafter

Description of Covenant

Procurement and technical audits by independent auditors

Name	Recurrent	Due Date	Frequency
Retroactive Financing Financing Agreement: Section IV.B.1a, Schedule 2	No	-	-

Description of Covenant

No withdrawal shall be made for payments made prior to the date of the Financing Agreement, except that withdrawals up to an aggregate amount not to exceed $ 6,000,000 equivalent may be made for payments made prior to this date but on or after June 1, 2012, for Eligible Expenditures under Categories (1) and (2) of the disbursement table

Name	Recurrent	Due Date	Frequency
Financing to Participating States Financing Agreement: Section IV.B.1b, Schedule 2	No	-	-

Description of Covenant

No withdrawal shall be made under Categories (2) through (5) of the Disbursement Table, for payments to a Participating State, unless and until the respective Participating State has executed its Subsidiary Agreement with the Recipient, and the Association has received an opinion satisfactory to it establishing that the Subsidiary Agreement has been duly authorized or ratified by the Recipient and the respective Participating State and is legally binding upon the Recipient and the Participating State in accordance with its terms.

Team Composition

Bank Staff

Name	Title	Specialization	Unit	UPI
Amos Abu (TTL)	Senior Environmental Specialist	Environmental risk assessment, spatial ecology, policy, safeguards enhancement	AFTEN	342505
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Shobha Shetty	Sector Leader	Agricultural economics	SDN	101065
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Dinesh Aryal	Senior Operations Officer	Natural resources and operations	AFTEN	176411
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Charles Boudry	Legal Associate	Legal and policy aspects	LEGAF	399865
Grant Milne	Senior Natural Resources Specialist	Watershed/catchment management	SASDA	176681
Harshadeep Nagarajao	Senior Environmental Specialist	Water resources, civil/environmental engineering, environment, spatial analysis	AFTEN	64862
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Caroline Sage	Senior Social Development Specialist	Social development	AFTCS	260495
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Marcus Holmlund	Economist	Impact evaluation	DECOS	334821
Vincenzo Di Maro	Economist	Impact evaluation	DECOS	291668
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Daniel Gross	STC, Social Safeguards	Social safeguards	AFTEN	20919
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Louis Bockel	Policy Officer, FAO	Policy and economics of watersheds and climate change	FAO	External
Martin Bwalya	Head, CAADP, NEPAD Agency of the Africa Union	Agriculture and sustainable land management	NEPAD Agency	External

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Locations

Country	First Administrative Division	Location	Planned	Actual	Comments
Nigeria	Southeast Nigeria: Anambra, Imo, Abia, Enugu, Ebonyi states	Sites to phase in when designs are ready for implementation			
	South-south Nigeria: Edo, Cross River states	Sites to phase in when designs are ready for implementation.			
	Four additional states to be selected and agreed with Government	Three Northern states plus one additional state from the southwest to participate using a phased approach when they meet implementation readiness criteria.			
	Federal Capital Territory	Technical assistance for federal activities in targeted river basins (Anambra-Imo, Benin-Owena, and Cross River) and in the Federal Capital Territory.			

I. STRATEGIC CONTEXT

A. Country Context

1. **Environmental security and economic development are intertwined in Nigeria.** The country now has one of the world's fastest growing economies and increasingly seeks to improve management of natural resources to help sustain, drive, and protect the quality of this growth. The non-oil economy grew by an average of 8.8 percent per year in 2007-2010 but is experiencing natural resource over-reach that could undermine this achievement. The cost of on-going environmental degradation (notably renewable natural resources) and associated disasters such as landslides and flooding is estimated at 9% of GDP[1], and is likely to increase under a business-as-usual scenario. Nationwide, cropland degradation accounts for 1.7 to 6.4% of GDP.[2] In some areas of southern Nigeria, land degradation has caused yield reductions of 30 to 90%.[3] Including other forms of land degradation such as urban gully erosion would add significantly to the overall economic cost.[4] Flooding and gully erosion is taking a large toll on the health, environment, economic and social assets of stakeholders, especially the poor in sensitive southern watersheds. Losses, damages and forgone revenues were valued at more than US$100M per year in terms of injuries and premature death, loss of vegetation cover and environmental services, income losses and yield reduction (farm to market mobility disruption), damage to infrastructure (transport, water systems, telecommunications, social infrastructure), as well as private property, social dislocation, and migration.

2. **Population growth, unsustainable land and water management practices, poor land use and physical works planning, governance issues, and climate risks combine in complex ways to drive environmental insecurity.** By 2020 the country's total population will approach 200 million, reaching nearly 300 million around 2050, placing additional strain on the natural resource base and physical infrastructure. Investments in public environmental goods, especially in land and water resources, are below the level needed to ensure a sustainable stream of benefits from natural wealth that help drive or protect growth. Current and future climate risks add to the challenge to secure services and livelihoods from natural wealth such as food, water, medicines, and power. Successful management of natural resources and environmental risks within and across a number of primary sectors and critical themes is essential for Nigeria to be among the world's 20th largest economies – a target it aspires to in its Vision 20:2020 and for which the country's Transformation Agenda of 2011-2015 provides a roadmap.

3. **Despite considerable human, natural, and financial resources that could prime a development take-off, environmental insecurity and poor public service delivery hinder the country's efforts to close its infrastructure gap**. As a result, poverty remains high, with 84% the population in 2008 considered poor. From 1984 to 2009, the Gini coefficient worsened from 0.43 to 0.50, which is among the highest inequality levels in the world.[5] Poverty is aggravated by high unemployment (especially among youth), a high rate of school dropouts, and compromised conditions for agriculture due to natural resource degradation.

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[1] World Bank (2006), *Nigeria Rapid Country Environmental Analysis.* World Bank, Washington DC.
[2] World Bank (2011 draft), *Review of Costs, Benefits, and Public Expenditure for Land Management Options in Nigeria.* World Bank, Washington DC.
[3] Ibid.
[4] Ibid.
[5] UNDP (2008-2009), *Human Development Report*. UNDP, New York.

B. Sectoral and Institutional Context

4. **Up to 6,000 square kilometers -- almost 6% of Nigeria's land mass -- are severely degraded** at a time when population is increasing at over 2% per year and numerous sectors depend on the integrity of land resources to deliver on key sector objectives.

5. **Gully erosion is accelerating in the southeast.** Southern Nigeria is affected by massive and expanding gully erosion, an advanced form of land degradation. There are an estimated 3,000 gullies, which can be up to 10 km long with multiple fingers spreading through the rural or urban landscape. In southeastern states, gullies and areas exposed to erosion tripled; the total area affected by rill, sheet or gully erosion increased from about 1.33% (1,021 km^2) in 1976 to about 3.7% (2,820 km^2) in 2006.[6] Damage to infrastructure includes severed roads, highways, and pipelines, collapsed houses and buildings, and silted waterways, reservoirs and the Calabar port. Losses to natural assets include loss of productive farmland and forest. Forest and farmland degradation also compromise watershed functions. This process exacerbates erosion downstream and siltation, compromises biodiversity important for livelihoods, and weakens natural buffers against climate and erosion risk. Many of the region's land degradation hotspots are also the most densely populated areas, such as Anambra state, the self-proclaimed gully capital of the world and the most densely populated region in Africa. Ongoing attempts by states and federal institutions to stabilize or prevent gullies are at best partially or temporarily effective, for complex reasons (See Annex 8).

6. **The root causes of gully erosion are complex.** The soils in southeastern Nigeria are highly susceptible to water erosion. Once a gully starts, it expands rapidly and is difficult to control. The causes of gully formation differ by site, but are largely human, including: (a) improper road design and construction, particularly inadequate drainage; (b) poor solid waste management in urban and peri-urban areas that chokes the already inadequate drainage meant to prevent erosion; and (c) destructive and unsustainable land-use practices that remove protective vegetation cover including protective biodiversity and carbon rich areas, or disturb the fragile soil, such as overgrazing, deforestation, cultivation of marginal lands, and uncontrolled mining for building material, and which are linked to poverty.

Box 1. The impact of gully erosion on one rural community

In 1986, the Agbaja-Ngwo reservoir was built to supply water to Enugu township. According to the Imeama-Ngwo community, the drainage channel for the reservoir should have been directed into the stream down the hill, but was not. Instead, the channel ended close to the reservoir, resulting first in rill and sheet erosion but which quickly grew into a large and expanding gully. This has affected the community sacred forest, and the trees of several families since the erosion occurred where many residents have their cashew and oil palm trees as well as other cash crops. This land is now cut off from them, requiring long distances to reach their farms. The community is also cut off from other communities, affecting their social linkages. To address erosion, the community has planted cashew trees and grasses along one gully finger, but the gully continues to expand. An additional problem has been the silting of the stream where residents used to get their water. The residents complained that although the reservoir is on their land so that other people can have good water supply, the community itself does not have good water to drink. To overcome this, the residents practice water harvesting during the rainy season or now have to buy their water. The situation continues to worsen.

7. **Climate change amplifies the challenges.** The Nigerian Meteorological Service shows that the country is already experiencing climate variability in the form of droughts, floods, shifts in rainy season onset and completion, and increasing rainfall intensity. Climate-related disasters already affect Nigeria's economy and society, as evidenced by the 2010 floods which displaced over two million people. Climate risks also are a significant factor in erosion in southern Nigeria, especially because of the very high

[6] World Bank project preparation study on land use and land cover, 2011.

rainfall intensity. Recent regional climate modeling suggests rainfall will become more intense in the southern basins, by as much as 80% by 2060.[7] Each unit increase in rainfall intensity results in up to twice the historical rate of erosion and greater vulnerability to landslide risk.

8. Climate variability already affects agriculture, and uncertainty about the future confounds planning among land users. Farmers are aware of more variable weather patterns such as an unpredictable and compressed growing season, which makes planting decisions more problematic and can reduce yield. The projected rise in temperature by 2050 (an estimated 0.5 degrees in the south, 3.5 degrees in the north) will reduce yields according to new models. For example, under business-as-usual the Anambra-Imo basin will likely show yield reductions of 5-10% for the south's important cassava, maize, and rice crops by 2020 and double that by 2050.[8] The models also show that heat stress on northern livestock is rising as gross primary productivity of grazing land is declining; these factors will produce higher livestock mortality in the coming decades. Research and extension services are not advising on these issues at scale.

9. **Throughout the country, water resources management is critical to address climate variability and erosion while contributing to key sub-sectors** such as hydropower, irrigation, floodplain agriculture, and bulk water supply. Water resources are threatened by sedimentation from soil erosion, over-extraction, loss of vegetation cover and other forms of land degradation, as well as from climate variability. Some of Nigeria's water storage potential has been tapped for use in irrigation and hydropower, but this potential remains small compared to the additional investment that is being considered for the future. Integrated watershed management can help address these challenges but is not yet carried out although there are some recent positive developments in this regard being undertaken by the federal government. This approach is critical to help manage land use options and trade-offs in the landscape, including both built and natural assets. In particular, sub-watersheds need to be better managed to slow erosion and reduce its severity – which requires mobilizing local, state and federal stakeholders to act in concert to implement shared visions for basins, watersheds and sub-watersheds.

10. **Land degradation and environmental insecurity are accelerating in the north,** where an intersection of hotspots leads to increasingly tenuous livelihoods. High levels of population growth and poverty rates, resource depletion, rainfall variability, recurrent droughts and floods, soil infertility and erosion, and deforestation compromise the efforts of the 80% of northern Nigerians who depend on land and water resources for their economic and physical security. Yet these natural resources are being depleted by a growing human footprint coupled with inefficient resource management and reservoir maintenance. This depletion is occurring precisely at a moment when temperatures have risen one degree and will rise another degree in the next decade, accompanied by more variable rainfall and uncertain response mechanisms. This situation has upset the region's ecological balance and therefore the ability of its ecosystems to provide services such as food and fiber production, freshwater provision, and flood regulation. Nigeria's woody savannah systems are under stress from clearing and reduced rainfall. Firewood depletion outstrips replenishment, and bush burning is commonplace. Key tree species can reduce livestock heat stress, help replenish water tables, generate raw materials for marketing, provide medicines, strengthen soil structure to resist wind and water erosion, and naturally fix nitrogen to cheaply fertilize crops. Good tree cover also attracts and retains biodiversity, in

[7] Preliminary finding from on-going World Bank economic and sector work (2012): Climate Change Assessment: draft report on climate risk management in agriculture and water resources.
[8] Ibid.

particular diverse sources of protein and pollinators. Vegetation cover is also necessary to store carbon in biomass and soils. While the carbon potential for drylands are not as impressive as those for humid systems, they are nonetheless valuable, as carbon trends are also an indicator of overall ecosystem health and with it, basic land productivity and soil health. Across the border from Sokoto, large-scale natural regeneration of trees has taken root in Maradi, Niger.

11. **Investment responses to address erosion are fragmented and inadequate.** State and local governments and their constituencies are overwhelmed by the scale and complexity of the gully erosion problem. Attempts at all tiers of government to prevent or rehabilitate gullies have been generally unsuccessful for the following reasons: (a) Unclear and overlapping mandates of federal and state institutions[9] responsible for erosion prevention and management and watershed management; (b) insufficient technical capacity in these institutions; (c) poor, incomplete or inadequate scale of response (such as an over-emphasis on inflexible civil engineering interventions without addressing water flows in the sub-watershed or building upon a strong evidence base); (d) absent or weak land-use planning; (e) weak regulatory compliance and enforcement; (f) weak community involvement in prevention and restoration activities; (g) insufficient attention to alternative livelihood issues; and (h) insufficient attention to transparent governance, corruption, and local participation. The different challenges are interwoven and require integrated solutions. However, institutions, information, and incentives are fragmented, weakening the ability of state and federal ministries, departments and agencies (MDAs) or the communities that they serve to address the issues in a strategic and integrated manner. In particular, the government's Ecological Fund has carried out gully erosion activities in different parts of Nigeria, among other environmental activities, but these have had mixed results.

12. **The Nigeria Erosion and Watershed Management Project (NEWMAP) helps address these gaps** by (a) investing in the public environmental goods; (b) improving institutional performance, governance and multi-sector coordination, and information access; and (c) by establishing replicable investment models and institutional solutions that can be scaled up inside and outside the project. An impact evaluation will help quantify success factors for interventions by examining sites funded by NEWMAP and sites outside the project. As such, NEWMAP and the Ecological Fund would complement each other and offer mutually beneficial learning opportunities. This could lead to greater transparency of the country's Ecological Fund, for example by public disclosure of Ecological Fund projects and sites to avoid duplications and inefficiencies. Over the long term NEWMAP should therefore contribute to making subsequent government efforts more effective.

C. Higher Level Objectives to which the Project Contributes

13. The project contributes to the growth and resilience goals of Nigeria's Vision 20:2020 and the country's Transformation Agenda. This agenda is expected to prioritize job creation and implementation of strategies for resolving Nigeria's long-standing infrastructure problems, particularly in power and transportation, and will include institutional reforms in agriculture and other sectors. The project has been specifically designed in response to the President of Nigeria's request to the Bank to support the country to address severe erosion and its impacts in southeastern Nigeria.

[9] Nigeria has a federal system, with 36 state governments and 774 local governments. Significant powers, resources, and responsibilities are decentralized. State and local governments control nearly half of public spending and are responsible for land use planning and management.

14. *Rationale for Bank engagement.* The Project is consistent with the Country Partnership Strategy II (2010-2013), which seeks to support sustainable and inclusive non-oil growth. Improved environmental and climate risk management is a central part of CPS II which acknowledges the need to address weak policy, institutional and incentive frameworks to support wider adoption of sustainable land use practices.

15. The Bank's Africa Development Strategy, *Africa's Future and the World Bank's Support to It*. The Project contributes to Pillar 2 (vulnerability and resilience) while also strengthening governance and public sector capacity by addressing unclear institutional mandates, capacity constraints and corruption among relevant actors and sectors. In addition, the project aligns to the goals of the TerrAfrica program in which government and Bank both participate and which helped fund project preparation (www.terrafrica.org).

16. The Bank is well-placed to support the project given its prominent role among development partners in Nigeria and its support to several complementary sectors. Existing or upcoming projects and government plans related to hydropower, irrigation, roads, urban development, and agriculture are affected by or have the potential to contribute to erosion. These projects and plans can all benefit from integrated watershed management approaches. The project will be synergistic with Bank projects addressing infrastructure and livelihoods.

17. *Rationale for engagement by the Global Environment Facility (GEF) and Special Climate Change Fund (SCCF).* The GEF and SCCF are intervening to support the development of replicable local and community innovations on climate adaptation and soil, water, and biodiversity conservation that can be scaled up within the broader project. The Project will deliver global environmental public goods by enhancing below and above ground biodiversity, reducing land degradation and terrestrial carbon emissions. These global benefits are paired with local climate adaptation benefits. The operation contributes to the priorities in Nigeria's First National Communications for the UN Framework Convention on Climate Change (UNFCCC) which prioritizes southern gullies, as well as the country's action plans for the UN Convention on Biological Diversity (UNCBD) and the UN Convention to Combat Desertification (UNCCD). Lastly, the operation contributes to the goals and indicators of the *World Bank-GEF Sahel and West Africa Program (SAWAP) in support of the Great Green Wall Initiative*.

II. PROJECT DEVELOPMENT OBJECTIVE (PDO)

A. PDO

18. **The PDO is to reduce vulnerability to soil erosion in targeted sub-watersheds**.[10] The Nigeria Erosion and Watershed Management Project (NEWMAP) is designed to support the country's transformation agenda to achieve greater environmental and economic security. It will primarily support state-led investments to enhance resilience to soil erosion and associated climate variability and change in specific sub-watersheds -- beginning in the first years with replicable models for priority southern gully sites and getting northern states and their interventions ready -- while raising capacities to promote long-term climate resilient, low carbon development. NEWMAP will take an integrated watershed management approach to erosion that will be informed by lessons learned on the interlinked challenges of poverty, ecosystem services, climate change, disaster risk management, biodiversity, institutional performance and governance. GEF and SCCF support will be fully blended with IDA resources to fund locally

[10] The GEF Global Environment Objective is subsumed in the PDO.

driven planning and replicable, innovative investment actions for protective tree cover and biodiversity, urban stormwater management, and water harvesting.

B. Project Beneficiaries

19. **The total number of primary beneficiaries at the onset of the project will reach about 2.2 million people and will gradually increase to about 2.6 million in 2020 and about 4.2 million in 2042** (30 years after project effectiveness). This population, residing in both rural and urban areas, will benefit from erosion site interventions that include civil works in the immediate command area of a gully system, soil and water conservation measures in the sub-watershed, or livelihoods enhancements throughout the sub-watershed. More broadly, benefits will accrue to majority populations of most of the participating states. This figure is estimated at 30 million in 2013, rising to 33 million in 2020 and 47 million in 2042. These benefits derive from reconnected transport corridors, reduced siltation, support for improved stormwater planning, reduced flooding, improved disaster risk preparedness, and enhanced agricultural productivity, depending on each state's conditions. In addition, while carrying out civil works to stabilize and prevent erosion, local employment and casual labor will be generated.

C. PDO Level Results Indicators

20. The ***PDO level results indicators*** include:

- Targeted gully complexes and other erosion sites treated with at least 75% of planned rehabilitation measures for targeted sub-watersheds (#)
- Targeted gully complexes and other erosion sites with reduced severity level after treatment (#)
- Vegetation cover in treated sub-watersheds (%)
- Direct project beneficiaries (number), of which female (%) [core indicator].

III. PROJECT DESCRIPTION

21. **NEWMAP is an 8-year multi-sectoral and multi-scale project** that initially targets seven southeastern states with acute gully erosion (Abia, Anambra, Cross River, Ebonyi, Edo, Enugu and Imo), while laying the foundation for scaling out to northern states and additional southern states. At the same time, the project also focuses on improving livelihoods in these and additional states through sustainable management of natural resources. The request for inclusion of activities in the north came later during preparation, such that northern site interventions will necessarily begin somewhat later than in the southern states where significant preparatory activities have been ongoing. Even among the above southern states, three appear to be advancing at a pace that will allow implementation to begin early in the project cycle. All 11 states in the north and south will continue to receive technical assistance to advance their investment preparations as soon as the project is effective, with investment support to commence when site designs are ready. In principle, if all states meet the intervention criteria, NEWMAP will support investment in up to 11 states.

22. **State Phasing.** NEWMAP is structured around a phased implementation approach. Participating states are initially supported with technical assistance activities for enhancing critical capacity and skills needed to develop integrated site designs to the highest international quality standards. Criteria for state participation in NEWMAP include:

- Formation of interim multi-sectoral State Project Management Unit (SPMU)

- Provision of office space for the SPMU
- Opening of a dedicated account with a minimum of 30 million naira (approximately US$200,000)
- Long list and location of priority sites
- State commitment to finance involuntary resettlements (as necessary) as their financial contribution to the project

Once the state participation criteria are met, the state will then phase into detailed design preparation, including for safeguards, leading to implementation activities involving gully stabilization and restoration, broader sub-watershed management, and livelihood improvement (See table 1). At the time of the first of two Mid-Term Reviews, if states are successfully implementing project activities and preparation of site intervention designs are advancing, additional financing may be sought to ensure sufficient resources for all participating states. The Bank is not establishing ceilings per state for investment support under component 1; the Government of Nigeria, however, may do so independently.

Table 1. Indicative Sequence of State Participation in NEWMAP

Phasing of states that meet project participation criteria	**By end Year 1**	**By end Year 2**	**By end Year 4**	**By end Year 6**
Estimated minimum # of states with site intervention designs that meet agreed criteria for triggering investment support activities	3 states	5 states	6 states	11 states
Estimated # of states participating in technical assistance activities to ready intervention designs	11 states	11 states	11 states	11 states

Note: States participate on a rolling basis

23. **The project's strategic approach to southern intervention sites** is to: (i) start with "damage control" to slow the expansion of a targeted set of existing aggressive gullies that are still physically possible to stabilize, thereby reducing the loss to property and infrastructure and helping cultivate community ownership; (ii) leverage the gully intervention to support integrated watershed management[11] and move towards greater adoption of sustainable land and water management practices by local people in the sub-watershed where the gully is located; (iii) enhance livelihoods in the sub-watershed and carefully implement local Resettlement Action Plans; (iv) strengthen disaster risk reduction and preparedness at state, local, and community levels; and (v) underpin these efforts by strengthening relevant institutions and information services, including urban storm water drainage management planning, planning for Imo-Anambra and Benin-Owena basins, building a better knowledge base, and contributing to improved governance such as through better contract management, reporting transparency, open data, and beneficiary verification. The size of the sub-watersheds averages 400 hectares (ha) but varies from approximately 100 ha to several thousand ha or more, depending on the gully system targeted. More detail on the technical approach is in Annex 8D.

[11] Integrated Watershed Management provides a framework to integrate natural resource management with community livelihoods in a participatory and sustainable way. It addresses the issues of degradation of natural resources, soil erosion, landslides, floods, and other disaster risks, low agricultural productivity, biodiversity, water quality and quantity, and poor access to land and related resources from an integrated perspective.

24. **The project's strategic approach to northern intervention sites** focuses on contributing to re-establishing or securing ecosystem functions by managing erosion in states in the Sokoto-Rima and Upper Niger basins. Given that gullies are not prevalent in the north, the emphasis of the project in these states will be more on addressing broader soil erosion that can compromise the natural resource base and associated livelihoods. For example, land degradation and drought threaten productive lands and the watersheds 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. The approach can bring entire landscapes back into production to the benefit of local communities. It has been successfully demonstrated just across the border in the Maradi region of the Republic of Niger, in other African countries, and countries in other regions such as India. This approach would contribute to Nigeria's priorities for the Great Green Wall Initiative. As such, a different set of evidence-based criteria will be established by northern states for their site interventions. The project's Federal Project Management Unit (PMU) and Steering Committee will confirm readiness for implementation in the northern states (see Annex 3 on implementation arrangements).

A. Project Components

25. **The Project has four components** summarized below: (1) Erosion and Watershed Management Infrastructure Investments; (2) Erosion and Watershed Management Institutions and Information Services; (3) Climate Change Response; and (4) Project Management.

26. **Component 1: Erosion and Watershed Management Infrastructure Investments** (Total including contingencies is US$482.73M: IDA US$398.88M, GEF US$3.96M, SCCF US$3.13M, State Governments US$76.75M, implemented at state and community levels)

27. The *objective* is to support on-the-ground interventions to help reduce vulnerability to land degradation. Key *outcomes* are achieved through a strategic approach that: (i) stabilizes severe erosion sites, and/or (ii) prevents emerging erosion problems early while intervention costs are relatively low, while also (iii) improving preparedness for landslides and floods. Physical interventions will include a range of engineering/structural and vegetative measures, supported by participatory sub-watershed planning and extensive communications and outreach. In addition, communities will benefit from livelihood support. These interventions will generate important local, national, and global public goods related to disaster and climate risk reduction, ecosystem function, biodiversity, terrestrial carbon, soil health, and siltation reduction.

28. Interventions will be at the sub-watershed level, in three stages: (i) creating conditions for gully and watershed rehabilitation and livelihood development, including community sensitization, social mobilization, communications, and capacity building to ensure ownership and a strong foundation for subsequent interventions; (ii) implementation of sub-watershed management plans including disaster response, and livelihoods development; and (iii) continuing financial and technical support for gully and sub-watershed rehabilitation and livelihood activities as well as monitoring, while phasing out civil engineering activities. Component 1 will also refund the US$3M Project Preparation Advance (PPA).

29. *Activities.* This component will finance works, goods, equipment, and consultant services for the following activities organized into **three sub-components**:

> ***Sub-component 1A. Gully Rapid Action and Slope Stabilization*** (GRASS): This sub-component supports actions to stabilize and rehabilitate major erosion-related sites and

underlying causes of gully erosion using both structural and vegetative measures. GRASS can be used in emergency situations as a palliative to help limit damage and address immediate threats to houses and critical infrastructure. At the same time, it plays the role of entry point into the local communities, to help secure their participation and ownership of the larger erosion and watershed management planning and implementation activities that will bring a more permanent solution. Activities include: (i) emergency and temporary halting of gullies and landslide management; (ii) complementary structural erosion and water management works; and (iii) preventive erosion control works, as well as associated community monitoring.

Sub-component 1B. Integrated watershed management: This sub-component supports the participatory development of integrated watershed management plans and local investments for the wider sub-watershed surrounding the gully systems (or other erosion-affected areas) targeted by sub-component 1.A. By taking an integrated approach, the sub-component addresses degradation of natural resources and biodiversity, erosion, landslide and flood risks, low agricultural productivity, water quantity and quality, as well as access to land and related resources. The following activities are supported: (i) sensitization, mobilization and organization of communities to manage erosion and prevent disasters; (ii) preparation and implementation of integrated sub-watershed management plans and related technical guidelines and manuals including land and water management and disaster risk preparedness measures; and (iii) carrying out of specific subprojects for the identification, establishment and management of soil and water conservation zones, including implementation of associated land and water management practices, through the provision of sub-grants to eligible community organizations. The major structural works included in the sub-watershed management plans will be financed in sub-component 1.A.

Sub-component 1C. Livelihoods: The targeted intervention sites will include support for livelihood activities including: (i) sub-grants for community sub-projects on livelihood enhancements including natural-resource based enterprises such as local community geo-textile and gabion box manufacture; alternative income generating activities such as small livestock, mushroom, snail and honey production; and service provision/trading such as small shops and bicycle repair; (ii) sub-grants for community sub-projects on employment and skills acquisition opportunities, for instance maximizing labor-intensive public works; and (iii) provision of community and household water harvesting for eligible communities to help reduce runoff expected from increased rainfall intensity as well as storing water for use during the prolonged dry season. The SCCF will co-finance water harvesting.

Component 2: Erosion and Watershed Management Institutions and Information Services (Total including contingencies is US$39.70M: IDA US$38.20M, SCCF US$1.50M, implemented at FGN and state levels)

30. The *objective* is to strengthen the enabling environment for effective implementation of erosion and watershed management. Effective investment and implementation of Nigeria's transformation agenda requires better institutional performance and information modernization. The component supports all three tiers of government and the private sector, but with a special focus on improving the effectiveness of states in investment design and supervision, with the

federal level serving primarily as facilitator, regulator, monitor, bench marker, information broker, and aggregator.

31. The component will contribute to a number of *outcomes* centered on enhanced capacities, modernization and coordination of relevant federal, state, and local institutions involved in investment planning, management, assessment, enforcement, and monitoring of watershed and erosion related activities and disaster risk management. To reinforce good design and prioritization of investments under component 1, this component will help improve engineering and watershed and basin planning among states and federal actors, enhance the regulatory environment, data modernization and openness, information sharing, design and construction standards, development and application of analytical and monitoring tools, and watershed diagnostics. In particular, because states have primary responsibility for land allocation and management, they have primary responsibility in NEWMAP for site interventions financed under Component 1 and land-use planning. It is critical that states participate in a continual process of institutional strengthening and investment-oriented learning across states and stakeholders. The activities below help address this need, thereby underpinning the sustainability of NEWMAP's investment approach and setting the stage for further investment action.

32. *Activities.* This component will finance goods, equipment, services, operating costs, and small works, for the following activities, organized into four sub-components:

> ***Subcomponent 2A. Federal MDA Effectiveness and Investment Services for States:*** (i) Providing investment design support and quality assurance for federal and state MDAs through diverse expertise in relevant disciplines such as geotechnical engineering and watershed planning; (ii) Carrying out an institutional assessment of and providing training for participating implementing agencies and the Ecological Fund Office, to help the government in its efforts to streamline the functions of the numerous agencies and institutions in the erosion and watershed sector of the country, to make them more effective and enhance service delivery; (iii) Strengthening regulatory capacity of key environmental and disaster response institutions; (iv) Strengthening information and monitoring services and tools including a HydroMet system in the project area, integrated in a state-of-the-art erosion monitoring and landslide risk early warning system; (v) Building a Spatial Knowledge Management Information System (MIS) as part of an erosion and watershed management knowledge resource network; (vi) Developing tools for basin and watershed planning and inter-state coordination; and (vii) Providing engineering guidelines and tools that could, for example, help the government make changes in the way drainage structures and roads are regulated, designed, approved, budgeted, constructed and maintained, with a view to reduce gully formation (linked with state efforts below).
>
> ***Subcomponent 2B. State MDA Effectiveness and Services:*** (i) Providing investment design support for states through environmental engineering and planning expertise, (ii) Urban and rural land use and watershed planning tools; (ii) Providing tools and a platform that could help the government improve state roads' cross drainage, with a view to reduce gully formation (linked with federal efforts above), and (iii) Strengthening state emergency management agencies (SEMAs) to anticipate, ameliorate, and respond to natural disaster related emergencies. An additional SCCF grant will finance the development of 1-2 comprehensive urban stormwater plans, starting in Onitsha, Anambra state, to help stem gully formation, better manage flood and landslide risk, adapt to

higher rainfall intensities and run-off, and identify priority investment options that can be scaled up and replicated with IDA and other resources.

Subcomponent 2C. Effectiveness and Services of Local Government Areas: Strengthening Local Government Areas (LGAs) in intervention sites to sustain operation and maintenance project works and disaster risk reduction and response capacities.

Subcomponent 2D. Private and Non-Government Sector Institutions and Services: Training contractors and other non-government entities that can be engaged as needed to deliver professional services. Such needs include: (i) labor intensive works; (ii) manufacture and installation of geo-textiles and gabion boxes; (iii) water harvesting and storage; and (iv) natural resource based enterprises such as seedling nurseries.

Component 3: Climate Change Response (Total including contingencies is US$30M: IDA US$30M, implemented at FGN level)

33. This component will include actions that contribute to strengthening Nigeria's strategic framework for climate action. As such, the component *objective* is to enhance Nigeria's capacity to promote low carbon, climate resilient development. The contribution that this support will make to Nigeria's strategic framework for climate action is important because climate variability and change threaten to exacerbate Nigeria's erosion challenges, and more broadly might undermine the country's efforts to reach its longer-run development aspirations. For example, climate variability and change are affecting critical sectors such as agriculture, livestock, forest, water resource management, and coastal zone development. At the same time, Nigeria has a significant potential to contribute to global efforts to reduce the emission of greenhouse gases (GHGs). With the right combination of better knowledge, enhanced governance of climate-related policies, and international funding for climate action, Nigeria could make its development more climate-resilient, and pursue a range of win-win options to reduce emissions while at the same time spurring growth. For these reasons, to help the country put in place a strategic framework for reducing the longer-term climate-related challenges, the government requested that NEWMAP includes a dedicated component aimed at assisting the country to address the broader climate change agenda.

34. *Outcomes* focus on providing tools and approaches for government to become better equipped to respond to climate change; and on supporting demonstration projects on the ground to test the viability and scaling-up potential of low-carbon development options.

35. *Activities* to be financed under this component will consist primarily of technical assistance, to be delivered through consulting services, procurement of goods (e.g. IT equipment, software), workshops/consultations, and knowledge sharing via publications, web-sites, etc; and small civil works/ goods for the implementation of demonstration activities. Eligibility and priority criteria for financing demonstration sub-projects, acceptable to the Bank, will be included in the project implementation manual (PIM).

Sub-component 3A. Strengthening the strategic policy and institutional framework: Activities include institutional development and capacity building in support of the FGN and its framework for climate action, including institutional development and capacity building in support of the FGN, including the National Climate Change Commission (once established), to manage and act upon data and information on climate change,

integrate climate risk and low carbon into policies and planning, and facilitate the mobilization of international and national resources for climate action.

In addition, the project will strengthen the capacity of federal institutions in key climate-vulnerable sectors to design and implement climate-resilient development activities, including planning and climate-screening of water infrastructures, identification and design of "triple wins" agriculture management options (higher productivity, higher climate resilience, reduced carbon emissions), development of financial instruments to manage climate risks.

Sub-component 3B. Promoting low carbon development. The project will support the development of an enabling framework for renewable energy, including incentive frameworks for private sector investments, feed-in agreements for small and medium scale renewable energy production; upgrading the knowledge base on on-shore and off-shore wind potential; feasibility studies for large-scale renewable plants (for example wind and concentrated solar), and demonstration projects of off-grid, low-carbon technologies to provide access to energy in rural areas (e.g., hybrid systems: solar/wind/diesel).

Component 4: Project Management (Total including contingencies is: 106.16M: IDA US$32.92M, FGN US$64.85M, State governments US$8.40M, implemented at FGN and state government levels)

36. To ensure efficient delivery of project resources and document results, the *objective* of this component will finance goods, equipment, staff, travel, and consultant services for the following activities: (a) project management and coordination at federal and state levels, including procurement and financial management; (b) social and environmental safeguards management and oversight; (c) strategic project communications and outreach; (d) project M&E, including two Mid-Term Reviews; and (e) an impact evaluation fully integrated into M&E arrangements that will help build replicable intervention models early during implementation. The M&E system will address input-output, process and outcome monitoring. Impact evaluation will examine the causal impact of the project and its interventions on key outcomes. M&E and impact evaluation will be used to reinforce and help build a multi-state learning platform on erosion and watersheds and inform adaptive project management and improvement of next-generation site intervention designs that can be replicated inside and outside the project. Credit proceeds cannot be used to fund salaries or bonuses of civil servants.

B. Project Financing

Lending Instrument

37. *Proposed instrument and scope.* This project is financed through an 8-year Specific Investment Loan (SIL) of US$508.59M, consisting of a US$500M IDA concessional loan (including the US$3M PPA) blended with GEF and SCCF grants totaling US$8.59M. The Government's contribution will amount to approximately US$150M. The amount comprises (i) a federal contribution both cash and in-kind of US$83.34M for staff and office costs, and (ii) a cash and in-kind contribution by each state of approximately US$6M (for each of 11 states totaling approximately US$67M) for resettlement as they pertain to investments on the ground, staff and office costs and pre-feasibility designs of intervention sites. See table 2 below.

Table 2: Project Costs by Component and Use of Financing

Project Components by Sources of Financing	Federal Government		State Governments		IDA		GEF		SCCF		Total	
	(USD Million)											
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Component 1: Erosion and Watershed Management Infrastructure Investments												
1.A: Gully Rapid Action for Slope Stabilization (GRASS)												
1.A.1: Emergency and Temporary Stabilization of Gullies and Landslide Management	0.00	0.0	30.70	17.3	146.99	82.7	-	0.0	-	0.0	177.69	27.0
1.A.2: Complementary Structural Erosion and Water Management Works	0.00	0.0	46.05	27.4	122.15	72.6	-	0.0	-	0.0	168.20	25.5
1.A.3: Preventative Erosion Management Works	0.00	0.0	0.00	0.0	29.98	100.0	-	0.0	-	0.0	29.98	4.6
Subtotal	0.00	0.0	76.75	20.4	299.11	79.6	-	0.0	-	0.0	375.86	57.1
1.B: Integrated Watershed Management												
1.B.1: Community Sensitization, Mobilization and Organization	-	0.0	0.00	0.0	12.37	100.0	-	0.0	-	0.0	12.37	1.9
1.B.2: Integrated Sub-Watershed Management and Monitoring (community sub-grants)	-	0.0	0.00	0.0	12.37	100.0	-	0.0	-	0.0	12.37	1.9
1.B.3: Community Sub-grants for Soil and Water Conservation Zones	0.00	0.0	0.00	0.0	3.48	50.0	3.48	50.0	-	0.0	6.97	1.1
Subtotal	0.00	0.0	0.00	0.0	28.22	89.0	3.48	11.0	-	0.0	31.71	4.8
1.C: Livelihoods												
1.C.1: Livelihoods Identification and Preparation Support	-	0.0	0.00	0.0	5.58	100.0	-	0.0	-	0.0	5.58	0.8
1.C.2: Livelihoods Sub-grants for Income, Skills and Employment Opportunities (community sub-grants)	-	0.0	0.00	0.0	12.37	100.0	-	0.0	-	0.0	12.37	1.9
1.C.3: Household and Community Water Harvesting	0.00	0.0	0.00	0.0	2.75	50.0	-	0.0	2.75	50.0	5.50	0.8
Subtotal	0.00	0.0	0.00	0.0	20.70	88.3	-	0.0	2.75	11.7	23.45	3.6
Subtotal	0.00	0.0	76.75	17.8	348.03	80.7	3.48	0.8	2.75	0.6	431.02	65.4
Component 2: Erosion and Watershed Management Institutions and Information Services												
2.A: Federal MDA Effectiveness and Investment Services for States												
2.A.1: Investment services	-	0.0	0.00	0.0	7.84	100.0	-	0.0	-	0.0	7.84	1.2
2.A.2: Strengthening technical services and effectiveness of the Department of Erosion, Flood and Coastal Zone Management of the FME (FME/DEFCZM)	0.00	0.0	0.00	0.0	1.98	100.0	-	0.0	-	0.0	1.98	0.3
2.A.3: Strengthening technical effectiveness of the EA Department	-	0.0	0.00	0.0	3.84	100.0	-	0.0	-	0.0	3.84	0.6
2.A.4: Strengthening the monitoring and enforcement effectiveness of NESREA	-	0.0	0.00	0.0	0.09	100.0	-	0.0	-	0.0	0.09	0.0
2.A.5: Strengthening effectiveness of the National Emergency Management Agency (NEMA)	-	0.0	0.00	0.0	0.40	100.0	-	0.0	-	0.0	0.40	0.1
2.A.6: Erosion and Watershed Resource Network for Knowledge and Monitoring (FME)	0.00	0.0	0.00	0.0	6.16	100.0	-	0.0	-	0.0	6.16	0.9
2.A.7: Basin and Watershed Planning	0.00	0.0	0.00	0.0	0.41	100.0	-	0.0	-	0.0	0.41	0.1
2.A.8: Strengthening Effectiveness for Managing Environmental and Social Impacts from Federal Roads	-	0.0	0.00	0.0	0.24	100.0	-	0.0	-	0.0	0.24	0.0
2.A.9: Cross-cutting Public Investment Management	-	0.0	0.00	0.0	0.44	100.0	-	0.0	-	0.0	0.44	0.1
Subtotal	0.00	0.0	0.00	0.0	21.40	100.0	-	0.0	-	0.0	21.40	3.2
2.B: State MDA Effectiveness and Services												
2.B.1: Investment Development Support on Erosion and Watershed Management	0.00	0.0	0.00	0.0	9.37	100.0	-	0.0	-	0.0	9.37	1.4
2.B.2: Urban Stormwater Drainage Management Planning	-	0.0	0.00	0.0		0.0	-	0.0	1.32	100.0	1.32	0.2
2.B.3: Strengthening Effectiveness for Managing Environmental and Social Impacts in State Roads and Urban MDAs	-	0.0	0.00	0.0	0.25	100.0	-	0.0	-	0.0	0.25	0.0
2.B.4: Strengthening State and Local Preparedness on Disaster Risk Management	-	0.0	0.00	0.0	0.80	100.0	-	0.0	-	0.0	0.80	0.1
Subtotal	0.00	0.0	0.00	0.0	10.41	88.8	-	0.0	1.32	11.2	11.73	1.8
2.C: Effectiveness and Services of Local Government Areas												
2.C: Effectiveness and Services of Local Government Areas	-	0.0	0.00	0.0	0.96	100.0	-	0.0	-	0.0	0.96	0.1
2.D: Private and Non-Government Sector Institutions and Services												
2.D: Private and Non-Government Sector Institutions and Services	-	0.0	0.00	0.0	0.82	100.0	-	0.0	-	0.0	0.82	0.1
Subtotal	0.00	0.0	0.00	0.0	33.58	96.2	-	0.0	1.32	3.8	34.90	5.3
Component 3: Climate Change Response												
3.A: Climate Change Response												
3.A: Strengthening the Strategic Policy and Institutional Framework	0.00	0.0	0.00	0.0	4.40	100.0	-	0.0	-	0.0	4.40	0.7
3.B: Promoting Low Carbon Development	0.00	0.0	0.00	0.0	21.98	100.0	-	0.0	-	0.0	21.98	3.3
Subtotal	0.00	0.0	0.00	0.0	26.37	100.0	-	0.0	-	0.0	26.37	4.0
Component 4: Project Management												
4.A. Federal Project Management												
Federal Project Management	57.04	91.4	0.00	0.0	5.37	8.6	-	0.0	-	0.0	62.41	9.5
Monitoring and Evaluation	-	0.0	0.00	0.0	6.50	100.0	-	0.0	-	0.0	6.50	1.0
Safeguards	-	0.0	0.00	0.0	0.97	100.0	-	0.0	-	0.0	0.97	0.1
Subtotal	57.04	81.6	0.00	0.0	12.84	18.4	-	0.0	-	0.0	69.88	10.6
4.B. State Project Management												
State Project Management	-0.00	0.0	7.38	42.3	10.06	57.7	-	0.0	-	0.0	17.44	2.6
Safeguards	-	0.0	0.00	0.0	6.01	100.0	-	0.0	-	0.0	6.01	0.9
Subtotal	-0.00	0.0	7.38	31.5	16.08	68.5	-	0.0	-	0.0	23.45	3.6
Subtotal	57.04	61.1	7.38	7.9	28.91	31.0	-	0.0	-	0.0	93.33	14.2
Total PROJECT COSTS excluding contingencies	57.04	9.7	84.13	14.4	436.90	74.6	3.48	0.6	4.07	0.7	585.62	88.9
Physical Contingencies		0.0		0.0	0.08	100.0		0.0		0.0	0.08	0.0
Price Contingencies	7.81	11.2	1.02	1.5	60.02	85.9	0.48	0.7	0.56	0.8	69.89	10.6
Project Preparation Advance												
Project Preparation Advance	-	0.0	0.00	0.0	3.00	100.0	-	0.0	-	0.0	3.00	0.5
Total PROJECT COSTS	**64.85**	9.8	**85.15**	12.9	**500.00**	75.9	**3.96**	0.6	**4.63**	0.7	**658.59**	100.0

C. Lessons Learned and Reflected in the Project Design

38. Investments in Nigeria and globally have provided key lessons (See Annexes 8 and 9)[12]:

Thematic lessons:

(a) Watershed management, including gully restoration and prevention, is complex and must address a myriad of interactions among land, water and people. Successful approaches balance evidence-based planning with meaningful stakeholder involvement at an early stage.

(b) Begin watershed planning with a larger scale assessment, but also implement activities at a smaller scale appropriate for integrating communities into a participatory process. This approach can help internalize externalities in the watershed, connecting upstream and downstream users.

(c) It is important to adopt an integrated approach that addresses livelihoods and watershed management. Civil works and simple land management interventions can safeguard soil and water resources and reduce climate risk, while livelihoods interventions can reduce pressure on natural resources.

(d) With major gullies, it is important to first understand the causal factors, which often arise from poorly designed infrastructure, urban development and inappropriate agricultural practices. Prevention is usually more cost effective than remediating existing gullies. Measuring the success of gully restoration interventions often requires more than one indicator.

(e) There is a need for a balanced focus on information, institutions, and on-the-ground investments (combining structural, vegetative, and livelihoods).

(f) It is critical to sustain government commitment through a supportive enabling legal, policy, and institutional environment to invest at scale, including transparent procurement and reporting systems, clear accountabilities, and good dialogue and coordination across sectoral and geographical boundaries.

(g) Successful watershed programs are characterized by openness to testing innovative approaches, while insisting on rigorous and locally appropriate civil engineering designs and monitoring.

Operational lessons:

(h) A robust and well funded M&E system that addresses input-output, process and impact evaluation is required. It will also include appropriate application of new technologies such as remote sensing and GIS, with strong feedback to guide project implementation. A highly qualified firm can often provide significant technical support to implementing agencies, and arms-length reporting.

(i) The use of GEF resources should be fully integrated into IDA financed operations, avoiding the common use in the past in Bank-financed Nigeria operations of parallel implementation structures for GEF and IDA.

(j) Harmonization of local development planning. The experience of Bank-assisted community driven development (CDD) projects shows greater impact on poverty

[12] Lessons come from Nigeria's Ecological Fund, Kenya's experience with governance in community-driven development programs, the Bank lending portfolio in Nigeria, TerrAfrica's regional investment portfolio and knowledge products, Bank-financed watershed development programs in China, India and Latin America, the US Chesapeake Bay watershed program, and an international review of good practice of gully remediation in Brazil, Australia, Ethiopia and elsewhere.

and results from harmonization of tools and approaches. This lesson will be incorporated into the project by fostering collaboration with similar projects intervening in the same zone if present, such as Fadama III and the Community Social Development Project.

(k) Supervision must be strong and well funded, and as much as possible should devolve to the state PMUs and backstopped and coordinated by the federal PMU.

(l) Independent entities can provide critical implementation enhancements to improve performance and results. The project incorporates this lesson by: (i) reinforcing the PMU with international consultancies for civil engineering and land and water management, project management, and M&E; (ii) empowering beneficiaries to verify project activities; and (iii) applying rigorous impact evaluation to improve project performance and adaptive management.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

39. *The project is multi-sectoral and multi-state, involving many federal and state Ministries, Departments and Agencies (MDAs), local governments, communities, and civil society in southern and northern Nigeria.* As such 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, relying upon a robust annual joint work programming process facilitated by the respective Project Management Unit (PMU) – one at federal level and one for each participating state (housed in the respective environment ministries). 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, space and hydrological information or watershed/basin regulation.[13]

40. *The states in particular will be at the heart of project implementation.* The vast majority of the project's investments will occur at state level, as states have primary responsibility for land management and land allocations. In general, the *federal level project structure will reinforce the state level* by, for example, providing engineering and watershed management expertise, monitoring tools, benchmarking performance among states, and providing a platform for states to coordinate activities, such as across a shared watershed (see Annex 3 for details).

41. *State phase-in to project investment.* States phase in at two levels. First, one of the 11 targeted states must meet project participation criteria and can then immediately benefit from NEWMAP's technical assistance support to prepare investment site designs and plans. The technical assistance support is provided for participating states to ready their technical site interventions. The existence of vetted, publicly consulted, high quality and professionally vetted site designs to international standard is the key consideration for states to participate in the investments financed under Component 1 (See technical approach in Annex 8 section D). Three of the seven participating states are making progress in their intervention site designs. All eligible states in the targeted areas, however, will be eligible to participate in the project's technical assistance activities under Component 2, including efforts to improve engineering

[13] Such as the Nigeria Hydrological Services Agency (NIHSA), Nigeria Integrated Water Resources Management Commission (NIWRMC); Nigeria Meteorological Agency (NIMET), and Nigeria Environmental Standards and Regulation Agency (NESREA), and the Nigeria National Space Research and Development Agency (NASRDA).

design capacity and produce high quality, vetted designs for later investment under Component 1. Depending on how quickly the northern states can be selected and their feasibility studies done, implementation on the ground could start as early as year 2 of project effectiveness.

42. *Federal level structures*. The Federal Ministry of Environment (FME) is the lead coordinating agency. However, given the multi-sectoral nature of the project it was agreed that overall project coordination will be carried out by an independent and multi-sectoral Federal Project Management Unit (FPMU) hosted by FME. The FPMU is headed by a Federal Coordinator, staffed with a broad range of expertise, and supplemented by secondments from relevant MDAs. With respect to technical expertise required in developing and implementing the gully control measures, the FPMU will be reinforced by three consultancies at the highest standards available: (i) an environmental engineering and design consultancy; (ii) a procurement consultancy; and (iii) a third-party M&E consultancy whose main role will be to collect, analyze and disseminate lessons coming out of the different states during implementation. The strategic direction of the project is overseen by a NEWMAP Federal Steering Committee that will, among other duties, make final decisions on when the additional states become eligible to participate in NEWMAP by endorsing proposals by the Technical Committee (see below) on State readiness to participate based on the agreed criteria in para 22. The Steering Committee is chaired by the environment minister and composed of ministers/commissioners, permanent secretaries, or directors-general from relevant MDAs. A Technical Committee composed of relevant directors from key MDAs provides technical guidance to the PMU.

43. *State level structures.* There will be one Project Management Unit in each state, headed by a State Project Coordinator. Each State PMU (SPMU) is hosted by its respective environment ministry and is staffed with a broad range of expertise, supplemented by secondments from relevant MDAs. Overseeing the SPMUs are NEWMAP State Steering and Technical Committees, which, similar to those at federal level, are composed of policy level and technical level officials, respectively, from relevant MDAs.

44. *Local Government Areas* (LGAs) where a site under Component 1 is implemented will be strengthened with a NEWMAP Technical Officer who: (i) acts as liaison to their SPMU and MDAs; (ii) provides senior technical advisory services to communities; (iii) convenes affected and directly participating communities (liaising with neighboring LGAs as needed); (iv) closely interacts with the community facilitators; and (v) participates in site monitoring. LGAs will be involved in maintenance of works and will convene Site Committees with communities and other stakeholders.

45. *NEWMAP Site Committees* are formed where a site intervention under Component 1 is implemented. These committees are formed from LGAs and community actors and the state and sub-state level stakeholders providing services to them, as well as contractors and consultants. The Site Committees are responsible for sub-watershed planning, identification of erosion problems, possible solutions, maintenance, monitoring/verification and identification of possible livelihood opportunities. The Site Committees will include a *registered Community Association* composed entirely of community members, a project facilitator from the community, and existing community organizations or new Community Interest Groups to be formed as needed. The Community Associations will receive sub-grants from their respective SPMU to manage sub-projects. Non-governmental organizations (NGOs) will be deployed as needed to assist in community mobilization and participation. The NEWMAP Technical Officer at the relevant LGA will provide additional support to the community level and link to LGA and state levels.

46. *To promote quality technical implementation and enhance supervision*, an independent NEWMAP Expert Advisory Services Pool (EASP) will be formed, which is a pool or panel of international and national technical expertise pre-qualified by the FPMU and paid on a fee-for-service, interim basis. Pool members can be deployed anywhere in the project by the FPMU to raise quality at federal, state and local levels. There will be a firewall in place to prevent pool member themselves or their institutions from bidding on project contracts. This will help maintain pool independence. The EASP: (i) works under contract to and reports to the FPMU; (ii) provides expert input to local, state efforts and federal activities as needed and as demanded by a specific PMU or partner MDA; (iii) reviews proposed activities and site designs as needed; (iv) advises Steering and Technical Committees on key issues; and (v) strengthens capacities of PMUs and participating institutions. Annex 3 includes the profiles of their expertise.

47. *Multi-sector work programming.* Working with relevant MDAs, each PMU develops a joint annual work program against which project disbursements will be made by the relevant PMUs at state level and the single FPMU. The relevant Steering Committee approves the work program after vetting by the relevant Technical Committee. A Liaison Officer from each relevant MDA sits in the relevant PMU and is responsible for ensuring that the respective MDA fully participates in joint work programming, preparation of bidding documents, and supervision of key tasks for which the MDA is responsible. Component 1 (investment) will largely be implemented at state level with the SPMU working closely with specific LGAs and communities organized into sub-watershed Site Committees, under which there are legally registered Community Associations responsible for discrete activities under Component 1. Components 2 and 4 will be implemented at federal and state levels, while Component 3 will be implemented only at federal level. To implement the agreed set of activities, each PMU works closely with relevant MDAs, develops and issues TORs, bidding documents, and calls for Expressions of Interest (EOI), carries out bid reviews, supervises consultancies, develops and implements RAPs and ESIAs, carries out project monitoring and evaluation at the respective level; and develops and participates in impact evaluation and project communications.

48. *Financial management.* The FM arrangements will be handled by each respective state's existing Project Financial Management Unit (PFMU) and the existing Federal Project Financial Management Division (FPFMD) at the federal level. The PFMUs and FPFMD are multi-donor and multi-project FM platforms, established in all states and at the federal level respectively through the joint efforts of IDA and the government. These common FM platforms feature robust systems and controls. The FPFMD and PFMUs are presently involved in the implementation of a number of Bank-assisted projects. The designated project accountant will prepare on a timely basis relevant periodic financial reports. As part of the FPMU's coordinating function and to facilitate overview of activities carried out by SPMUs, the FPMU will be expected to consolidate semester IFRs received from the various SPMUs and forward to IDA and FME. An independent external auditor will be appointed by the FPMU to perform an audit of the entire project and certify the consolidated financial statements for the project. A copy of the Annual Audit report of the project will be sent to the FMF/IER and IDA. Community Associations will report to the Bank via SPMUs on how funds were spent on eligible expenditure. A simplified template will be provided in the FM manual to facilitate this.

49. *Procurement.* The project's procurement will be implemented by the FPMU and each SPMU. At the FPMU, there will be a qualified and experience Procurement Specialist from a participating federal MDA or from the market if the requisite skills and qualifications are

unavailable. The FPMU will also recruit a procurement consultancy for implementation and coordination of the procurement activities of the PMUs. The procurement consultancy will support the procurement implementation of the FPMU and SPMUs. The TOR of the procurement consultancy will include: (i) preparing draft documents/ RFPs for adoption by all PMUs, (ii) preparing and circulation to all PMUs specifications for common items to be procured; (iii) guiding all PMUs in preparing evaluations, TORs etc; (iii) reviewing all documents prepared by all PMUs for quality assurance for post review packages and also for prior review packages before they are submitted to the Bank; (iv) organizing hand-holding training for procurement staff of all PMUs; (v) reviewing the procurement implementation of all the PMUs to ensure compliance with approved guidelines and procedures. Similarly, each SPMU will have an experienced Procurement Officer fluent in World Bank procurement processes. SPMUs will receive support from the Procurement Consultancy by getting documents for adoption and submitting documents to the Procurement Consultancy for quality assurance before submission to the Bank. The Procurement Consultancy will also give the SPMU Procurement Officers technical advice while providing training where capacity is minimal. Each SPMU will competitively recruit reputable NGOs to provide technical assistance to Community Associations under these sub-components, as well as implement complementary activities. Community Associations will receive sub-grants from the relevant SPMU to implement sub-projects under activity sets 1B.3 and 1.C.2. There will be no procurement at LGA level.

50. *Flow of funds.* IDA will disburse the credit through designated accounts consisting of: (a) one designated account (DA) for the FPMU managed by the FPFMD; and (b) one DA for each SPMU to be managed by each state's respective PFMU. One current (draw-down) account in Naira to which draw-downs from the DA for FPMU/SPMU will be credited in respect of incurred eligible expenditures; the balance on this account will be maintained as close to zero as possible after payments. The GEF and Special Climate Change Fund (SCCF) will both be disbursed at state level through separate DAs managed by the PFMUs. At community level technical assistance will be provided through credible NGOs. In addition, sub-grants from the SPMU to legally recognized Community Associations will be provided for communities to implement sub-projects on livelihoods and soil and water conservation. Community Associations will establish and maintain a bank account for such purpose.

51. *Disbursement.* Given the programmatic nature of this SIL, disbursements start slowly and then accelerate later in project implementation. Early in implementation, the states will advance international-standard site designs and once this happens disbursement will ramp up quickly. This approach also allows the project to learn from its initial investments in specific intervention sites, and to build upon those lessons using a combination of impact evaluation, beneficiary participation and verification, and strong M&E and fiduciary arrangements.

52. *Supervision.* State, local and community level capacities must be strengthened to manage this multi-sectoral operation. A budgeted *implementation support plan* that provides for capacity building and workflow arrangements critical to project implementation is described in Annex 5. Given the complexities and duration of the project, provisions are made for two Mid-Term Reviews (MTR), at 30 and 60 months. In addition, the project is scheduled to benefit from more frequent implementation support missions in the first 18-24 months of the project to ensure that it is implemented on a sound footing. These would be continued beyond this period if needed.

B. Results Monitoring and Evaluation

53. The results monitoring matrix including indicators, definitions, and targets is in Annex 1. The M&E system will address input-output, process and outcome monitoring. Impact evaluation will examine the causal impact of the project and its interventions on key outcomes. M&E and impact evaluation information will be used to reinforce and help build a multi-state learning platform on erosion and watersheds and inform adaptive project management and improvement of next-generation site intervention designs that can be replicated inside and outside the project. Under project component 4, a total of US$32.92M is planned for project management, out of which US$7.39M is earmarked for M&E and impact evaluation. This amount includes data collection, equipment, software, training, and operating costs. Detail on the approach and implementation arrangements is in Annex 3.

54. *Implementation.* The project's M&E implementation arrangements rest upon a shared set of M&E responsibilities that balance ownership of M&E and improvement of government systems to raise project quality. These responsibilities include beneficiary verification, and professional third-party implementation support through an international-standard M&E Consultancy. Impact evaluation will be carried out with support from the Bank.

55. *Government capacity.* NEWMAP's M&E system will be linked with federal and state M&E systems and provide a basis for enhancing institutional capacity to monitor interventions. The project will focus on building capacity at federal, state and local levels by training personnel and procuring equipment for collecting, analysis, and reporting within the M&E system of NEWMAP and M&E systems at states and federal levels.

56. *Data reliability.* NEWMAP's objectives and indicators were selected to ensure an accurate attribution of the project's success through its achievement of the PDO. Special effort was made to ensure that the indicators selected were simple and had low-cost data requirements. In addition, NEWMAP will raise the capacity of the country to collect, store, share and manage data related to management of erosion, climate risk, watersheds, and carbon – and transform this data into usable information across stakeholders to underpin and plan their investment actions.

57. *Impact evaluation.* As part of the M&E arrangements, a rigorous impact evaluation will provide statistically reliable evidence on causal impacts of the project and its components on target outcomes. Such evidence will be used to understand project effectiveness, and as a management and program design tool in selecting between and scaling up different operational modalities to other states, and even beyond Nigeria. The impact evaluation will provide evidence on the causal impact of: (i) infrastructure investments in gully rehabilitation under NEWMAP, the Ecological Fund, and State Ministry of Environment management; (ii) livelihoods interventions under NEWMAP, (iii) community empowerment interventions; and (iv) mechanisms for increased accountability.

58. The impact evaluation will take a phased approach in line with project implementation. In the *first phase (project years 1-3)*, the impact evaluation will focus on priority, first-mover sites once selected and vetted for initial implementation. Results from the first phase will be used to inform project implementation in the *second phase (years 4-6).* Additional sites from selected states covered by the project will be included in the sample, which will improve the validity of the impact evaluation and allow for understanding additional success factors. This phased approach will add rigor to the findings and add further value to project stakeholders, and contribute to establishing good replicable investment models for scaling up. As they start to be

covered by the project, northern sites will be included in the impact evaluation design. The impact evaluation for the northern sites will have a different approach as the issues and interventions relevant for those states differ from those in the South/Southeast. See Annex 3.

C. Sustainability

59. NEWMAP has a transformational role to play in establishing a portfolio of best practice models for erosion prevention and gully rehabilitation that can be replicated inside or outside the project, such as through the government's Ecological Fund. The project seeks to sustain its impact through the following actions that have not been reliably implemented in the past: (i) *mainstreaming and replication:* project activities will be part of existing federal and state plans and establish a track record of good designs and practices that will serve as models for replication once the project closes; (ii) *institutional*: emphasize good governance including community monitoring and beneficiary verification of civil works, technical assistance for the staff of the Ecological Fund Office, better watershed and land use planning, use of robust data, enhanced capacities, establishment of a framework for upscaling investment that balances these critical medium-term issues with rapid on the ground civil works to sustain project momentum and ownership; (iii) *policy:* reinforce environmental assessment and regulatory compliance, disaster risk reduction, and promote successful local by-laws that prevent land degradation; (iv) *financial/economic*: insist on sound operations and maintenance including performance-based contract management; (v) *technical*: insist on high quality and professionally vetted engineering designs that also incorporate the sub-watershed and climate projections, and set appropriate examples early on that can be replicated inside and outside NEWMAP; (vi) *social*: protect natural resource based livelihoods or find alternative livelihoods for affected communities, keeping gender equity in mind; attend to gender roles for particular community and individual roles in local implementation, use gully interventions as a way to secure community ownership of the project and then mobilize on sub-watershed management; (vii) *mutual learning*: leverage project M&E and impact evaluation to feed back into project implementation knowledge on what is working and how to improve incentives and site designs; and (viii) *communications*: emphasize outreach to political institutions, decision makers and beneficiaries.

V. KEY RISKS AND MITIGATION MEASURES

60. *Political support and governance risks*: Although there is strong political and agency support for the proposed project at federal and targeted state levels, the project will use a phased approach. Because of the phasing, there is a danger that some states may feel less able to access funding even though they have erosion problems that may be just as serious. To mitigate this issue, all 11 states will receive or are already receiving technical assistance to achieve implementation readiness for investment. In addition, risk of corruption and fraud is high and will be mitigated by support to strengthen procurement, financial management and oversight systems. Developing a strong communication and consultation strategy, meaningful involvement of various stakeholders, beneficiary verification, and use of CSOs familiar with the region and communities will also help mitigate this risk.

61. *Security risks*: The recent escalation of violence has become a real challenge for security. The implementation arrangements in the PIM are robust and deploy a variety of methods. When those cannot be implemented due to security concerns, different arrangements will be assessed, such as cooperation with development partners. In addition, the project's use of a phased approach allows flexibility to move implementation to other areas should an area become

impossible to work in for a short period, and re-engaging when things stabilize. In addition, the project team and the CMU will engage closely with government to monitor the situation on the ground closely to ensure that the response is done quickly to avoid damaging any implementation progress.

62. *Fiduciary risks:* There is a need to strengthen familiarity with World Bank procurement and FM guidelines. This is due in large measure to weak capacity in public sector accounting, auditing, oversight and procurement. To mitigate this risk, FM functions for both the FPMU and SPMUs will be provided by the Federal Project Financial Management Division (FPFMD) and each participating state's Project Financial Management Unit. Procurement and FM functions will be provided by qualified and experienced staff and/or consultants to be competitively recruited, emphasizing candidates that have experience with Bank fiduciary requirements. The FPMU and SPMUs will be supported by procurement consultants. FPMU and SPMU staff will receive procurement, FM, and project management training prior to project effectiveness.

63. *Implementing agency risks*: The FME is responsible for the overall project implementation and coordination across sectors and states. Both the federal and state governments have executed similar activities on their own with mixed results. Generally, all the participating states have some experience in the implementation of World Bank funded projects. However, considerable risk is found in the inexperience of some of the line ministries and agencies in some of the states in handling Bank-financed projects, carrying out multi-sector projects involving works, water resources, and land use planning. There is the additional risk of not having a full complement of experienced professional technical level staff which may delay project implementation. Drawing on lessons learned from other Bank-financed projects, assistance on site designs was provided during project preparation and this will continue up to effectiveness and during implementation. Existing implementation structures and multi-sector coordination will be used. An increased number of implementation support missions will be held in the first 18-24 months of the project to ensure that implementation begins on a sound footing; if needed, they will be continued beyond this initial period. Lastly, the FPMU will be supported by a procurement consultancy, third-party M&E entity, and an environmental engineering/planning firm, as the requisite skills are under-represented in MDAs.

64. *Intervention design risks*: There is a history of failed approaches to managing gullies in Nigeria's southeastern region, for the reasons given earlier. The project proposes to mitigate these risks through a more holistic approach, improving technical capacity and coordination within and among institutions, provision of quality technical assistance for design and appraisal support, continuous learning from past and ongoing interventions, and deeper community and state involvement than has usually been the case.

65. *Involuntary resettlement and legacy issues* as well as associated conflicts are risks to project success. This is compounded by unclear land ownership in some parts of the project area. These risks are partially mitigated by the fact that all people around an active gully will benefit from the project's civil works, which are of a public goods nature and are designed to prevent additional gully expansion and the emergence of new gullies, as well as rebuild lost infrastructure in cases. The risks are further mitigated by the project's Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF), which have been completed and publicly disclosed in Nigeria and at the Bank's InfoShop (4 January 2012). The findings and recommendations of the ESMF and RPF have been internalized in project design. Site-specific resettlement action plans will be prepared in consultation with potential project

affected persons (PAPs) and communities prior to the commencement of civil works. The project also has a grievance redress mechanism in place for resolving conflicts that may arise. However, households whose assets have been destroyed by erosion and flooding prior to project interventions, and are thus not covered by OP4.12, may be eligible for the project's livelihood restoration activities if they reside in the targeted sub-watershed. The project has also carried out a detailed social assessment and livelihood study that informed the project design in effective targeting of vulnerable groups in the project area.

66. There is also a risk associated with provision of resettlement benefits to people affected by project works while not extending the same benefits to people previously affected by gully formation, landslides and the like. The latter may feel that they are just as deserving of assistance as those affected by project works and may demand such benefits. This risk will be mitigated by careful dissemination of public information about eligibility for project benefits. It is important that the public understand that the project is focused on addressing *additional* gully expansion in selected watersheds so that gullies will not cause further damage. Victims of gully expansion in the past may be considered for inclusion in livelihood programs. There is a further risk that the government may not provide resettlement compensation in a timely manner thereby delaying project implementation in a specific site. This will be mitigated in part by the project's being part of the government's budget, and the project staff, Steering and Technical Committees will proactively follow up on budget execution.

67. *On safeguards*, the project is expected to have highly positive environmental and social impacts for all people residing in a targeted sub-watershed and many others beyond, as it provides incentives for improved environmental management and livelihoods in critical and sensitive areas with active participation of communities. There are adequate legal and institutional frameworks in the country to ensure compliance with Bank safeguards policies triggered by the project. However, implementation/enforcement capacity for environmental and social safeguards is a challenge. The capacity of the enforcement agencies will be strengthened by the project through training and provision of equipment and logistics for more effective compliance enforcement, monitoring, and reporting. Also, targeted communities will be empowered to monitor and participate in project activities.

Table 3. Risk Ratings Summary

Risk	Rating
Project Stakeholder Risk	Moderate
Implementing Agency Risks (including fiduciary)	
Capacity	High
Governance	High
Project Risks	
Design	Substantial
Social and Environmental	Substantial
Delivery Monitoring and Sustainability	Substantial
Overall Implementation Risk	**High**

68. The overall risk rating is Substantial for preparation and High for implementation.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

69. A *quantitative cost benefit analysis* was carried out for an anticipated 30 intervention sites based on a sample of draft designs for a subset of candidate sites including their sub-watersheds. Major benefits in terms of health, environment, economic and social benefits are detailed in Annex 6 and include: (i) reduced loss of infrastructure including roads, houses, markets, and other real estate; (ii) reduced loss of agricultural land and productivity from soil loss caused by surface and gully erosion; (iii) reduced siltation in rivers leading to less flooding particularly in urban areas and which will also lead to performance enhancements to some of the water systems for improved access to domestic water supply; (iv) reduced risks of rural floods (due to reduced siltation and improved water quality) and reduced impacts on villages and agricultural areas; (v) reduced sedimentation in ports, rivers and in water infrastructure such as canals and dam reservoirs improving their life and productivity; (vi) improved access to economic activities, social services, communication and road networks; (vii) restored vegetative cover that benefits wildlife, terrestrial carbon sequestration, and local microclimates; and (viii) improvements from erosion stabilization that secures landscape services.

70. The financial net present value of sub-component 1.A investment cost over 30 years inclusive of contingencies and constant operations and maintenance (OMEX) at 5% discount rate was calculated and amounted to US$263.8M (2013-2042). An economic analysis was also performed in seven southern states to derive social benefits accruing to society over 30 years and gauge the viability of the project and sub-component 1.A. Only the seven initial southern states are considered in the analysis; additional states from the north will phase in.

71. Based on conservative assumptions, various valuation techniques were used to derive the benefits including: (i) an *a posteriori* odds ratio analysis based on a study in the gully-prone area targeted by the project to determine future income losses and asset damages incurred by the targeted population; (ii) number of averted deaths from flooding, gully and landslide events was determined to be 20 premature deaths per year based on a disaster time series where the human capital approach and value of statistical life mid-point was used; (iii) a forgone consumer surplus for water services in the city of Onitsha justified by the intake works of the water treatment plant that was submerged twice due to the siltation of River Nkisi; (iv) the revolving defensive public spending to dredge the Calabar port whose sedimentation is due to upstream erosion; (v) the opportunity cost of lost time due to traffic disruption increasingly affecting a number of primary, secondary and tertiary roads; (vi) an input/output method used to determine yield reduction attributable to land degradation; (vii) a forgone opportunity to use farmland due to land lost to erosion; and (viii) a replacement cost associated with soil nutrient loss due to land degradation. Budgeted (US$131M) and disbursed (US$81M) funds earmarked by various government tiers per year (2006-2011) to prevent or reduce land degradation in the seven states could qualify as defensive spending but were not used in the analysis.

72. The economic analysis summary in table 4 shows that the Project and sub-component 1.A investments are viable as they yield a net present value (NPV) of US$44M and US$136M respectively over 30 years, and benefit/cost ratios greater than 1 associated with economic internal rate of returns (IRR) exceeding 10%. A sensitivity analysis was conducted to test the viability of the project and sub-component 1.A with (i) a reduction of monetized benefits by 10%

per year from 2015 to 2042, (ii) an increase of investment costs by 15% per year over eight years for the project and seven years only for sub-component 1.A, and (iii) an increase in operations and maintenance (OMEX) cost by 15% per year over the 2020-2042 period. In all cases, the project and sub-component 1.A remain viable.

Table 4. Economic Analysis Summary of Component 1 (See Annex 6)

Key Economic Indicator	Results	Interpretation
Project Level		
Cost Benefit Analysis		
NPV/30 years	US$44 million	Net benefit exceeds cost
IRR/30 years (10%)	12%	Positive and greater than 10%
PV Benefit/Cost Ratio/30 years	1.2	Discounted benefit > discounted cost
Result: Three criteria indicate that the project is economically viable		
Sensitivity Analysis		
Reduction of aggregate monetized benefits by 10% per year over 2015-2042		Viable
Increase of investment by 15% over 8 years and OMEX increase by 15% per year over 2015-2042		Viable
Sub-component 1.A Level		
NPV/30 years	US$136 million	Net benefit exceeds cost
IRR/30 years (10%)	18%	Positive and greater than 10%
PV Benefit/Cost Ratio/30 years	1.9	Discounted benefit > discounted cost
Result: Three criteria indicate that the project is economically viable		
Sensitivity Analysis		
Reduction of aggregate monetized benefits by 20% per year over 2015-2042		Viable
Increase of investment by 20% over 8 years and OMEX increase by 20% per year over 2015-2042		Viable

73. A scenario analysis was also performed to determine the combined impact of variables in the economic analysis that are usually analyzed separately (Table 5). The various IRRs associated with the combined impact of variables for an optimistic, base case and pessimistic scenarios for the project are viable. The pessimistic scenario provides the switching or break-even point that would result in negative NPVs for the project and sub-component 1.A.

Table 5. Scenario Analysis of Economic Variables for Component 1 (See Annex 6)

Variable	Optimistic Scenario	Base Case Scenario	Pessimistic Scenario
Project Level			
Investment cost (US$ million)	386	420	454
OMEX growth over 2020-2042	-8%	±0%	+8%
Benefits	+8%	±0%	-8%
NPV/30 years	US$ 92 million	US$ 44 million	US$ 0.1 million
IRR/30 years (10%)	14%	12%	10%
PV Benefit/Cost Ratio/30 years	1.5	1.2	1.1
Sub-component 1.A Level			
Investment cost (US$ million)	202	277	352
OMEX growth over 2020-2042	-27%	±0%	+27%
Benefits	+27%	±0%	-27%
NPV/30 years	US$ 271 million	US$ 136 million	US$ 1 million
IRR/30 years (10%)	30%	18%	10%
PV Benefit/Cost Ratio/30 years	3.2	1.9	1.0

B. Technical

74. The project intervention centers on creating and promoting replicable investment models for erosion management. This is done using an innovative approach for Nigeria that strategically combines physical, institutional, and community responses to reduce erosion vulnerabilities in specific sites prioritized by participating states, underpinned by improvements in planning, monitoring, information, and regulatory environments.

75. *Component 1* emphasizes the development and implementation of comprehensive site designs that include three inter-dependent technical approaches: (i) apply a mix of rigid and flexible structural measures and vegetative land management solutions; (ii) incorporate local, participatory sub-watershed planning and climate variability data (e.g. rainfall intensity); and (iii) support livelihoods opportunities for affected communities. Once implemented, the early NEWMAP site designs will serve as models that can be replicated inside and outside NEWMAP, such as through the Ecological Fund. For this reason, early sites are being selected in part by the degree to which they can be showcase sites. Beneficiary verification will be included to enhance implementation. If these models are taken up more systematically as the guiding principle for the country's Ecological Fund, it would increase efficiencies in the implementation of erosion reduction measures and could thereby increase the sustainability and impact of its actions.

76. *New models, new measures, and new maps.* NEWMAP offers significant added value through its technical approach: First, gully rehabilitation has been tried before in southern Nigeria but the techniques and the strategic approach usually underperformed. NEWMAP's introduction of internationally tested techniques calibrated to local conditions will ensure impact, and also efficiency as they can be replicated throughout the estimated existing 3000 gully systems. Second, implementing only when the technical designs are ready increases chances of success and ensures replicability through demonstration. Third, the emphasis on technical designs that are supported by strong institutional capacity and evidence-based planning ensures that the opportunities and limitations of the technical designs are understood and internalized for future sustainability. Fourth, measures being vetted through the project's M&E system will also be critical for supporting on the ground activities as well as well as quality outputs and outcomes. Fifth, an impact evaluation will help quantify the key success factors for addressing erosion in a variety of sites. Lastly, site-specific interventions include a strategic mix of measures that will increase sustainability. These include flexible civil works such as gabions and check dams, drainage channels that terminates at a natural water outlet, geotextiles to help stabilize gully slopes, grassing inside gullies and on embankments and gully slopes, upstream soil and water conservation to reduce or divert run-off into the gully, water harvesting structures, and livelihoods for affected communities to improve incentives and encourage participation in implementing and monitoring gully actions. For more on the technical approach to site interventions see Annex 1 (table 1.1 lists each measure), Annex 2 (component 1 description), and especially, Annex 8 (section D: summary of technical approach to southern site interventions).

77. *Component 2* adds value to the government's investment focus under component 1 and beyond NEWMAP in two main ways at all three tiers of government as well as among private contractors. First, the component raises the ability of actors, especially state level MDAs, to develop international standard investment designs and the watershed/basin plans needed for good engineering designs. These aspects have been missing in the past given the low engineering capacities and ad-hoc approach to road construction, urban development and land use – elements

which are driving gully erosion in particular. The component provides considerable expertise to work closely with state and federal government and other actors on geotechnical and environmental engineering, hydrology, watershed planning, and other disciplines requiring reinforcement among MDAs to be able to make a lasting positive impact on the landscape. Second, the component strengthens environmental assessment and regulatory compliance, larger-scale watershed/basin monitoring, use of more robust and open data and tools, improved scientific and technical capacities, and establishment of a multi-sector institutional framework for up-scaling further investment. These knowledge-intensive approaches are necessary to improve the quality of investment design and implementation, by allowing project stakeholders know what is working and how to improve engineering designs, land use, and incentives.

78. *Component 3* adds a new dimension to the country's environmental risk profile in that climate risk and low carbon growth are key considerations that require further elaboration and testing of investment approaches for scaling up. Results from piloting investments are important for determining how the country could move in the near future. As such, this component was requested by government to strengthen the country's efforts to advance its climate change agenda beyond the erosion and watershed issues addressed under components 1 and 2. The request from government to include this component came after project preparation had advanced considerably. For this reason, the component's activities will be further detailed during the multi-sector preparation of the project's first joint annual work program.

79. *Component 4* provides sufficient financial resources to important M&E functions that allow the project to deliver on its promise to establish a learning platform across states while building government capacities at federal and state levels to supervise erosion and watershed investments using international standard M&E. With an impact evaluation featuring in project design, high quality data collection and management procedures are critical. Likewise, project management staffing and supporting international and national consultancies are critical to ensure quality enhanced supervision, accountability, greater government capacity and ultimately stronger governance that will reduce implementation risks.

C. Financial Management

80. Responsibility for establishing and maintaining acceptable FM arrangements will be handled by the existing Project Financial Management Unit (PFMU) in the participating states and the Federal Project Financial Management Division (FPFMD) at the federal level. The PFMUs and FPFMD are multi-donor and multi-project FM platforms, established in all states and at federal level respectively through the joint efforts of the Bank and the government. These common FM platforms feature robust systems and controls. The PFMUs and FPFMD are presently involved in the implementation of a number of Bank-assisted projects. The Bank's recent review showed that these units have been performing satisfactorily. To strengthen the financial management system in the PFMUs and FPFMD, implementation of some action plans are required. Further to the recommended action plans being implemented as per the agreed time frame, the financial management arrangements will meet the minimum FM requirement in accordance with OP/BP 10.02. Taking into account the risk mitigation measures, the financial management risk for this financing is assessed as **Substantial**. Annex 3 provides additional information on financial management.

D. Procurement

81. Project procurement activities will be implemented by the FPMU, SPMUs and community levels. An assessment of the capacity of the eight implementing agencies to implement project procurement activities was carried out in accordance with Procurement Services Policy Group (OCSPR) guidelines dated August 11, 1998. The assessment reviewed the organizational structures for implementing the project and the roles of the key actors in project implementation of the agencies. The detailed assessment is in the project files. The assessment notes that the FME has several years experience of implementing Bank funded projects with the Community Social Development Project (CSDP) currently ongoing. Lapses observed in the implementation of the previous and ongoing projects include inadequate capacity, poor documentation, political interference etc. These lapses were addressed by continuous internal and external training, PPR missions, engagement of procurement consultant, continuous dialogue with government, etc.

82. The review of the SPMUs shows that none have any history of implementing Bank-financed projects, and some states were just establishing their ministry of environment. Other risk issues include: (i) lack of procurement capacity; (ii) lack of effective and efficient storage; (iii) lack of appropriate MIS for tracking procurement records; (iv) lack of contract management skills; (v) potential undue interference in the procurement process; and (vi) frequent transfer of procurement staff after building capacity.

83. To mitigate these risks and considering the large volume of procurement, each PMU (federal and state) will competitively recruit a qualified and experienced procurement specialist and consultancy. A procurement assistant will also be assigned to each PMU and all staff will require continuous training. Thus a strong and adequate Procurement Unit will be established in each PMU. A Bank Procurement Specialist will also provide training where necessary and close supervision according to the following Bank guidelines:

- "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006 and revised in January 2011;
- "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011;
- "Guidelines: Procurement of Goods, Works and Non-consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011.

84. Considering the risks and proposed mitigation measures, and progress made in reforming federal and state procurement systems in Nigeria, the procurement risk is **Substantial.**

E. Social

85. *Community mobilization, communication, and benefits*: All preparation studies and site visits concluded that project success depends on mobilizing communities to ensure sustainability. Mobilization is financed in project components 1 and 4 using communications (Annex 11), direct engagement, and economic incentives. Nearly all residents in a targeted sub-watershed are expected to benefit directly or indirectly from NEWMAP's intervention to stabilize land degradation, through a range of interventions such as civil works of a public goods nature, livelihoods enhancements, sustainable land management practices, improved land use planning, water harvesting, or resettlement benefits.

86. Displacement or land acquisition generated by project works will trigger the Involuntary Resettlement Policy (OP/BP 4.12), preparation of a RAP and compensation for losses attributable to project works. Persons and businesses affected by gully erosion in the past will not automatically be entitled to project benefits, although they may be contemplated by livelihood programs. Communications activities will clearly communicate this point.

87. Another area requiring careful management and community engagement is the disposition of land reclaimed from gullies as stabilization work is carried out. Gully stabilization (or other land degradation treatments) could yield areas of arable land that can be used for such activities as economic trees (e.g. fruit-bearing, medicinal or fodder species). Such land could potentially be redistributed to persons who lost land to gullies in the past. Decisions regarding this land will be made by community groups in consultation with technical experts, but those who receive such land will need to be bound by by-laws concerning land use.

88. *Community implementation.* Community Associations will receive sub-grants provided from the SPMU to implement livelihoods and soil and water conservation sub-projects. At the same time, credible NGOs will be engaged by the SPMUs through a competitive process to provide community oversight and assistance, and to implement complementary activities. The NGOs may initiate conflict resolution activities as necessary. See Annex 12.

89. *Guidelines for livelihood improvement activities.* Concurrent with the gully stabilization works, people living in a targeted, erosion-affected sub-watershed may be eligible for skills training, asset acquisition, technical assistance, small sub-projects and other forms of support designed to help maintain and improve their livelihoods. To the extent possible, livelihood activities will be linked to local conditions including past damage caused by erosion, market conditions, natural resource assets and rights, labor markets, and migration issues.

90. *Resettlement Policy Framework.* The issue of local residents who suffered losses or were displaced by gully erosion prior to the beginning of project activities has been raised. It was agreed and understood by the FGN and other stakeholders and communities consulted that the Bank's Resettlement Policy (OP/BP 4.12) does not apply to losses caused by erosive processes themselves. The project will not compensate persons for losses caused by gully erosion but rather will focus on preventing further damage going forward. Local residents might seek compensation under the resettlement plan for damage or loss to erosion that occurred prior to project intervention. However, compensation under OP 4.12 will be available exclusively to people whose land is taken by project interventions. There is no obligation, under Bank Policy, to replace assets lost to erosion. Considering the losses caused by legacy processes for affected people carries major risks as it would require difficult decisions to be made regarding entitlements. Thus, the RPF excludes such “legacy” cases from compensation for losses, but, as mentioned above, local communities will be consulted on ways in which land redistribution and livelihood restoration activities could assist people adversely affected by gullies in the past.

91. Each site intervention under the project shall be screened for possible triggering of OP/BP 4.12 (Involuntary Resettlement). Civil works could result in land acquisition or the displacement of families or businesses on a temporary or permanent basis. Works such as drainage trenches or canals could also result in loss of access even when agricultural, commercial, or residential plots themselves are not affected. Land acquisition for project works will also trigger the policy even when people are not displaced. Screening will be done early in the planning process by trained SPMU staff, in consultation with specialists who design and

supervise the site interventions. Project designs will seek to minimize displacement and loss of access to the extent feasible. Consultations with and participation of affected people and possible host communities are mandatory. The concerns and aspirations of communities will be taken into consideration. Modifications of drainage in the upper watershed of active gullies could require restrictions on building construction, pavement, and on agricultural activities. Abbreviated Resettlement Action Plans (ARAPs) will be prepared for displacements of fewer than 200 people, while those involving more than 200 people will be subject to full RAPs.

92. *ESMPs/RAPs*. Each site approved for project support can be eligible for financing only after an integrated ESMP and RAP/ARAP consistent with OP 4.01 and OP 4.12 have been completed and disclosed. Because the specific locations of final sites have not been identified prior to appraisal, an ESMF and RPF have been completed and serve as guides to the preparation of ESMPs and RAPs. For the first two years of implementation, RAPs and ESMPs require prior review by the Bank, after which post-review may be authorized at the Bank's discretion.

93. During appraisal, it was clarified that Bank financing will not be used for land acquisition or cash compensation for resettled people. These costs will have to be assumed by the states and/or federal level as applicable. Proper valuation and timely payment will be supervised by IDA during implementation.

94. With respect to boundaries, the sub-watershed is the logical target unit although such units may not correspond to actual social boundaries (e.g. kinship or ethnic groups), hence the need for a *social assessment*, which will be prepared as part of an integrated ESMP for each site. The scope of the social assessment and ESMP will be commensurate with the size and population density of the site. Sites involving more than 500 people will require intensive investigation and dialogue with the affected community, while sites with fewer people will require short-term investigations to identify the particular characteristics of the affected community (-ies) and to tailor the social assessment and management plan to the needs and characteristics of that community. The ESMF contains an ESMP outline. In view of the diversity of community social organization, each social assessment and ESMP will take into account the actual local organization to assure the sustainability of actions taken to curb and prevent erosion.

F. Environment

95. NEWMAP has been classified as a Category A project, in view of its scale, the types of problems it addresses, and potential significant adverse impacts if the erosion rehabilitation and prevention works are not correctly designed and implemented. There are also challenges presented by the need to strengthen institutional capacities at federal, state and local level, where the functions of environmental enforcement and NEWMAP implementation are closely linked.

96. Specific locations of the final individual site interventions are not known at the time of appraisal, therefore an Environmental and Social Impact Framework (ESMF) was prepared. The ESMF contains descriptions of relevant aspects of the environment in participating states; potential adverse impacts from NEWMAP; mitigation and monitoring measures for the impacts; institutional arrangements for ESMF implementation, including capacity strengthening; an environmental and social screening process and checklist to determine the environmental instrument required prior to implementation of individual site interventions (ESIA and ESMP); guidelines for ESIA preparation; a summary of stakeholder consultations conducted during ESMF preparation; guidelines for disclosure of and consultation on instruments for site

interventions; and a grievance procedure. Effective integration of project management and ESMF implementation should result from the fact that the FME/SMEs lead NEWMAP.

97. **The project is expected to have highly positive environmental impacts:** (i) it will address erosion at selected locations beginning with sites dominated by gully complexes; (ii) it will develop and establish measures to prevent gully formation in the forms of guidelines for road and drainage design, and environmental guidelines and urban and watershed management planning; and (iii) it will restore degraded lands to productive uses and eliminate threats to water and soil quality, safety in settlements, and safe and efficient road travel. States should develop policies regarding the proper termination of culverts and other drainage from roads including the extension of right-of-way from the road bed to a safe water disposal location. The adoption of such standards is a condition of a second site intervention being financed in any given state. In addition, the project will support Nigeria's climate change agenda, increasing the country's capacity to promote low-carbon, climate-resilient development beyond land degradation issues. Annex 12 provides a more detailed list of positive impacts described in the ESMF.

98. A list of potential adverse impacts identified in the ESMF is also included in Annex 12. None of these is individually significant or complex. Most of them can be avoided by sound design, good construction practice, effective maintenance, and prompt repair of defects, reinforced by adequate supervision during construction and inspection and enforcement during operation. Impacts that cannot be avoided altogether can be mitigated through application of the typical measures presented in the ESMF, implementation of ESMPs and/or standards and codes of practice. They can also be mitigated by including environmental management inputs into watershed planning and livelihood development field manuals.

99. The natural habitats policy is triggered (OP 4.04) because some project works may take place near natural habitats and some mitigation measures may be necessary to minimize any adverse environmental and social impacts. The project is not being implemented in any areas with critical natural habitats, nor does it involve the significant conversion or degradation of natural habitats; indeed, it will help restore habitats. As the project involves forest rehabilitation and substantial afforestation in some areas, the forests policy (OP 4.36) is triggered. ESMPs will include measures to manage impacts on natural habitats and/or forest management plans.

100. The pest management policy (OP 4.09) is triggered because some livelihood enhancement activities involve agriculture, re-vegetation or afforestation and may involve the use of pesticides. Some of these activities may be directly financed by the project, while others may be supported by farmers themselves with the advice of project technical assistance. An outline of an Integrated Pest Management Plan is annexed to the ESMF, along with terms of reference for preparation of a detailed plan.

101. The physical cultural resources (PCR) policy (OP 4.11) is triggered because PCR could be impacted at one or more sites. These may include sacred shrines and burial sites. The Environmental and Social Screening Checklist and the Generic Environmental and Social Mitigation Measures Checklist that are annexed to the ESMF address PCR, and the ESMF includes a chance finds procedure for archaeological remains.

102. The project may support drainage activities on international waterways. Project implementation could conceivably alter flow patterns or water quality, most likely in a beneficial fashion. This triggers the international waterways policy (OP 7.50). On December 22, 2011, the FGN sent the riparian notification that OP 7.50 requires to the Government of Cameroon and the

Niger Basin Authority. The Vice President for the Bank Africa Region issued approval to proceed with project processing on March 13, 2012, in accordance with OP 7.50 provisions that apply when no comments have been received after a reasonable time, as is the case with this project, and the likelihood of any adverse impact to the interests of riparian states is low.

103. The project may involve the construction, strengthening or modification of small dams or check dams for flood control, water impoundment or erosion control. For this reason, the safety of dams policy (OP 4.37) is triggered, even though the project is not supporting any large dams. The *Good Practice Guidance Note* annexed to the ESMF provides design guidance, and qualified engineers will be engaged for design and supervision.

104. Project stakeholders were consulted during the preparation of the ESMF in all seven southern states that have been involved in project preparation, and at national levels. The four additional states will participate later, following the same procedure as the first seven States. Interviews, questionnaires, and focus groups were the main techniques applied. Stakeholders consulted included commissioners, permanent secretaries, NEWMAP State Coordinators, directors, department heads of state ministries of environment and other line MDAs, community based organizations, NGOs, representatives of vulnerable communities, and heads of households.

105. The ESMF and RPF were disclosed in-country and by the InfoShop on January 4, 2012.

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment (OP/BP 4.01)	[X]	[ ]
Natural Habitats (OP/BP 4.04)	[X]	[ ]
Forests (OP/BP 4.36)	[X]	[ ]
Pest Management (OP 4.09)	[X]	[ ]
Physical Cultural Resources (OP/BP 4.11)	[X]	[ ]
Indigenous Peoples (OP/BP 4.10)	[ ]	[X]
Involuntary Resettlement (OP/BP 4.12)	[X]	[ ]
Safety of Dams (OP/BP 4.37)	[X]	[ ]
Projects on International Waterways (OP/BP 7.50)	[X]	[ ]
Projects in Disputed Areas (OP/BP 7.60)	[ ]	[X]

Annex 1: Results Framework and Monitoring

NIGERIA: Nigeria Erosion and Watershed Management Project

Project Development Objective: to reduce vulnerability to soil erosion in targeted sub-watersheds **Global Environment Objective:** *same as above*	**Baseline**	**Target Values** cumulative end of year unless otherwise noted								**Freq.**	**Data Source/ Methodology** See indicator definitions in supplemental tables 1.1 and 1.2 below	**Responsi-bility for Data Collection**
		PY1	**PY2**	**PY3**	**PY4**	**PY5**	**PY6**	**PY7**	**PY8**			
PDO Indicators[14]												
1. Targeted gully complexes and other erosion sites treated with at least 75% of planned measures for targeted sub-watersheds (#)	0	0	1	3	7	15	23	26	30	Annual	Project records, supplemented by beneficiary verification	Federal and State PMUs, with LGA technical Project Officers
2. Targeted gully complexes and other erosion sites with reduced severity level after treatment (#)	0	0	1	3	7	15	23	26	30	Annual	Independent expert review, with participatory community involvement, using	Federal and State PMUs, with LGA technical Project

[14] Additional physical impact indicators that are not directly attributable to the project will be included in the broader M&E system, given the large numbers of variables outside the project's direct span of control. These indicators will support the project's efforts to better understand the complex gully and watershed dynamics and improve project interventions during project implementation. These indicators will inform the project's Impact Evaluation, the project's knowledge base, and scientific capacity building. These indicators could include, for example:

- Changes in gully system size, volume and boundaries in targeted areas under the Project
- Reduction rate of turbidity at gully outlet in targeted areas under the Project (%)
- Reduction rate of siltation in targeted erosion-affected sub-watersheds under the Project (%)
- Estimated (modeled) terrestrial carbon accumulated in targeted areas under the Project (tons CO2e)

											classification system from level 5 (catastrophic) to level 1 (stable). Information provides feedback on effectiveness of works.	Officers
3. Vegetation cover in treated sub-watersheds (%)	0	+0	+0	+1	+2	+3	+4	+5	+6	Annual	Remote sensing using a refractive vegetative index[15] Data sources could include LandSat, Aster, NigerianSat 2, GeoEye and DigiGlobe, local photo monitoring	Federal and State PMUs, with NASRDA and/or other service providers
4. Direct project beneficiaries (number), of which female (%) [core indicator].	0	0	20K	60K	145K	318K	499K	577K	681K	Project years 3, 5, 7	Survey of perceived project benefits	Federal and State PMUs

Intermediate Outcomes and Indicators												
Component 1. Erosion and Watershed Management Infrastructure Investments												
Intermediate result 1.1. Erosion and watershed management improved												
1.1.1. Targeted land treated for erosion with selected	0	0	400	1,200	2,800	6,000	9,200	10,400	12,000	Annual	Project records, supplemented by	Federal and State

[15] Such as Normalized Difference Vegetation Index, or another option

measures in targeted sub-watersheds (hectares) *Note: See list of measures in supplemental table 1.1 below*											beneficiary verification	PMUs, with LGA NEWMAP Technical Officers
1.1.2. Participatory sub-watershed management plans developed under the project for targeted erosion-affected sub-watersheds (#)	0	0	1	3	7	15	23	26	30	Annual	Project records, supplemented by beneficiary verification	Federal and State PMUs
Intermediate result 1.2. Communities mobilized to secure livelihoods and watershed services												
1.2.1. People receiving project-supported advisory support services in integrated land/water management practices, planning, and/or monitoring under the Project (#, of which % female)	0	0	5,000	15,000	26,000	23,000	38,000	45,000	45,000	Annual	Survey and project records, supplemented by beneficiary verification; see note 1 at end of annex for assumptions used.	State PMUs, NGOs
1.2.2. Households benefitting from livelihoods enhancement activities under the Project (#, of which % female)	0	0	400	2,300	4,600	7,400	9,200	9,200	9,200	Annual	Survey and project records, supplemented by beneficiary verification; see note 1 at end of annex for assumptions used.	State PMUs, NGOs

Intermediate result 1.3. Natural resource management improved to help secure global public goods and adapt to climate change												
1.3.1. GEF and Special Climate Change Fund[16] tracking tools updated (#)	4				4				4	Project years 4 and 8	Project records *Note:* Only a small selection of indicators in tracking tools needed. See note 1 below.	Federal and State PMUs
Component 2. Erosion and Watershed Management Institutions and Information Services												
Intermediate result 2-1. Information services improved for informing investment and policy												
2.1.1. Spatial Knowledge Management Information System on erosion and watersheds operational (#)	0	0	0	1	1	1	1	1	1	Annual	Project records	FPMU
2.1.2. Proportion of upgraded or new HydroMet stations providing data that is published annually and uploaded to the web (%)	0	0	0	50%	60%	70%	80%	80%	80%	Annual	Project records	FPMU
Intermediate result 2-2. Institutions strengthened												

[16] Indicators 1.1.1 and 1.2.2 in the NEWMAP results framework will provide the data for reporting on the SCCF core indicator 1.2.1.2 in the SCCF tracking tool ("Resilient infrastructure measures introduced to prevent economic losses," which in the context of NEWMAP is household water harvesting structures financed by SCCF).

to plan and implement measures to manage erosion, watersheds, disaster risk, and climate impacts												
2.2.1. City stormwater master plans developed which are informed by climate projections of increased rainfall intensity and risk assessments (#)	1	1	1	2	2	2	2	2	2	Annual	Project, State and city records	State PMUs working with city government
2.2.2. Application of multi-sector management effectiveness tool by state and federal governments (#)	0	0	0	3	4	6	7	8	9	Annual	Index score based on survey of key processes for all participating federal and state institutions	Federal and State PMUs
Intermediate result 2-3. Strengthened institutional capacity on EIA implementation and compliance												
2.3.1. EIA guidelines developed for targeted investment types that affect erosion (road cross drainage, urban water supply and drainage) (#)	0	1	-	-	-	-	-	-	-	Annual	Project records	Federal and State PMUs
2.3.2. Duration for approving EIAs for category 1 projects (average working days)	180	180	180	180	170	160	150	140	130	Annual	Project and administrative records	Federal and State PMUs

Component 3. Climate Change Response												
Intermediate result 3-1. Government is better equipped to respond to climate change												
3.1.1. Technical reports/ guidelines on promoting low carbon development or enhancing climate resilience completed (#)	0	0	1	2	3	4	5	6	7	Annual	Project and administrative records	FPMU
3.1.2 Low carbon demonstration projects under implementation (#)	0	0	1	2	3	4	5	7	8	Annual	Project and administrative records	FPMU
Component 4. Project Management												
Intermediate result 4-1. Project effectively managed												
4.1.1. Monitoring and reporting systems producing data on project progress at federal and state levels (#)	0	3	4	4	5	6	7	8	9	Annual	Project records	State PMUs
4.1.2. Participating states with at least 75% of the activities in its current joint work program are under implementation	0	1	2	3	4	5	6	7	8	Annual	Project records	State PMUs

Supplemental Table 1.1. **Definition of Intermediate Result Indicator 1.1.1.** This indicator tracks the total treatments in terms of hectares, kilometres, and number of structures. These treatments will be applied in unique, site-specific combinations to generate multiple benefits including erosion threat reduction, climate resilience, water quantity and quality, biodiversity conversation, terrestrial carbon retention, and in some cases, livelihoods. Efforts will be made to raise scientific monitoring capacity to better understand and quantify these benefits with more precision than is typically done. This list does not preclude additional measures for specific sites.

Intermediate Result Indicator 1.1.1	Relevance
1. Additional targeted land treated for erosion with selected measures (measured in hectares and reported in the project results framework above)	
1. Slope stabilization using geotextiles	To stabilize soil structure
2. Grassing of embankments and gully slopes	To stabilize soil structure
3. Planting bamboos, elephant grass, vetiver, etc inside gullies	To stabilize soil structure
4. Afforestation	To stabilize soil structure
5. Natural regeneration of vegetation/forest	To stabilize soil structure while protecting biodiversity assets, accumulating terrestrial carbon, and generating other local benefits
6. Designated community soil and water conservation zones in areas threatened by biodiversity, forest, and/or soil loss	To stabilize soil structure while protecting biodiversity assets, accumulating terrestrial carbon, and generating other local benefits
7. Other measures (such as area closure, grazing corridors, etc.)	
2. Additional targeted land treated for erosion with selected measures (measured in km, but reported separately in broader M&E system)	
1. Drainage channels in towns (not inside gully)	To reduce or divert run-off
2. Drainage channels inside gullies	To reduce or divert run-off
3. On-farm terraces/bunds	To stabilize soil structure, regulate soil moisture, and reduce or divert run-off
4. Live fencing (hedgerows, trees, etc)	To stabilize soil structure while protecting biodiversity assets, accumulating terrestrial carbon, and generating other local benefits
5. Cutoff drain	To reduce or divert run-off
6. Rehabilitated roads	To reconnect communities to markets and natural resources
7. Other measures (such as shelterbelts, etc.)	

3. Additional targeted land treated for erosion with selected measures (in #, but reported separately in broader M&E system)	
1. Adaptive household and community rainwater harvesting structures	To **further** adapt to a projected climate future of significantly increased rainfall intensity in the south and therefore increased run-off, while mobilizing communities and reducing their water purchases
2. Check dams or gabions	To reduce or divert run-off
3. Infiltration and retention pits	To reduce or divert run-off
4. Chute structures	To reduce or divert run-off
5. Retaining walls	To reduce or divert run-off and maintain soil structure
6. Earthworks	To reduce or divert run-off
7. Other measures	

Supplemental Table 1.2. **PDO Indicator Definitions**

PDO Indicator	Definition / explanation
1. Targeted gully complexes and other erosion sites treated with at least 75% of planned measures for targeted sub-watersheds (#)	Measures the total # of sites and whether or not the strategic combination of customized treatments (see Supplemental Table 1.1 above) in each approved site intervention design are being implemented.
2. Targeted gully complexes and other erosion sites with reduced severity level after treatment (#)	This indicator measures the biophysical severity of each gully site after project treatment, compared to a site-specific baseline to be collected before works begin, using a set of qualitative categories. See table and note below. If a targeted gully categorization moves up the list of severity categories below, it is marked as '1.' Gully categorization will be carried out by an independent body likely formed from the NEWMAP Expert Advisory Services Pool and Gully Erosion Institute at FUTO Owerri, and reinforced by aerial photography (such as by using innovations such as digital camera-equipped weather balloons – "community satellites" – or low-cost helicopter drones) or more expensive flyovers, and high resolution remote sensing. ***Category 1: Stable.*** Drainages are represented as natural, stable channels; no signs of erosion; vegetation very common. No signs of active headcuts, nickpoints, or bed erosion. ***Category 2: Slight.*** Active erosion is uncommon; vegetation stabilizing the majority of slopes; no signs of active headcuts, nickpoints, or bed erosion. ***Category 3: Moderate.*** Active erosion is infrequent but scattered; vegetation is intermittent on slopes and/or bed; occasional headcuts may be present; few signs of active nickpoints or bed erosion ***Category 4: Severe.*** Frequent, heavy and active erosion throughout the gully complex; down-cutting is intermittent; vegetation is very intermittent on slopes and/or bed; headcuts are frequent and active; nickpoints scattered throughout the complex; bed erosion highly apparent. ***Category 5: Catastrophic.*** Extremely frequent, extremely heavy and active erosion, and down-cutting throughout the gully complex; vegetation is largely absent or very infrequent on slopes and/or bed; nickpoints and headcuts are very numerous and highly active.
3. Vegetation cover in treated sub-watersheds (%)	Land cover is a proxy for preventing erosion and for ecosystem function. Watershed projects typically track changes in land use and land cover. NDVI is a common "unitless" vegetation index used with data available at low or no cost from a variety of sources including free data from NASA. Higher resolution data can be purchased by the Project as needed for specific targeted intervention sites. Nigeria's space agency, NASRDA, has two new earth observation satellites generating data at 2.5m (monochromatic) and 5m (color). As part of the Nigerian government, NASRDA is participating in NEWMAP and has committed to providing free data to the project. Local aerial photo monitoring (e.g., weather balloons, low cost helicopter drones, fly-overs) can supplement remote sensing imagery. All such methods will require ground-truthing.
4. Project beneficiaries	The number of project beneficiaries will be measured 3 times over the lifetime of the project, at project years 3, 5, and 7.

(number), of which female (%) [core indicator].	This will be done through a statistically significant rapid survey, implemented by SPMUs with support from the federal-level M&E Consultant, which will determine the number of persons within targeted project sites that perceive they are benefitting from one or more NEWMAP interventions. Benefits will be measured in terms of target beneficiary perceptions of improved assets, income, and access due to NEWMAP interventions. There are two scales at which the survey could be undertaken: within a specific sub-watershed targeted by the project, or at the scale of the entire state involved in the project. The targets listed in the results framework refer to the smaller scale. If the larger scale is also reported on, these numbers will be three orders of magnitude higher: there will be 854K beneficiaries in project year 3, 7M in year 5, 8.1M in year 7, and 9.5M at the end of the project. These higher numbers reflect the fact that stabilized gullies result in re-connected roads that benefit large populations far from the immediate gully site, and is calculated only for southern states.

Notes:

- Average of 16,104 people per intervention site of 400 ha. With average population per household of 6.84, this is 2,354 households per site, roughly 50% male and 50% female.
- For indicator 1.2.1, advisory services represents at least a single training course or on-farm visit by an extension agent. Assume an average of one person per household in each site receives some form of training each year of the project cycle, and that 50% of households participate.
- For indicator 1.2.2. Assumptions include:
    - Community Association grant beneficiaries = 471 households per grant
    - Community Interest Group beneficiaries (including possible groups of educators/students) = 167 households per grant

Annex 2: Detailed Project Description

NIGERIA: Nigeria Erosion and Watershed management Project

Project Development Objective

1. The **Project Development Objective** (PDO) is to reduce vulnerability to soil erosion in targeted sub-watersheds.[17]

2. NEWMAP is designed to support the country's transformation agenda to achieve greater environmental and economic security. The Project will enhance resilience to soil erosion and associated climate variability and change in specific watersheds -- beginning in the first years with replicable models for priority southern gully sites and readying northern models -- while raising capacities to promote long-term climate resilient, low carbon development. NEWMAP will take an integrated watershed management approach to erosion that will be informed by lessons learned on the interlinked challenges of poverty, ecosystem services, climate change, disaster risk management, institutional performance and governance. GEF and SCCF support will be fully blended with IDA resources to fund locally driven planning and replicable, innovative actions for protective tree cover and biodiversity, urban stormwater management, and water harvesting.

3. **Beneficiaries.** The total targeted population at the onset of the project will reach about 2.2 million primary beneficiaries and will gradually increase to about 2.6 million beneficiaries in 2020 (at the close of the project) and about 4.2 million in 2042 (30 years after project effectiveness). This population, residing in both rural and urban areas, will benefit from erosion site interventions that include civil works in the immediate command area of a gully system, soil and water conservation measures in the sub-watershed, or livelihoods enhancements throughout the sub-watershed. More broadly, benefits will accrue to majority populations of most of the participating states. This figure is estimated at 30 million in 2013 and rising to 33 million in 2020 and 47 million in 2042. These benefits relate to reconnected transport corridors, reduced downstream siltation, support for improved stormwater planning, reduced flooding, improved disaster risk preparedness, and enhanced agricultural productivity, depending on each state's conditions. In addition, during the course of carrying out civil works to stabilize and prevent erosion, local employment and casual labor will be generated.

4. **PDO level results indicators** include:
   - Targeted gully complexes and other erosion sites treated with at least 75% of planned rehabilitation measures for targeted sub-watersheds (#)
   - Targeted gully complexes and other erosion sites with reduced severity level after treatment (#)
   - Vegetation cover in treated sub-watersheds (%)
   - Direct project beneficiaries (number), of which female (percentage) [core indicator].

Strategic approaches

5. **NEWMAP is an 8-year multi-sectoral and multi-scale project** that initially targets seven southeastern states with acute gully erosion (Abia, Anambra, Cross River, Ebonyi,

[17] The GEF Global Environment Objective is subsumed in this PDO.

Edo, Enugu and Imo), while laying the foundation for scaling out to northern states and additional southern states. At the same time, the project also focuses on improving livelihoods in these and additional states through sustainable management of natural resources. The request for inclusion of activities in the north came later during preparation, such that northern site interventions will necessarily begin somewhat later than in the southern states where significant preparatory activities have been ongoing. Even among the above southern states, only three appear to be advancing at a pace that will allow implementation to begin early in the project cycle. All 11 states in the north and south will continue to receive technical assistance to advance their investment preparations as soon as the project is effective, with investment support to commence when site designs are ready. In principle, if all states meet the intervention criteria, NEWMAP will support investment in up to 11 states.

6. **State Phasing.** NEWMAP is structured around a phased implementation approach. Participating states are initially supported with technical assistance activities for enhancing critical capacity and skills needed to develop integrated site designs to the highest international quality standards. Criteria for state participation in NEWMAP include:

- Formation of Interim multi-sectoral State Project Management Unit (SPMU)
- Provision of office space for the SPMU
- Opening of a dedicated account with a minimum of 30 million naira (approximately US$200,000)
- Long list and location of priority sites
- State commitment to finance involuntary resettlements (as necessary) as their financial contribution to the project

Once the state participation criteria are met, the state will then phase into detailed design preparation, including for safeguards, leading to implementation activities involving gully stabilization and restoration, broader sub-watershed management, and livelihood improvement (See table 1). At the time of the first of two Mid-Term Reviews, if states are successfully implementing project activities and preparation of site intervention designs are advancing, additional financing may be sought to ensure sufficient resources for all participating states. The Bank is not establishing ceilings per state for investment support under component 1; the Government of Nigeria, however, may do so independently.

Table 1. Indicative Sequence of State Participation in NEWMAP

Phasing of states that meet project participation criteria	**By end Year 1**	**By end Year 2**	**By end Year 4**	**By end Year 6**
Estimated minimum # of states with site intervention designs that meet agreed criteria for triggering investment support activities	3 states	5 states	6 states	11 states
Estimated # of states participating in technical assistance activities to ready intervention designs	11 states	11 states	11 states	11 states

Note: States participate on a rolling basis

7. *The project's strategic approach to southern intervention sites* is to: (i) start with "damage control" to slow the expansion of a targeted set of existing aggressive gullies that are still physically possible to stabilize, thereby reducing the loss to property and infrastructure and helping cultivate community ownership; (ii) leverage the gully intervention

to support integrated watershed management[18] and move towards greater adoption of sustainable land and water management practices by local people in the sub-watershed where the gully is located; (iii) enhance livelihoods in the sub-watershed and carefully implement local Resettlement Action Plans; (iv) strengthen disaster risk reduction and preparedness at state, local, and community levels, and (v) underpin these efforts by strengthening relevant institutions and information services, including urban storm water drainage management planning, planning for Imo-Anambra and Benin-Owena basins, building a better knowledge base, and contributing to improved governance such as through better contract management, reporting transparency, open data, and beneficiary verification. The size of the sub-watersheds averages 400 hectares (ha) but varies from approximately 100 ha to several thousand ha or more, depending on the gully system targeted. More detail, especially on the technical approach, is in Annexes 2, 8, and 9.

8. *The project's strategic approach to northern intervention sites* focuses on contributing to re-establishing or securing ecosystem functions by managing erosion in states in the Sokoto-Rima and Upper Niger basins. Given that gullies are not prevalent in the north, the emphasis of the project in these states will be more on addressing broader soil erosion that can compromise the natural resource base and associated livelihoods. For example, land degradation and drought threaten productive lands and the watersheds 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. The approach can bring entire landscapes back into production to the benefit of local communities. It has been successfully demonstrated just across the border in the Maradi region of the Republic of Niger, in other African countries, and countries in other regions such as India. This approach would contribute to Nigeria's priorities for the Great Green Wall Initiative. As such, a different set of evidence-based criteria will be established by northern states for their site interventions. The project's FPMU and Steering Committee will confirm readiness for implementation in the northern states (see Annex 3 on implementation arrangements).

Project Components

9. **The Project has four components:** (i) Erosion and Watershed Management Infrastructure Investments; (ii) Erosion and Watershed Management Institutions and Information Services; (iii) Climate Change Response; and (iv) Project Management.

Component 1: Erosion and Watershed Management Infrastructure Investments *(Total including contingencies is US$482.73M: IDA US$398.88M, GEF US$3.96M, SCCF US$3.13M, State Governments US$76.75M, implemented at state and community levels)*

10. This component aims to support on-the-ground interventions to reduce vulnerability to land degradation. The primary focus during early implementation will be on addressing gully erosion in southeastern Nigeria while northern states develop their site intervention approaches and designs (with support provided under the project for the ready states).

[18] Integrated watershed management provides a framework to integrate natural resource management with community livelihoods in a sustainable way. It addresses the issues of degradation of natural resources, soil erosion, landslides, floods, and other disaster risks, low agricultural productivity, biodiversity, poor water quantity and quality, and poor access to land and related resources from an integrated perspective.

11. *Approach.* A strategic combination approaches and technologies will be deployed to contribute to (i) stabilize erosion sites, and/or (ii) prevent emerging erosion problems early on when intervention costs are low. Accordingly, interventions will include structural, vegetative, and natural resource-based livelihood measures, coupled with sub-watershed planning where necessary. These interventions will generate important local, national, and global public goods related to ecosystem function, biodiversity, terrestrial carbon, climate adaptation, and erosion and siltation reduction. The component also supports disaster readiness activities for landslides and flooding.

12. Interventions will typically be at the sub-watershed level (averaging 400 hectares in a small sample of southern sites – northern watersheds are larger). The size of the sub-watersheds varies from perhaps one hundred hectares (ha) to several thousand ha or more, depending on the gully system targeted. This includes areas upstream from the gully and downstream sections, at least until the point of safe termination of the intervention, where the water flow will not cause further gully formation or major erosion. The actual gullies are from about 1 to 40 meters deep, and 2 to 50 meters wide, but in exceptional cases several hundred meters wide. They vary in length from about 10 meters to over 10 km. Many gullies find their origin in urban or semi-urban settings and along roads.

13. There will be three elements to the sub-watershed interventions: (i) structural measures to stabilize erosion problems, (ii) integrated sub-watershed planning and vegetative land management measures, such as establishing community soil and water conservation zones, and (iii) livelihoods to further incentivize communities to remain engaged in erosion management. This component necessarily brings together communities, engineers, foresters, agronomists, social scientists, and government officials to implement a comprehensive approach to stabilizing erosion sites and the broader sub-watershed. See Annex 8D for more details on the technical approach to gully stabilization in southern Nigeria.

14. Criteria for prioritizing intervention sites under Component 1 include:

- State of erosion (stable, slight, moderate, severe, or catastrophic);
- Size of affected population (disaggregated by poverty rate);
- Risk to human life;
- Risk to physical assets;
- Risk to natural assets;
- Replicability potential of the site;
- Readiness of the state to cover the cost of resettlement (if required); and
- No on-going competing intervention in the same sub-watershed.

After a site has been included in the strategic or "long" list, it will undergo more detailed site assessments, design development, and community consultations to enable the SPMU to establish a short list of sites that are ready for implementation.

15. **The component is organized in three sub-components:** (1.A) Gully Rapid Action and Slope Stabilization; (1.B) Integrated Watershed Management; and (1.C) Livelihoods. Component 1 will also refund the US$3M PPA.

Sub-component 1.A: Gully Rapid Action and Slope Stabilization (GRASS) *(Total US$416.99M: IDA US$340.24M, State government US$76.75M, implemented at state government level)*

16. The GRASS sub-component will finance activities to stabilize and rehabilitate major erosion-related sites and causes in the targeted states using both structural and vegetative

measures. GRASS could be used in emergency situations to control damage and stop immediate threats to lives, houses and critical infrastructure. At the same time, it plays the role of entry point into the local communities, to help secure their participation and ownership of the larger sub-watershed management planning, soil and water conservation, livelihoods and monitoring activities that will contribute to a durable solution. Additional structural engineering works that will be included in the overall sub-watershed management plan developed under Sub-Component 1.B will also be financed through the GRASS sub-component.

17. GRASS will finance a substantial amount of works. It is essential that the design of these works takes account of: (a) the size and characteristics of the upstream sub-watershed and expected peak-flows of appropriate return period, (b) economic importance of infrastructure, and (c) settlement patterns of people living adjacent to the gully banks, and (d) downstream characteristics of the watershed system and beneficiaries as well as the streambed, to determine the dimensions of drainage structures and related works required. The type and intensity of works will vary not only according to local landscape, soil, meteorological and hydrological features, but also according to setting: in urban and semi-urban areas; related to roads, pipelines, or other specific infrastructure; and in rural areas. High resolution spatial analysis (i.e., mapping) must be part of the plans.

18. ***Activity set 1.A.1:*** *Emergency and temporary stabilization of gullies and landslide management (Total US$201.90M: IDA US$170.20M, State government US$30.70M, implemented at state government level).* This activity aims to control damage and stop immediate threats, while gaining time for the planning and preparation of full-fledged integrated watershed management plan that will provide a more permanent and sustainable solution to the problem. It is essential that the design of these emergency works takes account of the size and characteristics of the upstream sub-watershed and design peak-flows, as well as downstream characteristics of the watershed system and beneficiaries as well as the streambed, to determine the dimensions of drainage structures and related works required. The type and scope of works will vary not only according to the local landscape, locally available construction material, soil, meteorological and hydrological features, but also according to setting: in urban and semi-urban areas; related to roads, pipelines, or other specific infrastructure; and in rural areas.

19. These works indicatively include: (i) upstream storm water retention and/or diversion structures, such as dikes, infiltration pits and retention ponds, roof rainwater harvesting, etc.; (ii) chute structures at gully heads, followed by a series of downstream gabion check dams; and (iii) in some cases, detour of roads and highways at the brink of collapse due to active gully expansion; this could also include bailey bridges if the possibility for detour is limited. Given the fragile nature of the soils, constructing these temporary structures requires a very careful community consultation, sound technical design, and close supervision to avoid further erosion particularly in areas where the dikes and detours are to be constructed.

20. This activity set will also refund the US$3M PPA.

21. ***Activity set 1.A.2:*** *Complementary structural erosion and water management works (Total US$184.99M: IDA US$138.94M, State government US$46.05M, implemented at state government level).* Works will be constructed based on the stipulations of an agreed upon full-fledged integrated watershed management plan (carried out under 1.B below). In the case of gully systems, the design of these works not only accounts for the sub-watershed area upstream of the gully head, but also the additional area that drains into the gully below the gully head, but upstream from the safe (water) disposal point. These works indicatively include: (i) soil and/or stone faced contour terraces and bunds; (ii) moisture retention

pits/infiltration ponds and trenches and water collection and storage structures; (iii) appropriate chute structure at gully heads; (iv) gully embankment protection retailing walls; (iv) gully reshaping, fill back and re-vegetation; (v) gabion, brushwood or stone check dams; (vi) energy dissipating stilling basins at the bottom of chutes and check dams; and (vii) downstream construction or rehabilitation of small scale irrigation infrastructure.

22. ***Activity set 1.A.3:*** *Preventive erosion management works (Total US$34.10M: IDA US$34.10M, implemented at state government level).* This activity will support additional preventive works where needed to be included in or added to planned road construction works, in particular where the mandate of the concerned Federal or State Ministry of Works is insufficient to do so itself. These preventive works include: (i) extending drainage channels to safe disposal points; and (ii) constructing check dams inside flood disposal gullies. Meanwhile, to reinforce prevention, Component 2 the Project will support land use and investment planning and monitoring among federal and state MDAs as well as local stakeholders.

23. For the three activity sets above under sub-component 1.A, IDA will finance works, goods, services, operating costs, and training.

Sub-component 1.B: Integrated Watershed Management *(Total US$36.06M: IDA US$32.10M, GEF US$3.96M, implemented at state government and community levels)*

24. This sub-component supports the participatory development of integrated watershed management plans and local investments for the wider sub-watershed surrounding the gully systems (or other erosion-affected areas) targeted by sub-component 1.A. By taking an integrated approach, the sub-component addresses degradation of natural resources and biodiversity, erosion, landslide and flood risks, low agricultural productivity, water quantity and quality, as well as access to land and related resources. The following activities are supported: (i) sensitization, mobilization and organization of communities to manage erosion and prevent disasters; (ii) preparation and implementation of integrated sub-watershed management plans and related technical guidelines and manuals including land and water management and disaster risk preparedness measures; and (iii) carrying out of specific subprojects for the identification, establishment and management of soil and water conservation zones, including implementation of associated land and water management practices, through the provision of sub-grants to eligible community organizations. The major structural works included in the sub-watershed management plans will be financed in sub-component 1.A. Sub-component 1.B will finance smaller-scale sustainable land management interventions, particularly those involving vegetative activities and conservation where appropriate. Livelihood improvement activities are financed in sub-component 1.C. This sub-component will be implemented at state level with full participation of communities and with the support of a highly qualified NGO operating at both the state and community levels; this approach is described below in sub-component 1.C.

25. ***Activity set 1.B.1:*** *Community sensitization, mobilization and organization (Total IDA US$14.07M, implemented at state government level).* This activity starts with the establishment of credibility of NEWMAP in the eyes of local communities affected by aggressive erosion. The damage control works under GRASS and prior consultations with communities during gully restoration design will serve as an entry point to establish this credibility in some areas. Further sensitization and mobilization of both upstream and downstream inhabitants in the whole sub-watershed will be led by the state NGO. In each sub-watershed selected for intervention, the NGO will station a resident liaison officer (with

expertise in community driven development) to ensure a constant field presence with communities. Activities to be supported include:

a. Facilitating the establishment and/or strengthening of a viable and legally registered NEWMAP Community Association with representation from all significant groups in the community including chiefs, opinion leaders, men, women, landless and the poor. In communities where existing local institutions can fulfill this role, they will be strengthened where necessary through appropriate training.[19] It is important that the local communities are well informed, empowered to undertake land-use planning and conservation measures, and that procedures and decision-making processes are fully transparent and gender-sensitive;

b. Training and equipping the Community Association to manage sub-grants under activity sets 1.B.3 and 1.C.2, and to participate in the activities of the broader Site Committee;

c. Facilitating the establishment of Community Interest Groups (if needed, depending on the site) under the Community Association. These Interest Groups would be organized around various work streams or topics as developed locally, but could include, for example: a disaster preparedness working group, a business skills group financed through sub-grants under sub-component 1.C.2 below, or a group to develop a community soil and water conservation zone financed through sub-grants under sub-component 1.B.3 below;

d. Recruiting and training a facilitator from the community to help organize and coordinate the different activities and strengthen the link with local government and project management. The facilitator will receive modest financial support as well as a mobile phone for communication;

e. Carrying out a sensitization campaign by planning and carrying out field visits and local study tours to other project sites, and carrying out general sensitization work (see Annex 11 on Communications) for community members and local leaders to develop awareness of possible erosion and watershed management actions and interventions and the community's role in durable solutions and beneficiary verification; and sensitization on resettlements and other safeguards issues in a manner understandable to local residents. See the Annex 12 on safeguards;

f. Implementing action-oriented environmental education by students and teachers. One possible thematic area would be to help students participate in broader monitoring work;

g. Once the above are underway, facilitate the Community Association to develop a Community Action Plan as an input into the integrated sub-watershed management plans to be developed by the Site Committee under activity set 1.B.2. This Community Action Plan will identify livelihoods activities, natural assets and hazards, delineate a community soil and water conservation zone (if relevant), and will include the proposed sub-projects eligible for sub-grants to the Community Association under activity sets 1.B.3 and 1.C.2, respectively; and

h. Carrying out other community mobilization activities as outlined in the PIM or that are advocated by the community themselves once they are engaged.

[19] If a community is already organized under the Bank-financed Fadama III operation, the Fadama Community Association (FCA) structure could be used.

26. In carrying out these activities, the NGO is expected to encourage gender equity in community organization and responsibilities, while balancing this goal against community preferences and gender roles for certain tasks. To the extent possible, community preferences and aspirations should be adhered to within the context and aims of the project intervention.

27. IDA will finance the SPMU to procure small works, goods, services, operating costs, and training.

28. ***Activity set 1.B.2:*** *Integrated sub-watershed management planning and monitoring (Total US$14.07M: IDA US$14.07M, implemented at state government level).* This activity set centers on a participatory approach combined with expert services, and includes:

a. Preparation of good practice technical guidelines and related field manuals (as appropriate) in local languages for the design, implementation and supervision of a typology of watershed/erosion works that will be financed under the GRASS sub-component 1.A. and/or below through community sub-grants under activity sets 1.B.3 and 1.C.2[20];

b. Preparation of a participatory and professional integrated sub-watershed management plan for each targeted sub-watershed that integrates, among others: the Community Action Plan developed above in activity set 1.B.1 by the community, a disaster contingency plan identifying major hazards, areas and infrastructure at risk as well as appropriate risk reduction measures, high quality mapping, and key locally appropriate indicators with baselines and targets (that are aggregated at SPMU level). The planning process will use high resolution maps from recent satellite imagery coupled with ground-truthing and beneficiary verification, and low cost airborne photo imagery if needed (using weather balloons and GPS enabled digital cameras to name one possible example). These maps are required for the work contracted under sub-component 1.A as SPMUs need them to plan site designs, and firms need them to carry out their work. These maps are also required for the Resettlement Action Plans, if any, and disaster preparedness planning. The planning process can also rely upon the social and environmental assessments carried out as part of safeguards due diligence (see Annex 12 on safeguards);

c. Training and implementation support for community interest groups to help them implement sustainable land and water management practices (such as small works, and goods such as seedlings);

d. Training and implementation support for community interest groups to form community-watch programs to monitor incipient gullies, landslide risk, check sheet erosion, remove solid waste from drainage, and monitor the work of engineering contractors secured by the SPMU under the GRASS subcomponent 1.A.;

[20] These works and practices are generally of a public goods nature. The main types are summarized in Annex 1, table 1.1. The works and practices include: Drainage canals, chute structures, check dams, usage of gabions, embankment protection retaining wall, earth works (re-shaping, back filling and compaction), rain water harvesting, moisture retention structures (pits, terraces, conservation tillage etc), access roads for construction, grass sodding of embankments, plantation of bamboos, elephant grass etc inside gullies, regeneration of vegetation cover such as forest, forestation and agro-forestry (orchards, multi-storey cropping, etc), cover crops, area closure from animal and human interference (to allow re-vegetation), gullies and embankment stabilization, geo-textiles, flood protection dikes and water management for productive use, and many others that are locally appropriate. Other technologies appropriate to northern interventions will be devised as the northern states ready their investment strategy.

(v) Development and application of local monitoring tools such as with GPS-enabled digital cameras combined with weather balloons (so-called "community satellites") or other simple technologies; and

29. These activities will rely upon the use of good information throughout the full process from planning to evaluation, including from remote sensing, agency and third-party monitoring, process monitoring, community monitoring and verification to improve planning, targeting, adaptive decision making, landslide risk reduction and contingency plans, and evaluation. Some of this information is currently available and other information will come on-line as Component 2 implements activities to modernize data and improve information access. There are also benefits related to transparency and governance with procurement and execution of works from having communities involved in monitoring.

30. IDA will finance the SPMU to procure small works, goods, services, operating costs, and training.

31. ***Activity set 1.B.3:*** *Community sub-grants for soil and water conservation zones (Total US$7.92M: GEF US$3.96M, IDA US$3.96M, implemented at community level).* This activity set, with incremental GEF support from its focal areas for biodiversity, land degradation and sustainable forest management, will provide sub-grants for eligible Community Associations in eligible sub-watersheds to identify, establish, maintain, and monitor soil and water conservation zones for spatially explicit areas with a biodiversity asset *or* a threatened community forest or sacred grove in the sub-watershed around an existing targeted gully system or other erosion problem. These sites will likely be rural or peri-urban although some urban sites could qualify in principle. The support will generate local livelihoods opportunities through, for example, economic trees for medicines, fodder, soil stability and fertility, firewood, building materials, and nutrition. Another example is on-farm soil conservation efforts such as no-tillage, which will contribute to reduce rill and sheet erosion. The support will also generate local and global environmental benefits by helping retain or expand tree cover which will also generate terrestrial carbon assets that could, at some future point, be monetized. By establishing these soil and water conservation zones and ensuring their continuation, communities will directly contribute to reducing erosion while securing sustainable access to natural wealth. An effort should be made to formalize the Community Soil and Water Conservation Zone through local by-laws and enforced by the community and local government. Some locales in Niger State have, for example, been successful in enforcing bush burning bans.

32. The NGO secured under activity sets 1.B.1 and 1.B.2 will work closely with the NEWMAP Technical Officer sitting at the LGA to provide technical services to and facilitate the Community Association to implement this sub-component. The NGO will not manage sub-grants for community sub-projects. Rather, these funds will be passed from the SPMU to the Community Association directly in tranches once the NGO has certified that the proposed sub-project is ready for implementation.

33. The GEF and IDA will jointly finance sub-grants provided to eligible Community Associations in eligible sub-watersheds to procure small works, goods, services, operating costs, and training under. Afforestation is not among the eligible sub-projects, as this technique cannot be supported by the GEF.

34. *Criteria for accessing the GEF support.* It is estimated that up to 30 intervention sites could benefit from the joint GEF/IDA support, with an initial maximum per targeted sub-watershed of US$250,000 in sub-grants. Demand for this support is expected to be high among the states, and greater than the total amount sub-grants available. Therefore, the

project, through a participatory consultative process, has devised a set of criteria to be applied in financing complementary community-led sub-projects. Any sub-grants under this activity set must meet each of the following criteria:

Criteria for accessing sub-grants for community soil and water conservation zones
The erosion site intervention is on a state's priority short list
The erosion site intervention designs are under preparation
The soil and water conservation zone will be part of the local sub-watershed plan for the approved intervention site, and includes a preliminary cost estimate for establishment and O&M
An endemic specie(s) of global importance has been identified (specify) in the local sub-watershed, **OR** a current or potential native forest asset has been identified in the local sub-watershed
The community has land access or use rights to the intended soil and water conservation zone, either individually or severally.
NEWMAP's SPMU confirms that the community(-ies) clearly demands the soil and water conservation zone and meets the criteria above.

35. *Monitoring of the soil and water conservation zones.* Each soil and water conservation zone financed through sub-grants should have locally appropriate indicators and activities to monitor and measure success. The endemic specie(s) (such as a bird or fish) and/or forest asset (such as a sacred grove) identified as part of the eligibility criteria should be specified and regularly counted and tracked. For example, an indicator species by micro-catchment could be identified at the onset of the activity and be monitored by communities and verified by the NGO during implementation and after completion of the activity. These indicator species differ dramatically from site to site and can be initially identified through expert analysis and community consultations. For example, benthic species in and along creeks, certain birds, worms, and so on could all be relevant to biodiversity below and above ground as well as broader ecosystem function. Likewise, activities to improve management of existing forests, forest fragments, and reforestation should contribute to building up carbon, which is also an ecosystem health indicator. These indicators will be reported in the broader NEWMAP M&E system and in the GEF tracking tools for land degradation, biodiversity, and sustainable forest management, which will need to be completed (by the NGO, NEWMAP Technical Officer, or SPMU) during mid-term and at project close.

36. *Sustainability.* Each soil and water conservation zone financed through sub-grants should be codified through by-laws and enforced by the community to help prevent, for example, bush burning. A community representative or interest group could be identified and trained, and equipped with phones and cameras and paid a small stipend to help monitor the soil and water conservation zones and report back to the community and the Community Association and Site Committee.

Sub-component 1.C: Livelihoods *(Total US$26.67M: IDA US$23.54M, SCCF US$3.13M, implemented at state government and community levels)*

37. This sub-component brings together livelihood alternatives and employment opportunities in the participating sub-watersheds, with a view to further incentivizing communities to participate in reducing environmental risks. There are three complementary activity sets that focus on (1.C.1) livelihoods identification support, (1.C.2) livelihoods sub-grants to Community Associations, and (1.C.3) household and community water harvesting.

38. *Implementation* of activity sets 1.C.1 and 1.C.3 is through the SPMU with support from the same NGO implementing sub-component 1.B. Implementation of activity set 1.C.2

is through community sub-projects managed by the relevant Community Association described above. More detail on the local implementation set up is in Annex 3 under Component 1 implementation.

39. Whether implemented by Community Associations, the NGO or a firm, all livelihoods activities supported under sub-component 1.C will be selected by communities themselves, guided by a list of potential activities, sensitization carried out under sub-component 1.B, and exposure visits to other project sites. However, sub-grants to Community Associations for community managed sub-projects will be provided only in activity set 1.C.2. The NGO will provide technical services to the Community Association as described earlier, and facilitate the overall process, backstopped by the NEWMAP Technical Officer at the respective LGA. As activities are selected, and groups and/or individuals develop appropriate plans, local trainers with expertise in specific livelihood activities will be retained for short periods to provide hands-on instruction for participants in how to develop the activity. While production and marketing cooperatives could be set up, most training will be aimed at the individual entrepreneur, small family businesses and local partnerships. The overall budget for livelihood improvement will necessarily be set by the SPMU with consideration of such factors as the size of the community, the number of people living in poverty and the degree of damage done to the community by erosion. Care will be taken to ensure that the community members identify beneficiaries most in need of livelihood support, for example those most affected by erosion, the poor, landless, disabled and female-headed households. Communities will be alerted to the risk of elite capture or allowing outsiders to usurp community members' positions in livelihood improvement activities. The community itself will be the principal monitor to verify that the investments and training go to those who most need it, backed up by processes developed by the NGO.

40. The NGO will not manage sub-grants for community sub-projects. Rather, these funds will be passed from the SPMU to the Community Association directly in tranches once the NGO has certified that the proposed sub-project is ready for implementation.

41. The basic model of livelihood assistance draws upon successful lessons implemented by the Bank-supported Fadama III project. Where Fadama is focused primarily on agricultural development, at the community level NEWMAP is addressing erosion problems such as gully stabilization and restoration, sub-watershed planning, implementation of soil and water conservation, and complementary livelihoods opportunities.

42. ***Activity set 1.C.1:*** *Livelihoods Identification and Preparation Support (Total US$6.35M: IDA US$6.35M, implemented at state government level).* This activity will finance the state-level NGO, through its technical staff, resident liaison/community officer, and the project's local community facilitator and NEWMAP Technical Officer in the LGA, to work closely with the Community Interest Groups (***established*** under sub-component 1.B.1 – community mobilization) that may wish to develop group activities. Community Interest Groups will be provided training in small business development and writing business plans, basic bookkeeping, banking, accessing commercial finance, and marketing. Study tours will be financed to other sites in the state (and neighboring states) to gain exposure on successful livelihood activities. The groups will also be assisted to identify potential opportunities for livelihood enhancement that could be financed through sub-grants to Community Associations under sub-component 1.C.2 below.

43. IDA will finance the SPMU to procure goods, services, operating costs, and training.

44. ***Activity set 1.C.2****: Livelihoods Sub-grants for Income, Skills and Employment Opportunities (Total US$14.06M: IDA US$14.06M, implemented at community level).* This

activity set provides sub-grants from the SPMU to Community Associations to implement community sub-projects selected by the Community Association and/or the Community Association's smaller Community Interest Groups. The community sub-projects will include: (1) those that generate income, and/or (2) those that provide technical skills that could lead to employment opportunities or new start-ups. The list of eligible activities will be detailed in the PIM and include: (a) geo-textile manufacturing from coconut/palm/crop residue and other materials; (b) gabion box making; (c) construction skill training on gabion box installation/erection and other masonry/concrete works for the affected communities to work on the project; (d) horticulture on reclaimed lands; (e) seedling and/or fruit tree nurseries, managed by women; (f) grasscutter, mushroom, and snail production; (g) planting/protection of moringa (*moringa olifera*) or other locally appropriate trees for soil stabilization, food products and other economic and environmental benefits; (h) beekeeping and honey production; (i) developing vetiver grass for use in gully stabilization; and (j) establishing small shops and providing associated skills training in the service sector, such as auto and small machine mechanics, food production and sale, specialized marketing facilities such as private warehouses and transport equipment. Skills for employment in local industries such as environmentally friendly rock quarrying, or sawmill operation, security-related activities depending on needs in local labor markets could also be taught.

45. Again, community demand will determine the specific options provided in area targeted site. The field NGOs will provide technical support Community Associations and targeted, smaller Community Interest Groups[21] to develop suitable, market driven livelihood options.

46. IDA will finance sub-grants to eligible Community Associations to procure small works, goods, services, operating costs, and training.

47. ***Activity Set 1.C.3.*** *Household and community water harvesting (Total US$6.26M: SCCF US$3.13M, IDA US$3.13M, implemented at state government level).* This activity set provides an added, tangible economic incentive to communities to get involved in erosion reduction and climate adaptation. The activity finances professional installation of cisterns and associated equipment to capture rainwater from a critical mass of households, schools, and churches in vulnerable communities in targeted sites threatened by erosion and where the community has mobilized under NEWMAP to act on erosion and who demand the technology.

48. If done on sufficient scale, this activity will reduce total runoff by up to 56,000m3 per year for a typical southern site, which represents a conservative figure of approximately 15% of total runoff per year per site, depending on the location of the community in the gully system's immediate catchment and the catchment characteristics, thereby helping prevent gully formation or expansion. This is important given that rainfall intensity in the south is projected to increase. Recent regional climate modeling suggests that extreme precipitation events will be more intense in Nigeria's southern basins in 2035-2060, by as much as 80% by 2060. Because run-off is multiplied by a factor of approximately two for each unit increase in rainfall, more widespread erosion and vulnerability to landslide is anticipated. The activity will finance the procurement of household rainwater harvesting cisterns and associated equipment for each household mobilized in a vulnerable sub-watershed to act on erosion.

49. This activity is naturally calibrated to urban and peri-urban settings, while activity set 1.B.2 is calibrated for rural and peri-urban settings. An estimated direct 34,000-49,000 people

[21] Possible selection criteria could be those people most affected most by gully erosion, the poorest in the community, and women.

could be reached, with many more beneficiaries from reduced downstream soil erosion. In addition, many villages and towns lack reliable water supplies especially during dry season and must resort to purchasing expensive water from tanker trucks. The water harvesting will thus have a positive benefit on household budgets. Below is a snapshot of the intervention:

- Targeted households per site: 350 on average (6.84 people per household)
- Cost of each household's water harvesting equipment and services: US$1333
- Average total cost per site: 466,000
- 14-20 sites could be reached

50. The SCCF and IDA will jointly finance the SPMU to procure small works, goods, services, operating costs, and training. Indicative costs and procurement categories are as follows:

- 60% goods (cisterns, gutters and drainage pipe, valves, etc)
- 40% services (design, supervision, labor for installation, training to communities for maintenance of structures, transport and other services)
- Maintenance and labor provided in-kind by community

51. *Criteria for accessing the SCCF funds.* The Site Committee will, in consultation with the Community Association, SPMU, NEWMAP Technical Officer, and supported by the NGO working in the community, make the case for accessing this support for their intervention site and include it in the proposed sub-watershed plan. The SPMU makes the decision for including the support in the site intervention. There is a maximum available of up to US$466,000 for each eligible intervention site. This support is integrated into the mainstream Component 1 activities of NEWMAP to help secure global environmental benefits from a subset of NEWMAP's site interventions Demand for this additional support is expected to be high among the states, and greater than the total amount of funding available. Therefore, the project, through a participatory consultative process, has devised a set of criteria to be applied. Any activities seeking support under this activity set must meet each of the following criteria:

Criteria for accessing resources for adaptive household and community water harvesting structures
1. The erosion site intervention is on a state's priority short list
2. The erosion site intervention designs are finalized and the social and environmental safeguards assessments are underway
3. Water harvesting structures are included in the site plan, with costs for installation, O&M
4. There must be an acute water supply shortage at household level (e.g. water supplies trucked in, for example) which cannot be readily met by alternative means.
5. At least 80% of community members in the targeted site express demand for the household water harvesting structures and commit to providing in-kind labor to **install** and **maintain**: (i) their own structures and (ii) the structures owned by their widowed, disabled, or elderly neighbors and female-headed households who do not have other means of installing or maintaining the structures themselves.
6. All roofs must be appropriate material that will not affect water quality (e.g., not made of asbestos for example) (*Note: The project will not upgrade roofs*)
7. NEWMAP's SPMU confirms that the community clearly demands the water harvesting structures and meets the criteria above.

Component 2: Erosion and Watershed Management Institutions and Information Services (Total including contingencies is US$39.70M: IDA US$38.20M, SCCF US$1.50M, implemented at FGN and state levels)

52. *The objective* is to strengthen the enabling environment and investment planning and readiness for effective implementation of erosion and watershed management. Effective implementation of Nigeria's transformation agenda requires transformations in institutional performance and information modernization. The component supports all three tiers of government and the private sector, but with a special focus on states, with the federal level serving primarily as facilitator, regulator, monitor, bench marker, information broker, and aggregator. It will contribute to a number of *outcomes* centered on enhanced capacities, modernization and coordination of relevant federal, state, and local institutions involved in planning, management, assessment, enforcement, and monitoring of watershed and erosion related activities and disaster risk management, from small sub-watersheds involving one or two LGAs to basin scale across states.

53. This component will contribute to government's efforts to transform institutional performance, focusing on actions that have not generally been done sufficiently by government in the past. These actions represent innovations for Nigeria. For example, this component will:

a. Provide tools and assessments, and capacity building for states and other actors to improve environmental engineering, site designs, land use and watershed planning and with this, clarifying investment parameters and options;

b. Contribute to potentially better performance of the Ecological Fund by providing replicable technical models and governance models (e.g., contracting, procurement, fiduciary reporting tools, etc) and an institutional assessment of the Ecological Fund Office;

c. Develop guidelines for improving road design and urban drainage and planning, and backing this up with multi-sector collaboration between roads ministries (poor road cross-drainage and urban drainage and planning are some main causes of erosion), the environment ministries and other MDAs;

d. Develop tools for improving regulatory oversight and EIA;

e. Put in place a strong capacity development program on technical and fiduciary topics to reinforce state and local implementation;

f. Carrying out an institutional assessment of and providing training for relevant agencies and the Ecological Fund Office, to help the government in its efforts to streamline the functions of the numerous agencies and institutions in the erosion and watershed sector of the country, to make them more effective and enhance service delivery;

g. Improve the information base, access to it, and the use of it to promote evidence-based planning, policy, and investment as well as lessons learned from abroad.

54. To reinforce good design and prioritization of investment, the component will contribute to enhancing the policy environment, data modernization, improved design and construction standards, development and application of analytical and monitoring tools, and watershed diagnostics. The component further includes provisions to train private and non-government entities in specific subject matters requiring capacity development, such as labor intensive construction methods of water and erosion control structures or natural resource management based enterprises. In addition, the component supports regional, south-south,

and domestic exposure visits for relevant actors at technical levels (domestic and international) and policy levels (largely domestic). Lastly, while NEWMAP targets priority interventions to rehabilitate and secure gully erosion and landslide affected areas, effective disaster risk reduction and preparedness will include the strengthening of institutions and capacities, support risk adverse planning processes and enable communities, local, state and federal government to be prepared and rapidly respond to natural disasters. This approach is not limited to landslide hazards, but addresses all natural hazards related to extreme rainfall events integrated in the project's watershed approach.

55. **The component is organized in four sub-components on effectiveness and services** of: (2.A) Federal MDAs; (2.B) State MDAs; (2.C) Local government and communities; and (2.D) Private and non-government sector.

Sub-component 2.A: Federal MDA Effectiveness and Investment Services for States *(Total US$24.34M: IDA US$24.34M, implemented at FGN level)*

56. ***Activity set 2.A.1****: Investment services (Total US$8.92M: IDA US$8.92M, implemented at FGN level).* This activity includes: (i) Establishment and operating costs for the Expert Advisory Services Pool (EASP). The EASP is a small quality control group. Its members, who can be international or national, will be deployed to states (or Federal MDAs) to address a range of technical project challenges as they arise, on an as-needed, short-term basis. The EASP will provide globally leading advisory services on GIS, hydrology, watershed planning, geotechnical and structural engineering (See Annex 3 on the EASP); and (ii) Provision of an international standard firm to secure and deliver environmental/geotechnical engineering and planning, training and technical design support to all NEWMAP states ready to prepare and finalize their site designs for financing under Component 1. The above work will include preparation of feasibility and complementary studies for scaling up the project to other parts of the country.

57. IDA will finance services, operating costs, and training.

58. ***Activity set 2.A.2****: Strengthening technical services and effectiveness of the Department of Erosion, Flood and Coastal Zone Management of the FME (FME/DEFCZM) (Total US$2.26M: IDA US$2.26M, implemented at FGN level).* This activity includes: (i) annual training including study tours and twining arrangements for federal and state actors in the project; (ii) strengthening the existing GIS center under the Flood Monitoring and Control Division; and (iii) establishing a comprehensive, interactive, and continuously updated atlas and database for all gullies and monitoring of active gullies which will be linked to the project's M&E and linked Spatial Knowledge MIS, and (iv) preparation of standard country specific guidelines for the design of gully control structures in Nigeria to successfully cope with gully erosion. The standard design will contain simple technical guidelines and developed based on the "Good Practice Guidance Note" and practical experience in Nigeria and lessons learned from other parts of Africa.

59. IDA will finance goods, services, operating costs, and training.

60. ***Activity set 2.A.3****: Strengthening technical effectiveness of the EA Department (Total US$4.37M: IDA US$4.37M, implemented at FGN level).* This activity includes: (i) developing sector-specific guidelines on road construction and urban development related to drainage and erosion management; (ii) securing additional external EIA experts and advisory services related to erosion and watershed topics in geotechnical and civil engineering and hydrology*;* and (iii) facilities improvements including computerizing EIA processes and digitizing databases, improving the building, and communications. This activity set will

build on the Bank-financed Nigeria Electricity and Gas Improvement project which is providing support to the EIA Division, and will not duplicate efforts.

61. IDA will finance goods, services, operating costs, and training.

62. ***Activity set 2.A.4****: Strengthening the monitoring and enforcement effectiveness of NESREA (Total US$0.11M: IDA US$0.11M, implemented at FGN level).* This activity includes training opportunities on erosion and watershed monitoring and enforcement approaches, especially concerning roads, urban development and land use planning.

63. IDA will finance services, operating costs, and training.

64. ***Activity set 2.A.5****: Strengthening effectiveness of the National Emergency Management Agency (NEMA) (Total US$0.45M: IDA US$0.45M, implemented at FGN level).* This activity includes (i) strengthening regulatory capacity to provide advocacy, legal and institutional support of SEMAs and disaster risk management platforms, and (ii) strengthening the agency's oversight for risk assessments, early warning, contingency planning, and support for effective response and cooperation between different tiers of government in case of landslides and floods.

65. IDA will finance goods, services, operating costs, and training.

66. ***Activity set 2.A.6****: Erosion and Watershed Resource Network for Knowledge and Monitoring (Total US$7.00M: IDA US$7.00M, implemented at FGN level with state participation).* This set of activities will support a transformation toward evidence-based investment and policy. As such this activity set will establish and strengthen an investment- and action-oriented knowledge network and associated tools across institutional, geographic and disciplinary boundaries. This approach will connect relevant government MDAs (at all levels) and targeted academic institutions to collaborate on investment-oriented knowledge and strengthen the ability of stakeholders to gather, process, and use data and information. This will be accomplished through the use of advanced analytical and spatial tools, coupled with customized management information systems and infrastructure innovation fora that, taken together can help plan and monitor investment on the ground throughout Nigeria. The M&E and impact evaluation work under Component 4 will feed back into this knowledge platform.

67. For each of the three detailed activities below, IDA will finance goods, services, operating costs, small works, and training.

68. A number of actors are key information stakeholders, including: the Erosion Institute at the Federal University of Technology, Owerri (FUTO), nearly all FME departments, National Technical Sustainable Land Management Committee (FMARD which chairs, FME, FMWR, NIMET, etc), the Nigeria Integrated Water Resources Management Commission (NIWRMC, of FMWR); Nigeria Hydrological Services Agency (NIHSA, of FMWR), NESREA and NEMA, NESREA, FMARD, Academic organizations and units, Nigeria National Space Research and Development Agency (NASRDA), research institutes, etc.

69. (2.A.6.1) <u>Spatial Knowledge MIS and monitoring tools</u> (led by FME in partnership with all key MDAs and states). This activity will support the systematic mapping and monitoring of erosion and watersheds throughout Nigeria, starting with the initial states and basins of investment focus under NEWMAP. More specifically this activity will finance the development of: (i) the Spatial Knowledge MIS itself (software, services, mapping, and training) that will integrate existing information as well as new information resulting from the HydroMet system (mentioned above) and the following tools; (ii) a GIS-based atlas of major gullies and associated watersheds including an early warning system for landslide and flood risk; (iii) use of high-resolution satellite imagery, overhead digital photography (such as by

using low-cost drones or weather balloons, for example) at specific intervention sites, and other surveys to track and map gullies and monitor change; (iv) land degradation analysis and mapping; (v) support for crowd-sourcing of information (via cell phones) about erosion and water flows to improve mapping, targeting and monitoring of investments; (vi) assessments and tools to gauge and track watershed and ecosystem functions, including land degradation, biodiversity, terrestrial carbon and water flows;[22] and (vii) identification of areas and infrastructure at risk from critical gullies and erosion-prone watersheds. These activities will allow the FME and its partners in NEWMAP to compile and disseminate information and strengthen the national repository of such information, improving relevant information in the public domain, and in promoting knowledge networking.

70. This work will be linked to the on-going work financed by Fadama III and involving FMARD, FME, FMWR, NIMET, and others, to modernize and disseminate the knowledge base on SLM nationwide through the government's National Technical SLM Committee.

71. NASRDA is the government repository for all satellite imagery covering Nigeria and has recently launched two earth observation satellites with 2.5 and 5m resolution, respectively. NASRDA will provide free open data on space-based derived information, such as land use land cover, soil moisture, NDVI or another refractive index, for project sites. In addition to providing imagery on investment sites, NASRDA will be involved in data collection, processing, and analysis for one of the main PDO indicators for the project: change in vegetation cover in targeted sub-watersheds – in partnership with other MDAs, service providers, and actors. NASRDA can also provide more detailed data analysis and training to partner agencies on GIS and remote sensing.

72. (2.A.6.2) The Hydro-met System (led by NIHSA in partnership with all key MDAs and states) will be improved to provide real-time data (e.g. with GSM or other low-cost telemetry) hydro-meteorological systems (e.g. precipitation, river stage/ flow gauges, and water quality/turbidity measurement) in targeted locations. This will be done with a view to modernize and expand the density of the network and promote public domain access and use. It will be accompanied by groundwater data collection, and capacity building in collating, analyzing, visualizing, communicating, and using such information. In this regard, support will be provided to set up or strengthen operational control rooms to visualize this information on-demand in a customizable manner at NIHSA (Federal and two Zonal offices in the southern basins), who will work with their partner agencies (NIWRMC, RBDAs, NIMET, NEMA, and the State Emergency Management Agencies). The support will also improve meteorological and hydrological forecasts (merging gauge and satellite data and community monitoring), and communication (e.g. with SMS servers, improved e-mail bulletins, modern social and traditional media use, websites, cell phones, etc.). The activity will finance goods, services, small civil works for installation of data collection platforms (e.g., Sutron Meteosat), current meters and sediment samplers for surface water monitoring. This will be complemented by groundwater monitoring including drilling of monitoring boreholes, exploratory boreholes and tubewells, for groundwater data collection, and lastly, associated training and information dissemination using web, print and communication

[22] Additional physical impact indicators that are not directly attributable to the project will be included in the broader M&E system, given the large numbers of variables outside the project's direct span of control. These indicators will support the project's efforts to better understand the complex gully and watershed dynamics and improve project interventions during project implementation. These indicators will inform the project's Impact Evaluation, the project's knowledge base, and scientific capacity building. These indicators could include, for example:

- Changes in gully system size, volume and boundaries in targeted areas under the Project
- Reduction rate of turbidity at gully outlet in targeted areas under the Project (%)
- Reduction rate of siltation in targeted erosion-affected sub-watersheds under the Project (%)
- Estimated (modeled) terrestrial carbon accumulated in targeted areas under the Project (tons CO2e)

equipment. As part of NEWMAP's emphasis on information transformation, all data resulting from the HydroMet system will be made freely available in published and digital form on the web.

73. (2.A.6.3) Fora on Infrastructure, Investment, and Innovation (led by FME) will support activities to harness and diffuse innovations and latest and best practice on erosion management, including civil engineering, vegetative land management interventions, and monitoring. These for a will include relevant actors from all levels, including MDAs, academia, professional societies, NGOs, and the private sector. Efforts will also be made to tap into the private sector, various Nigerian and other public institutions for innovative ideas to address erosion in Nigeria, by facilitating: (i) a Development marketplace for innovative ideas, and (ii) an Annual International Forum on Erosion and Watershed Investment and Innovation.

74. ***Activity set 2.A.7****: Basin and Watershed Planning (Total US$0.46M: IDA US$0.46M, implemented at FGN level, led by NIWRMC).* This activity will support the overall planning of selected river basins, to improve land and water management and erosion reduction. In particular, this activity wills support NIWRMC to work closely with states to (i) Generate catchment management plans for watersheds in the Eastern Littoral Area (i.e., Hydrological Area VII – Imo-Anambra and Cross River basins), which will involve carrying out a water resources audit and extensive stakeholder consultations to establish a basin vision and prioritize actions on investment (including erosion reduction), institutions, and information, (ii) Operational costs, training, and equipment to the Eastern Littoral Catchment Management Office in Abakaliki, Ebonyi state, and (iii) Training support for the NIWRMC and Catchment Offices on watershed management, data management, GIS and remote sensing, as well as study tours and trans-boundary planning to support state-state coordination. This activity will be coordinated with ongoing international and national support to various basin planning and capacity building efforts, especially in Cross River and the north.

75. IDA will finance goods, services, operating costs, and training.

76. ***Activity set 2.A.8:*** *Strengthening Effectiveness for Managing Environmental and Social Impacts from Federal Roads (Total US$0.27M: IDA US$0.27M, implemented at FGN level, led by FMW in collaboration with FME and states).* This activity includes: development of tools that could help the government make changes in the way in which federal roads' cross drainage is regulated, designed, approved, budgeted, constructed and maintained, with a view to reduce and prevent gully formation. For example, at present, the Federal Ministry of Works (FMW) is not authorized to construct appropriate drainage systems beyond a distance of 20 meters from the road, while in practice such systems should often extend much further, down to a safe water disposal point. This is a major cause of gully formation, and eventually may sever the road itself, as happened in 2012 near Onitsha. The FMW, states and the FME plan to work together on this issue, as current institutional fragmentation interferes with sustainable solutions. The project's joint annual work programming approach will help remedy this situation, and this sub-component will help by providing tools and approaches to underpin joint dialogue and planning. This activity will finance the production of "soil-smart" guidelines for roads and drainage in collaboration with state level counterparts, and associated training and services to put the guidelines into use at relevant ministries at federal and state levels, as well as follow-up monitoring.

77. IDA will finance goods, services, operating costs, and training.

78. ***Activity set 2.A.9:*** *Cross-cutting Public Investment Management (Total US$0.50M: IDA US$0.50M, implemented at FGN level, under oversight of FMF and NPC, and*

contracted to independent entities). This activity set will support innovations in public investment management related to erosion management investment and improved governance, including: (i) Carrying out an institutional assessment of relevant agencies and the Ecological Fund Office, to help the government in its efforts to streamline the functions of the numerous agencies and institutions in erosion and watershed management of the country, to make them more effective and enhance service delivery; (ii) developing a framework for and carrying out capacity building on public investment management for key agencies like the Ecological Fund Office and Ecological Offices in the participating states; and (iii) Strengthening the skills and capacity for audit and expenditure tracking at the sector relevant MDAs, including the Ecological Fund of the Federation and Ecological Offices in the participating states.

79. IDA will finance goods, services, operating costs, and training.

Sub-component 2.B: State MDA Effectiveness and Services *(Total US$13.34M: IDA US$11.84M, SCCF US$1.50M, implemented at state government level)*

80. Because states have primary responsibility for land allocation and management, they have primary responsibility in NEWMAP for site interventions financed under Component 1 and land-use planning. It is critical that states participate in a continual process of institutional strengthening and investment-oriented planning and learning across states and stakeholders. The activities below are designed to address this need, thereby underpinning the sustainability of NEWMAP's investment approach and setting the stage for further investment action.

81. ***Activity set 2.B.1:*** *Investment Development Support on Erosion and Watershed Management (Total US$10.65M: IDA US$10.65M, implemented at state government level, led by relevant State Ministry of Environment).* This activity includes: provision of one lead environmental engineer/planner based in each state, annual engineering/planning training events (one in the north and one in the south), and goods for state governments to carry out erosion and watershed investment planning to a high standard of quality during NEWMAP and after. States engaging in this activity set will be reinforced by the Expert Advisory Services Pool financed under Component 2A at federal level who will be deployed to states to provide the training, feedback, and reviews of state designs. This activity set will also link to Component 1 which will finance development of site-specific designs, feasibility studies and related assessments, and supervision along with the expertise needed for these.

82. IDA will finance goods, services, operating costs, and training.

83. ***Activity set 2.B.2:*** *Urban Stormwater Drainage Management Planning (Total US$1.50M: SCCF US$1.50M, implemented at State Government level).* This activity set will provide tools to support the modernization of city development plans, particularly focusing on effective management of stormwater (to appropriate design standards), stabilization/rehabilitation of urban gullies (many of which are priority sites), and land use zoning and city development planning to reduce further stress on land erosion. Benin City has, with the services from a South African firm, independently developed a storm water master plan that could be replicated in other cities in the project area depending on state and city interest and readiness to participate in NEWMAP.

84. This activity set will help cities in the project area adapt to climate variability and change by preventing gully formation -- via promotion of more rational drainage works that can accommodate the projected increased rainfall intensities in the project area. The SCCF will support development of 1-2 urban stormwater master plans, covering an estimated 5-10

million people, starting in the city of Onitsha, Anambra state, which is one of West Africa's largest trading center, and highly exposed to erosion. These plans will include, among others, identified investment priorities to reduce formation or recurrence of gullies. Priorities will include a mix of current and future road projects and cross drainage, urban drainage projects, as well as improved zoning such as to avoid building in flood plains or areas prone to landslides. In this way, this intervention complements and influences the hard investments under sub-component 1.A above and directly influences site intervention designs in urban and peri-urban settings.

85. The SCCF will finance goods, services, and operating costs.

86. ***Activity set 2.B.3:*** *Strengthening Effectiveness for Managing Environmental and Social Impacts in State Roads and Urban MDAs (Total US$0.28M: IDA US$0.28M, implemented at state government level, led by relevant state MDAs responsible for works and urban development*). This activity set will provide and apply tools that could support changes in the way in which state roads' cross drainage and urban development are regulated, designed, approved, budgeted, constructed and maintained, with a view to reduce and prevent gully formation. The state MDAs responsible for works, urban development, and environment will work together operationally on this issue, in cooperation with their federal level counterparts. The activity set will finance training and services to develop and put the aforementioned national "soil-smart" guidelines for road construction and urban drainage (see activity set 2.A.2) into use at state and local levels.

87. IDA will finance goods, services, training and operating costs.

88. ***Activity set 2.B.4:*** *Strengthening State and Local Preparedness on Disaster Risk Management (Total US$0.91M: IDA US$0.91M, implemented at state government level, led by relevant state MDAs responsible for disaster risk management.*). This activity set focuses on the institutional strengthening of disaster risk management authorities (SEMAs) including advocacy, legal and institutional support, risk assessments, early warning systems (integrated with the project's Spatial Knowledge MIS), contingency planning, and support for effective response and cooperation between different levels in case of disasters. While the states will be in the lead to ensure effective disaster risk management, it relies on the involvement of many stakeholders including the federal level, civil society, volunteers, the private sector, the media and scientific community. Activities will be tailored to the specific needs of the states. The involvement of the federal level (NEMA) and key experts will ensure that appropriate national and international standards and procedures are met. Activities include:

- Conduct risk assessment and establish early warning systems for landslides, other geo-hazards and floods in priority areas, building upon activity set 2.A.5 (Knowledge MIS) to get a comprehensive overview of risks in the states.
- Conduct community awareness campaigns to inform about disaster risks and stimulate risk-averse behavior.

89. IDA will finance goods, services, training and operating costs.

Sub-component 2.C: Effectiveness and Services of Local Government Areas *(Total US$1.09M: IDA US$1.09M, implemented at state government level, led by State Environment Ministry, working closely with relevant LGA staff through the NEWMAP Technical Officer*).

90. Under this sub-component, additional technical assistance will be provided on key issues to help sustain O&M for site interventions in specific targeted sub-watersheds treated under NEWMAP component 1. Key areas of action include improving the effectiveness of LGAs to provide services and extension to communities in solid waste removal, vegetative

and structural land/water management measures. In addition, LGAs will be sensitized on civil engineering approaches, spatial planning, disaster preparedness, social accountability, and livelihoods work supported under NEWMAP. To save costs, training will be consolidated among LGAs at state levels; training will be managed by the SPMU.

91. IDA will finance goods, services, training and operating costs.

Sub-component 2.D: Private and Non-Government Sector Institutions and Services *(Total US$0.93M: IDA US$0.93M, implemented at FGN level by FME)*

92. Contractors and/or NGOs may be short of understanding, experience and capacity to deliver services or tender for contracts along the lines of NEWMAP expectations. Therefore the project includes a training provision for contractors and other non-government entities that can be used as the need emerges. Such needs are likely to include: (i) labor intensive works; (ii) manufacture and installation of geo-textiles and gabion boxes; (iii) water harvesting and storage from rooftops; and (iv) natural resource management based enterprises. In addition, these contractors and NGOs will participate in events supported under sub-component 2.A).

93. IDA will finance goods, services, training and operating costs.

Component 3: Climate Change Response (Total including contingencies is US$30M: IDA US$30M, implemented at FGN level)

94. Climate variability and change might affect Nigeria's ability to fully achieve its development aspirations, particularly in light of impacts on land and water resources, agriculture, livestock, and coastal zone development. At the same time, Nigeria has a significant potential to contribute to global efforts to mitigate climate change. With the right combination of better knowledge, enhanced governance of climate-related policies, and international funding for climate action, Nigeria could make its development more climate-resilient; and could pursue a range of win-win options (in the power, oil/ gas, agriculture, forest and transport sectors) to reduce emissions while at the same time spurring growth. As such, NEWMAP includes a dedicated component aimed at assisting the country to address the broader climate change agenda

95. *The objective* of this component is to strengthen Nigeria's capacity to promote low carbon, climate resilient development. Outcomes focus on providing tools and approaches for government to become better equipped to respond to climate change; and on supporting demonstration projects on the ground to test the viability and scaling-up potential of low-carbon development options.

96. *Activities* to be financed under this component will consist of small civil works/goods for the implementation of demonstration activities, as well as the necessary complementary technical assistance to be delivered through consulting services, and goods (e.g. IT equipment, software) and workshops to disseminate knowledge. Eligibility and priority criteria for financing demonstration activities, acceptable to the World Bank, will be included in the PIM.

Sub-component 3.A: Strengthening the strategic policy and institutional framework *(total US$5M: IDA US$5M, Implemented at FGN level)*

97. This sub-component will include actions aimed at strengthening Nigeria's overall governance framework for climate action, possibly including support to the National Climate

Change Commission, a statutory body which has recently been established through a bill approved by the National Assembly (awaiting presidential endorsement to be turned into law).

98. *Activity set 3.A.1, Framework for climate action across sectors (US$1M).* This activity set will strengthen the ability of the Federal Government to:

- Collect, analyze, and act upon, data and information on climate risks and low carbon development;
- Integrate climate considerations into policies and development planning; and
- Mobilize national and international resources for climate action.

99. IDA will finance goods, services, training and operating costs.

100. *Activity set 3.A.2, Capacity strengthening in selected sectors (US$4M).* In addition to supporting a strategic framework for climate action across sectors, the project will also help strengthen the capacity of federal institutions in key climate vulnerable sectors to deliver adaptive design and implementation of development activities. The areas of support under this activity set include (to be specified in further details as part of the annual work plan preparation process):

a. Technical assistance to consolidate and harmonize policies and legislation related to water resources management, as a pre-requisite for organic and effective integration of climate change considerations into sector planning and development;

b. Strengthening capacity of water sector institutions (at headquarters and river basin level) to design and implement climate-resilient water management projects, including through the development of guidelines (containing design criteria to enhance the reliability of water storage infrastructure under wider precipitation swings); and upgrading – in terms of facilities and human skills – of climate change information and analysis systems;

c. Development of planning tools (e.g. a climate smart agriculture atlas) to define and prioritize, across space and crops, opportunities for adopting “triple-win” agricultural options (higher yields, higher climate resilience, reduced carbon emissions). Priority options to be analyzed include improved seed variety, change in seeding dates, minimum tillage, natural regeneration and agroforestry, grazing land management regimes such as rotational grazing, integrated soil fertility management, and rainwater harvesting (which could be financed under Component 1);

d. Targeted support to Nigeria’s agriculture research system, to develop crop and livestock management practices listed above that are aimed at enhancing resilience of smallholder farming systems;

e. Technical assistance to farmer organizations to enable trading, in the voluntary/compliance markets, of carbon assets (e.g. soil carbon) developed as a result of the implementation of climate-smart agriculture activities; and

f. Feasibility studies for financial instruments aimed at reducing/managing weather related risks to agriculture (including Weather Index Crop Insurance).

101. IDA will finance small works, goods, services, training and operating costs.

Sub-component 3.B: Promoting Low Carbon Development *(Total US$25M: IDA US$25M, implemented at FGN level)*

102. The transition to a lower-emission growth path requires a policy and regulatory framework providing adequate knowledge and incentives to combine the rapid expansion of energy supply that Nigeria needs to spur growth, with a more diversified fuel mix and thus reduced emissions. Experimentation with rapidly evolving renewable energy technologies is also needed, to ensure that these are viable in the context of Nigeria.

103. *Activity set 3.B.1, Enabling framework for the development of renewable energy (US$1.5M).* This activity set will finance technical assistance needed to help develop an incentive framework for private sector investment; and, building on relevant work from the Nigerian Electricity Regulatory Commission (NERC), to upgrade the regulatory environment, including development of feed-in agreements for small and medium scale renewable production.

104. IDA will finance goods, services, training and operating costs.

105. *Activity set 3.B.2, support to large-scale renewable energy (US$6.5M).* Nigeria is endowed with vast, and virtually untapped, reservoirs of renewable energy (particularly solar and wind in the North), which could lead to the deployment of large scale, grid-based systems, complementing already established energy sources such as natural gas and hydro-power. While exploitation of these opportunities at scale is likely to be a medium to long-term process, there are a number of activities that could be undertaken in the short term to move the agenda forward. These include:

a. Studies and assessments to better characterize the overall potential for renewable energy development, including, but not limited to:
   - Upgrading of on-shore wind maps
   - Studies on off-shore wind potential

b. Scoping, pre-feasibility and feasibility studies for specific larger scale renewable energy projects, including, but not limited to:
   - Concentrated solar power plants (up to 100MW)
   - Wind power pilot plants (up to 100 MW)

106. IDA will finance small works, goods, services, training and operating costs.

107. *Activity set 3.B.3, Promoting energy access in rural areas through low carbon solutions (US$17.0M).* In parallel to the creation of an enabling environment for larger scale, grid-based renewable energy, the project will support a number of activities aimed at facilitating access to power and energy in rural areas that are unlikely to be reached by the grid in the foreseeable future. These activities will include:

a. A spatial baseline facility survey, in selected LGAs), of electricity infrastructure, and projected demand from main user, to optimize the planning of low-carbon power supply options;

b. Demonstration projects (including the necessary pre-feasibility/feasibility studies) on low-carbon off-grid/ mini-grid options. These demonstration projects would test various packages of technologies (e.g. wind/ diesel/ solar hybrid systems) and operational solutions to deliver power in rural areas; and

c. Promotion of efficient and improved woodstoves among selected rural communities to reduce pressure on forested areas and improve energy use.

108. IDA will finance small works, goods, services, training and operating costs.

Component 4: Project Management (Total including contingencies is US$106.16M: IDA US$32.92M, FGN US$64.85M, State governments US$8.40M, implemented at FGN and state government levels)

109. This component aims to ensure efficient and timely delivery of project resources in accordance with the project's objectives. The component will provide funds for: (a) project management and coordination at federal and state levels, including procurement and financial management; (b) social and environmental safeguards management and oversight; (c) strategic project communication and documentation; (d) project M&E, including two Mid-Term Reviews; and (e) impact evaluation. Impact evaluation will examine the causal impact of the project and its interventions on key outcomes. M&E and impact evaluation information will be used to reinforce and help build a multi-state learning platform on erosion and watersheds and inform adaptive project management and improvement of next-generation site intervention designs that can be replicated inside and outside the project. See Annex 3 for more details on project implementation, including detailed approaches for safeguards, M&E and impact evaluation. A procurement consultancy and a third-party M&E consultancy will support this component.

Sub-component 4.A. Federal project management *(Total US$78.38M: IDA US$13.53M, FGN US$64.85M, implemented at FGN level)*

110. *Project management and coordination at federal level.* This activity supports the establishment and operating cost of the FPMU. The FPMU will be reinforced by three consultancies at the highest standards available: (i) a procurement consultancy, (ii) a third-party M&E consultancy whose main role will be to collect, analyze and disseminate lessons coming out of the different states during implementation, and (iii) a civil engineering and design consultancy (funded under Component 2) to reinforce all participating states' efforts to develop and supervise sustainable site designs.

111. *Social and environmental safeguards.* This activity includes management, implementation and supervision of safeguards at federal level, including audits. See Annex 12.

112. *Strategic project communications*. This activity focuses on strategic project-wide communications activities that cut across most aspects of project implementation. See Annex 11.

113. *Impact evaluation.* The project's M&E arrangements include a rigorous impact evaluation to identify the success factors for erosion investments in a small sample of southern and northern sites. This will strengthen the ability of the government to know what approaches are working best and under which conditions, and will quantify a set of local benefits. See Annex 3.

114. *M&E implementation.* The project's M&E implementation arrangements rest upon a mixed set of responsibilities that balance ownership of M&E and improvement of government systems and capacities with independent verification and impact evaluation. The system will function through a combination of an external third party entity, M&E units at the federal and state levels, and community-level M&E. Data collection for M&E and the impact evaluation are unified under the budget for M&E financed under Component 4. The impact evaluation will not have a parallel implementation track. Component 4 will provide support

for competitively contracting a third party entity for M&E activities and will also cover, at minimum, the data collection for the impact evaluation. This entity will be competitively procured by the FPMU yet will be responsible for working closely with state governments and their SPMUs including all staff and in particular the M&E officer and technical experts in each SPMU. It will also work closely with NPC and FMF. See Annex 3.

115. IDA will finance goods, services, training, and operating costs. Credit proceeds cannot be used to fund salaries or bonuses of civil servants.

Sub-component 4.B. State project management *(Total US$27.79M: IDA US$19.39M, State Government US$8.40M, implemented at state government level)*

116. *Project management and coordination at state level*. This activity supports the establishment and operating cost of each State PMU.

117. *Social and environmental safeguards.* This activity will finance management, implementation and supervision of safeguards at State level. See Annex 12.

118. *Strategic project communications*. This activity focuses on strategic project-wide communications activities that cut across most aspects of project implementation, and is further described in Annex 11.

119. *M&E implementation:* Each State PMU will have an M&E officer who acts as liaison between state and federal levels. This person will work closely with the third party M&E entity to be secured at federal level to help ensure cross-state consistency, learning and benchmarking, and participate in the impact evaluation if relevant. See Annex 3.

120. IDA will finance goods, services, training, and operating costs. Credit proceeds cannot be used to fund salaries or bonuses of civil servants.

Annex 3: Implementation Arrangements

NIGERIA: Nigeria Erosion and Watershed Management Project

1. This Annex has four parts: (i) Project administration mechanism including institutional and implementation arrangements, (ii) Financial management, disbursement and procurement, (iii) M&E including impact evaluation, and (iv) Role of partners.

I. PROJECT ADMINISTRATION MECHANISM

Institutional and Implementation Arrangements

2. NEWMAP is designed to support the country's transformation agenda to achieve greater environmental and economic security, and is therefore multi-sectoral. The Project will address severe erosion problems in the short term, reduce vulnerability to soil erosion and climate variability in the medium term, and promote long term climate resilient development, and throughout strengthen natural resource management and livelihoods. To address these issues, NEWMAP will take a comprehensive watershed management approach and will specifically address the interlinked challenges of poverty, erosion, ecosystem services, climate change, disaster risk management, institutional capacity and governance.

3. *The project is multi-sectoral, necessarily involving many federal and state Ministries, Departments and Agencies (MDAs), local governments, communities, and civil society.* Effective implementation therefore requires inter-ministerial and inter-state coordination, collaboration, and information sharing (see Figures 3.1 and 3.2 below). Each component, sub-component and activity will be implemented through relevant federal and state MDAs, relying upon a robust annual joint work programming process facilitated by the respective Project Management Unit (PMU) – one at federal level and one for each participating state. 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 watershed/basin regulation.[23] Most of the project's investments will occur at state level, as states have primary responsibility for land management and land allocations. In general, the federal level project structure will reinforce the state level structures by, for example, providing engineering and watershed management expertise, monitoring tools, and benchmarking performance.

4. The Federal Ministry of Environment (FME) is the lead implementing agency. However, given the multi-sectoral nature of the project it was agreed that overall project coordination will be carried out by a multi-sectoral Federal Project Management Unit (FPMU) hosted by FME. The FPMU is headed by a Federal Coordinator, staffed with a broad range of expertise, and supplemented by secondments from relevant MDAs. Because the skills and technologies required are not fully available in MDAs, the FPMU will be reinforced by three consultancies at the highest standards available: (i) a civil engineering and design consultancy, (ii) a procurement consultancy, and (iii) a third-party M&E consultancy whose main role will be to collect, analyze and disseminate lessons coming out of the different states during implementation. Each component, sub-component and discrete activity set will be implemented through relevant federal and state MDAs working with federal and SPMUs (housed in the respective environment ministries) that carry out the administrative oversight. **The states will be at the heart of project implementation, with the federal level**

[23] Such as the Nigeria Hydrological Services Agency (NIHSA), Nigeria Integrated Water Resources Management Commission (NIWRMC); Nigeria Meteorological Agency (NIMET), and Nigeria Environmental Standards and Regulation Agency (NESREA).

reinforcing the state level. For an example of state level implementation see Figure 3.2 below. Similar arrangements are spelled out for each state in the PIM.

Figure 3.1. NEWMAP institutional arrangements: collaborative relationships

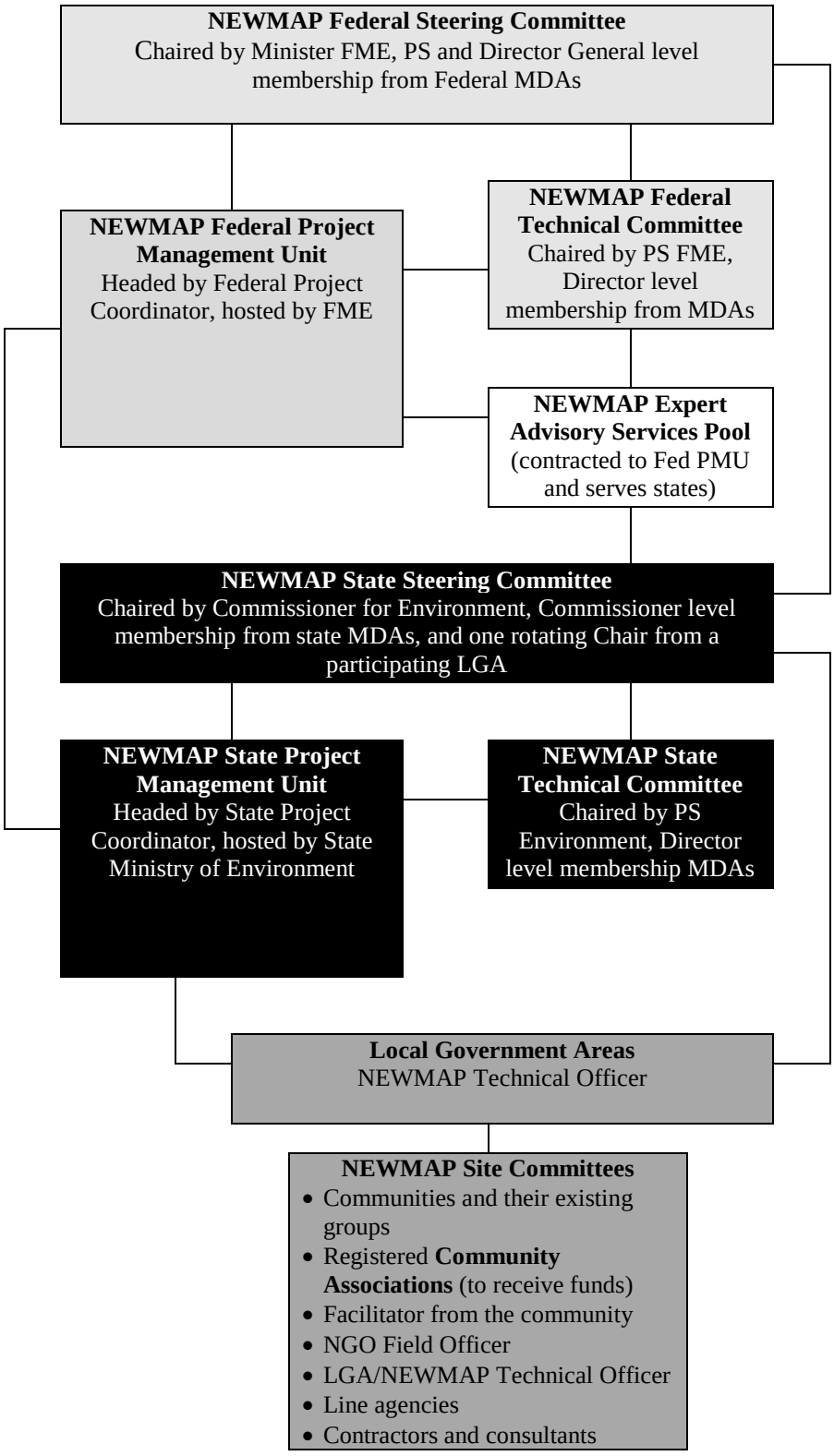
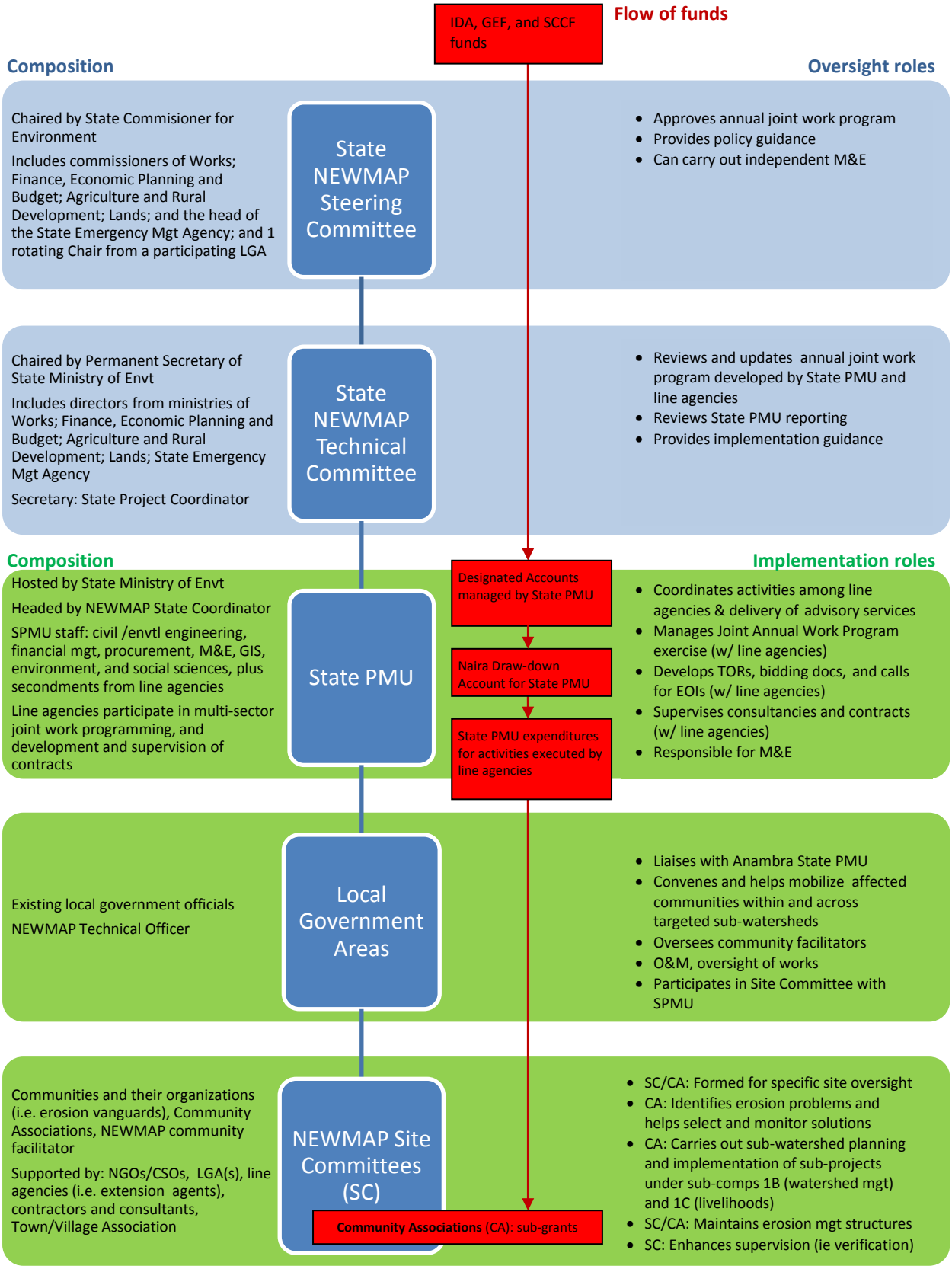


Figure 3.2. Example of State and Community Implementation Arrangements



Federal Level

5. The NEWMAP ***Federal Steering Committee*** (FSC) is the apex decision making body for the operation, responsible for providing policy guidance and final approval of multi-sector joint annual work programs. The FSC is chaired by the Minister FME and is composed of Permanent Secretary (PS) or Director General representation from partner MDAs: the Federal Ministry of Water Resources (FMWR) representing also the Nigeria Hydrological Services Agency (NIHSA) and the Nigeria Integrated Water Resources Management Commission (NIWRMC); the Federal Ministry of Works (FMW); the Federal Ministry of Agriculture and Rural Development (FMARD); the Federal Ministry of Finance (FMF); the National Planning Commission (NPC); the Nigeria Meteorological Agency (NIMET); the Nigeria Environmental Standards and Regulation Agency (NESREA), the National Emergency Management Agency (NEMA); the Federal Ministry of Power (FMP), Federal Ministry of Science and Technology (FMST), Federal Ministry of Transport (FMT), the Federal Ministry of Petroleum Resources (FMPR), the Energy Commission of Nigeria (ECN), Federal Ministry of Housing and Urban Development (FMHUD), and Office of the Surveyor General of the Federation. The Federal Project Coordinator will serve as Secretary of the FSC.

6. *FSC accountabilities.* The FSC meets at least twice per year and: (i) approves Joint Annual Work Program (each activity will identify a lead MDA); (ii) provides guidance to Federal Technical Committee and FPMU; (iii) ensures conformity with national sector and development planning; (iv) sector, policy and project harmonization; (v) nurtures multi-sector and multi-state dialogue; (vi) takes decisions on recommendations forwarded by the Federal Technical Committee and PMU; (vii) determines state readiness to participate in project activities (in particular component 1 site-specific investments) according to readiness criteria; and (viii) determines if states can continue to access financing for site interventions, based on satisfactory implementation of fiduciary responsibilities and in accordance with the PIM.

7. *A project ombudsman will report to the FSC.* The Ombudsman is entirely independent and handles concerns arising from stakeholders throughout the operation at federal and state levels, directing those stakeholders with grievances or questions to the appropriate channel (such as the procurement grievance mechanism), and following up.

8. The FSC is supported by a NEWMAP ***Federal Technical Committee*** (FTC) that reviews the activities and reporting of the FPMU. The FTC is chaired by the PS of FME and consists of Director level representation from partner MDAs including those listed above under the FSR and supplemented by technical agencies including NIHSA, IWRMC, and NASRDA. The Federal Project Coordinator will serve as Secretary to the FTC. The FTC meets at least quarterly and: (i) reviews and updates Joint Annual Work Program for federal NEWMAP activities (each activity identifies a lead MDA); (ii) develops inter-sectoral MOUs if needed; (iii) reviews FPMU reporting; and (iv) informs and advises FSC on decisions that need to be taken by FSC.

9. The NEWMAP ***Federal Project Management Unit*** (FPMU), hosted by the FME and headed by the Federal Project Coordinator (FPC), coordinates the project and facilitates delivery of advisory services and overview of activities carried out by SPMUs.

10. *FPMU Accountabilities*: The FPMU (i) acts as Secretariat to both Federal Steering and Technical Committees; (ii) manages Joint Annual Work Program exercise with Federal MDAs, including development, supervision, and monitoring of the work program; (iii) recommends to the Federal Steering Committee if states can continue to access financing for site interventions via performance-based criteria; (iv) handles the procurement of goods, works, and consultancy services and also supports the procurement implementation of the

SPMUs, (v) backstops lead federal MDAs on implementing specific tasks, including procurement of goods, works, non-consulting services and consultancy services with full collaboration with the relevant MDAs; (vi) backstops SPMUs – organizes multi-state learning events, helps convene experts (via the Expert Advisory Services Pool; see below), (vii) project M&E – aggregates states' M&E information and reports to national and international levels; carries out oversight of site M&E independently as needed; (viii) impact evaluation; and (ix) project communications and advocacy. The execution of certain activities (particularly under component 3) could be outsourced from the FPMU to relevant MDAs, under the terms – acceptable to IDA – of MOUs to be signed during project implementation between the FME and the relevant sector ministry.

11. *Staffing*. The FPMU comprises the FPC and key technical staff including specialists in: geotechnical/civil engineering, land management, water resources and hydrology, social/livelihoods, GIS, M&E, environment (safeguards), procurement, financial management, communications, and energy/climate. This team will come from a mix of MDA secondments and the open market depending on skills availability. Additional specialists will be seconded from each relevant MDA to serve as Liaison Officers. A project Ombudsman will be on staff to handle grievances and accountability issues throughout the project, including state level. Relevant consultants will be engaged when the need arises to support any of FPMU functions for effective and efficient performance and achievement of the objectives.

12. In particular, the FPMU will be supported by **three professional consultancies of the highest standard,** covering (i) engineering/watersheds, (ii) procurement, and (iii) M&E. An *Environmental Engineering Consultancy* will ensure that site designs are at the highest possible quality. As such the consultancy will work with all SPMUs and relevant MDAs and local actors to ensure that designs are robust, pragmatic, accurately costed, monitored, and where applicable, participatory. A *Procurement Consultancy* will provide assistance in key procurement issues – and approach which is intended to improve investment quality. This assistance will also be extended to the SPMUs, to assist with state readiness and implementation. The FPMU will also source an international standard *M&E Consultancy,* specifically to develop the Project's M&E system, oversee data collection including for the project's additional impact evaluation, raise institutional capacities to implement it and in the process, improve government systems (see M&E section below). Lastly, the FPMU may from time to time recruit international or national consultants (individuals, institutions or firms) as necessary to strengthen project planning and management, and states' site designs.

13. ***Individual federal MDAs*** are accountable for critical aspects of project implementation. First, they participate deeply in the annual joint work programming process facilitated by the FPMU. This work program is backed by inter-MDA MOUs if needed. Second, they will participate in the bidding processes of the FPMU and provide the required technical advice when necessary. Table 3.1 summarizes the accountabilities for each federal MDA.

Table 3.1

MDA	Role
FME	Project host and focal point
FME/ Erosion Department	Hosts FPMU
FME/EIA and NESREA	ESIA and regulatory oversight
FME/SCCU and Nigeria Climate Change Commission (when established by National Assembly)	Coordination on climate change issues
FME/Forest Department	Extension and advisory services on watershed planning and forest (with FMARD)
FMARD	Vegetative sustainable land management measures and livelihoods, extension (with FME/Forest Department)
FMWR	Watershed planning, diagnostics, and climate resilience in water resources management
FMWR/NIWRMC	Watershed planning and regulatory oversight
FMWR/NIHSA	Diagnostics (with NIMET and NASRDA) to support state investment and M&E
NIMET	Diagnostics (with NIHSA and NASRDA) to support state investment and M&E
NASRDA	Earth observation satellite imagery and analysis to support state investment and M&E
FMW/Roads	Road and cross-drainage rehabilitation and construction; coordination with other federal and state MDAs to further reduce land degradation from roads
Office of Accountant General / Federal Project Financial Management Division	Project financial management for all Bank-financed federal operations
NPC and FMF	Participate in monitoring and evaluation and supervision
NEMA	Landslide and flood response
FMP, ECN and FMPR	Low carbon development in power and oil/ gas
FMHUD	Building standards and codes and housing/real estate policy; administration of federal buildings and lands
Office of the Surveyor General	Mapping, delimitation of boundaries
FMST	Technology transfer and pilots

14. The NEWMAP ***Expert Advisory Services Pool*** (EASP) is a quality assurance pool of international and national expertise on geotechnical and civil engineering, watershed planning, related diagnostics such as hydrology or ecosystem monitoring, and social sciences. EASP members will be deployed by the FPMU anywhere in the project at federal, state and local levels to perform quality reviews and enhance supervision. EASP support will be provided as state and federal MDAs demand and resources allow. EASP members will be pre-qualified and contracted as needed by the FPMU, but will retain technical independence. There will be a firewall in place to prevent pool members themselves or their institutions from bidding on project contracts. This help will retain pool independence.

15. *EASP accountabilities* are: (i) provide expert input to local, state efforts and federal activities as needed; (ii) review proposed activities and site designs as needed; (iii) independently advise FSC and SSCs on key issues; and (iv) strengthen capacities of PMUs and MDAs.

State Level

16. NEWMAP targets seven southeastern states with acute gully erosion (Abia, Anambra, Cross River, Ebonyi, Edo, Enugu and Imo), while laying the foundation for scaling out to southern and northern states. At the same time, the program also focuses on improving

livelihoods in these and additional states through sustainable management of natural resources. The request for inclusion of activities in the north came later during preparation, such that site investments financed under NEWMAP will begin with three early mover southern state***s that have prepared candidate site intervention*** designs in line with technical design criteria. Additional states in the north and south will continue to receive technical assistance to advance their investment preparations as soon as the project is effective, with investment support to commence when site designs are ready. In principle, if all states meet the participation and site selection criteria as well as design standards, NEWMAP will support investment in up to 11 states.

17. **State Phasing.** NEWMAP is structured around a phased implementation approach. Participating states are initially supported with technical assistance activities for enhancing critical capacity and skills needed to develop integrated site designs to the highest international quality standards. Criteria for state participation in NEWMAP include:

- Formation of Interim multi-sectoral State Project Management Unit (SPMU)
- Provision of Office Space for the SPMU
- Opening of a Dedicated Account with a minimum of 30 million Naira (approximately US$200,000)
- Long list and location of priority sites
- State commitment to finance involuntary resettlements (as necessary) as their financial contribution to the project

Once the state participation criteria are met, the state will then phase into implementation activities involving gully stabilization and restoration, broader sub-watershed management, and livelihood improvement (See table 3.2). At the time of the first of two Mid-Term Reviews, if states are successfully implementing project activities and preparation of site intervention designs are advancing, Additional Financing would be sought to ensure sufficient resources for all participating states.

Table 3.2. Indicative Sequence of State Participation in NEWMAP

Phasing of states that meet project participation criteria	**By end Year 1**	**By end Year 2**	**By end Year 4**	**By end Year 6**
Estimated minimum # of states with site intervention designs that meet agreed criteria for triggering investment support activities	3 states	5 states	6 states	11 states
Estimated # of states participating in technical assistance activities to ready intervention designs	11 states	11 states	11 states	11 states

18. ***Criteria for prioritizing intervention sites under Component 1 include:***

- State of erosion (stable, slight, moderate, severe, or catastrophic);
- Size of affected population (disaggregated by poverty rate);
- Risk to human life;
- Risk to physical assets;
- Risk to natural assets;
- Replicability potential of the site;
- Readiness of the state to cover the cost of resettlement (if required); and
- No on-going competing intervention in the same sub-watershed.

After a site has been included in the strategic or "long" list, it will undergo more detailed site assessments, design development, and community consultations to enable the SPMU to establish a short list of sites that are ready for implementation.

19. ***State readiness for investment under Component 1.*** Based on the above criteria, as well as the usual Bank fiduciary standards, up to three states are expected to be ready for investment support under NEWMAP Component 1 by the time the operation is effective, although this number could rise depending on state circumstances. These states are Anambra, Cross River, and Imo. Additional southern and northern states will continue to participate in NEWMAP technical assistance until such time as they are determined ready through the process identified above to participate in NEWMAP Component 1 support for investment site interventions (See PAD section III on state phasing into the project). It is anticipated that a mix of northern and southern states will implement activities on the ground. Up to 11 states could become eligible for investment support for their specific priority sites depending on the quality of their intervention plans and designs.

Institutional set-up at state level

20. The NEWMAP ***State Steering Committees*** (SSCs) are chaired by the Commissioner of the State Ministry of Environment (SME), and composed of Commissioner-level representation from partner MDAs responsible for works, agriculture, land use and strategic planning, lands and urban development, the State Emergency Agency (SEMA), and annual rotating representation of one Chair of a participating LGA. The SSCs are the apex decision making bodies for the operation in each participating state. Each SSC is responsible for providing policy guidance and final approval of the state's multi-sector joint annual work program. The SSC: (i) approves the State Joint Annual Work program; (ii) provides guidance to State Technical Committee and SPMU; (iii) nurtures multi-sector dialogue; (iv) ensures conformity with national sector and development planning; (v) sector, policy and project harmonization; (vi) takes decisions on recommendations forwarded by the State Technical Committee and SPMU; and (vii) appoints independent M&E consultants to monitor sites. The State Project Coordinator will ensure the role of Secretary to the SSC.

21. The NEWMAP ***State Technical Committees*** (STCs) are chaired by the PS of the SME, and composed of Director-level representation from partner state MDAs responsible for works, agriculture, land use planning, lands and urban development and SEMA. The STC: (i) reviews and updates the Joint Annual Work Program for state NEWMAP activities (each activity identifies a lead MDA); (ii) develops inter-sectoral MOUs if needed; (iii) reviews SPMU reporting; and (iv) informs and advises SSC on decisions that need to be taken by SSC. Specific state MDA accountabilities on the STC are similar to the Federal MDA accountabilities on the FTC. The State Project Coordinator will ensure the role of Secretary to the STC.

22. The NEWMAP ***State Project Management Units*** (SPMUs), hosted by the state ministries of environment and headed by ***State Project Coordinators*** (SPCs), coordinate the State level activities of the project and delivery of advisory services.

23. The SPMU *accountabilities* are: (i) acts as Secretariat to both State Steering and Technical Committees; (ii) manages the Joint Annual Work Program exercise with state MDAs, including development, supervision, and monitoring of the work program; (iii) handles the procurement of goods, works, and consultancy and non-consulting services (with lead state and federal MDAs); (iv) supervises consultancies for state and sub-state level activities (with lead MDAs); (v) backstops lead state MDAs on implementing specific tasks, including procurement and disbursement; (vi) backstops LGAs by, for example organizing

multi-LGA learning events, convening experts (such as the federal Expert Advisory Services Pool), providing expert review of LGA TORs and activities; (vii) state-level M&E: oversees and aggregates intervention site M&E and reports to federal levels; carries out M&E of sites and other state activities; (viii) participates in the impact evaluation (depending on state); (ix) carries out program communications and advocacy at state level; (x) development and implementation of RAPs and ESIAs, and (xi) contracts and supervises NGO that will interface with selected watershed communities.

24. *SPMU Staffing.* Each SPMU will include an SPC and key technical staff including specialists in: geotechnical/civil engineering, land management, water resources and hydrology, social/livelihoods, GIS, M&E, environment (safeguards), procurement, financial management, and communications. This team will be assembled from a mix of MDA secondments and the open market depending on skills availability. Additional specialists will be seconded from each relevant MDA to serve as Liaison Officers. Relevant consultants will be engaged when the need arises to support the above specialists; one example is the international environmental engineer/planner financed under Component 2. Additional support will also be provided by the three consultancies (engineering, procurement, M&E) that will be contracted by the FPMU (see above), and the respective state-level NGO selected to work with the each state PMU on community mobilization, livelihoods, sub-watershed planning, participatory monitoring and beneficiary verification. Space permitting, this state-level NGO will be housed in the SPMU to promote better coordination and knowledge sharing.

25. ***Individual state MDAs*** play a critical role in project implementation. First, they participate deeply in the annual joint work programming process facilitated by the FPMU. This work program is backed by inter-MDA MOUs if needed. Second they will participate in the bidding processes of the FPMU and/or SPMU (as relevant) and provide the required technical advice as needed. Table 3.3 summarizes the *accountabilities* for each state MDA. Key federal MDAs will backstop and work closely with the state MDAs.

Table 3.3

MDA	Role
State ministry of environment (SME)	Project host and focal point; hosts SPMU
SME/Dept of EIA	EIA and regulatory oversight of works
State forest commissions	Extension and advisory services on watershed planning and forest (with state ministries of agriculture)
State ministries of agriculture	Vegetative sustainable land management measures and livelihoods, extension (with state forest commissions)
State ministries of works/roads	Road projects and coordination with other MDAs to further reduce land degradation from roads
Office of State Accountant General / State Project Financial Mgt Division	Project financial management
State Planning Commission (or equivalent)	Assists in monitoring and evaluation
State Emergency Management Agency	Landslide and flood response

Local level

26. ***Local Government Areas*** *(LGAs),* where a site under Component 1 (Investments) is implemented, will be strengthened with a NEWMAP Technical Officer (reporting to the SPMU) who: (i) acts as liaison to the SPMU, MDAs, and the NGO working with communities in the site; (ii) provides senior technical skill-set and advisory services to communities and LGAs; (iii) convenes affected and directly participating communities

(liaising with neighboring LGAs as needed); (iv) closely interacts with the community facilitators, and (v) supports site monitoring. This arrangement forms a critical operational pivot that ensures local ownership while maintaining dynamic links with higher level project management and coordination.

27. ***NEWMAP Site Committees*** are formed where a site intervention under Component 1 (Investments) is implemented. The Site Committees are formed from local and community actors and the state and sub-state level stakeholders providing relevant services to them (such as forest and agriculture extension agents, NGOs, and faith organizations), as well as contractors and relevant consultants. The Site Committees and will develop the sub-watershed plan (with support from the NGO), Site Committees are responsible for (i) identifying local erosion problems and helping select possible solutions for inclusion in the sub-watershed plans, (ii) overseeing physical works; (iii) participating in site monitoring; and (iv) cooperating with neighboring communities and LGAs as needed for trans-boundary sub-watersheds. The general approach for the project is to build trust and experience in specific communities affected by land degradation, and use this trust to scale work out to sub-watershed and larger scale planning and interventions designed to prevent future gully formation.

28. ***One NEWMAP Community Association*** will participate in each Site Committee and are composed only of community members (with the NGO described below providing guidance) including a community facilitator from within a participating community, existing community organizations (such as "erosion vanguards" in Anambra State) or new community organizations to be formed as needed[24]. A NEWMAP Community Association is a ***registered legal entity*** and an action group responsible for carrying out community level and local work at sub-watershed and smaller scales. They will set up a bank account to receive sub-grants from the SPMU to finance start-up kits and training for new livelihood activities by various ***Community Interest Groups*** (to be defined or newly formed by the community themselves based on their current organization and support from the NGO) that have received appropriate training or to carry out participatory watershed planning, monitoring, and beneficiary verification. The accountabilities of the Community Associations are site-specific and include: (i) coordinating community inputs into sub-watershed planning, implementation and monitoring with guidance from the NGO and technical providers such as extension agents, (ii) working with the NGO to identify and select livelihood improvement opportunities, (iii) preparing sub-project proposals eligible under sub-components 1B (watershed management) and 1C (livelihoods), and implementing these sub-projects, (iv) identifying labor for structural and vegetative land management works under sub-component 1A (GRASS); (v) maintaining erosion management structures (i.e. remove solid waste from drains), with their respective LGA; and (vi) participating in site monitoring.

29. ***NGO.*** An NGO will provide guidance to Communities, and will have expertise in community driven development, participatory watershed planning, social mobilization, group formation, and livelihood development. The NGO will be selected on a competitive basis in each participating state. The NGO selected will normally have a team leader, senior specialists for training, community development, livelihoods, and watershed management. They will be supported by an accounting/financial management specialist, and a field-based community development specialist. Specific accountabilities will include: (i) community sensitization and social mobilization; (ii) assisting communities in the formation of a representative Community Association, (iii) guiding the community through the participatory

[24] In intervention site areas where Fadama III is present, the project will use existing Fadama community structures

watershed planning process and identification, selection and implementation of vegetative land management sub-projects; (iv) guiding the community with identification, selection and implementation of livelihood sub-projects; (v) mobilization of cooperative labor for physical works under sub-component 1A (GRASS); (vi) developing community-owned processes for identifying and resolving conflict; (vii) recruitment of a local facilitator from within the selected community; (viii) identifying training needs and organizing training events; and (ix) providing support to the community for participatory monitoring.

30. There is weak capacity especially at state and site levels. An ***implementation support plan*** that provides for capacity building and workflow arrangements critical to project implementation is described in Annex 5.

By Component

31. ***Component 1.*** States have primary responsibility for implementing site interventions on the ground that include a mix of works, soil and water conservation, and livelihoods. State MDAs will be convened by each SPMU, which will facilitate the delivery of a state joint annual work program that specifies MDA accountabilities for implementing specific activities. SPMUs will have primary responsibility for procurement and disbursement. MDAs will participate in the procurement process and provide technical oversight of implementation of specific activities for which they are accountable in the joint annual work programs. Community Associations will be responsible for sub-project identification and implementation under sub-components 1.B.3 and 1.C.2. See figure 3.2 above for an organogram summarizing state and sub-state implementation arrangements. See Annex 2 for more detail on state phasing into investment and specific accountabilities at state and community levels. See Annex 8D for more detail on the technical approach and the sequence of activities from site selection, to design and implementation, including safeguards. The PIM includes more detail on the implementation arrangements.

32. *Activities at state level under sub-component 1.A (GRASS).* These activities will be implemented at state level by each respective SPMU, which will competitively source high quality firms with the diverse range of skills needed to carry out the final designs. Depending on the specific site, these skills include but are not limited to: structural and geotechnical engineering, vegetative land management works, roads engineering, urban development, hydrology, spatial analysis and mapping, and watershed and land-use planning.

33. *Federal/state coordination at site level.* Federal MDAs will backstop and work closely with the state MDAs as needed, for example the FMWR and its technical bodies concerned with watershed planning and water resources monitoring, or the FMW. This federal/state coordination is critical especially for those site interventions where there are federal, state and private assets to be protected and/or rehabilitated. In such cases, federal and state will co-finance site interventions.

34. *Activities at local/community level under sub-components 1.B.3 (Integrated watershed management) and 1.C.2 (Livelihoods):* These activities will be implemented at the community level, drawing from (but not exactly identical to) the Fadama III model. Each participating LGA will have a NEWMAP Technical Officer (reporting the SPMU) who will serve as the government focal point between the SPMU, LGA, participating community and their supporting NGO. In particular, this person will work with the communities, LGA, and NGO on O&M for the civil works and other structural land management measures. A Site Committee will be constituted by the LGA, NEWMAP Technical Officer, communities, and the NGO and will report to the SPMU. The Site Committee includes all stakeholders active in the sub-watershed and will develop the sub-watershed plan (with support from the NGO).

Within the Site Committee, the community will form an association to be called the Community Association (with assistance from an NGO to be contracted by the SPMU – see next paragraph). The Community Association will be a registered legal entity. Groups within communities to be directly involved in livelihood and other site-specific activities will be called Community Interest Groups and will be organized by Community Associations themselves as the operation implements. It is expected that these Community Interest Groups will implement sub-projects for various discrete activities summarized in sub-components 1B and 1C under the oversight of the Community Association.

35. *Development of sub-projects.* With the support of the NGO and the NEWMAP Technical Officer and LGA, the Community Association develops a **Community Action Plan** as an input into the integrated sub-sub-watershed management plans to be developed by the Site Committee. This Community Action Plan will include the proposed sub-projects under activity sets 1.B.3 and 1.C.2 that, respectively, delineate a community soil and water conservation zone and livelihoods activities. Additional specific eligibility criteria for accessing sub-grants for specific sub-watersheds are given in Annex 2 under the sub-component descriptions.

36. *Approval of sub-projects.* Supported by the NEWMAP Technical Officer, the Site Committee reviews the Community Action Plan and their priority sub-projects and recommends them for final approval by the SPMU in accordance to the eligibility criteria and procedures as specified in the PIM. The State Ministry of Environment as host of the SPMU signs the sub-grant agreement with the recipient Community Associations.

37. Funding will be released to Community Associations in tranches. The Community Association either (i) procures service providers directly to supply the needed inputs to the Community Interest Groups, or (ii) releases money to Community Interest Groups for procurement of their inputs using CDD procurement procedures and methods acceptable to the Bank (using no-objection as a requirement of disbursement) and specified in the PIM, under the guidance and supervision of the Community Association.

38. A registered, experienced and well established state-level NGO will be competitively recruited by each SPMU to reinforce communities in identifying and implementing their sub-projects and in other activities financed in component 1. The NGO will serve as a specialized institutional mechanism for the implementation of capacity building and social mobilization, guiding the community through a participatory watershed planning process, livelihood development process, and participatory M&E (including beneficiary verification) throughout the sub-watershed. Details of these activities and operational modality are set out in the PIM.

39. For activity set 1.C.2 (Livelihood sub-grants to Community Associations), sub-grants will be passed from the SPMU to the Community Association directly, once the NGO has certified that the proposed sub-project(s) selected by the Community Association is ready for implementation. The Site Committee will not have any procurement function apart from assisting in the preparation and reviewing of community's sub-project proposals.

40. ***Component 2.*** The annual work plan to be prepared by the FPMU and SPMUs will further specify implementation responsibilities and costs for activities proposed for implementation under component 2. For each activity, the work plan will indicate the lead federal agency responsible for the technical overview of the implementation process, and include a letter from the relevant senior staff (such as the Permanent Secretary of the relevant ministry) confirming the commitment of the MDA to provide the necessary secondments and technical back-up to the FPMU.

41. Various activity sets in Component 2 are implemented by discrete Federal MDAs and state MDAs, each of whom sends a secondment to their respective state or FPMU. Secondees from partner MDAs will be responsible for all technical aspects of implementation in their respective area of institutional attribution (e.g. preparation of Terms of Reference, requests for expression of interest, bidding documents, review of technical reports, supervision of activities, and close participation in detailed joint work programming with partner MDAs); and for seeking inputs as needed from the appropriate departments/ units in their respective ministries/ agencies. MDA staff seconded to the FPMU might also seek the support of external consultants as a back-up in the preparation of technical documents of particular complexity or specialized nature.

42. Component 2 is financing the procurement of a leading environmental engineering and planning firm to provide leading design service to participating states. This activity is financed and implemented at Federal level. The FPMU will facilitate and ensure that each participating state will receive the services of the firm to improve and finalize the state's site intervention designs, while putting in place stronger state level capacities on environmental engineering and planning. By consolidating the firm services at federal level, cross state consistency is reinforced and all states can better learn from one another.

43. ***Component 3.*** Implementation of Component 3 is similar to that of Component 2. Component 3 requires close and effective collaboration among the various MDA with a stake in the climate agenda. This will be made possible by the secondment to the FPMU of staff from the following MDAs: Ministry of Power, Ministry of Agriculture, and Ministry of Water Resources. As in Component 2, secondees from these MDAs will be responsible for all the technical aspects of implementation in their respective area of institutional attribution (e.g. preparation of Terms of Reference, requests for expression of interest, bidding documents, review of technical reports, supervision of activities, and close participation in detailed joint work programming with partner MDAs); and for seeking inputs as needed from the appropriate departments/ units in their respective ministries/ agencies. MDA staff seconded to FPMU might also seek the support of external consultants as a back-up in the preparation of technical documents of particular complexity or specialized nature, using resources allocated to activity set 3.A.1 (Framework for climate action across sectors).

44. As a disbursement condition for funds allocated to activity set 3.B.3, the PIM will need to specify the eligibility and priority criteria, acceptable to the World Bank, for identifying and selecting demonstration projects on low carbon development and improved woodstoves to be financed under that activity set. The PIM will also indicate how the project's overall framework for social and environmental safeguards will be operationalized for the execution of such demonstration projects.

45. The annual work plan to be prepared by the FPMU will specify activities proposed for implementation under component 3. For each activity, the work plan will indicate the lead federal agency responsible for the technical overview of the implementation process, and include a letter from the relevant senior staff (e.g. Permanent Secretary of the relevant Ministry) confirming the commitment of the agency to provide the necessary secondments and technical back-up to the FPMU.

46. ***Component 4.*** Component 4 is implemented by one federal and up to 11 State PMUs (each of which phases in to NEWMAP when ready), with added support from a (i) procurement consultancy and (ii) a third-party M&E entity. The firm(s) will provide services to participating states. In this way, activities and learning will be more consistent across participating states. The FPMU will also work closely with NPC and FMF on M&E. For more on M&E implementation including the impact evaluation please see the section below

on M&E implementation. Project management includes support for carrying out safeguards, and strategic project-wide communications which cuts across all project components. Local communications campaigns are handled under Component 1 as part of community mobilization.

II. FINANCIAL MANAGEMENT, DISBURSEMENT AND PROCUREMENT

A. Financial Management

47. A financial management assessment of the implementing entities was conducted in November 2011, in line with the Financial Management Manual (March 1, 2010) and the AFTFM Financial Management Assessment and Risk Rating Principles (October 2010). The objective is to determine whether the implementing entities have acceptable financial management arrangements, which will ensure: (i) that all transactions and balances relating to the project are correctly and completely recorded; (ii) the preparation of regular, timely, and reliable financial statements; (iii) safeguarding of the entity's assets; and (iv) existence of auditing arrangements acceptable to the Bank.

48. The overall FM risk for the Project is assessed as high. This is mainly because of the inherent risks and issues of multiple implementation levels, not because of the control risks associated with the basic elements of the project FM arrangement. However, these inherent risks are well mitigated by the use of the PFMU and FPFMD, which features robust controls (internal and external). Also, the PFMUs have obtained adequate experience in managing financial flows to multiple levels from other projects in the portfolio and they will be given additional training. With the mitigation measures, the residual FM risk is Substantial. The mitigation measures include use of NGOs to provide oversight in the implementation of community sub-projects, computerized accounting systems, professionally qualified and experienced FM staff, and independent and effective internal audit and risk management functions. The Financial Procedures Manual will detail an adequate internal controls framework and risk management strategy that will apply to the Project. Regular reporting arrangements and supervision plan will also ensure that the implementation of the Project is closely monitored and that appropriate remedial actions are taken expeditiously. The FM risks will be reviewed during Project implementation and updated as appropriate.

49. The PFMUs and FPFMD are established in seven initial states and federal level respectively through the joint efforts of the Bank and government. These units are presently involved in the implementation of a number of Bank-assisted projects. The FPFMD will collaborate with the PFMUs to prepare consolidated financial reports for the project. The Bank's recent reviews showed that the PFMUs and FPFMD are performing satisfactorily. The PFMUs and FPFMD feature among other things the following: (i) all the key elements of FM, including: budgeting, funds flow, accounting, internal control, reporting and audit; (ii) computerized system and robust FM procedures manual; (iii) qualified staff that are well-trained in relevant Bank procedures and requirements, including procurement; (iv) robust segregation of functions/duties; (v) a strong control environment, which is required to mitigate fiduciary risks; (vi) highly independent and well-trained internal auditors (vii) full alignment with government FM systems but with important enhancements and controls.

50. The key issues noted within the PFMUs and FPFMD are unretired advances and inadequate documentation for incurred eligible expenditures. These are mainly the result of application of government no retirement policy on advances and the inadequate understanding of Bank FM requirement. To mitigate the risks arising from these issues, adequate procedures for the handling of advances against expenses including remedial

actions in the event of default will be elaborated in the Financial Procedures Manual (FPM) and an indicative check list of appropriate supporting documents for incurred eligible expenditures developed and included in the FPM.

51. *Planning and budgeting:* Budget preparation will follow the federal or state governments' procedures as appropriate. On an annual basis, the Project Accountant (in consultation with key members of the implementing unit) will prepare the budget for the fiscal year based on the work program. Detailed procedures for planning and budgeting will be documented in the FPM.

52. *Funds flow.* Project funding will consist of IDA credit, GEF and SCCF grants, and Government contribution. All project funds will be used in line with the Financing Agreement and the Bank FM procedures. IDA will disburse the credit and the grants through Designated Accounts (DA) opened with reputable commercial banks acceptable to IDA which will be managed by FPMU/FPFMD and SPMU/PFMU at the federal and state levels respectively. The specific banking arrangements are as follows (see figure 3.3 below):

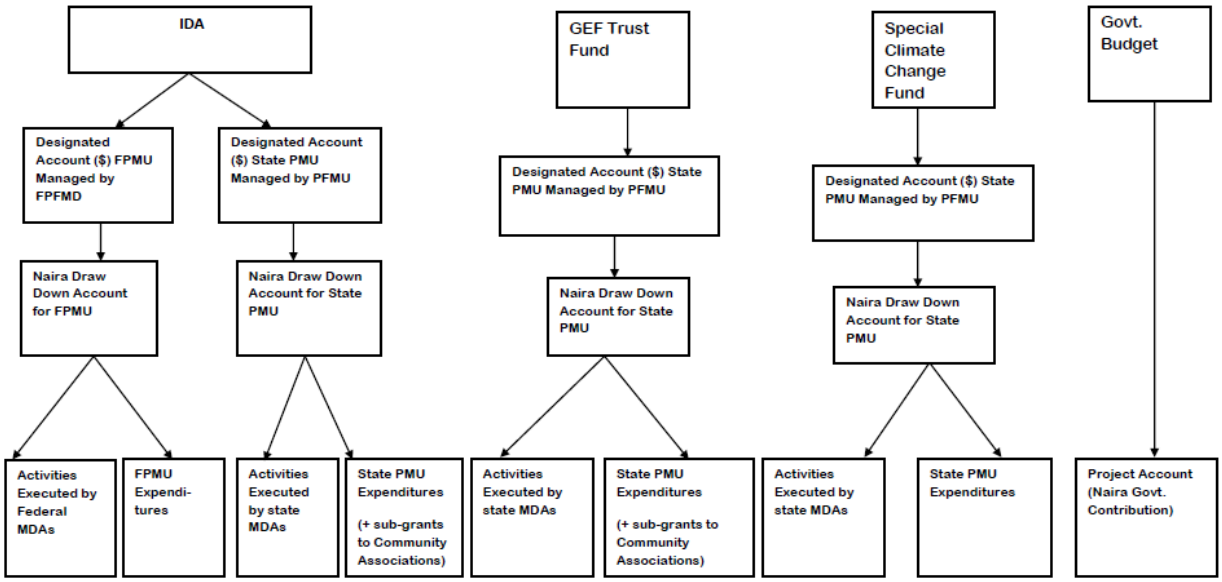
FPMU:

- *FPMU Designated Account:* A US$ DA to which initial deposit and replenishments from IDA funds will be lodged
- One current (Draw-down) account each in Naira to which draw-downs from the DAs for FPMU will be credited in respect of incurred eligible expenditures, maintaining balances on this account as close to zero as possible after payments.

SPMU:

- A US$ DA to which initial deposit and replenishments from IDA will be lodged.
- A US$ DA to which initial deposit and replenishments from the GEF grant will be lodged
- A US$ DA to which initial deposit and replenishments from the SCCF grant will be lodged
- One current (Draw-down) account in Naira to which draw-downs from the DA will be credited in respect of incurred eligible expenditures, maintaining balances on this account as close to zero as possible after payments.

Figure 3.3. Illustrative Funds Flow



53. *Accounting:* IDA funds will be accounted for by the Project on a cash basis. Computerized accounting system will be used, utilizing flexible accounting software currently in use at the PFMUs and FPFMD. The software will be expanded to include the project activities. Annual financial statements will be prepared in accordance with relevant International Public Sector Accounting Standards (IPSAS). All accounting and control procedures will be documented in the FPM, a living document which will be subject to review as appropriate.

54. *Financial reporting:* Calendar semester Interim Financial Reports (IFRs) will be prepared by the FPMU and the SPMUs. SPMUs will submit IFRs to the FPMU not later than 45 days after the semester while the FPMU will consolidate IFRs for all SPMUs and the FPMU and submit to IDA within 60 days of the end of each calendar semester. The formats of IFRs will be developed at appraisal and agreed at Negotiation. Consolidated annual project financial statements will be prepared and submitted to IDA within 6 months of the end of the government fiscal year by the FPMU. Regular periodic returns will be made to the Federal and States Accountants General for consolidation in the government accounts.

55. *Internal control:* Adequate internal controls are in place at both PFMUs and FPFMD. The control features include robust FM procedures manual, relevantly qualified staff that are well trained in relevant Bank procedures and requirements, including procurement; robust segregation of functions/duties and highly independent and well-trained internal auditors – the FM staff are appointed by each State Accountant General and the Accountant General for the Federation. Risks mitigation measures applicable to community sub-projects (Sub-components 1.B.3 and 1.C.2) including tranching of disbursement, and FM supervision integrated with M&E to validate expenditures and physical verification of site interventions by PIAs and social accountability mechanisms, including community meetings and display of sub-project information on notice boards in the community hall will be documented in the FPM. Also state NGOs will provide oversight on implementation of community sub-projects. Random selection of sub-projects will be visited during Bank FM mission.

56. *The project will be audited by an independent external auditor* appointed based on Terms of Reference acceptable to IDA to audit the entire project and certify the consolidated financial statements for the project. The auditor will express an opinion on the Annual Consolidated Financial Statements in compliance with International Standards on Auditing (ISA). In addition to the audit report; the external auditors will prepare a Management Letter. Copy of the audited financial statements along with the ML will be submitted to IDA not later than six months after the end of each financial year. Technical audit will equally be conducted.

57. **Risk mitigation measures related to governance and anti-corruption.** Measures to mitigate FM GAC related risks in the project include: having in place complaints handling mechanisms which shall be handled by a specialist specifically engaged for that purpose. and the use of field NGOs to provide oversight on project implementation at community level. See Annex 10 on GAC.

B. Disbursements

58. Issues of inadequate documentation for incurred expenditures and poor quality IFRs are flagged in the FM and external audit reports of some on-going projects at FPFMD and PFMU. Accordingly, the project will use the transaction-based disbursement procedures and not report-based disbursements at effectiveness. When project implementation begins, the calendar semester IFRs produced by the project will be reviewed. Where the reports are found adequate and produced on a timely basis and borrower request conversion to report-

based disbursements, a review will be undertaken by the IDA project team to determine if the project is eligible for report-based disbursement. Details of the disbursement arrangement will be in the Disbursement Letter.

Financial Management Action Plan

59. Actions to be taken for the project to further strengthen its financial management system are listed in table 3.3.

Table 3.4. FM Action Plan

No.	Action	Due Date[25]	Responsible
1	Agreement of format of Interim Financial Report (IFR), Annual Financial Statement and External Auditors/Technical Auditors Terms of Reference	Completed	FPMU/FPFMD and SPMU/PFMU with support and guidance of IDA task team
2	Train staff in Bank FM procedures and Disbursement Guidelines.	Before effectiveness	FPMU/FPFMD and SPMU/PFMU
3	Appoint external auditor	Within 90 days after effectiveness	FPMU/FPFMD
4	Update computerized accounting systems at FPMU and all participating SPMUs as of effectiveness	For FPMUs, 3 months after effectiveness; for SPMUs, 3 months after the respective subsidiary agreement	FPMU/FPFMD and SPMU/PFMU
5	Designate PA, PIA and support accounting technicians to FPMU and SPMU	Before effectiveness	FPMU/FPFMD and SPMU/PFMU
6	Agreement on Memorandum of financial services and service standards between FPFMD & FPMU and PFMU & SPMU	Before effectiveness	FPMU/FPFMD and SPMU/PFMU
7	Carry out financial assessment of Community Associations	Prior to receiving any sub-grants	SPMUs
8	The FM manual to include a template for Community Association reporting on FM issues.	Prior to receiving any sub-grants	FPMU/FPFMD and SPMU/PFMU

Financial Management Implementation Support Plan

60. FM supervision will be consistent with a risk-based approach, and will involve collaboration with the Bank's project team, LOA and procurement. The supervision intensity will be based initially on the PAD FM risk rating and subsequently on the updated FM risk rating during implementation. Given the Substantial residual risk rating, on-site supervision will be carried out twice a year. On-site review will cover all aspects of FM, including internal control systems, the overall fiduciary control environment, and tracing transactions from the bidding process to disbursements as well as SOE review. Additional supervision activities will include desk review of semester IFRs, quarterly internal audit reports, audited Annual Financial Statements and management letters as well as timely follow up of issues that arise, and updating the FM rating in the Implementation Status Report (ISR) and the Portfolio and Risk Management (PRIMA) system. The Bank's project team will support in monitoring the timely implementation of the action plan.

[25] Actions 3 and 4 are specified in the legal agreement, and the others in the PIM (which is also incorporated by reference in the legal agreement).

Disbursement Categories

61. The table below sets out the expenditure categories and percentages to be financed out of the credit proceeds.

Table 3.5. Allocation of credit proceeds to be financed for eligible expenditures (goods, works, services, training and operating costs) in each category (IDA)

Category	Amount of the Credit Allocated (expressed in SDR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consultants' services, training and operating costs under Parts 2.A, 2.D, 3 and 4.A of the Project	43,300,000	100%
(2) Goods, works, non-consulting services, consultants' services, training, and operating costs under Parts 1.A, 1.B.1, 1.B.2, 1.C.1, 2.B.1, 2.B.3, 2.B.4, 2.C and 4.B of the Project	262,500,000	100%
(3) Goods, works, non-consulting services, consultants' services, training, and operating costs under Part 1.C.3 of the Project	2,000,000	50%
(4) Goods, works, non-consulting services, consultants' services, training and operating costs required for Subprojects under Part 1.B.3 of the Project and to be financed through Sub-grants	2,600,000	50% of amounts payable under the applicable Sub-grant Agreement
(5) Goods, works, non-consulting services, consultants' services, training and operating costs required for Subprojects under Part 1.C.2 of the Project and to be financed through Sub-grants	9,100,000	100% of amounts payable under the applicable Sub-grant Agreement
(6) Refund of Project Preparation Advance	1,900,000	Amount payable under Section 2.07 of the General Conditions
TOTAL AMOUNT	321,400,000	

Conclusion

62. The Financial Management Assessment conclusion is that subject to the mitigation measures and the action plan being implemented as per agreed time frame, the project has met the minimum FM requirement in accordance with OP/BP 10.02. Further, this objective will be sustained by ensuring that strong and robust financial management arrangements are maintained for the project throughout its duration. Detailed financial management reviews

will also be carried out regularly, either within the regular proposed supervision plan or a more frequent schedule if needed, to ensure that expenditures incurred by the project remain eligible.

C. Procurement

C.1. General

Country Environment

63. Nigeria has been implementing a procurement reform program based on the recommendations of the 2000 Country Procurement Assessment Review (CPAR). A review of the progress made on the 2000 CPAR recommendations as reflected in 2007 PEMFAR shows that implementation of procurement reform program has brought about substantial improvements in obtaining value for money in the public sector expenditure. It further introduced some level of transparency into the country's procurement process which has led to substantial reduction of contract prices. The Public Procurement Act was promulgated in Nigeria in June 2007 with a view to further sanitize public procurement system, which has often been the subject of abuse and corruption. The regulatory agency, the Bureau of Public Procurement (BPP) was established while procurement professionals' cadre was also established at the federal level in 2006. These measures have brought significant improvement in the existing procurement system in the public service and enhanced transparency. The Act adheres to the principles of the UNCITRAL model law, and outlines the principles of open competition, transparent procurement procedures, clear evaluation criteria, award of contract to the lowest evaluated tender, and contract signature. The legislative framework is applicable to all procurement categories (suppliers, contractors, consultants) and must be applied for all public funds regardless of value. The Act has provisions for exceptions to competitive tendering, which are the exception rather than the rule. Also, Government has already prepared relevant implementation Regulations, Standard Bidding Documents (SBD) and Manuals for the Procurement of Goods, Works and Consulting Services, which describes the minimum contents of the tender and proposal documents. The essential elements are in line with internationally acceptable procurement standards. The Procurement Act also provides for complaints and appeals mechanism to be established to enhance accountability.

64. *Procurement risk at the country level:* with the substantial progress in procurement reforms as described above, procurement risk such as capacity, fraud and corruption etc are being addressed. The BPP has organized series of trainings and awareness workshops to sensitize the cadre of professionals with the current procurement processes. Currently, the Government Procurement Reform Program is being supported by an IDA Credit-ERGP with a substantial component focusing on procurement reforms. There are also three IDF Grants, to assist federal and two state governments address the weak procurement capacity in the public sector and to build appropriate partnership with the private sector. The project instrument has been used by the government to prepare the relevant procurement tools mentioned above. On the other hand, Government is also reforming the Customs practices to modernize and make it more effective, thereby enhancing private sector confidence in public procurement processes.

65. *Procurement risk at the sector, state, and project level.* The environment sector at the federal level has a long history of implementation various Bank-financed projects and it currently implementing the Community Social Development Project (CSDP). At the state

level however, ministries of environments are relatively new and the ongoing CSDP in the implementing states is housed in other Ministries. The risk therefore includes inadequate procurement capacity at the federal level (due to change of staff) and the state level and inadequate filing system and poor record keeping which are still manual. Post procurement review of previous projects has also identified inadequate procurement planning and contract management skills. Procurement reform activities are slow in the seven southern states that have been participating in project preparation. Other than the yearly budget, procurement plans for government contracts are usually not prepared. The Bank has approved the National Bidding Document at the Federal level. Therefore, under NEWMAP, the Bank's procurement policies and procedures shall be used while allowing the use of the national bidding documents for NCBs.

Procurement Arrangements

66. Procurement activities in the project shall be decentralized by having the FPMU handle the procurement at the federal level while each SPMU will handle the procurement at the state level. The FPMU will coordinate procurement at the federal level. Therefore, each participating federal MDA will prepare its work plan as part of the annual joint work programming process, and submit it to the FPMU (which facilitates multi-sector dialogue to avoid duplications). The FPMU will in turn collate the work plans and prepare one unified procurement plan which will include all procurement activities required by each MDA. The procurement unit of the FPMU will collaborate with the technical experts of MDAs who are seconded to the FPMU to handle the bidding and supervision processes in an effective, efficient and transparent manner to ensure value for money and multi-sector coordination.

67. Each state also undergoes a multi-sector joint work programming process facilitated by the SPMU, ultimately resulting in one unified procurement plan from the SPMU. Each participating state MDA will submit its work plan to the SPMU who will prepare one procurement plan for the state. The bidding processes will be handled by both the procurement unit of the SPMU and the technical experts of the participating Ministries/agencies in the states. Though procurement will be decentralized as stated above, the FPMU (supported by the procurement consultancy) will closely support the SPMU's procurement implementation in the following areas: i) preparation of draft standard bidding document for common goods or works bidding document and request for proposals (RFP) for adoption by the states, ii) design, drawings and specifications will be shared with the SPMU for guidance, iii) the FPMU procurement consultant will visit the SPMUs during bidding processes and provide quality assurance on the documents for both post and prior review packages, and iv) conduct a review of the SPMU procurement system to ensure compliance with procurement policies, procedures and proper documentation ahead of the Bank's post-procurement review mission.

68. For sub-state level procurement arrangements at local/community level, see the implementation arrangements above for Component 1. In sum, funding shall be released to a registered Community Association in tranches and the Community Association either (i) procures service providers directly to supply the needed inputs to the Community Interest Groups, or (ii) releases money to Community Interest Groups for procurement of their inputs using CDD procurement procedures and methods acceptable to the Bank and specified in the PIM, under the guidance and supervision of the Community Association.

69. Under activity sets 1.B.3 (Community Soil and Water Conservation Zones) and 1.C.2 (Livelihood sub-grants to Community Associations), the state-level NGO may not manage funds targeting the community-driven activities. Rather, these funds will be passed from the

SPMU to the Community Association directly, once the NGO has certified that the proposed sub-project(s) selected by the Community Association is ready for implementation.

C.2. Guidelines

70. Procurement under the proposed project will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works, and Non Consulting Services under IBRD Loans and IDA Credits and Grants by World Bank Borrowers" dated January 2011; "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011; Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006 and revised in January 2011; and the provisions stipulated in the Legal Agreements. The various items under different expenditure categories are described in general below. For each contract to be financed by the credit, the different procurement methods or consultant selection methods, estimated costs, prior review requirements, and time frame are agreed between the Recipient and the World Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

71. **Procurement of works:** A total of about US$300M has been allocated for the procurement of works under this project. Works procured under the project will include structures to manage floods and erosion, vegetative land management measures, rehabilitation of damaged infrastructure, and renovation of offices. See Annex 8B for a detailed summary of the technical approach.

72. **Procurement of goods and non-consultancy Services:** A total of about US$100M has been allocated for the procurement of goods under this project. Goods procured under the project will include: office furniture; project vehicle; computers; accessories; software; communication; office equipment, hydro-meteorological systems, GIS, satellite imagery, overhead photography, survey equipment, seedlings and related goods and tools for vegetative land management and agricultural measures, tools to gauge and track watershed, terrestrial carbon and water flows etc. Procurement of goods will be carried out using the Bank's SBD for all ICB and National SBD agreed with or satisfactory to the Bank. Procurement for readily available off-the-shelf goods that cannot be grouped, or standard specification commodities for individual contracts of less than US$50,000 equivalent, may be procured under shopping procedures as detailed in paragraph 3.5 of the "Guidelines: Procurement under IBRD Loans and IDA Credits" dated January 2011; and the Guidance on Shopping Memorandum" issued by IDA on June 9, 2000.

73. **Selection of consultants:** Consultancy services valued at about US$100M will be provided under the project and includes the following categories: financial audit, procurement, feasibility and design studies, works design and supervision, institutional development, training, M&E, capacity development, environmental engineering and design consultant, Consultants shall be selected using Request for Expressions of Interest, short-list, and the Bank's Standard Request for Proposal, where required by the Bank's Consultant Guidelines. Short lists of consultants for services estimated to cost less than US$200,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 through 2.8 of the Consultant Guidelines. Consultant services requiring hiring of research institutes and universities, and individuals from these entities, public training institutions and NGOs, to carry out various studies, data collection, training and M&E will be selected in accordance with paragraph 1.13 (b–e) and 3.16 of the

Consultant Guidelines. The procedures to be used for selecting consultants at the community level will be as defined in the PIM.

74. **Advanced contracting and retroactive financing:** The project will provide retroactive financing for any contract executed prior to project effectiveness provided that the procurement process was competitive and below a limit of US$6M, and that the expenditures are eligible under categories 1 and 2 in table 3.5 above. These goods, services, operating costs, and training will provide mobilization fees to secure requisite engineering and hydrological expertise, mapping and other tools, and operating costs for the FPMU and SPMU to finalize investment designs. Expenditures under retroactive financing will be eligible if dated on or after 1 June 2012.

75. **Capacity building, training programs, conferences, and workshops**. A total amount of US$30M will be provided for these activities which will be geared towards capacity development and improving management and staff skills within the PMUs and among MDAs. Intensive workshops will be held for the private sector and NGOs on the likely business opportunity available in this project. If they understand the project, it will be easier and faster to conclude the bidding process. All training and workshops will be carried out on the basis of the project's Annual Work Plans and Budget which will have been approved by IDA on a yearly basis, and which will inter alia, identify, (i) the training and workshop envisaged, (ii) the personnel to be trained, (iii) the institutions which will conduct the training, and (iv) duration of the proposed training.

76. **Operating costs**: The operating costs will include office rental expenses, maintenance and insurance of vehicles and equipment, fuel, office supplies, utilities, communication expenses, consumables, bank charges, advertising expenses, travel, per diems, accommodation and salaries of support staff, but excluding salaries of consultants and civil servants. Operating costs financed by the project will be procured using the implementing agency's administrative procedures that will be acceptable to the Bank.

C.3. Assessment of the agency's capacity to implement procurement

77. Procurement capacity assessments of the agencies to implement the project were conducted and reported under Section IV (Appraisal Summary). The assessment reviewed the organizational structure for implementing the project and the roles of the key actors in project implementation. The key issues and risks concerning procurement in the implementation of the project and action plan to address them were discussed with the government. The corrective measures that will be put in place to address the issues and risks are reflected in Tables 3.6 and 3.7 below.

78. The FPMU has assigned a qualified and experience Procurement Specialist who has several years experience working on Bank funded projected. The Procurement Specialist is a staff of the FME and was Procurement Specialist for the closed Local Empowerment and Environment Project (LEEMP) and also the Procurement Specialist of the ongoing Community Social Development Project (CSDP) as the project does not have any major procurement activities left. Similarly, seven SPMUs have now assigned experienced Procurement Officers with World Bank procurement experience.

79. Due to the complexity, the large volume of procurement activities, and the number of PMUs in this operation, before effectiveness the FPMU will competitively recruit a procurement consulting firm with experience and qualified staff for processing the procurement of goods, works and consultancy services. The firm will support the procurement implementation of both the FPMU and the SPMUs. A consultant from the

FPMU will visit the SPMUs during bidding process and provide quality assurance to the documents for both post and prior review packages. All the prior review packages of the SPMUs will be reviewed by the FPMU procurement consultants for quality assurance before submission to the Bank for prior review. Each SPMU will also hire a consultant to support the procurement activities in the first year of project implementation and could be renewed base on need. The procurement consultants will train the PS/Procurement Officers. The PS/POs will require training on a continuous basis. The FPMU and SPMUs will not change the PS/POs during the life of the project except if found wanting. The procurement risk rating ought to be high but based on the robust procurement arrangement to be put in place, it is considered to be **Substantial**.

Table 3.6 Procurement Action Plan

	Action	**Responsibility**	**Due Date**[26]	**Remarks**
1.	Procurement Plan for the first 18 months prepared and agreed with the Bank	FPMU/ SPMUs	This has been met	
2.	Recruitment of Procurement Consultants (all PMUs)	FPMU/ SPMUs	By effectiveness and during implementation	FPMU to hire a procurement consulting firm before effectiveness
3.	Bank has approved an NCB standard bidding document for the FGN. Therefore, the FPMU will use NCB documents	FPMU	During implementation	First set of NCB bidding documents to be prepared and reviewed by the Bank before disbursement
4.	Since none of the participating states has an approved NCB bidding document, the SPMU has agreed to use the National Standard Bidding Document	SPMUs	During implementation	First set of NCB bidding document to be prepared and reviewed by the Bank before disbursement
5.	Training of procurement specialists through workshops and institutional Training	FPMU/ SPMUs	Before effectiveness and during project implementation	Continuous
6.	Organize contract management training for staff	FPMU/ SPMUs	For the FPMU, three months after effectiveness. For SPMUs, three months after signing their subsidiary agreement. For all PMUs, maintain during project implementation.	To improve project staff contract management skills
7.	Preparation of draft bidding documents for goods, EOIs RFPs, QSLs, etc.	FPMU/ SPMUs	This has been met	To ensure that advert will be places as soon as project is approved for timely project implementation
8.	Procurement tracking system (use of procys)	FPMU/ SPMUs	For the FPMU, as soon as PPA is effective and by project effectiveness. For SPMUs, within	FPMU/SPMU staff will be trained by Bank's procys champion on how to operate the system and

[26] Actions 1, 8, 9 and 12 will be specified in the legal agreement, and the others in the PIM (which is also incorporated by reference into the legal agreement).

			one month of signing their subsidiary agreement	will commence the use of the system under the PPA procurement implementation and before project effectiveness
9.	Establishment of a procurement complaints database, creation of an email address, procurement of a computer, complaint box and GSM hot line	FPMU/ SPMUs	For the FPMU, three months after effectiveness. For SPMUs, three months after signing their subsidiary agreement. For all PMUs, maintain during project implementation	To reduce fiduciary risks
10	Recruitment and training of a Complaint Officer by each PMU	FPMU/ SPMUs	For the FPMU, three months after effectiveness. For SPMUs, three months after signing their subsidiary agreement	Designated officer will be trained by agencies such as EFCC, ICPC. He/she will produce quarterly reports and submit to PC and Steering committee at bother FPMU and SPMU levels
11	Email address of complaint shall be included in every bidding documents/RFPs	FPMU/ SPMUs	Continuous	This will enable any aggrieved person to submit a compliant at any time
12	Conduct procurement and technical audit (technical consultant to be recruited by FPMU)	FPMU	Audit carried out within 18 months after effectiveness and once every two years thereafter (Audit due within 6 months)	When an audit is needed earlier than the due date it may be carried out on an exceptional basis

Table 3.7. Assessment of Critical Delay Sources, Index of Delay Time and Delay Mitigation Measures

No.	Delay risk areas in procurement processing steps	Major sources of delays	Mitigation actions	By whom	By when
Services					
1	Limited Capacity in selection of Consultants Specially on Evaluation of EOIs , RFP s, Technical and Financial Proposals	Delays in getting internal approvals at the level of Entity Committee, or Central, Ministerial and Regional Review Boards as applicable, and also at IDA, and Political Interference.	1. The Procurement Unit of FPMU and SPMUs will conduct and manage procurement activities, including finalization of RFPs based on inputs from relevant technical experts	PMUs	During implementation
			2. Hands on training on the shortlist evaluation processes will be organized. Efforts will be made to reduce approval times. Further, the critical approval time will be reflected in the timelines of the procurement plans.	PMUs	On continuous basis
			3. Close monitoring of procurement plans on a monthly basis both by the FPMU and the Bank; develop plans based on an understanding of: (i) estimated cost of the services and, therefore, appropriate level to direct approval requests, and (ii) the meetings schedules of the appropriate authorities. The plans will reflect the actual time it takes to prepare and evaluate proposals based on country specific systems	PMUs and the Bank	On continuous basis
2	Awarding contracts	Interactions with Entity Committees and Review Boards, Bank review of No-Objection request, and possible interference from higher authorities	PMUs to closely monitor and exercise quality control on all aspects of the procurement process, including evaluation, selection and award. On the Bank side, the team will monitor progress of activities on a regular basis and maintain a monthly evaluation system. All delays and irregularities will be documented by the Public Procurement Authority for discussions at a higher level.	Relevant Agencies, Public Procurement Authority, Bank	On continuous basis
Goods					
1	Preparation of bidding documents and Bid Evaluation Report (BER) and Award by NPoPC	Unfamiliarity with World Bank Procurement Procedures will be a major source of delays	A. Procurement Capacity Building will be conducted for the staff of procurement Unit. Procurement Consultants will be hired by FPMU/SPMUs to support the implementation. In addition, POs of SPMUs will continue to liaise with POs of other Bank financed projects in the states on continuous basis. B. Each PMU's Procurement Unit will conduct and manage procurement activities, including finalization of bidding documents based on inputs from relevant departments or agencies.	PCU	By effectiveness and continuous
			C. Close monitoring of procurement plans on a monthly basis both by the PMUs and the Bank; develop plans based on an understanding of: (i) estimated cost of the goods and works and, therefore, appropriate level to direct approval requests, and (ii) the meetings schedules of the appropriate authorities. The plans will reflect the actual time it takes to prepare and evaluate proposals based on country specific systems	PCU and Bank	On continuous basis

2	Awarding contracts	Interactions with Entity Committees and Review Boards	Efforts will be put in place to reduce approval times; PMUs to closely monitor and exercise quality control on all aspects of the procurement process, including evaluation, selection and award. *On the IDA side*, the team to monitor progress of activities on a regular basis and maintain a monthly evaluation framework. All delays and irregularities will be documented by the PMUs for discussions at the Public Procurement Authority, Steering Committee of other higher level.	PMUs Steering Committees Public Procurement Authority Bank	On- continuous basis
Other Factors					
1	Lack of adequate procurement capacity. Limited staff with specialized knowledge in Bank procurement and Appearance of Political Interference in the procurement process at the PMUs	Inability to prepare quality documents in a timely manner	Focused training specific to the areas of weakness; a training program will be developed to respond to specific gaps identified in a needs assessment and to closely monitor and put measures in place to prevent political interference.	NPoPC and NBS	After project effectiveness; and to be maintained on a regular basis
2	Competing demands on staff resulting in delays	Assigned staff to the project also have other areas of assignment which compete with time the put on the project.	Appointment of dedicated procurement staff to the project for efficient scheduling of workload deliverables and strengthening the procurement team through training and mentoring	All implementing and beneficiary agencies	During project Implementation
3	Removal of staff without reason	After spending time and money to build the capacity of procurement staff, the staff are removed whenever there is a change in government or in leadership of the supervision Ministry.	Trained Procurement staff not to be removed for the duration of the project except when found wanting.	Public Procurement Authority	During project Implementation
4	There are several items which are common to all the PMUs. Central procurement of these common Goods could by handled by FPMU but this is not allowed due to bad experience when it was allowed for 3 previous projects in Nigeria	Political Interference with the bidding process was experienced in previous project who procured centrally leading to delay in concluding the process and delay in implementation.	Each PMU will procure Goods, Works, Non consulting services and consultant require for project implementation. Procurement Agent will prepare draft standard ICB and NCB documents /RFP that the PMUs can adopt. Design, Drawings or common Works will also be shared among the PMUs. Each PMU will then prepare its biddings/RFP ready for issuance.	FPMU/SPMU	During project Implementation

C.4. Procurement Plan

80. The 18-month procurement plan for project implementation provided the basis for the procurement methods during appraisal, which was finalized and agreed upon during negotiations. It will also be available in the project's database and in the Bank's external website. The Procurement Plan will be updated in agreement with the Project Team annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

C.5. Procurement Reviews and Thresholds

Table 3.8: Thresholds for Procurement Methods and Prior Review

No	Expenditure Category	Contract Value Threshold** (US$)	Procurement Method	Contracts Subject to Prior Review (US$)
1	Goods and Services (other than Consulting Services	C>=750,000	ICB	All Contracts
		50,000= <C < 750,000	NCB	First contract only
		C<50,000	Shopping	None
		All values	Direct Contracting	All Contracts
2	Works	C>=5 million	ICB	All Contracts
		100,000= <C < 5 million	NCB	First contract only
		C<100,000	Shopping	None
3	Consulting Services	All values	QCBS (International)	All Contracts
		200,000 =<C<200,000 firms	QCBS (National)	All Contracts
		C<200,000	CQS	None
		C>=50,000 individuals	IC	All contracts
		C < 50,000 individuals	IC	None
		All Values	Single Source Selection	All Contracts
4	Training, Workshops, Study Tours	All Values	To be based on Joint Annual Work Plan & Budgets	

**These thresholds are for the purposes of the initial procurement plan. The thresholds will be revised periodically based on re-assessment of risks.

C.6. Frequency of Procurement Supervision

81. In addition to the prior review supervision to be carried out from Bank offices, the capacity assessment of the Implementing Agency has recommended at least two supervision

missions a year to visit the field to carry out post review of procurement actions. The procurement post-reviews should cover at least 20 percent of contracts subject to post-review. In addition, post reviews of in-country training will be conducted from time to time to review the selection of institutions/facilitators/course contents of training, and justifications thereof, and costs incurred. An Independent Procurement Audit will be conducted to contribute to the mid-term review exercise.

C.7. Details of the Procurement Arrangements Involving International Competition

Goods and Non Consulting Services

Table 3.9 List of contract packages to be procured following ICB and direct contracting:

Ref No.	Contract (Description)	Estimated Cost US$'000	Procure-ment Method	P-Q	Domestic Preference (Yes/No)	Review by Bank (Prior/Post)	Expected Bid Opening Date
1	Civil works, and maintenance of flood and gully erosion sites	252,000	ICB	NO	YES	Prior	October 12, 2012

Note: *ICB (International Competitive Bidding) contracts estimated to cost US$75,000 (Goods/supply and installation) or US$5,000,000 (Works) and above per contract and all direct contracting will be subject to prior review by the Bank.*

Consulting Services

Table 3.10 List of consulting assignments with short-list of international firms.

Ref. No.	Description of Assignment	Estimated Cost US$'000	Selection Method	Review by Bank (Prior / Post)	Expected Proposals Submission Date	Remarks
1	Consultancy for the supervision of civil works for 35 sites	6,824 (see remark column)	QCBS	Prior	September 2012	Consultancy for **Priority** sites by each of the 7 SPMU (see each state Proc. Plan).
2	Consultancy for the RAP study for 35 sites	875 (see remark column)	IC	Prior	On-going	Consultancy for **Priority** sites by each of the 7 SPMU is estimated at (25 USD.
3	Consultancy for the ESIA study for 35 sites	875 (see remark column)	IC	Prior	On-going	Consultancy for **Priority** sites by each of the 7 SPMU is estimated at (25 USD.
4	Consultancy for socio-economic study for 35 sites	875 (see remark Colum	IC	Prior	On-going	Consultancy for **Priority** sites by each of the 7 SPMU is estimated at 25 USD per site
5	Consultancy for GIS data collection and mapping for 35	875 (see remark	IC	Prior	On-going	Consultancy for **Priority** sites by

	sites	column)				each of the 7 SPMU is estimated at 75 USD per site
6	Consultancy for the detailed engineering designs and data collation for an **additional** 35 sites	3500 (see remark column)	QCBS	Prior	August, 2012	FPMU contracts firm and deploys firm to SPMUs/state government for site design support
7	Consultancy for the detailed ESIA, RAP and socio-economic studies for an **additional** 35 sites	2625 (see remark column)	QCBS	Prior	June, 2013	Consultancies for **5 additional** sites by each of the 7 SPMU is estimated at 75 USD per site
8	Procurement consultancy for the support of SPMUs and FPMU	800 (see remark column)	QCBS	Prior	Sept., 2012	FPMU contracts firm and deploys firm to all SPMUs/state government
9	Consultancy for legal services	800 (see remark column)	IC	Prior	Sept., 2012	Consultancy by each of the 7 SPMU & FPMU is estimated at 100 USD
10	Consultancy for developing M&E system and impact evaluation and providing capacity support to federal and state MDAs	7000 (see remark column)	QCBS	Prior	Sept., 2012	FPMU contracts firm and deploys firm to all SPMUs/state government
11	Consultancy for training and capacity building	1600 (see remark column)	QCBS	Prior	August, 2012	Consultancy by each of the 7 SPMU & FPMU is estimated at 200 USD
12	Consultancy on community consultation, public education and erosion management and awareness techniques	800 (see remark column)	IC	Prior	Sept., 2012	Consultancy by each of the SPMUs & FPMU is estimated at 100 USD
13	Consultancy to develop of urban stormwater master plan for Onitsha city	1000	QCBS	Prior	Sept., 2012	
14	Consultancy to develop HydroMet system	4000	QCBS	Prior	Nov., 2012	
	Sub Total	**25,960.00**				

Note 1. Consultancy services estimated to cost US$200,000 and above per contract, Individual consultant estimated to cost US$50,000 and above and all single sourcing of consultants (firms and Individuals), will be subject to prior review by the Bank.
Note 2. Short-lists composed entirely of national consultants: Shortlists of consultants for services estimated to cost less than US$200,000 per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

C.8. Publication of Results and Debriefing

82. On-line (DG Market, UN Development Business, and/or Client Connection) publication of contract awards will be required for all ICB, NCB, Direct Contracting and the Selection of Consultants for contracts exceeding a value of US$200,000. In addition, where prequalification has taken place the list of pre-qualified bidders will be published. With regard to ICB and large-value consulting contracts, the Recipient will be required to ensure publication of contract awards as soon as IDA has issued its “no objection” notice to the recommended award. With regard to Direct Contracting and NCB, publication of contract awards can be in aggregate form on a quarterly basis and in local news papers. All consultants competing for an assignment

involving the submission of separate technical and financial proposals, irrespective of its estimated contract value, should be informed of the result of the technical evaluation (number of points that each firm received) before the opening of the financial proposals. The FPMU/SPMU will be required to offer debriefings to unsuccessful bidders and consultants should the individual firms request such a debriefing. All approved livelihood sub-projects details shall be published at the FPMU/SPMU websites and public media on a quarterly basis.

III. MONITORING AND EVALUATION IN PROJECT IMPLEMENTATION

Background

83. An effective monitoring and evaluation (M&E) system encompasses both monitoring and evaluation, and channels results into learning. This process is defined as follows:

- *Monitoring* is a systematic and continuous assessment of the progress and direction of all activities throughout the project period. Shortcomings are identified and brought to the notice of decision makers on a rolling basis, to facilitate implementation of corrective measures and adaptive project management more broadly.

- *Evaluation* is determining the net contribution of the project towards targets and broader goals within the project area by using a set of indicators, baseline values, and a counterfactual group.

- *Learning* encompasses measures identified from M&E that can help bridge gaps observed in the program. The learning insights that emerge are documented as part of a project knowledge base that is then fed back into investment design and implementation.

84. Based on global best practice, a comprehensive M&E system consists of the following elements: i) baseline studies; ii) concurrent monitoring of progress and key processes; monitoring and pathway analysis; iii) participatory monitoring and evaluation; iv) thematic studies and case-studies, with learning and policy/investment oriented workshops; and vii) impact evaluation. Reporting is supported by a web-enabled, computerized management information system (MIS). It is an integral part of the M&E system, integrated into the development of an overall MIS of the implementing agency. As far as possible, M&E data should be available on an open-access basis, as one tool to support greater transparency and improved project governance. The M&E system will utilize cutting edge technology such as remote sensing and GIS to complement field-level surveys and measurements, as well as simple, locally appropriate data collection measures that can often include participation by local stakeholders, depending on a given metric.

85. An effective M&E approach involves different stakeholders, implementing agencies, research organizations, and communities. This helps project partners take timely corrective measures, if and where required, reinforces multi-sector and multi-scale implementation, and enables better targeting of available resources for achieving the project goals. Therefore, M&E plays a strategic role in the pre-planning, planning and implementation cycle of the project. An effective M&E system includes tools, systems and processes to facilitate ongoing feedback

among project partners (the learning aspect) and enable continuous improvements in project implementation.

Overview of Proposed M&E System for NEWMAP

86. NEWMAP will deploy a comprehensive and innovative M&E system based around two main components: (A) *concurrent progress monitoring* (ongoing assessment of inputs, outputs and results, and key processes), and (B) *discrete monitoring* (e.g. a fully fledged impact evaluation) at periodic points throughout the project. It will also include (C) participatory monitoring, (D) thematic studies and case studies, and (E) action learning, all designed to assess performance against key indicators. The M&E components are briefly described below, followed by summaries of the additional key design elements.

A. Concurrent progress monitoring

87. Under NEWMAP, concurrent monitoring will assess progress in implementation against timescales and targets, and resource use against budgets. Concurrent monitoring will report on progress of implementation and expenditures on both a quarterly and annual basis. Concurrent monitoring consists of two parts (i) results monitoring and (ii) process monitoring and pathway analysis, as follows.

88. *Results monitoring.* Input-output monitoring (updated monthly, and reported quarterly and annually) will track the efficiency and effectiveness of project interventions. Inputs (investment costs and quantities of specified inputs) will be compared with outputs actually achieved against annual targets. Shortcomings in target achievement can then guide further analyses to determine how performance can be improved. Findings of internal input-output monitoring will be validated by analyzing samples of collected data on a quarterly basis. For some indicators and activities (especially physical works), remote sensing and GIS will complement field surveys.

89. Process monitoring and pathway analysis. Process monitoring deals with critical processes that are directly related to the project's objectives. These processes include, for example, formulation and execution of participatory integrated sub-watershed plans, execution of large-scale gully reclamation investments, effectiveness of training, functioning of community groups, performance of livelihood activities, etc. Monitoring of these types of processes will be combined with 'pathway analyses' to more systematically study and analyze the factors leading to achievement or non-achievement of project intermediate outcomes. Performance of the implementing agencies and key partners at different levels will also be measured through regular surveys and participatory methods to assess activities according to agreed standards.

B. Impact evaluation (discrete monitoring)

90. Impact evaluation determines the net contribution of the project and its interventions towards targets and broader goals within the project area by using a set of indicators, baseline values, and a counterfactual group.

91. *Operational research questions/issues to be addressed through the impact evaluation*: The impact evaluation will be designed to answer the following types of research questions:

1. What are the economic and social impacts of the early site livelihoods interventions on households?

2. How does the impact of NEWMAP interventions compare to those carried out under alternative institutional arrangements, such as the Ecological Fund and state-financed investments? In other words, how does a multi-sector approach (such as NEWMAP) compare to a standalone infrastructure investment?

3. What mechanisms can be employed to mobilize and sustain community interest and participation in the construction and maintenance of erosion and watershed management investments?

4. Does the impact of NEWMAP spread geographically to areas outside of the immediate proximity of gullies/interventions? What is the impact of rehabilitation of roads severed by the gullies on trade and access to markets?

5. Can the use of community monitoring and crowd sourcing to document the progress of investments increase accountability?

6. How effective are interventions such as support to dry land agriculture, water resources management and livestock development, which are being designed for the Northern states? In particular, within each category of interventions, which one has the largest impact, and why does it work or not work, and what are the mechanisms through which produces an impact or not?

Framework for impact evaluation design

92. The impact evaluation will take a phased approach in line with project implementation. In the *first phase (project years 1-3)*, the impact evaluation will focus on priority, first-mover sites selected for initial implementation (expected to be in Anambra, Cross River, and Imo states, though other sites from different states might be included in the first phase of the impact evaluation.). Results from the first phase will be used to inform program implementation in the *second phase (years 4-6)*. Also, additional sites, from all the states covered by the program, will be included in the sample, which will improve the validity of the impact evaluation and allow for the testing of additional research questions.. This phased approach will add rigor to the findings and add further value to project stakeholders, and contribute to establishing good replicable investment models for scaling up. As they start to be covered by the program, the Northern states will be included in the impact evaluation design. The impact evaluation for the Northern states will have a different approach, as the issues and interventions relevant those states differ from those in the South/South-east. Proposed intervention for the Northern states might include support to dry land agriculture, water resources management, and livestock development.

93. In addition to NEWMAP first-mover sites, phase one of the impact evaluation will also be used to understand the impact of gully rehabilitation interventions carried out under the Ecological Fund and State Ministries of Environment. This means that there will be a total of 5 intervention sites (3 NEWMAP, 1 Ecological Fund, and 1 state). Pipeline Ecological Fund and state sites will be selected for the impact evaluation from within the phase one NEWMAP

states.[27] For each of the intervention sites, an appropriate control site will be identified. There will thus be a total of 10 study sites (5 intervention or "treatment," and 5 control). This general evaluation framework will be extended to allow for the testing of interventions at the sub-site level.

Interventions and impact evaluation design

94. To estimate the impact of physical infrastructure investments under Component 1, the impact evaluation will compare outcomes between treatment and control sites. For instance, the impact of these investments will be measured in terms of indicators such as the speed of gully stormwater flow and the use of land around gully areas. Additionally, outcomes at household or individual levels will be examined. These include, for example, primary school enrolment and psychological well-being, and individual land management practices.

95. Control areas will be selected from eligible priority sites planned for later investment by the project, which will be matched to phase one intervention sites. To do this, a pre-matching analysis will be carried out on potential control sites to select the ones that provide the best counterfactuals. The matching design assures that intervention and non-intervention areas are comparable by considering a large set of characteristics. By comparing the change over time in target outcomes in intervention and control sites (a so-called difference-in-differences approach), the project's causal impact on these outcomes can be ascertained.

96. In addition to this, the natural phasing of investments could be exploited. For example, for several reasons some investments might be phased in early or before others, with this giving a "natural experiment" setting in which the impact of the early investment can be isolated. For the evaluation of sub site intervention, an experimental approach is proposed. An experimental approach allows for attributing with a high degree of certainty any change in target outcomes to the interventions being evaluated. By randomly assigning some project areas to the "treatment" group (e.g. capacity building in community planning to support project activities) and other areas to the "control" group (where no such capacity building activities are carried out), one may understand the impact specifically of the capacity-building activity on the target outcomes. Random assignment allows for creating groups which are equal on average in terms of both observable and non-observable characteristics. By randomly providing the intervention to some areas and not to others, any ex-post difference in target outcomes can be confidently considered as the impact of that intervention. In terms of livelihood interventions a possible design is to implement the package of interventions in some of the gully fingers while giving an "augmented" package to other gully fingers. This additional feature of the "augmented" package could be, for example, follow up business marketing training sessions.

97. A similar approach could be used for testing mechanisms to empower communities. On the one hand, the impact evaluation can measure the impact of community members participating in the monitoring of the construction activities (for example, they could document the activity progress through photos taken at the construction sites and uploaded in a public access website). On the other hand, also the impact of community members actively participating in the civil works and maintenance of the constructions could be estimated.

[27] Selection of pipeline sites allows for the collection of data prior to the start of any intervention. Pre-intervention baseline data can be used to control for pre-existing differences between treatment and control sites. Without such data, it cannot be determined whether differences between treatment and control sites were pre-existing, or if they are due to interventions.

Data collection

98. Indicators will be defined in conjunction with the SPMU and State Ministry of Environment in each state participating in the impact evaluation, and with the FPMU and Ecological Fund. Whenever possible, data on these indicators will be collected through the project's M&E system. It will, however, be necessary to collect a large amount of complementary data through impact evaluation-specific surveys. This is due to the need to collect detailed information on household and individual-level indicators, which cannot be done through the standard M&E system. Furthermore, all data will be collected in both intervention *and* control areas.

99. Survey sample size is calculated on the basis of the baseline value of key indicators, and the expected changes in these indicators resulting from the project/interventions. This calculation will also be performed so that our sample is representative at the site level. In line with the impact evaluation design framework, data will be collected across all ten sites. For the subsite-type interventions, it is expected that required sample size will approximately increase by a factor equal to the number of sub-sites. Baseline data collection is planned for project year 2, prior to the start of any project interventions, and a follow up data collection for year 4.

Implementation arrangements for the impact evaluation

100. The drafting of specific impact evaluation documents (concept note which will be subject to peer review, followed by the detailed implementation and work plan, instruments, etc.) will commence in the run up to project effectiveness with a practical Impact Evaluation Workshop run by the World Bank's Development Impact Evaluation Initiative (DIME). The client's project leadership, key technical experts involved in the project, and Bank staff are expected to participate. At this stage, the project will be assigned one or two senior researchers who will provide technical and intellectual guidance to the impact evaluation. Following the workshop, a field coordinator will be selected who will provide daily support to the impact evaluation. Ongoing support, guidance, technical assistance, and supervision will be provided by the DIME secretariat.

101. A third-party M&E consultancy/firm will be selected to run the data collection activities for all the impact evaluation sites. *This will be the same consultancy secured for the broader M&E system.* The consultancy will need to partner with national/local institutions. The selection process will insure that the consultant/firm will have the requisites to collect both data at the site level (for result framework and related indicators) and at the household and individual levels (for the impact evaluation). In participating states, a field coordinator will be contracted to supervise the field activities for data collection, and providing technical assistance for IE to the SPMUs. These field coordinators will be the primary liaison with the DIME team.

102. Within the FPMU, a focal person for the impact evaluation will be selected. Ideally this will be the M&E specialist/officer. This arrangement will be mirrored at the state level. In addition, a technical resource person will be selected from academia, such as the Erosion Institute at the Federal University of Technology, Owerri, to bring detailed natural history and geotechnical and socio-economic research on erosion in the project area.

C. Participatory M&E

103. Participatory M&E tools will be developed and used for gathering local information on both institutional performance, and major physical works such as gully rehabilitation. Proposed methods of participatory monitoring for institutional performance in NEWMAP include:

- **Citizen report cards** to assess performance of key implementing agencies at field level. In specific terms, report cards can be used to: a) generate citizen feedback on the degree of satisfaction with the project-related services provided by various public service agencies; b) establish credible benchmarks to track project implementation progress over time; c) catalyze citizens to adopt pro-active stances to request better accountability, accessibility and responsiveness from project service providers, contractors, and implementing agencies, d) serve as a diagnostic tool for service providers, external consultants and analysts/researchers, to facilitate effective prognosis and therapy; and e) encourage public agencies in the project to adopt and promote citizen friendly practices, design performance standards and facilitate transparency in operations. Care needs to be taken to ensure that citizen report cards are themselves produced with a degree of transparency yet protecting citizens' privacy to avoid potential retaliation against low scores.
- **Self-assessment processes** by Community Based Organizations (CBOs) for evaluating how effectively they are performing relative to project-related functions, and gauging of institutional maturity, inclusiveness, etc. Results will then be used to develop capacity building strategies.

104. For major physical works such as gully restoration, it is envisioned that participating communities will be assisted to adopt simple ICT approaches to monitor level of completeness relative to disbursements, and overall quality of the work. Techniques could include equipping community groups with GPS-enabled digital cameras and uploading regular photos to Google Maps (accessible to the public), and low-cost weather balloons outfitted with GPS-enabled digital cameras to provide geo-located images at a wider scale. These techniques could also be applied to major physical works in surrounding watershed areas, such as soil and water management structures (check dams, bunding, water storage, etc). Such work can also have an ancillary benefit in serving as a valuable environmental education experience for the community members, in particular students.

D. Thematic studies and case studies

105. Thematic studies will supplement and complement other monitoring components through validation of information on indicators of the results framework, as well as provide analytical inputs which go beyond routine monitoring functions. The need for thematic studies will emerge as the project progresses results of process monitoring and external quality monitoring indicate a need for specific studies. Specialized organizations with expertise in areas to be studied will be invited for planning and conduct of these studies, to be supervised by the implementing agency at the national level. In addition, members of NEWMAP's proposed independent Science and Technical Advisory Panel could be involved in providing expert independent input and review.

E. Action learning, documentation and reflection

106. The project will proactively undertake documentation of processes, case-studies, best practices and lessons learnt from project experience that can be shared with stakeholders and political institutions to raise awareness and build support for project activities. Documentation will be a continuous process throughout the project duration and across all the project personnel. It will support internal learning and help project authorities to be responsive to ongoing monitoring. The effectiveness of internal learning will depend upon the degree of institutionalization of learning among the various levels of project organization and the communities. A considerable part of learning will take place through a structured set of participatory workshops associated with quarterly and annual review and planning, at various levels. The project will also participate in regional, continental and global mutual learning events with Nigeria's neighbors involved in the Sahel and West Africa Program in support of the Great Green Wall, and TerrAfrica's continental learning events on sustainable land management. Globally, south-south exchanges may be set up, potentially with Brazil which has had some success in urban gully rehabilitation, as well as India and China which have had success in large scale landscape and watershed rehabilitation through Bank-financed operations.

107. NEWMAP will raise the capacity of the country to collect, store, share and manage data related to management of erosion, climate risk, watersheds, and carbon – and transform this data into usable information across stakeholders to underpin and plan their actions. This requires forging and sustaining "data partnerships" among actors, instilling a culture of open information and mutual learning, and a shift toward more evidence-based decision making on investment and policy.

108. A comprehensive result monitoring matrix including objectives, performance indicators, definitions, and targets is being developed at this time. The approach proposed for NEWMAP is to identify a logical and measureable set of indicators for each component. **The project Results Framework in the PAD Annex 1 is a subset of these indicators; it represents only those changes that can be directly attributed to specific project activities.** For example, a simple, qualitative measure may be used in the PAD to measure broad bio-physical improvements from gully restoration investments at the PDO level. At the same time, the larger set of M&E indicators could include additional and more complex and scientifically rigorous indicators that may partially reflect project investments, such as changes in overall gully area or volume, turbidity at the gully mouth, downstream sedimentation, terrestrial carbon accumulation (carbon is a proxy for ecosystem performance and could potentially be monetized at a future date), community monitoring of biodiversity asserts such as changes in the number of benthic organisms in creeks (also an ecosystem proxy), and others. A project theory of change is presented below in Figure 3.1, which shows impacts outside the project's direct span of control.

Figure 3.1. NEWMAP theory of change

Current practices and situation	Project Interventions	Changed practices and situation	Project outcomes within 8 years	Long-term impacts outside direct span of project control
Road cross drainage and urban drainage do not usually terminate at water body, causing rapid gully expansion and landslides, with resulting loss of roads, housing, lives and livelihoods	Shift to improved designs and raised capacities to design, implement, collaborate on, and monitor works	Drainage always terminates at water body, preventing gully formation and expansion.	Vulnerability to erosion reduced -- from treated erosion sites and expanded vegetation cover in targeted sub-watersheds.	Quality of life increased and poverty reduced -- from longer road and building life, reduced siltation, improved ecosystem function, higher agricultural productivity, more jobs and more secure livelihoods
Current gully erosion projects emphasize concrete and de-emphasize prevention	Shift to integration of flexible civil works and sustainable land mgt practices (i.e. grassing)	Flexible civil works and sustainable land mgt practices commonly applied		
Current gully rehabilitation and prevention designs do not take into consideration gully catchments or climate futures	Shift to sub-watershed and urban stormwater planning that consider (i) gully dynamics within the local landscape and (ii) rainfall intensity projections	Improved sub-watershed planning around the gully system reduces water flow to the gully, and prevents further erosion		
Communities affected by erosion tend to attribute responsibility to the government alone	Communication campaign and community mobilization	Mobilized communities take responsibility for changes in land use and mgt, solid waste mgt, storm water mgt in sub-watershed		
Data and information are fragmented, missing, or unavailable	Shift to open data and information platforms; update systems	Planning, civil engineering, and land and water mgt are evidence-based		
Poor contract mgt leads to unfinished works that do not work	Shift to results based and accountable procurement	More works completed on time, within cost, and following best practices		
Weak governance, regulatory compliance, and multi-sector coordination	Strengthen regulatory compliance across institutions	New works projects include measures to prevent gully formation		

3. Project Management Information System (MIS)

109. Concurrent monitoring will be supported by a web-enabled computerized MIS that will be developed through project support. It will be an integral part of the M&E system, wherever necessary integrated into the overall implementing agency MIS systems. Off-the-shelf MIS software is readily available that can be customized for the NEWMAP operation to facilitate structured data entry at field level (in all states), which can then be consolidated at state and national levels for reporting[28].

110. The MIS will track activities and sites, by component, sub-component and by state. Partner agencies at state level and below, will be required to keep detailed records of activities, outputs, and expenditures against the agreed joint annual work programs, and following standard formats including robust financial monitoring. The project will support an analysis of software options relative to management information requirements and potential for ICT automation; procurement; customization to NEWMAP; field testing and system roll-out; and ongoing technical support for maintenance, including further adaptation and refinement.

111. Importantly the M&E MIS will integrate with the broader NEWMAP Spatial Knowledge MIS, which will convene all information under the project (See component 2, under which the Spatial Knowledge MIS is financed).

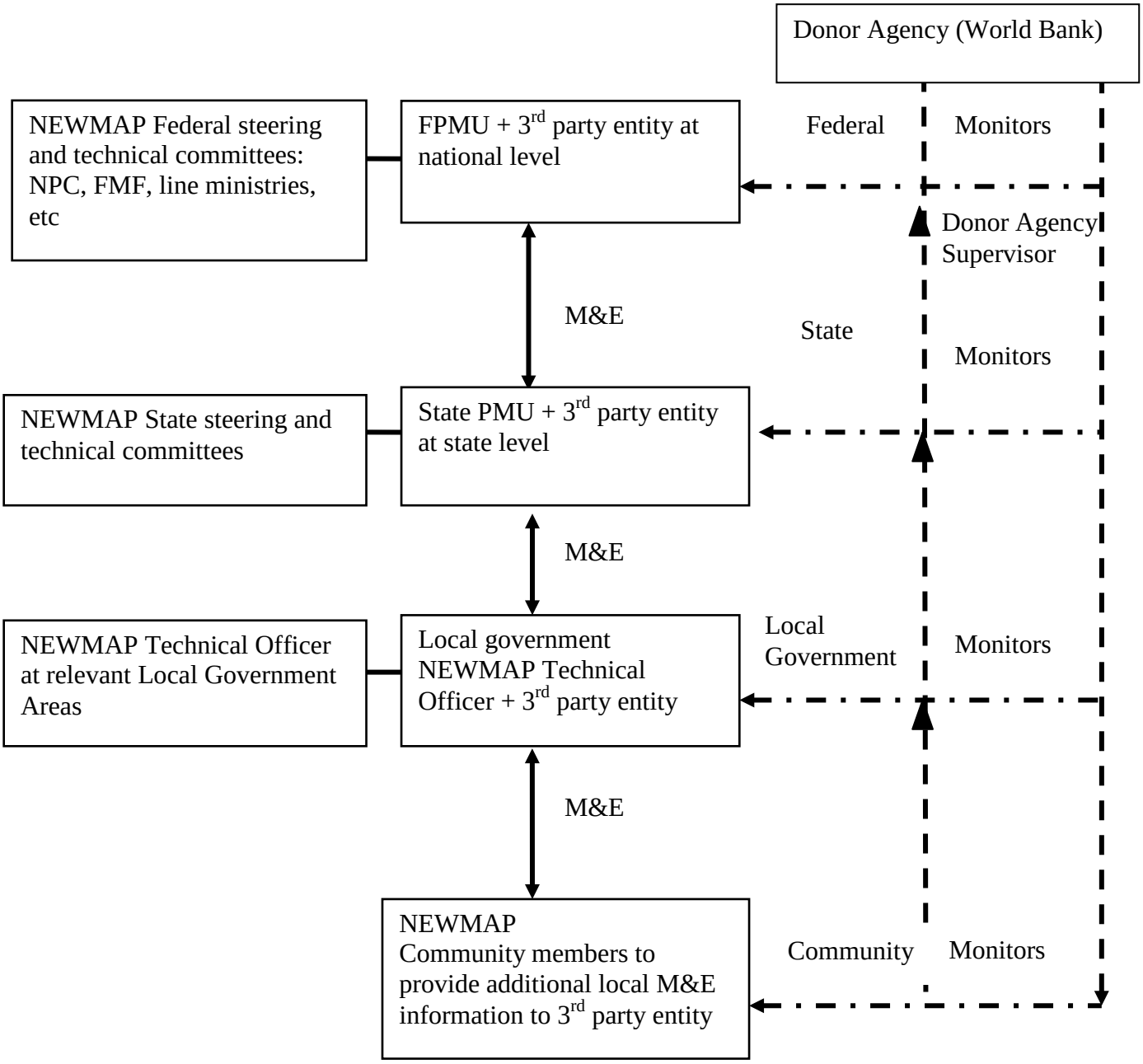
4. Institutional Arrangements for Implementing M&E

112. The project's M&E implementation arrangements rest upon a mixed set of responsibilities that balance ownership of M&E and improvement of government systems and capacities with independent verification and impact evaluation. The system will function through a combination of an external third party entity, M&E units at the federal and state levels, and community-level M&E. The FPMU will also work closely with NPC and FMF on M&E. See diagram 3.4 below.

113. Data collection for M&E and the impact evaluation are unified under the budget for M&E financed under Component 4. The impact evaluation will not have a parallel implementation track. The third party entity working on the M&E activities will also cover, at minimum, the data collection for the impact evaluation.

[28] A good example is the MIS software developed by the Indian Space Research Organization (ISRO) to handle M&E data for the award winning Karnataka Watershed Development Project, supported by the Bank. ISRO also designed user-friendly software to facilitate community level micro-watershed planning, linked to thematic GIS maps.

Diagram 3.4. Proposed M&E implementation arrangements



114. ***Independent third party M&E service provider***. A key principal of the proposed M&E approach for NEWMAP is the use of a highly qualified third party entity to lead the development and operation of the overall M&E system, working in collaboration with and raising the capacities of: (i) project M&E units of the federal and state PMUs, (ii) the environment ministries at federal and state levels, (iii) those MDAs responsible for front-line data collection such as NIMET, NIHSA, the NASRDA, and lastly, existing academic entities such as FUTO Owerri's Erosion Institute, and existing platforms such as Nigeria's National Technical SLM Committee involving FME, FMWR, NIMET and others, and currently chaired by FMARD.

115. There are a number of reasons for the third party approach. First, by contracting a highly qualified and experienced entity, it is expected that cutting edge M&E approaches will be embedded into the NEWMAP system. Second, the low M&E capacity (human resources, systems, and technology) within the proposed implementing agencies at federal and state levels, requires a third party to ensure that M&E is operational early in the project (See below for more details on M&E capacities). Finally, an appropriate third party entity, working with a high degree of autonomy at all levels in the project, will promote greater transparency and promote improved governance. The third party entity will finalize the overall M&E baseline indicators and in collaboration with thematic specialists working closely with their liaison colleagues in partner implementing agencies. It is expected that the third party entity will field a national M&E coordinator and state coordinators. The third party entity will also be responsible for placing staff at the field level to manage data collection and guide communities with various participatory monitoring activities. The entity will be expected to retain functional specialists covering: GIS; remote sensing/digitization; MIS operation; social and community development; natural and water resources management, civil and geotechnical engineering, hydrology, soil science, process monitoring, etc. As part of the umbrella contract, this entity will lead the adoption and roll-out of the overall MIS.

116. ***Federal level M&E office***. NEWMAP is led by the FME, which hosts the independent FPMU. The FPMU will be responsible for the project's overall M&E system and operation. As part of this effort, the project will support establishment and operation of a M&E office in the FPMU. The project MIS, as outlined above (section 3) will be used to manage concurrent monitoring data collected by the third party agency and communities and assist in ongoing evaluations. At the federal level, data will be aggregated from state and sub-state data and information through the MIS, to track and report on overall project activities. The federal M&E office will coordinate the acquisition of relevant data from many partner national MDAs to support the overall M&E operation in the project. For example, the FME erosion department has prepared detailed maps and GIS layers on erosion nationwide. FMARD is likewise digitizing and updating soil maps nationwide. The NASRDA has two new an earth observation satellites that can generate remote sensing imagery down to 2.5 (black and white) and 5 meters (color) of resolution – which is adequate for most monitoring of land and water systems in NEWMAP. Higher resolution images may be required to monitor certain land-based treatments and test new approaches for measuring changes in gully area or volume. NASRDA will participate in NEWMAP as a service provider and partner organization, helping contribute to evidence based decision making on land use planning and management. NASRDA can also assist in training partner MDAs and PMUs at state and federal levels on GIS and remote sensing analysis. Efforts such as these are fragmented yet can be networked in the context of NEWMAP's effort to modernize data and pursue "data democracy" that can underpin better planning, better policy,

better investment, and ultimately, better results. A second gap to be filled by NEWMAP is to establish a real-time HydroMet system in the project area and connect the data and information to government systems across sectors. The Nigeria Hydrological Services Agency will be the lead technical agency. Lastly, NEWMAP's independent Expert Advisory Services Pool will provide high level advisory services on M&E design and implementation, suggest critical thematic and case studies as needs emerge.

117. ***State level M&E office.*** Each SPMU will be able to use the MIS to aggregate information from site interventions as information travels up to the FPMU. It is expected that participating states will also use the MIS to aggregate the data to facilitate their own project management, learning and reporting functions.

118. NEWMAP's broad M&E system will support the demonstration of best practices for gully erosion monitoring systems, water and climate monitoring systems; vegetative cover, land-use and biodiversity monitoring systems in targeted areas, terrestrial carbon in targeted areas. It will build the capacity of different institutions and stakeholders (including community groups). For example, technical expertise can be drawn from the Nigerian academic community, which has worked extensively in documenting and monitoring the complex dynamics of gully erosion in the southeast, but until now this has been somewhat isolated from government programs. NEWMAP will help bridge this gap through its M&E work.

119. ***Community monitoring, reporting and feedback.*** ICT-enabled platforms, particularly SMS based mechanisms, are being used around the world to increase the amount, specificity and accuracy of information the government has available from communities on the ground. In turn, such platforms allow government to provide citizens with real time information and updates, and enable citizens to give feedback or raise concerns about different issues.

120. Given the geographic scope and coverage of the erosion problem in Nigeria, and the fact that some of the key causes of erosion are badly designed infrastructure, drainage, destructive livelihoods practices etc, getting people at the grass roots involved in monitoring and reporting is essential. At the same time there has been an increased demand for social accountability in government projects and programs

121. Nigeria has seen the widespread development of mobile networks and broad adoption of mobile technologies, even in the rural areas. The project will support the development of an ICT enabled, SMS based, community mapping, monitoring, reporting and complaints system. The system will be tailored to serve the information needs of communities, project teams and the government. Community generated data will be fed into the project MIS and broader Spatial Knowledge MIS and will serve as a continued cross check on activities supported under the project.

122. The community mapping and monitoring system would allow communities to report on early warning signs such as a blocked drain or newly formed gullies, or destructive practices such as illegal dumping, logging or sand mining. Such a system also allows citizens to monitor contractors and service providers operating in the local community. It would also provide mechanism to lodge and respond to complaints and grievances.

5. Sector capacity for M&E

123. NEWMAP's M&E system will be linked with federal and state M&E systems as well as innovative community reporting mechanisms, and provide a basis for enhancing institutional

capacity to monitor interventions. However, capacity is currently insufficient at federal, state and local levels. According to a 2011 rapid assessment of the sector's M&E systems, there is no M&E department yet within the overall framework of the FME; M&E is currently carried out only as components of donor-funded projects. However, there is a plan for the provision for a M&E Unit in the department of Policy Analysis, Monitoring and Inspectorate to have the responsibility for monitoring and evaluation of the Ministry's activities, projects and programmes centrally but at the moment; this is yet to be operational.

124. The gaps in M&E at the level of the FME are replicated at state level and include the following:

- Inadequacy of tools and instruments for data management e.g. inadequate or absence of data collection and analysis tools e.g. ArcGIS, data analysis tools and computers (both hardware and software – SPSS and other analytical tools)
- There is no M&E operational manual including M&E framework or policy
- Inadequacy of funding for M&E activities

125. The required staff members that could drive the process are in short supply. The department of the Policy, Monitoring Inspectorate will need to be adequately staffed for it to function effectively.

126. NEWMAP will provide support to improve monitoring capacity in FME and relevant institutions and apply this to government programs. An M&E workshop will be carried out immediately upon effectiveness including relevant actors at all levels. All PMUs currently have designated M&E officers in place who will facilitate this workshop. NEWMAP liaisons in each related MDA will provide additional inputs, data, and information to the PMU M&E desk.

6. Estimated M&E Costs

127. Under project component 4, US$7.39M is allocated for M&E and impact evaluation. This will cover the cost of the third party M&E entity (including design and operation of the MIS), incremental costs in the FPMU and SPMUs for data collection, staffing, equipment, software, reporting, learning events, etc.

D. ROLE OF PARTNERS

128. The GEF and the SCCF are co-financing NEWMAP as a fully-blended project with grant resources for biodiversity, sustainable forest management (including forest carbon), land degradation, and climate adaptation. The GEF and SCCF have two different Councils that each take financing decisions on the allocation of GEF and SCCF grants. These Councils are composed of rotating representatives of UN member countries. For the purposes of the SCCF, the GEF functions under the guidance of the Conference of the Parties to the UNFCCC.

Annex 4: Operational Risk Assessment Framework (ORAF)

NIGERIA: Nigeria Erosion and Watershed Management Project

Project Stakeholder Risks				
Stakeholder Risk	**Rating: Moderate**			
Description: The multi-sectoral nature of the development challenges targeted by this operation involves coordinating activities across a range of ministries, departments and agencies (MDAs) at federal, state and local levels. In addition, several communities with diverse ways of life are involved. Inadequate or ineffective stakeholder participation and capacity could undermine success or sustainability of project activities. There remains a risk that individual stakeholder MDAs may want dominate while some stakeholders may feel that their actions are being constrained and therefore oppose project.	*Risk Management:* The design of the institutional and implementation arrangements took this risk into account in arriving at a multi-sectoral Project Management Units (PMUs - one in each state and one at federal level) to ensure adequate representation, ownership and produce synergies among the different stakeholders. A stakeholder communications strategy developed during project preparation will be implemented early in the life of the project. A broad set of stakeholders including independent third party monitors will be involved in project implementation and monitoring. A strong capacity-building program at all levels (federal, state and local) is included in the project. Meanwhile, in the course of preparing this project, there have been ample consultations with stakeholders including potential project beneficiaries, project affected persons, communities, NGOs and community organizations. This consultation will continue during project implementation. In addition, NGOs and CSOs will be involved in project supervision and monitoring.			
	Resp: GoN	**Stage:** Implementation	**Due Date:** Early implementation	**Status:** Included in design
Implementing Agency Risks (including fiduciary)				
Capacity	**Rating: High**			
Description: Technical capacity There is a risk of limited capacity in some of the states and weak coordination across agencies at and among the different MDAs at federal, state, and local levels. Institutional mandates for erosion and watershed management are unclear. Multi-sector coordination is weak. It is worth noting however, that the FME and all the participating states have trained PFMUs that oversee all IDA project finances in each state.	*Risk Management:* The project will hire at the national level at least one internationally recognized expert in land degradation / watershed management in both humid systems and drylands. Besides having a seasoned internationally experienced professional embedded within the federal PMU, a well qualified engineering firm will be procured through the credit financing to provide overall project supervision and technical designs. The project's Expert Services Pool (EASP) provides an additional source of national and international expertise to be deployed throughout the project at state and federal levels to enhance quality where needed. The mix of physical civil works investments and ecological efforts will be well designed, balanced, and phased. The project's component 2 is dedicated to institutional strengthening at all levels, and component 3 brings additional support on the climate change agenda. Clear roles and responsibilities, coupled with robust accountability mechanisms, will guide project implementation. An operational manual will be developed for proposed interventions. The strong M&E system detailed in Annex 3 will be operationalized to reinforce adaptive management in the PMUs and across MDAs.			
	Resp: Project team	**Stage:** Implementation	**Due Date:** On-going	**Status:** Not yet

				due
Description: FM capacity. Lack of familiarity with IDA procurement and FM guidelines and procedures remain problematic in some of the participating states. This is due in large measure to weak capacity in public sector accounting, auditing and oversight. In addition, implementing agencies may not follow proper financial management practices and may have difficulties in hiring qualified staff trained in Bank procedures.	*Risk Management:* To mitigate this risk, the FM functions for both the FPMU and SPMUs will be provided by the Federal Project Financial Management Division (FPFMD) and Financial Management section of the FPMU respectively. The PMU staff will be competitively recruited with an emphasis on candidates with prior experience with Bank fiduciary requirements. In addition, FM services will be provided by the PFMUs in the participating states and the FPFMD at federal level. The PFMUs and FPFMD are multi-donor and multi-project FM platforms, established in all states and at federal level respectively through the joint efforts of the Bank and the government. These common FM platforms feature robust systems and controls. To strengthen the financial management system in the PFMUs and FPFMD, training and closed supervision will be employed early in project implementation.			
	Resp: Client	**Stage:** Preparation and Implementation	**Due Date:** On-going	**Status:** Not yet due
Description: Procurement and administrative capacity Project procurement activities will be implemented by the federal and state PMUs. An assessment of the capacity of the implementing agencies to implement project procurement activities was carried out in accordance with Procurement Services Policy Group (OCSPR) guidelines dated August 11, 1998. Lapses observed in the implementation of the previous and ongoing projects include inadequate capacity, poor documentation, political interference etc. These lapses were addressed by continuous internal and external training, PPR missions, engagement of procurement consultant, continuous dialogue with government, etc. The review of the state PMUs, however, revealed that none have any history of implementing Bank-financed projects and some states were just establishing their Ministry of Environment. Other risk issues include: (i) lack of procurement capacity; (ii) lack of effective and efficient storage; (iii) lack of appropriate MIS for tracking procurement records; (iv) lack of contract management skills; (v) potential undue interference in the procurement process; and (vi) frequent transfer of procurement staff after building capacity.	*Risk Management:* The PMU and activity implementing agencies will be supported by short-term procurement consultants and PMU staff will receive all the basic procurement, FM and project management training prior to project effectiveness. The PPA for project preparation will fund the preparation of procurement and financial management manuals and trainings for project staff on fiduciary matters. The project will use prior review until such a time that the PMUs exhibit sufficient capacity for post review. Considering the large volume of procurement in this operation, each PMU (federal and state) will competitively recruit a qualified and experienced procurement specialist and consultant. A procurement assistant will also be assigned to the PMU and all staff will require training on continuous basis. Thus a strong and adequate Procurement Unit will be established in each PMU. Bank PS will also provide training clinics where necessary and close supervision. In addition, due to the inadequate procurement capacity to handle the large volume of procurement activities and the number of PMUs in this operation, the FPMU will competitively recruit before effectiveness a Procurement Consulting firm with experience and qualified staff for processing the procurement of Goods, Works and Consultancy services. The firm will support the procurement implementation of both the FPMU and the state PMUs. The FPMU procurement consultants will visit the SPMUs during the bidding process and provide quality assurance to the documents for both post and prior review packages. All the prior review packages of the SPMUs will be reviewed by the FPMU procurement consultants for quality assurance before submission to the Bank for prior review. Each SPMU will also hire a consultant to support the procurement activities in the first year of project implementation and could be renewed base on need. The project will use prior review until such a time that the PMUs exhibit sufficient capacity for post review. Finally, PMU procurement staff well be supported to undergo World Bank training courses on procurement.			
	Resp: Client and Bank	**Stage:** Preparation and Implementation	**Due Date:** On going	**Status:** Not yet due

Governance	**Rating: High**			
Description: Weak contract management and regulatory compliance present risks to achievement of institutional and policy goals. Lack of management and key staff continuity are risks to momentum of project implementation. Multi-sector project activities generally require effective coordination between a range of government agencies and NGOs (who play a prominent role in rural service delivery); this is always challenging, and may be especially so in Nigeria where capacities and information availability are low.	*Risk Management:* Component 2 of the project is designed explicitly to strengthen institutional performance and coordination through establishment of a robust knowledge base and institutions: • A Steering Committee has been established to support effective coordination across sectors. • Capacity will be strengthened on contract and procurement management aspects and policy enforcement at the PMUs. A strong training program for stakeholders at all levels (domestic engineering firms, beneficiaries, MDAs, etc) is also part of the activities that will implement early in the life of the project. Good documentation will be supported by a strong project M&E system. Awareness raising programs will interpret technical information for a broad public audience and include training for media on erosion and watershed management issues. Field activities, such as micro-catchment management, will involve participatory planning processes and extensive training and empowerment of both community members and district staff. In addition, third party monitoring and beneficiary verification will be involved to provide independent, objective monitoring data. The project will also establish grievance redress mechanism to address conflicts that could result from the implementation of the activities of the project.			
	Resp: Project team	**Stage:** Preparation and Implementation	**Due Date:** Not yet due	**Status:** Not yet due
Project Risks				
Design	**Rating: Substantial**			
Description: Erosion and watershed management projects are necessarily complex including multiple types of investments, implementing agencies and stakeholders as they aim to synergize the actions of a variety of agencies. There is a history of failed approaches to managing gullies in Nigeria's southeastern region, for the reasons given earlier. There is a risk of agencies not taking up comprehensive, integrated approaches to erosion management, and continuing with past inappropriate technical designs for anti-erosion interventions on the ground.	*Risk Management:* The project design has been guided by a review of best practices and lessons learned in the implementation of similar projects in Nigeria and elsewhere. International expertise through firms and individuals will be sourced within the project to help improve the site intervention designs. A more integrated approach will be taken by the project. Appropriate international and domestic technical assistance, coupled with strong governance measures, is being built into the project design for investment preparation, review and quality control. A strong M&E system plus impact evaluation will provide guidance from early interventions and strengthen accountability. Each major intervention will include a completion report to document lessons learned that will be compiled and disseminated by the PMUs.			
	Resp: Bank and GoN	**Stage:** Preparation	**Due Date:** Appraisal	**Status:** Included in design
Description: Investments in erosion and watershed management are long-term by nature, and their impacts are not easy to monitor and dependent on a number of well sequenced and coordinated activities that must be well implemented on the ground	*Risk Management:* The project is designed to last for 8 years. At the outset, the project will focus on quick wins but high impact activities such as interventions in priority sites as identified by the communities and key stakeholders themselves. The activities will show demonstrable impacts in selected watersheds critical for maintenance of ecological infrastructure and for flood risk management. In addition, the GEF and SCCF resources will be used to set up local innovations that			

	will be subsequently scaled up using IDA resources. This approach will allow local experience to be gained and lessons learned to guide scaled up operations in later phases. In addition, component 2 includes scientific capacity raising and application of monitoring tools to gauge improvements in ecological conditions that take a long time to gestate. Lastly, impact evaluation will be deployed to establish important key variables in stabilizing gullies and how affected communities can benefit and how they can best be mobilized through good incentives such as livelihoods enhancements.			
	Resp: Bank and GoN	**Stage:** Preparation	**Due Date :** Appraisal	**Status:** included in design
Social & Environmental	**Rating: Substantial**			
Description: The project is expected to have highly positive environmental and social impacts, as it provides incentives for improved environmental management in critical and sensitive areas with active participation of communities. There are adequate legal and institutional frameworks in the country to ensure compliance with World Bank safeguards policies triggered by the proposed project. However, weak enforcement and compliance for environmental and social impact assessments including resettlement action plans may hinder the project's ability to address: - Unclear land ownership in some locations - Land access/ownership conflicts and disputes on resettlement in erosion sites - Current practices that induce erosion - Designs, construction techniques, and ongoing maintenance not conforming to good standards. - Improper use of non-native species for re-vegetation. The existence of many people in the project areas who have suffered the consequence of gully formation and growth poses a problem with regard to expectations. While people who may undergo displacement as a consequence of project operations (e.g. gully stabilization), will be compensated under the terms of OP4.12, those who suffered losses of farmland, domicile or other assets due to gully formation in the past are not entitled to compensation under the Bank's resettlement policy. However, there is a prevalent attitude that not enough has been done by government in the past to prevent gullies and virtually nothing has been done to alleviate the losses caused by gully formation	*Risk Management:* An Environmental and Social Management Framework (ESMF) and a Resettlement Policy Framework (RPF) for the project have been completed and publicly disclosed in Nigeria and at World Bank InfoShop (4 January 2011). In particular, the findings and recommendations of the ESMF and RPF have been internalized in project design. Project component 2 will directly support the counterpart to strengthen environmental assessment and regulatory compliance. In addition, a strong team on environmental and social aspects is in place. The project is directly attempting to improve deteriorating environmental and social conditions. Lastly, the project is developing and providing specific guidelines, standards, and codes of practice for erosion control and prevention activities. In addition to these measures, a robust and continuous communications program will be implemented to advise people in a clear but compassionate way regarding their rights, explaining which entitlements will be created and which will not. With regard to the risk of government not providing timely resettlement benefits, this will be mitigated in part by the project's being part of the government's budget, and the project staff, Steering and Technical Committees will proactively follow up on budget execution.			
	Resp: Client	**Stage:** Implementation	**Due Date:** On going	**Status:** Safeguards documents exist as publicly disclosed documents. Other actions not yet due.

in the past, it is expectable that many people will feel that they are entitled to special consideration and compensation under the Bank financed program. Local communities will be consulted about ways in which land redistribution and livelihood restoration activities could assist people adversely affected by gullies in the past. There is a risk that the government may not provide resettlement compensation in a timely manner thereby delaying project implementation in a specific site.				
Program & Donor *Description:* N/A	**Rating:** N/A	N/A		
Delivery, Monitoring & Sustainability	**Rating: Substantial**			
Description: Engineering contractors and other project stakeholders may not fully achieve the results. While there have been some successes, contractors have had a history of poor delivery. In addition, there is weak supervision capacity especially at state and site levels. Ability to respond in a timely manner to vulnerable groups that are currently living around gully erosion sites. On-going erosion is rapid in places, and may undermine Project achievements. Project investments may not be effectively maintained after Project close.	*Risk Management:* Reputable international and national firms will be hired by the federal and state PMUs to ensure adequate quality of the designs and close supervision of the works. The federal PMU will deploy members of the Expert Advisory Services Pool to enhance quality. Beneficiary verification will enhance supervision. Performance-based service contracts, as well as independent and participatory M&E, will be built into the Project to strengthen accountability. The Project team will manage expectations with a strategic communications plan. The Project will also pursue an integrated technical approach to worksite interventions (See Annex 8), with due diligence for contracting and monitoring, and community involvement. The Project will also engage local stakeholders closely during project preparation and implementation to strengthen ownership and sustainability. With regard to supervision, a strong implementation support plan that provides for capacity-building and workflow arrangements critical to project implementation will be carried out.			
	Resp: GoN	**Stage:** Early implementation	**Due Date :** NGO contracts expected to be finalized shortly after Effectiveness	**Status:** Not yet due
Description: Inadequate attention to operations and maintenance of project investments may result in their premature deterioration and failure. Intensive project investments may not be sustainable beyond project life given the weak fiscal situation of government.	*Risk Management:* The Bank team will monitor operations and maintenance planning and expenditures of investment projects and ensure that annual work plans at federal and state levels budget for and use funds for O&M. The project is designed to last for 8 year to allow for the gains and results to take deep roots: Specifically, sustainability will be ensured by: (i) the project activities will be part of existing federal and state plans; (ii) institutional: emphasize good watershed planning, use of robust data, enhanced capacities, establishment of a framework for upscaling investment that balances these critical medium-term issues with rapid on the ground civil works to sustain project momentum and ownership; (iii) policy: reinforce environmental assessment and regulatory compliance, disaster risk reduction, and promote successful local by-laws that prevent land degradation; (iv) financial/economic: insist on good operations and maintenance			

	including performance-based contract management; (v) technical: insist on good engineering designs that also incorporate the sub-watershed and climate variability, and set appropriate examples early on that can be replicated inside and outside NEWMAP. In addition, sustainability issues are built into activities through inclusion of capacity building, cost-saving approaches such as the use of modern communication equipment for automated hydro-meteorological monitoring, and attention to financing mechanisms			
	Resp: Project team	**Stage:** Implementation	**Due Date:** Not yet due	**Status:** Not yet due

Overall Risk Following Review	
Preparation Risk Rating: Substantial	**Implementation Risk Rating: High**
Comments: *Description:* Project preparation has been led by a multi-sectoral, multi-agency, and multi-State team of the Government with widespread consultations with stakeholders. Given the challenges often associated with multi sectoral projects that involve different tiers of government as well as weak institution capacity. It is also true that the risk of not undertaking such a project or not investing at scale is also significant given the urgency of the erosion problem. NEWMAP enjoys extremely strong client commitment, as it was requested by the President of Nigeria with strong support of Governors in the project area.	**Comments:** *Description:* The rating reflects the fact that the Project is taking a holistic approach to erosion and watershed management, which has not been adequately done in the past. This approach will help directly address many of the technical risks by internalizing them within the project structure. As such, the Project is essentially an environmental improvement operation and as such is directly targeting many of the key risks above. The rating also reflects GAC issues, institutional weaknesses, and the potential conflicts that could result from involuntary resettlement and legacy issues. Coupled with the technical complexity of the development issues involved, the institutional, GAC, and fiduciary risks described above are being internalized by the project through its robust and fiduciary oversight and strong multi-sector implementation arrangements that seek to coordinate the many MDAs and stakeholders involved in preventing or treating erosion. Also, the project's strong safeguards response has been integrated into project design and implementation.

Annex 5: Implementation Support Plan

NIGERIA: Nigeria Erosion and Watershed Management Project

Background

1. The project is designed to reduce vulnerability to soil erosion and associated climate variability and change. This will occur through restoration of major gullies prioritized by states, improved land-use practices in surrounding watersheds and support for livelihoods. While most project resources are directed to these investments on the ground, information and institutional development will also be supported by the project to reinforce the sustainability and targeting of the investments. In addition, the project will also support a major climate change agenda to strengthen Nigeria's overall governance framework for climate action, and promoting and facilitating a transition to a lower-emission growth path.

2. The Implementation Support Plan (ISP) describes how the Bank in close coordination with the government will support the implementation of the risk mitigation measures (identified in the ORAF) and provide the technical guidance necessary to facilitate achieving the PDO (linked to results/outcomes identified in the result framework). Furthermore, in recognition of significant fiduciary risk of the project, the ISP also identifies the minimum requirements to meet the Bank's fiduciary obligations.

Strategy and approach for implementation support

3. The overall supervision strategy for the proposed NEWMAP will draw heavily from the lessons learned from the implementation of projects in Nigeria and in other countries. The project will use a combination of monitoring tools and systems to ensure quality and depth in supervision, reduced corruption and strengthened governance. Implementation support will focus significant oversight on the design, construction and overall quality of major civil works associated with gully restoration. Effort will also be placed on ensuring effective implementation of watershed management, livelihood improvement, and capacity building activities. Implementation support will emphasize flexibility and ongoing feedback to the client to guide adjustments in project component direction. This will be based on a robust M&E system addressing input-output, process and impact monitoring, including a rigorous impact evaluation, and delivered through a comprehensive project Management Information System; this work will be supported through a third-party M&E consultancy, and drawing on community inputs and beneficiary verification where possible. The project's independent Expert Advisory Services Pool will also enhance supervision by bringing additional leading expertise to bear on technical challenges. These approaches will be augmented by physical supervision by Bank teams with expert staff, a complaints handling mechanism and physical, financial and technical audits. Along with key line MDAs, the FMF and NPC will also be closely involved in supervision, paying special attention to M&E.

4. Given the large allocation of resources towards gully restoration, these activities will be subject to intensive oversight. Key lessons incorporated in the supervision strategy are: (a) the need for comprehensive site visits/physical verification by Bank-managed teams with leading, relevant professional expertise; in-depth review of engineering designs (c) independent verification of project activities; (d) follow up on detailed fiduciary issues highlighted in aide-memoires; (e) strengthening of prior and post-reviews of contract procurement to highlight

fiduciary red flags such as collusion and price-fixing; (f) verifying authenticity of bidders; (g) reconciling payments with contracts; (h) supervising large numbers of decentralized low-value procurement, and (i) include a larger number of implementation support missions early in project implementation to help get the project off to a good start. Supervision teams will consist of geotechnical/civil engineers, agronomists or watershed management experts, fiduciary (procurement/FM) specialists, and environmental and social experts. The teams will review M&E data and verify results in the field.

5. The project will also incorporate a social accountability mechanism at community levels, which will emphasize transparency and local level accountability. This will be done for example, by equipping communities neighboring gullies with GPS enabled digital cameras to photograph physical progress of civil works and submit these to a Google Map maintained by the third-party M&E entity, and accessible to stakeholders. During project implementation, issues that arise which cannot be dealt with at the community level will be referred to the project's grievance redress system within the FPMU or relevant SPMU.

Institutional Arrangements

6. The FPMU comprises a FPC and key technical staff including: an environmental specialist, social specialist, procurement specialist, financial specialist, an M&E specialist, communications specialist, energy specialist, a geotechnical/civil engineer, and a senior watershed management specialist. Other specialists will be seconded from relevant MDAs and will be responsible for engaging with their home MDAs to ensure good multi-sector work programming and supervision (see below). Key firms will bring additional support and help raise capacities of government, as follows:

7. *Accounting firm.* The FPMU will be supported by a procurement consultancy, which will provide assistance in key areas of procurement and financial management.

8. *Engineering firm.* The FPMU It will also be supported by an environmental engineering and design firm of the highest standard, to provide additional support for states to improve feasibility studies and site designs and plans.

9. *M&E firm.* The FPMU will also source an international-standard M&E consultancy specifically to develop the Project's M&E system including a state-of-the-art MIS, raise institutional capacities, and to implement the M&E system, contribute substantively to the impact evaluation, and contribute to the application of results across sectors and stakeholders (working closely with the PMUs' communications and M&E specialists in particular). The M&E system will also incorporate the use of remote sensing, innovative low-cost geo-located aerial and conventional photography, and GIS to track progress of major physical works. Throughout the M&E process, an associated goal is to improve the internal capacity of the government to manage and maintain the M&E systems, which will promote sustainability. Lastly, the FPMU may from time to time recruit international or national consultants (individuals, institutions or firms) as necessary to strengthen project planning and management, and States' site designs.

10. Implementation support will also be enhanced through the independent NEWMAP Expert Advisory Services Pool (EASP), which is a quality assurance pool of leading international and national experts in disciplines related to NEWMAP, such as geotechnical and civil engineering, watershed planning, hydrology and ecosystem monitoring. The EASP members will be pre-qualified and contracted by the FPMU to be deployed anywhere in the project at federal, state and local levels to enhance supervision, and raise project quality and investment sustainability.

11. Table 5.1 below reflects preliminary estimates of skill requirements, timing, and resource requirements for the ISP over the life of the project. Keeping in mind the need to maintain flexibility over project activities from year to year, the ISP will be reviewed annually to ensure that it continues to meet the implementation support needs of the project.

Table 5.1 ISP Matrix

Time	Focus	Primary Skills Needed	Number of Trips	Resource Estimate (USD)	Partner Role	Comments
Project Year 1	• Initiating key project activities and quality control processes, especially for gully restoration from already completed designs. • PMUs operating effectively • M&E system operating effectively • Financial management systems functioning effectively • Procurement practices following Bank norms	• Team lead • Financial management • Procurement • Engineer • Technical specialists covering watershed management, rural livelihoods, capacity building. and climate change • Safeguards	*FY12* - nil *FY13* September 2012 December 2012 March 2013 **Total**	 US$35,000 US$35,000 **US$105,000**	Staff up M&E cells in PMUs, training Initial operation of third party M&E entity Initial work with communities in first project sites to develop their capacity and tools to participate in M&E system	• Project will likely become effective in November, 2012 • Support smooth start-up leading up to and following effectiveness, with special emphasis on quality of gully interventions that will be started in year 1.
Project Year 2	• Monitor overall progress • Civil works • Financial management • Procurement • Environment and social safeguards	• Team lead • Financial management • Procurement • Engineer • Technical specialists covering watershed management, rural livelihoods, capacity building, and climate change • Safeguards	*FY14* September 2013 December 2013 March 2014 **Total**	 US$36,000 US$36,000 US$36,000 **US$108,000**	M&E entity and PMUs will prepare comprehensive project progress report in advance of each mission, and field plan	• New project sites come into the project • Continue to support main R&D component • Ensure safeguards are built into new integrated watershed planning process
Project Year 3	• Monitor overall progress • Civil works • Financial management • Procurement • Environment and social safeguards	• Team lead • Financial management • Procurement • Engineer • Technical specialists covering watershed management, rural livelihoods, capacity building, climate change, and marketing • Economist and Cost-tab specialist • Safeguard specialists	*FY15* September 2014 March 2015 **Total**	 US$37,000 US$50,000 **US$87,000**	M&E entity and PMUs will prepare comprehensive project progress report in advance of each mission, and field plan	Mid-term review
Project Years 4 to 5	• Monitor overall progress • Civil works • Financial management	• Team lead • Financial management • Procurement • Engineer • Technical specialists	*FY16* September 2015 March 2016 **Total**	 US$38,000 US$38,000 **US$76,000**	M&E entity and PMUs will prepare comprehensive project progress report in	General support to monitor progress, provide technical oversight, ideas for improvement, etc.

	• Procurement	covering watershed management, rural livelihoods, capacity building, and climate change • Safeguards	*FY17* September 2016 March 2017 **Total**	 US$39,000 US$39,000 **US$78,000**	advance of each mission, and field plan	
Project Year 6	• Monitor overall progress • Civil works • Financial management • Procurement •	• Team lead • Financial management • Procurement • Engineer • Technical specialists covering watershed management, rural livelihoods, capacity building, and climate change • Safeguards	*FY18* September 2017 March 2018 **Total**	 US$40,000 US$40,000 **US$80,000**	M&E entity and PMUs will prepare comprehensive project progress report in advance of each mission, and field plan	General support to monitor progress, provide technical oversight, ideas for improvement, etc.
Project Year 7	• Monitor overall progress • Civil works • Financial management • Procurement	• Team lead • Financial management • Procurement • Engineer • Technical specialists covering watershed management, rural livelihoods, capacity building, and climate change • Safeguards	*FY19* September 2018 March 2019 **Total**	 US$41,000 US$52,000 **US$93,000**	M&E entity and PMUs will prepare comprehensive project progress report in advance of each mission, and field plan	General support to monitor progress, provide technical oversight, ideas for improvement, etc.
Project Year 8	• Final IS mission and then ICR	• Team lead, ICR lead • Financial management • Procurement • Engineer • Technical specialists covering watershed management, rural livelihoods, capacity building, and climate change • Safeguards	*FY20* September 2019 March 2020 **Total**	 US$42,000 US$75,000 **US$117,000**	M&E entity and PMUs will prepare comprehensive project progress report in advance of each mission, and field plan	ICR will start immediately prior to project closure

Annex 6: Economic and Financial Analysis

NIGERIA: Nigeria Erosion and Watershed Management Project

Framework for Project Economic and Financial Analysis

1. Financial analysis (i.e., commercial profitability analysis) and economic analysis (i.e., national profitability analysis) differ in several ways. The objective of commercial profitability analysis is to assess the net financial results of a project from the investor and/or beneficiary point of view, while the national profitability analysis aims to identify and measure the net economic benefits of the project from the society point of view. Moreover, commercial profitability analysis is based on prevailing market prices, while national profitability analysis is determined with the help of adjusted prices (i.e., shadow prices) that are deemed to be an approximation of true economic prices (reflecting the social opportunity cost). Similarly, for commercial profitability analysis, the time value of money is tackled by application of the private discount rate based on the prevailing interest rate of the capital market, while in the case of national profitability analysis, the social discount rate is applied, i.e., the rate at which Nigeria can borrow money taking into consideration the country risk.

2. Because the economic analysis for NEWMAP cannot do justice to the full range of benefits and the transformational agenda as well as the dynamic interactions between social development and policy that will result from components 2 and 3 of the project, there the economic analysis, which covers sub-component 1.A, is likely to underestimate the benefits of the NEWMAP.

3. The economic and financial analysis is based on a *typology* of investments which can be grouped into the following broad categories for the seven states:

i. Infrastructure
   - Water
   - Roads including major expressways, dual carriageways and link roads
   - Buildings encompassing commercial properties and private houses
   - Port sedimentation reduction due less silted runoff

ii. Land Rehabilitation and Restoration
   - Land degradation
   - Agriculture and forest

iii. Flooding

4. The project's *major benefits* will occur in the form of:

(A) Improved erosion management and gully rehabilitation which will provide for the following:

- Reduced loss of infrastructure including roads, houses, markets, and other real estate;
- Reduced loss of agricultural land and productivity from soil loss caused by surface erosion;
- Reduced siltation in rivers leading to less flooding particularly in urban areas and which will also lead to preservation of some of the water systems for improved access to domestic water supply;
- Reduced risks of floods (due to reduced siltation and improved water quality) also in rural areas and reduced impacts on villages and agricultural areas;

- Reduced sedimentation in ports, rivers, in water infrastructure such as canals and dam reservoirs improving their life and productivity;
- Reduced lowering of the water table from the ravines caused by gullies;
- Improved access to economic activities, social services, communication and road networks;
- Progressively restore vegetative cover. Improve environmental conditions due to increased vegetation cover for wildlife, carbon sequestration, and make local microclimates more humid; and
- Environmental improvements because of the land stabilization to preserve the landscape and biodiversity.

(B) Increased incomes for rural households resulting from: improved agricultural and forest practices through the use of conservation agriculture, agro-forestry, natural regeneration, and so on, mainly in the southern part of Nigeria; and increased farming intensity and cropping patterns through many of the soil and water conservation mainly in the Northern part of Nigeria. Farming households may also diversify their livelihoods by introducing new crops such as cashew which can help to stabilize land but also provide increased revenue.

(C) Efficiency gains in public administration and public spending through improved knowledge base, analytical tools, multi-sectoral coordination and stakeholder dialogue.

(D) Increased social capital for the participating communities as they gain the confidence to get collective or economic results.

5. Under Component 1, a revolving *quantitative cost benefit analysis* is carried out based on 30 erosion intervention sites and sub-watersheds. Major and negative health, environment, economic and social impacts are illustrated in Table 6.1.

Table 6.1 Selected Major and Negative Impacts the Project will Address

Category	Health	Environment	Economic	Social
Infrastructure including roads, ports (siltation), water and sanitation systems, energy, pipeline, social, telecommunications, etc.	**Premature death, injuries, spread of opportunistic diseases (e.g., diarrhea) and conditions such as psycho-physical stress, and malnutrition**	**Local to global pollution, degradation and ecosystem disruption**	**Macro: (GDP, regional and external trade, balance of payment, inflation, etc.); and Micro: Opportunity cost of time, disruption and losses, goods and services increased prices, flows of goods and services**	**Social vulnerability, dropping out from school, migration, pauperization, coping, etc.**
Private and cultural assets, and activities	Premature death, injuries and conditions such as psycho-physical stress	Pollution	Opportunity cost of time, disruption and losses such as service provision, industries, tourism, commerce, etc.	Social vulnerability, dropping out from school, migration, pauperization, coping, etc.
Agriculture, including livestock	Risk of malnutrition and conditions such as psycho-physical stress, and malnutrition	Land degradation, land coverage (overgrazing), deforestation, etc.	Opportunity cost of time, disruption and losses Effects on yield, price increase on staple foods and carbon sequestration	Social vulnerability, dropping out from school, migration, pauperization, coping, etc.

Category	Health	Environment	Economic	Social
Natural Resource Management (land use planning, integrated resource management, mining, etc.)	Premature death, injuries, spread of opportunistic diseases (e.g., diarrhea, vector-borne diseases) and conditions such as psycho-physical stress	Soil erosion, deforestation, river/ dam sedimentation and siltation, river flow management, ground water depletion, (avoided rural and urban flooding) Loss of recreation	Opportunity cost of time, disruption and losses Increased yield, price increase on staple foods and carbon sequestration	Social vulnerability, dropping out from school, migration, coping, pauperization, etc.
Biodiversity	Medicinal plants	Loss of biodiversity, micro-climates and recreation	Indirect value losses	Social vulnerability, dropping out from school, migration, pauperization, coping, etc.
Global externalities	Premature death, injuries, spread of opportunistic diseases (e.g., diarrhea), reemergence of disease, and conditions such as psycho-physical stress and malnutrition	Five climate change variables and their category-wide effects	Opportunity cost of time, damages, disruption and losses	Social vulnerability, dropping out from school, migration, pauperization, coping, etc.
Natural disasters namely flooding, gully and landslide	Premature death, injuries, spread of opportunistic diseases (e.g., diarrhea), and conditions such as psycho-physical stress and malnutrition	Effect of flooding, droughts, weather extremes, tidal waves, etc. on natural assets	Effect of flooding, droughts, weather extremes, tidal waves, etc. on capital assets and opportunity cost of time, disruption and losses	Social vulnerability, dropping out from school, migration, pauperization, coping, etc.

6. A number of valuation techniques were evaluated and applied based on data availability. Selected valuation techniques could furthermore be used during the course of the project to derive financial and economic analysis “on demand”, and are listed in Table 6.2. A probabilistic risk assessment could also be performed to better prioritize the project site interventions that still need to be identified (sites in 4 additional states to be gradually added to the identified sites in seven states). A with/without scenario will be develop for important sub-categories where alternative cost interventions will be calculated.

7. If needed, either a combined poverty-social impact assessment or only a social impact assessment could also be performed during the project implementation. In either case, results would notably feed into the quantitative analysis.

Table 6.2 Potential Valuation Methods

Category	Health	Environment	Economic		Social
Infrastructure	HCA and VSL for mortality DALY lost and morbidity DALY lost (HCA will be used for pain and suffering) COI for illness, injuries and conditions (reported time series or cross-sectional data, exposure-based, relative risk, etc. could be used to derive a with/without scenario)	CV, CR, HP, RC, AB	National or Regional General Equilibrium model With effects on GDP, prices, Balance of Trade and Balance of Payment	OC of time, disruption and losses (some techniques under the environment category overlap with category), inflation index, and a number of techniques exist such as vehicle operating cost, etc.) to derive a with/without scenario, etc.	Poverty and Social Impact Assessment Social Impact Assessment
Private and cultural assets, and activities		CV, CR, HP, RC, AB, TC, VE			
Agriculture		IO, CP, CR			
Natural Resource Management (land use planning, integrated resource management, etc.)		CV, AB, RC, HP, TC, VE			
Biodiversity		CV (meta analysis when data is not available), HP, VE, RC, AB			
Global externalities		PRA and BN in addition to case specific techniques listed above			
Natural disasters namely flooding, gully and landslide		PRA and BN in addition to case specific techniques listed above			

Note 1: AB: averting behavior; BN: Bayesian networks; CI: cost of illness; CP: changes in production approach; CR: cost of remediation; HP: hedonic pricing method; CV: contingent valuation method; HCA: human capital approach; OC: opportunity cost; IO: Input/Output method; PRA: probabilistic risk analysis; RC: replacement cost approach; TC: Travel cost method; VE: value of enjoyment; and VSL: value of statistical life approach.
Note 2: Benefit transfer functions will be used when data is not readily available. When using the contingent valuation method, the overlap that could occur across the benefits will be considered, e.g., a willingness to pay to avert degradation will have an impact on health, environment, economic and social aspects.

8. An economic analysis was performed for the NEWMAP project and Component 1 (subcomponent 1.A) for seven states: Abia; Anambra; Cross River; Ebonyi; Edo; Enugu; and Imo. Moreover, additional in depth and sub-component specific economic analyses will be performed as interventions are more clearly identifying during project implementation for Component 1 (subcomponent 1.A) in the 4 states for: Ogun, Kaduna, Kano and Socoto. In the current analysis, three performance indicators are considered for the economic analysis:

- The Net Present Value (NPV) which is the difference between the discounted total benefits and cost;
- The Internal Rate of Return (IRR), which is the discount rate that zeroes out the NPV or, the interest rate that makes the net present value of all cash flows equal to zero; and
- The Benefit-Cost Ratio, which is the ratio of the present value (PV) of benefits over the PV of costs over the lifetime of the project.

Financial Analysis Process of Sub-component 1.A

9. There is no financial analysis to be done at this early stage. Therefore, the PV of sub-component 1.A investment cost over 30 years inclusive of contingencies and constant OMEX at 5% discount rate amounts to US$263.8 million over the 2013-2042 periods. During the course of the project, financial analysis will be conducted for projects to be implemented by the private sector such as the return of smallholder farm activities.

10. Information about how to conduct a financial analysis for projects is appended to Annex 6, which explains how to conduct the study, from the definition of the main items to using the three performance indicators in terms of financial IRR, financial NPV and financial PV of benefits over the financial PV of costs over the lifetime of the project. A sensitivity analysis needs also to be performed by increasing the costs and/or reducing the revenues to gauge the

risks, and determine the factors that affect most the performance indicators hence reaching the break even or switching point.

Economic Analysis Process of the Project and Sub-component 1.A

11. The major difference between the financial and economic analysis is that the economic analysis consists in eliminating all the distortions of prices on the inputs used for the component under consideration. There is therefore a need to identify and quantify price distortions that affect the operating expenditures as well as the investments. The evaluation of these distortions makes it possible to rectify the financial prices and to obtain the economic prices. From the corrected structure of the economic prices, the revaluation coefficients were estimated.

12. Determination of price distortions. The conversion of the financial costs into economic costs is essential to reflect the value of the output for the community. The objective of this calculation is to determine the opportunity costs of both the inputs and outputs. As taxes, duties and subsidies such as for electricity constitute internal flows in the national economy, those were not taken into account in the calculation of the economic costs. With regards to labor, wages applied for unqualified skills is the minimum wage without the social contribution. For the skilled job salaries, the conversion factor is taken equal to 1 but the social contributions are also not considered. Moreover, most labor needed for the whole project and other activities are assumed to be locally hired. As for equipment, goods and infrastructure, import and other taxes should be deducted from the economic costs of equipment, goods and infrastructure.

13. The total economic cost inclusive of contingencies to which an economic conversion factor of 0.84 is applied amounts to US$420M for the project and US$277M for sub-component 1.A (Table 6.3), which starts in 2013. The total targeted population in seven States at the onset of the project will reach about 2.2 million primary beneficiaries and will gradually increase to about 4.2 million people by 2042 in both urban and rural areas (Table 6.3 for targeting method). Nevertheless, the entire population of the seven states, estimated at 26.4 million in 2013 (18% of the total population of Nigeria), will directly or indirectly reap the benefits of the NEWMAP implementation. The targeted population will directly benefit from erosion site interventions that include civil works in the immediate command area of a gully system, or soil and water conservation measures and adaptive livelihoods in the gully's sub-watershed.

Table 6.3. Economic and Financial Cost of Component 1 Investments, US$ million

Intervention	Financial Cost	Economic Cost
	US$ million	US$ million
Sub Comp 1A: starts in 2013	330	277
Sub Comp 1B and 1C: start in 2015	50	42
Total Component 1	380	319
Total Project	500	420

Note: Contingencies are included in the economic and financial values. Totals may not add up due to rounding.
Source: NEWMAP PAD (2012).

Table 6.4 Methods for the Cost-Benefit Analysis and Beneficiaries/Benefits

Damages, losses, opportunities used as Benefits in the BCA	Methods used	Unit	Beneficiaries/Benefit	
			2013	2042
Income losses and asset damages	*A posteriori* Odds Ratio also considered a Probabilistic Risk Analysis	People #	2,184,346	4,194,440
Rural areas		People # within 4 km^2 from each site with the population derived from the average density of	36,948	61,408
Abia			6,328	10,517
Anambra			4,045	6,722
Cross River			671	1,116
Ebonyi			7,183	11,939

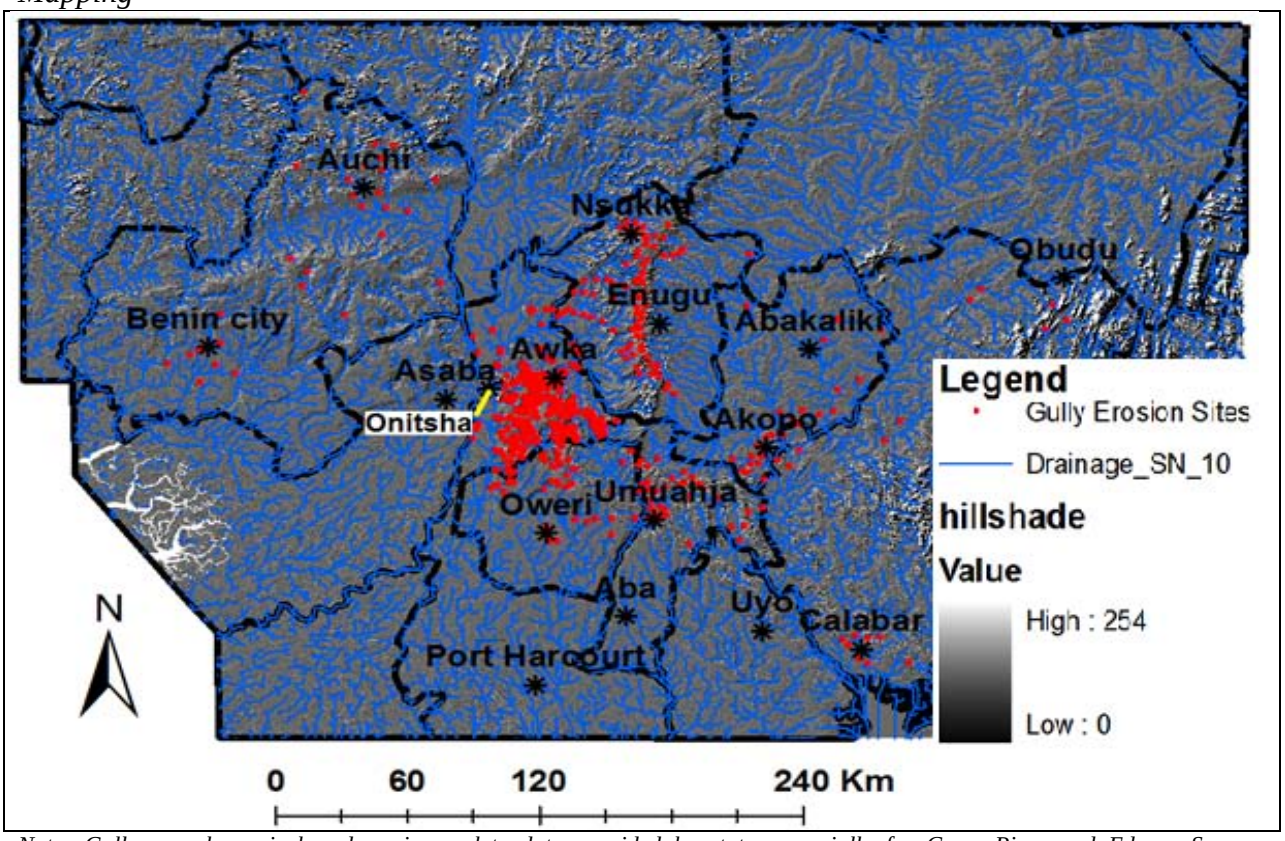
Damages, losses, opportunities used as Benefits in the BCA	Methods used	Unit	Beneficiaries/Benefit	
			2013	2042
Edo		the state	-	-
Enugu			4,262	7,083
Imo			14,458	24,030
Urban areas		People #: 40% of urban population considered	2,147,398	4,133,033
Umuahia (Abia)			168,290	323,903
Onitsha (Anambra)			143,542	276,271
Awka (Anambra)			165,519	318,570
Agulu (Anambra)			18,739	36,067
Calabar (Cross River)			173,819	334,544
Abakaliki (Ebonyi)			70,799	136,265
Afikpo (Ebonyi)			146,956	282,843
Benin City (Edo)			537,443	1,034,400
Enugu Town (Enugu)			396,526	763,182
Nssukka (Enugu)			145,059	279,191
Udi (Enugu)			113,843	219,111
Orlu (Imo)			66,861	128,686
Premature death risk	HCA/VSL	People #	20	20
Household Water additional expenditures	Consumer Surplus	People #	306,395	589,710
Port dredging cost Cross River	Defensive Spending	Calabar Port	1	1
Road disruption across & within 7 states *-primary network* *-secondary network* *-tertiary network*	Opportunity Cost of Time *650 Yearly avg. car per day* *400 Yearly avg. car per day* *50 Yearly avg. car per day*	Road #	38 *2* *16* *20*	38 *2* *16* *20*
Yield reduction -Anambra -Abia	Input/Output	Km^2	800 *484* *316*	1,068 *646* *422*
Unusable Farmland -Anambra -Enugu	Forgone opportunities	Km^2	2,169 *1,453* *716*	2,895 *1,939* *956*
Soil Erosion -Edo -Imo	Replacement cost	Km^2	2,390 *1,780* *510*	3,056 *2,376* *681*

Source: see Table 6.2 for methods and Table 6.5 for gully prevalence trend.

14. Deriving the economic analysis benefit is made difficult by the complexity and heterogeneity of the health, environmental, economic and social expected outcomes from investments to reduce the impact of the flooding, gullies and landslides that show large impact variation in the seven states (Table 6.5 and Figure 6.1 although gully prevalence is based on incomplete data provided by states especially for Cross River and Edo) where human unsustainable practices account for most gully erosion and flooding that will be exacerbated by climate change effects that will increase the frequency and intensity of rains in the southern states (see A. Country Context).

15. Benefits were calculated by using eight different typologies that were used to perform the cost benefit analysis at the project and sub-component 1.A levels. Far from being exhaustive, Table 6.4 illustrates the quantifiable benefits that could accrue during the NEWMAP implementation. Also, these benefits could be used and refined during project implementation thanks to budget provisions to collect data and run additional economic and financial analysis.

Figure 6.1. Severe Gully Densification in Southeastern Nigeria based on Incomplete Data Mapping



Note: Gully prevalence is based on incomplete data provided by states especially for Cross River and Edo. Source: Woldemariam (2011).

16. The gully prevalence is on the rise in the seven states since 1976 and the trend between 2006 (0.8% of the total area of the seven states) and 2042 is based on the past 1976-2006 trend (Fasona, 2011) that was slightly increased since 2036 to account for the climate change effects. The gully prevalence trend was used to determine the population at risk between 2013 and 2042 (Table 6.5 and Annex 8). Similarly, land degradation (as broadly defined) represents 9% of the total area of the seven states and the past 1976-2006 trend (Fasona, 2011) is similarly projected until 2042 using the same slope coefficient. Figure 6.1 illustrates the growth of the gullies especially in Abia and Anambra.

Table 6.5Gully Area Trend, Km^2

State	Total Area	Trend of Areas Affected by Gullies				
		2006	2013	2026	2036	2046
Abia	6,320	92.3	109.6	127.6	161.5	173.1
Anambra	4,844	263.7	313.2	364.5	461.6	494.5
Cross River	20,156	85.7	101.8	118.5	150.0	160.7
Ebonyi	5,670	46.2	54.8	63.8	80.8	86.5
Edo	17,802	98.9	117.4	136.7	173.1	185.4
Enugu	7,161	131.9	156.6	182.2	230.8	247.3
Imo	5,100	82.4	97.9	113.9	144.2	154.5
Total	67,053	801.1	951.3	1,107.2	1,402.0	1,502.1

Note: the 1976-2006 trend derived from Fasona (2011) is maintained until 2036 where an incremental factor is applied to reflect the climate change effects. Source: Fasona (2011).

Table 6.6. Damage Cost and Income Losses in Abia, Anambra, Ebonyi, Enugu and Imo States, US$

Item	Households over 10 years					
	Fixed Assets			Income	Not Affected	Total
	Housing	Soil erosion	Mixed property	Farmland		
Damage/Loss (US$)	116,000	78,000	200,000	252,000		646,000
Odds (occurrence)	0.070	0.104	0.230	0.304	0.293	1.000
Odds (occurrence used)		0.404		0.304	0.293	1.000
Total Income (US$)						3,544,272
% Damage/Income		11%		7%		

Source: Adapted from Abegunde et al. (2006).

17. A household *asset and income loss* proxy is used to derive the benefits accruing from the project investments by using an *a posteriori* odds ratio (the probability determined after consideration of the results of a study) of being affected by flooding, gullies and landslides in the targeted areas. The *a posteriori* odds ratio is derived from Abegunde et al. (2006) where the odds of income and asset losses occurrence in gully-prone areas is set at 0.71 over 10 years on average per household in towns and villages with the following breakdown: 0.3 in terms of lost revenues (or income) and 0.4 of disposable income equivalent to the loss in assets. In the absence of other studies to validate these factors, the latter were considered constant over the years, and considered very conservative as gully-prone areas and negative impact are increasing and being exacerbated by climate change: to increase the robustness of such studies and reduce their uncertainty, the project has set some provisions for additional economic (and financial) analysis in the field. The *a posteriori* odds ratio or the chances that a household will be affected by the gullies over 10 years in the targeted area in the future is: 0.3 for income with an average loss of 7% of household income; 0.4 for damages with an average loss of 11% of income in terms of damaged assets (Tables 6.6 and 6.7). Moreover, almost 58% of the surveyed households lived in absolute poverty, which means that losses and damages affecting the poorest of the poor over the 2017-2026. The odds of the damage cost and income losses are considered to be averted by project investments and are considered as benefits in the economic analysis.

Table 6.7. Damage Cost and Income Loss Odds in the Seven State Targeted Areas, 2017-2046, US$ million

Item	Unit	2017-2026	2027-2036	2037-2046
7 State Targeted Households (HH)	#	555,968	713,042	914,346
Income Odds 0.3: HH Average to be affected over 10 y	#	190,251	244,552	312,621
Asset Odds 0.4: HH Average to be affected over 10 y	#	252,834	324,997	415,457
Odds 0.3: HH Income over 10 y	US$ million	1,308.6	1,914.0	3,210.0
Odds 0.4: HH Income equiv. losses in assets over 10 y	US$ million	1,739.1	2,543.7	4,265.9
Odds 0.3: HH Income losses: 7% over 10 y	US$ million	93.0	157.0	263.2
Odds 0.4: HH Income equiv. losses in assets: 11% over 10 y	US$ million	193.3	326.2	546.8
Total losses and damages over 10 y	US$ million	286.4	483.1	810.0
Total annualized losses and damages per y	US$ million	28.6	48.3	81.0

Note: Gross National Income per capita and then household derived from World Bank (2010).The third tranche of benefits is used only for 5 years so half the annualized amount is used in the economic analysis. Totals may not add up due to rounding.
Source: Adapted from Abegunde et al. (2006); NBS (2009); and World Bank (2010).

18. A death occurrence due to these events and their direct causes (epidemic) was considered and is developed, which cause the spread of flooding, gully and landslide events, and is set conservatively at 20 premature deaths per year in the seven states targeted areas or 0.15‰ of premature deaths from unintentional injuries (including traffic accidents associated with the

flooding, gully and landslide events, building collapse, etc.), diarrhea and malaria based on WHO 2004 and CRED website (www.preventionweb.net/english/countries/statistics/?cid=126) on Natural Disasters in Nigeria with an average number of death of 677 per year over the 1980-2010 period, which is usually under-reported due to poor disaster and post-disaster monitoring.

19. The Calabar port in Cross River State has suffered from excess sedimentation over the decades, which is partly caused by the gully erosion and flooding that is affecting the Cross River watershed. The 1979 development, modernization and expansion of the Calabar Port amounted to US$69M. Since that day, dredging operations were repeatedly required and performed in the port area to allow heavy tonnage vessels and tankers to dock. Hence, the government has been actively engaged in defensive spending with however poor results to maintain the flow of import and export goods by allocating US$256.6M in current prices or US$279M in 2011 prices between 1995 and 2011. However, dredging operations have shown mixed results often leading to questionable transaction costs: recent dredging contracts have been signed with private contractors in 1986 (US$16M), 1995 (US$23M), in 2006 (US$56M) and more recently in 2011 (US$200M). The defensive spending are assumed to cover the period 1986-2011 with an average yearly spending of US$17.4M per year of which one forth or US$4.4M per year with a 3% increase over the project period is attributable to upstream gully erosion and flooding. This amount is assumed to be forgone with the implementation of the NEWMAP and is reported as a benefit in the economic analysis. Opportunity and fiscal losses from reduced vessel traffic could not be calculated due to the poor tonnage reporting for Calabar port. Yet, container operations resumed in 2009 after coming to a halt 2 decades ago due to increased sedimentation.

20. A consumer surplus that will accrue to households with water service improvement is calculated for greater Onitsha due the water scheme that failed to supply the town since 2003 due not only to the non-maintenance of the facilities and indiscriminate construction of buildings on the water pipe line but also by the intake works of the water treatment plant that was submerged due to silting of the Nkisi River in Anambra State that is partly attributable to the multiplication of the upstream gullies. The intake was relocated upstream to a new site in Tarzan area but the problem persisted (UN Habitat, 2009). Hence, despite defensive spending by water authorities, most of the water is supplied by vendors as this problem was already revealed in a study (Wittington et al., 1991) that shows that dwellers paid 5% of their disposable income for water whereas income spending benchmarking for the provision of good water and sanitation services should not usually exceed 3%. Since the time the 1991 study was published, the situation has significantly worsened in Onitsha with water vendors charging higher prices due to growing demand and lower utilities services. With a total population of 306,395 in 2013, an estimated 1% of the disposable income of the dwellers in Onitsha is considered in deriving the benefits attributable to the siltation of the Nkisi River. This figure could be revisited during the course of the project implementation to refine the analysis. The NPV benefit amounts to US$3.1M over 20 years. A number of towns face the same problem and the analysis could be replicated to other town during the course of the project implementation.

Table 6.8 Road Network at Risk from Gullying in seven States and Lost Opportunity Valuation

Roads	Average annual daily traffic	# of Hgw. and road	Number of passenger per car/cart or individuals	Time loss per car or person in hours per day	Avg. time lost per year in hours	Avg. time lost per year in days	GDP/capita /day	Value of Time lost (US$/year)
Highway	650	2	3	9	2,135,250	266,906	3.38	900,900
Secondary roads	400	16	3	9	1,314,000	164,250	3.38	554,400
Rural roads	50	20	1	1	18,250	2,281	3.38	7,700
Total		38			3,467,500	433,437		1,455,300

Source: Fasona (2011); and Foster and Pushak (2011).

21. About 12 roads in Enugu State and 6 in Anambra-Imo axis have been identified to be under serious threat from erosion and gullies, and represent more than 700 km of the road network in the seven states. These include dual-carriage highways such as the Onitsha-Awka-Enugu and the Enugu-Port Harcourt expressways, among others (Fasona, 2011). Moreover, some 40 rural roads have been affected by land degradation and notable gullies. The benefits that could accrue to the population of the seven states are in terms of the opportunity cost of time due to traffic disruption and lack of mobility. Table 6.8 illustrates the average annual daily traffic (Foster and Pushak, 2011) and the assumptions underscoring the calculation of the benefits. Also, an underlying assumption is that the network needs to improve in quality rather than in densification over the 2013-2042 periods (Table 6.5). Also, determining roads that will be affected by gully erosion in the future remain difficult to predict, therefore, the number of roads have been kept constant over the 2013-2042 periods.

22. All seven states are exposed to stagnating or declining yields and high erosion rates, except for Cross River that shows increasing yields despite the erosion. The remaining states present different characteristics among themselves where: annual yields remain almost stagnant in Imo, Enugu and Edo, and are characterized by high erosion rates; and Abia and Anambra have high declining yields and high erosion rates (Satellitebild et al., 1999). Only Abia and Anambra are therefore considered in the analysis with 10% and 5% of state area are estimated to be subject to gully prevalence that translates into yield reduction (Tables 6.4 and 6.5, and Figure 6.1). The net return forgone are valued at US$707 per ha in Abia and US$1,669 per ha in Anambra in 2013 and based on Satellitebild et al., 1999.

23. The forgone opportunity from utilizing farmland due to the high prevalence of gullies in Anambra and Enugu (Tables 6.4 and 6.5, and Figure 6.1). 30% and 10% of state area is estimated to be unusable farmland due to the high prevalence of gullies in Anambra and Enugu respectively. The forgone benefits are based on Satellitebild et al., 1999 with an average forgone weighted revenues of US$200 and US$142 per respectively per ha in 2013.

24. A replacement cost is used to derive soil erosion associated with soil nutrient loss due to land degradation. The impact of soil erosion productivity is based on Lal (1983) where the greatest productivity losses do not necessarily occur in areas with steeper slopes which are usually more seriously eroded. The study applies coefficients and estimates that the most affected states by agricultural yield losses are among others Abia (10.8%), Edo (8.6%) and Imo (8.1%). More recently, degradation has been thought as contributing to global problems such as climate change, by reducing soil ability to store carbon but carbon sequestration was not considered in the analysis. To increase productivity in the above cited states, additional fertilizer are needed to be applied, which translate into higher input levels (and hence, higher costs) to maintain yields. Nevertheless, an integrated soil fertility management that includes a mix of

fertilizer and manure that is less expensive and generate higher yields than each of the product considered alone. A US$19 per ha in terms of fertilizers is applied in Edo and Imo to areas having lost their nutrient due to land degradation. 10% of Edo and 10% of Imo areas (Table 6.5) are supposed to add fertilizer to maintain their original yield that was affected by land degradation that was translated by the loss of soil nutrient. The replacement cost amounts to US$0.44M per year in 2013 with the increase of land requiring additional fertilizer increasing at the same rate of the 2013-20 42 land degradation trend.

25. A number of key additional assumptions have been considered for the economic analysis:

- The economic analysis is carried out for the project and sub-component 1.A over a period of 30 years (from 2013 to 2042) with the assumption that no investment in new assets is needed over the periods with the consumer surplus accruing only over 20 years.
- A real discount rate of 10% per annum is used.
- Priority investments are disbursed over seven years of the project implementation.
- Operations and maintenance (OMEX) cost is used in the analysis starting year 2020.
- Conservative estimates of benefits have been used and include the averted damage and income losses from a flooding, gully and landslide event; and the premature mortality avoided due to these events and the spread of epidemic (usually water-borne diseases and malaria) that usually follows flooding. The Human Capital Approach (HCA) is used as a lower bound and the Value of Statistical Life (revealed preference for reducing the risk of mortality) is used as an upper bound to monetize the premature death. A HCA and VSL mid-point is used in the economic analysis. The HCA is assigned one year of GDP/capita lost of US$2,601 in 2013 and increased by 3% over the course of the project. The VSL meta-analysis figure is used to which is applied a benefit transfer. In this particular case, the figure of US$3.5M in 2005 for the 27 countries forming the European Union is provided by Lindhjem and Navrud (2010) that was prepared for the OECD and transferred to Nigeria by using the PPP GDP per capita differential between the EU and Nigeria, deflating the figure to 2013 prices and considering the income elasticity to be equal to one. The VSL used for Nigeria is US$252,976 in 2013 and increased by 3% per year over the course of the project. The HCA and VSL mid-point considered in the economic analysis for the premature death amounts to US$127,789. The age distribution income weight is as follows: 41% for under 15 years of age; 56% between 15 and 64 years; and 3% for more than 64 years. An income distribution of 50% for the under 14 years of age, 100% for the 15 to 64 years age bracket and 30% for more than 64 years of age. It is assumed that number of death is distributed according to the age distribution as it was not possible to obtain death age attributed to disasters. The cost of illness of injured people and people affected by diseases due to the aftermath of natural disasters was not considered because statistics are not readily available.
- Benefits are assumed to gradually begin accruing in 2017 in the economic analysis.
- The population average increase is set at 2.28% until 2015, 1.9% until 2025 and 1.5% after 2025 (UN, 2008). Household members were estimated to drop from 4.3 in 2013 for the seven states to 4.2 in 2027 and 4.1 in 2037 over the project life (NBS, 2009).

Economic Analysis Results for the Project and Sub-component 1.A

Determination of NPV, IRR and Benefit/Cost Ratio

26. The aggregate economic NPV discounted at 10% is positive amount to US$44M and US$136M for the project and sub-component 1.A respectively over 30 years, i.e., from 2013 to 2042. The benefit/cost ratios are greater than 1 while the economic IRRs are positive and exceed 10%. (Table 6.9). Despite the conservative stance and the few benefits considered in the economic analysis, the project and sub-component 1.A are economically viable.

Table 6.9 Economic Indicators with 10% Discount Rate

Key Economic Indicator	Results	Interpretation
Project Level		
NPV/30 years	US$44 million	Net benefit exceed cost
IRR/30 years (10%)	12%	Positive and greater than 10%
PV Benefit/Cost Ratio/30 years	1.2	Discounted benefit > discounted cost
Result: Three criteria indicate that the project is economically viable		
Sub-component 1.A Level		
NPV/30 years	US$136 million	Net benefit exceed cost
IRR/30 years (10%)	18%	Positive and greater than 10%
PV Benefit/Cost Ratio/30 years	1.9	Discounted benefit > discounted cost
Result: Three criteria indicate that the project is economically viable		

Sensitivity Analysis

27. The sensitivity analysis is conducted to test the viability of the project and sub-component 1.A with a reduction of 10% per year of the benefits accruing to households. The Project and sub-component 1.A are still viable with an NPV of US$13M and US$104M respectively while the PV benefit/cost ratios are greater than 1 and the economic IRRs are positive and exceed 10%. (Table 6.10).

Table 6.10 Economic Indicator Sensitivity Scenario: Benefits reduced by 10%/year

Key Economic Indicator	Results	Interpretation
Project Level		
NPV/30 years	US$13 million	Net benefit exceed cost
IRR/30 years (10%)	11%	Positive and greater than 10%
PV Benefit/Cost Ratio/30 years	1.1	Discounted benefit > discounted cost
Result: Three criteria indicate that the project is economically viable		
Sub-component 1.A Level		
NPV/30 years	US$104 million	Net benefit exceed cost
IRR/30 years (10%)	16%	Positive and greater than 10%
PV Benefit/Cost Ratio/30 years	1.7	Discounted benefit > discounted cost
Result: Three criteria indicate that the project is economically viable		

28. The sensitivity analysis is also conducted to test the viability of the project and sub-component 1.A when investments are increased by 15% over seven years and OMEX are

increased by 15% per year between 2020 and 2042. The Project and sub-component 1.A are economically viable with a NPV of US$3M and US$109M respectively. The PV benefit/cost ratios are greater than 1 while the economic modified IRRs are positive and exceed 10%. (Table 6.11).

Table 6.11 Economic Indicator Sensitivity Scenario: Investment & OMEX Increase by 15%

Key Economic Indicator	Results	Interpretation
Project Level	US$3 million	Net benefit exceed cost
NPV/30 years	10%	Positive and greater than 10%
IRR/30 years (10%)	1.1	Discounted benefit > discounted cost
PV Benefit/Cost Ratio/30 years		
Result: Three criteria indicate that the project is economically viable		
Sub-component 1.A Level		
NPV/30 years	US$109 million	Net benefit exceed cost
IRR/30 years (10%)	16%	Positive and greater than 10%
PV Benefit/Cost Ratio/30 years	1.6	Discounted benefit > discounted cost
Result: Three criteria indicate that the project is economically viable		

29. The project and sub-component 1.A investments remain viable as they are not sensitive over the lifetime of the project to either: a decrease by 10% per year of benefits; or an increase in investment by 15% over seven years and OMEX by 15% per year over the 2020-2042 periods.

Scenario Analysis

30. A scenario analysis is performed to determine the combined impact of variables on the project and sub-component 1.A economic analysis that are usually analyzed separately. Table 6.12 provides the various IRR associated with the combined impact of variables for an optimistic, base case and pessimistic scenarios for the project and sub-component 1.A. All scenarios are viable and the pessimistic scenario provides the switching point or breakeven point that would result in a negative NPV.

Table 6.12 Scenario Analysis of the Economic Analysis Variables for the Project

Scenario Variable	Optimistic Scenario	Base Case Scenario	Pessimistic Scenario
Project Level			
Investment cost (US$ million)	386	420	454
OMEX growth over 2020-2042	-8%	±0%	+8%
Benefits	+8%	±0%	-8%
NPV/30 years	US$92 million	US$44 million	US$0.1 million
IRR/30 years (10%)	14%	12%	10%
PV Benefit/Cost Ratio/30 years	1.5	1.2	1.1
Sub-component 1.A Level			
Investment cost (US$ million)	202	277	352
OMEX growth over 2020-2042	-27%	±0%	+27%
Benefits	+27%	±0%	-27%
NPV/30 years	US$271 million	US$136 million	US$1 million
IRR/30 years (10%)	30%	18%	10%
PV Benefit/Cost Ratio/30 years	3.2	1.9	1.0

References

Abegunde, A, S. Adeyinka, P. Olawuni and O. Oluodo. 2006. "An Assessment of the Socio- Economic Impacts of Soil Erosion in South-Eastern Nigeria." Shaping the Change XXIII FIG Congress. Munich, Germany, October 8-13, 2006.

European Commission (EC). 2008. *Guide to cost-benefit analysis for investment projects.* Prepared for: Evaluation Unit DG Regional Policy European Commission. Brussels.

Fasona, Mayowa. 2011. *Mapping Landuse and Landcover Change*. World Bank Nigeria Erosion and Watershed Management Project. Abuja.

Foster, Vivien and Nataliya Pushak. 2011. *Nigeria's Infrastructure: A Continental Perspective. Country Report.* Africa Infrastructure Diagnostic Country. The World Bank. Washington, D.C.

Lal, R. 1998. "Soil erosion impact on agronomic productivity and environmental quality." Critical Reviews in Plant Sciences 17, 319-464.

Lindhjem and Navrud. 2010. *Meta-analysis of stated preference VSL studies: Further model sensitivity and benefit transfer issues.* Prepared by Henrik Lindhjem, Vista Analyse, Norway, and Ståle Navrud, Department of Economics and Resource Management, Norwegian University of Life Sciences, Working Party on National Environmental Policies, OECD.

National Bureau of Statistics (NBS). 2009. *Social Statistics in Nigeria*. Abuja.

Satellitebild, Niger Surveys and Consultants, and SWECO International. 1999. *Assessment of Soil Degradation in Nigeria.* Final Report. Main Volume. Federal Republic of Nigeria. Ministry of Agriculture and Natural Resources. Federal Department of Agricultural Land Resources. Abuja.

Sepahvand, Mohammad. *The Analysis of Rural Poverty in Ethiopia regarding the three measurements of poverty*. Master thesis Department of Economics, Uppsala University. Uppsala.

United Nations (UN). 2009. The World Population Prospects: The 2008 Revision Highlights. Social Affairs & Economic. New York, N.Y.

United Nations (UN) Habitat. 2009. *Onitsha and Satellite Towns*. In partnership with the State of Anambra, Nigeria.

Wittington, Dale, Donald Lauria and Xie Ming Mu. 1991. "A Study of Water Vending and Willingness to Pay for Water in Onitsha, Nigeria." World Development 19 (2/3) 179-198.

Woldemariam, Kifle Woldearegay. 2011 draft. Anambra-Imo, Cross-River and Parts of Benin-Owena Basins. Background paper to the World Bank Nigeria Erosion and Watershed Management Project (NEWMAP). Abuja.

World Health Organisation website: <www.who.it>. 2004. *Global Health DALY Estimates 2004*. Department of Measurement and Health Information. Geneva.

World Bank. 2011. *World Development Indicator*. Washington, D.C.

Attachment 1 (to Annex 6): Basic Concepts in Financial Analysis

The international methodology of financial analysis of the project on a cash flow basis suggests conducting the financial analysis and the calculation of investment returns using the total costs of the investment (EC, 2008). For future agricultural projects in the context of the NEWMAP, three performance indicators will be considered for the financial analysis to determine whether the project is sound:

- The Net Present Value (NPV), which is the difference between the discounted total benefits and cost;
- The Internal Rate of Return (IRR), which is the discount rate that zeroes out the NPV or the interest rate that makes the net present value of all cash flows equal to zero; and
- The Benefit-Cost Ratio, which is the ratio of the present value (PV) of benefits over the PV of costs over the lifetime of the project.

In order to perform a sound financial analysis, careful attention must be paid to the following elements:

The Time Horizon
By time horizon is the maximum number of years for which forecasts are provided. Forecasts regarding the future trend of the project should be formulated for a period appropriate to its economically useful life and long enough to encompass its likely mid/long term impact.

Determining Total Costs
The data for the cost of a project are provided by the sum of costs of investment (land, buildings, vehicle, etc.) and operating costs (personnel, raw materials, supply of energy, etc.). Not included in the costs are: depreciation and amortization, as they are not effective cash payments; any reserves for future replacement costs; and any contingency reserves, because the uncertainty of future flows.

Revenue Generated by the Project
Some projects may generate their own revenue from the sale of goods. This revenue will be determined by the forecasts of the quantities of goods provided and by the relative prices. Not included in the revenues are: indirect taxes unless they are charged to the investor; any other subsidies (transfers from other authorities, etc.).

Residual Value of the Investment
Among the revenue items at the final year considered, there is the residual value of the investment (e.g., standing debt, standing assets, such as buildings and machinery, etc.) that should represented with a negative sign in the financial analysis.

Adjusting for Inflation
In project analysis, it is customary to use constant prices, that is to say prices adjusted for inflation and fixed at a base-year. However, in the analysis of financial flows, current prices may be more appropriate; these are nominal prices effectively observed year by year. Therefore, the use of current prices is in general recommended.

Financial Sustainability
The financial plan should demonstrate financial sustainability, which is that the project does not run the risk of running out of money; the timing of fund receipts and payments may be crucial in implementing the project. Sustainability occurs if the net flow of cumulated generated cash flow is positive for all the years considered.

Determining the Discount Rate
To discount financial flows to the present and to calculate NPV, the suitable discount rate must be defined and is usually considered roughly equal to the opportunity cost of capital in any of the targeted states in Nigeria.

Sensitivity Analysis
A sensitivity analysis needs to be performed by increasing the costs and/or reducing the revenues to gauge the risks and determine the factors that affect most the performance indicators.

Annex 7: GEF Incremental and SCCF Additional Costs

NIGERIA: Nigeria Erosion and Watershed Management Project

A. Introduction

1. NEWMAP's combined PDO and Global Environment Objective is to reduce vulnerability to soil erosion in targeted sub-watersheds. See Annex 1 for indicators.

2. Environmental security and economic development are intertwined in Nigeria. The country now has one of the world's fastest growing economies and increasingly seeks to improve natural resource management to help sustain, drive, and protect the quality of this growth. The non-oil economy grew by an average 8.8% per year in 2007-2010 but is experiencing natural resource over-reach that could undermine this achievement. The cost of on-going environmental degradation (notably renewable natural resources) and associated disasters such as landslides and flooding is estimated at 9% of GDP, and is likely to increase under a business-as-usual scenario.[29]

3. Population growth, unsustainable land and water management practices, poor land use and physical works planning, governance issues, and climate risks combine in complex ways to drive environmental insecurity. By 2020 the country's total population will approach 200 million, reaching nearly 300 million around 2050, placing additional strain on the natural resource base and physical infrastructure. Current and future climate risks add to the challenge to secure services and livelihoods from natural wealth such as food, water, medicines, and power. Successful management of natural resources and environmental risks within and across a number of primary sectors and critical themes is essential for Nigeria to be among the world's 20th largest economies – a target it aspires to in its Vision 20:2020 and for which the country's Transformation Agenda of 2011-2015 provides a roadmap.

4. **Gully erosion is accelerating in the southeast**. Southern Nigeria is affected by massive and expanding gully erosion, an advanced form of land degradation. There are an estimated 3,000 gullies, which can be up to 10 km long with multiple fingers spreading through the rural or urban landscape. In southeastern states, gullies and areas exposed to erosion tripled; the total area affected by rill, sheet or gully erosion increased from about 1.33% (1,021 km^2) in 1976 to about 3.7% (2,820 km^2) in 2006. Damage to infrastructure includes severed roads, highways, and pipelines, collapsed houses and buildings, and silted waterways, reservoirs and the Calabar port. Losses to natural assets include loss of productive farmland and forest. Forest and farmland degradation also compromise watershed functions. This process exacerbates erosion downstream and siltation, compromises biodiversity important for livelihoods, and weakens natural buffers against climate and erosion risk. Many of the region's land degradation hotspots also are the most densely populated areas, such as Anambra state, the self-proclaimed gully capital of the world and the most densely populated region in Africa. Ongoing attempts by states and federal actors to stabilize or prevent gullies are at best partially or temporarily effective, for complex reasons (See Annex 8).

5. **The root causes of gully erosion in the southern basins are complex**. The soils in southeastern Nigeria are highly susceptible to water erosion. Once a gully starts, it expands

[29] See page 1 for references.

rapidly and is difficult to tame. The causes for gully formation differ by site, but are largely human, including: (a) improper road design and construction, particularly inadequate drainage; (b) poor solid waste management in urban and peri-urban areas that chokes the already inadequate drainage meant to prevent erosion; and (c) destructive and unsustainable land-use practices that remove protective vegetation cover including protective biodiversity and carbon rich areas, or disturb the fragile soil, such as overgrazing, deforestation, cultivation of marginal lands, and uncontrolled mining for building material, and which are linked to poverty.

6. **Environmental insecurity is accelerating in the north**, where an intersection of hotspots leads to increasingly tenuous livelihoods. High levels of population growth and poverty rates, resource depletion, rainfall variability, recurrent droughts and floods, land degradation, and deforestation compromise the efforts of the 80% of northern Nigerians who depend on land and water resources for their economic and physical security. Yet natural resources are being depleted by a growing human footprint coupled with inefficient management and reservoir maintenance. The retreating vegetation cover provides diminishing fire wood, shade for livestock and migratory and endemic birdlife, and groundwater recharge. This is occurring precisely at a moment when temperatures have risen one degree and will rise another degree in the next decade, accompanied by more variable rainfall and uncertain response mechanisms. This situation has upset the region's ecological balance and therefore the ability of its ecosystems to provide services such as food and fiber production, freshwater provision, and flood regulation. Nigeria's woody savannah systems are under stress from clearing and reduced rainfall. Firewood depletion outstrips replenishment, and bush burning is commonplace. Key tree species can reduce livestock heat stress, help replenish water tables, generate raw materials for marketing, provide medicines, strengthen soil structure to resist wind and water erosion, and naturally fix nitrogen to cheaply fertilize crops. Good tree cover also attracts and retains biodiversity, in particular diverse sources of protein and pollinators. Vegetation cover is also necessary to store carbon in biomass and soils. While the carbon potential for drylands are not as impressive as those for humid systems, they are nonetheless valuable, as carbon trends are also an indicator of overall ecosystem health and with it, basic land productivity and soil health. Across the border from Sokoto, large-scale natural regeneration of trees has taken root in Maradi, Niger.

7. **Climate change amplifies the challenge**. The Nigerian Meteorological Service shows that the country is already experiencing climate variability in the form of droughts, floods, shifts in rainy season onset and completion, and increasing rainfall intensity. Climate-related disasters already affect Nigeria's economy and society, as evidenced by the 2010 floods which displaced over two million people. Climate risks also are a significant factor in erosion in southern Nigeria, especially because of the very high rainfall intensity. Recent regional climate modeling suggests that rainfall will become more intense in the southern basins, by as much as 80% by 2060.[30] Each unit increase in rainfall intensity results in up to twice the historical rate of erosion and greater vulnerability to landslide risk.

8. Climate variability already affects agriculture, and uncertainty about the future confounds planning among land users. Farmers are aware of more variable weather patterns such as a compressed growing season, which makes planting decisions more problematic and can reduce yield. The projected rise in temperature by 2050 (an estimated 0.5 degrees in the south, 3.5 degrees in the north) will reduce yields according to new models. For example, under business-as-usual the Anambra-Imo basin will likely show yield reductions of 5-10% for the south's

[30] Tentative preliminary finding from on-going World Bank ESW, 2011-2012. Climate Change Assessment: draft report on climate risk management in agriculture and water resources.

important cassava, maize, and rice crops by 2020 and double that by 2050. The models also show that heat stress on northern livestock is rising as gross primary productivity of grazing land is declining; these factors will produce higher livestock mortality rates in the coming decades. Research and extension services are not yet advising on these issues at scale.

9. **Investment responses to address erosion are fragmented and inadequate**. State and local governments and their constituencies are overwhelmed by the scale and complexity of the gully erosion problem. Attempts at all tiers of government to prevent or rehabilitate gullies have been generally unsuccessful for the following reasons: (a) Unclear and overlapping mandates of federal and state institutions responsible for erosion prevention and management and watershed management, (b) insufficient technical capacity in these institutions, (c) poor, incomplete or inadequate scale of response (such as an over-emphasis on inflexible civil engineering interventions without addressing water flows in the sub-watershed or building upon a strong evidence base); (d) absent or weak land-use planning; (e) weak regulatory compliance and enforcement; (f) weak community involvement in prevention and restoration activities; (g) insufficient attention to alternative livelihood issues; and (h) insufficient attention to transparent governance, corruption, and local participation. The different challenges are interwoven and require integrated solutions. However, institutions, information, and incentives are fragmented, weakening the ability of state and federal ministries, departments and agencies (MDAs) or the communities that they serve to address the issues in a strategic and integrated manner. In particular, the government's Ecological Fund has carried out gully erosion activities in different parts of Nigeria, among other environmental activities, but these have had mixed results due to the reasons above.

10. **The Nigeria Erosion and Watershed Management Project (NEWMAP) helps address these gaps** by (a) investing in the public environmental goods, (b) improving institutional performance, governance and multi-sector coordination, and information access, and (c) by establishing replicable investment models and institutional solutions that can be scaled up inside and outside the project. An impact evaluation will help quantify success factors for erosion interventions by examining intervention sites funded by NEWMAP and sites outside the project. As such, NEWMAP and the Ecological Fund would complement each other and offer mutually beneficial learning opportunities. This could lead to greater transparency of the country's Ecological Fund, for example by public disclosure of Ecological Fund projects and sites to avoid duplications and inefficiencies. NEWMAP will therefore contribute to making subsequent government efforts more effective.

B. The global dimensions of land degradation, biodiversity, forest, and climate in Nigeria

11. Nigeria's southern watersheds and specifically the erosion problem provide natural entry points for securing global environmental benefits. By establishing soil and water conservation zones and by taking additional, complementary structural measures to adapt to climate variability and change in erosion-prone areas, vegetation and tree cover can be expanded which reduces erosion and safeguards the water cycle, but also protects biodiversity assets on a sustainable basis, contributes to terrestrial carbon accumulation, and enhances the climate resilience of natural systems and infrastructure to higher rainfall intensity, more serious erosion, and in some cases, flooding. The challenges are intertwined and require integrated approaches to address them. Each challenge is presented below in terms of GEF focal area and the SCCF window.

12. ***Biodiversity***. Nigeria signed the Convention on Biological Diversity in 1992 and ratified it in 1994. The country is endowed with a rich biodiversity including about 7,895 plant species, and 22,000 vertebrates and invertebrates species. These species include about 20,000 insects,

about 1,000 birds, about 1,000 fishes, 247 mammals and 123 reptiles. Of these animals about 0.14% is threatened while 0.22% is endangered[31]. According to the Critical Ecosystem Partnership Fund (CEPF), one of the global hotspots for biodiversity is the Guinea Forest Hotspot which extends from Guinea across southern Nigeria and southwestern Cameroon. Approximately 9,000 species of vascular plants are estimated to occur in the Guinean Forest Hotspot, which ranks it eighth among the hotspots in the world[32]. Cross River State in Nigeria harbors this rich hotspot in the country, holding 31% of the remaining forests in Nigeria. The gene pool is impressive because this area survived the great ice age that affected the whole of central and West Africa many millions of years ago. There are more than 400 varieties of trees, around 170 species of reptiles and amphibians, 140 fish species in Cross River State. Of the 904 bird species recorded in Nigeria, 425 occur in Cross River. Endemic to these habitats and the adjacent Cameroon forests are the "Western mountain" gorilla, drills, and the redheaded rockfowl, *Picathartes*. Sclater's monkey, the red-bellied and white-throated guenons are found only in Nigeria. Ibadan malimbe, *Malimbus ibadanensis*, a type of weaver bird is endemic to the forests of south-western Nigeria.

13. The conversion of habitat to other land uses, loss and disruption of ecosystems and livelihoods to erosion, pollution, unsustainable natural resources use, and possibly climate change are among the key drivers of biodiversity loss in the country. The ecozones in the broader watersheds contain nationally and globally important species that play roles as timber and in traditional medicine/nutrition. There is insufficient information on the species abundance and extent of distribution of these species (data deficient) and under IUCN guidelines these species should be considered protected. The species include:

Tropical moist forest	**Derived savannah and Savannah**
Flora	***Flora***
Brachystegia eurycoma *Milicia excelsa* *Ceiba pentandra* *Pentaclethra macrophylla* *Pterocarpus milbraedii* *Treculia africana* *Cola acuminata* *Irvingia gabonensis* *Dacryodes edulis* *Hunteria umbellatum* *Alstonia booneii* *Uapaca guineensis*	*Daniellia oliveri* *Vitex doniana* *Vitelleria paradoxa* *Terminalia glaucescens* *Terminalia superba* *Paarkia biglobosa* *Nauclea latifolia* *Butyrospermum parkii* *Ziziphus Mauritania* *Khaya senegalensis* *Pterocarpus erinaceus* *Celtis integrifolia*
Fauna	***Fauna***
Mangabeys Colobus monkeys Sclater's guenon Owls Eagles Parrots Hawks	Baboons Elephants Duikers Bushbuck Crocodiles Hippopotamus Birds

[31] The Fourth National Biodiversity Report. The Government of Nigeria. 2010. (Ref. http://www.cbd.int/doc/world/ng/ng-nr-04-en.pdf)

[32] Guinean Forests of West Africa - Ecosystem Profile. Critical Ecosystem Partnership Fund. (Ref. http://www.cepf.net/where_we_work/regions/africa/guinean_forests/ecosystem_profile/Pages/biological_importance.aspx)

14. The targeted project states also have important bird areas (IBA) amongst which are Ebok-Kabaken (Cross River), Falgore and Lame Burra Game Reserve (Bauchi and Kano), Omo Forest Reserve (Ogun) and Kagoro- Nindan Forest Reserve (Kaduna). Some of the birds and mammalian wildlife are endemic and classified as threatened or endangered (e.g. all primates).

15. Northern Nigeria (North West, North Central and North East) is a risk-prone environment, with high inter-annual variations in rainfall. Farmers and herders have developed strategies, such as mobility or flexible access to natural resources, to cope with climatic risks. Animals of pastoralists and farmers feed on the rangelands, particularly during the rainy season. The most common tree species found on farmland are *Adansonia digitata, Anogeissus leiocarpus, Diospyros mespiliformis, Lannea microcarpa, Parkia biglobosa, Piliostigma reticulatum, Sclerocarya birrea, Tamarindus indica* and several species of Ficus and fruit trees. Traditionally, lopping of trees provides important feed resources during the dry season, especially for pastoralists with limited access to crop residues or stubble. Important browse species include *Butyrospermum parkii, Vitex doniana, Ziziphus mauritania, Pterocarpus erinaceus, Khaya senegalensis, Acacia seyal* and *Celtis integrifolia*. Adult plants are utilized very intensively so that recruiting for these species is seriously threatened. Although these plants are very useful little effort is made, as elsewhere in Nigeria, to replace old trees or to increase their numbers. These practices have resulted in the erosion of faunal and floral biodiversity and enhancing desertification. Climate change amplifies the situation, as in SE Nigeria.

16. However, the country's biodiversity is under threat due to habitat destruction from land use change, erosion (in the south) and illegal hunting. Conversion of forestlands and unsustainable land-use practices are identified by the Fourth National Biodiversity Report as some of the key threats to the habitat, and thus, the rich biodiversity of the country. Although the Government of Nigeria has established policies including creation of protected areas such as Cross River National Park, the degradation of land, in particular gully erosion, has created challenges for conservation efforts outside the parks.

17. ***Forest***. Nigeria's principal vegetation types range from dense mangrove forests of the Niger Delta and rain forests of the south, to dry grassland of the north, and montane grasslands on the Jos and Mambila Plateaux. Over the years, it has lost a significant portion of its forest especially in the southern humid zones. Presently, Nigeria's forest may contain up to 1,085 million metric tons of carbon in living forest biomass. Unfortunately, Nigeria has one of the highest deforestation rates in the world and has lost an estimated 55.7% of her primary forests. Since 1990, the country has lost an estimated 6.1 million hectares or 35.7% of its total forest cover. Carbon emissions from deforestation are claimed in its First National Communications for the UNFCCC to account for 87% of the country's total carbon emissions. According to an FAO report, the annual rate of deforestation in Nigeria was 3.5%, approximately 350,000-400,000 hectares per year (FAO. 2006). The primary forests have been disappearing at an even faster rate. The country has been losing an average of 11% of the primary forests per year since 2000. Over time, deforestation, large scale land clearing and floodplain encroachment, mainly for agricultural production, have resulted in loss of habitat and biodiversity, severe erosion, leading to the loss of valuable top soil and significant siltation of water bodies and flooding. Sustainable forest management is critical not only for the country's commitment to the global conventions, but more importantly for the economy and livelihood of the people.

18. Forest loss in West Africa's humid systems also is thought to impact inland in the more arid Savannah and Sahelian ecosystems. The Center for Global Change Science at the Massachusetts Institute of Technology in the late 1990s carried out research showing that the

series of droughts in the 1970s and 1980s in West Africa may have been caused by the destruction of moist forest systems in countries such as Nigeria and Ghana. Further deforestation could eventually lead to a collapse of the West Africa monsoon[33].

19. ***Land degradation***. Because of soil type, vegetation cover, unsustainable land-use practices and precipitation variability (particularly increased frequency of extreme climatic events), the erosion threat to the country's economy and livelihood of its people has been identified by the Government as one of the key environment and development challenges for the country. Southeastern Nigeria is a hotspot for massive gully erosion. Rapidly expanding gully complexes have resulted in extensive impacts including loss of human life and loss of both built and natural assets (e.g., roads, drainage, housing, farmlands, community assets, silted waterways, and port). The Bank and Government of Nigeria, with TerrAfrica support, carried out a cost benefit analysis of land management options, finding that specific measures to restore or maintain soil structure and fertility can be a profitable response to farmers in short, medium and long terms (depending on the measure) while preventing erosion and its possible downstream impacts. Nigeria's National Action Program (NAP)[34] developed as part of its commitment to the United Nations Convention to Combat Desertification (UNCCD), highlights both natural and anthropogenic factors as the causes of land degradation. Although the NAP is tailored towards Nigeria's arid north, it identifies extreme climatic variability and poor land use practices as key factors for land degradation in the country. The NAP highlights specific activities to promote sustainable agriculture and livestock production systems, water resources management, and environmental rehabilitation, regeneration and conservation. As mentioned above, drier systems are affected by large scale changes in land use in southern humid zones.

20. ***Climate change adaptation challenges***. According to the vulnerability assessment in Nigeria's UNFCCC National Communications, southern Nigeria will experience an increased level and severity of erosion due to higher rainfall intensity as the result of climatic variability. This finding is supported by new World Bank Economic and Sector Work on climate risk assessment (2012 draft findings), which has carried out new regional modeling projecting that rainfall intensity and run-off will rise in Nigeria's southern basins. Extreme precipitation events will be more intense in the southern basins, by as much as 80% by 2060.[35] Because run-off is multiplied by up to a factor of approximately two for each unit increase in rainfall, more widespread erosion and vulnerability to landslide risk is anticipated. The Nigerian Meteorological Service shows that the country is already experiencing climate variability in the form of droughts, floods, shifts in rainy season onset and completion, and increasing rainfall intensity (See paragraphs 7-8 above).

21. Nigeria's UNFCCC National Communication includes priority actions to be undertaken to address soil erosion issues -- particularly southern gullies -- including: (i) establishment of mechanical and engineering structures to better manage water erosion such as water harvesting, check dams, storm diversion channels, bench terraces, contour bunds; and (ii) biological measures such as cover cropping, mulching, contour cultivation, minimum or zero tillage[36]. It is

[33] The model confirms an old theory, first developed 30 years ago by MIT's Jule Charney, that the loss of vegetation on the edge of the Sahara Desert in the West African interior could reduce rainfall. But the authors say this effect is much smaller than that of coastal deforestation.

[34] National Action Programme to Combat Desertification. The Government of Nigeria. 2001. (Ref. http://www.unccd.int/actionprogrammes/africa/national/2001/nigeria-eng.pdf)

[35] World Bank 2012. Climate Change Assessment: draft report on climate risk management in agriculture and water resources.

[36] Nigeria's First National Communication under the United Nations Framework Convention on Climate Change. The Government of Nigeria. 2003. (Ref. http://unfccc.int/resource/docs/natc/nignc1.pdf)

important to note that similar actions also appear in other federal plans (NAP, NBSAP, and the Nigeria Agriculture Transformation Agenda), and state plans (such as the Anambra erosion action plan, or Cross River State SLM Investment Framework), reinforcing the idea of an integrated, holistic response to the erosion problem targeted by NEWMAP – an approach that has not been emphasized until now, as the project is taking a watershed approach to balance the various uses within the landscape and demands being placed upon the natural resource base.

C. Link with the GEF and SCCF Strategies

22. The table below lists the GEF and SCCF objectives, outcomes and core outputs to which this project contributes.

Table 7.1: Select GEF and SCCF Objectives, Outcomes, and Core Outputs

GEF Focal Areas Objectives	GEF Expected Outcomes	GEF Core Outputs
GEF Focal Area Land Degradation LD-3: Integrated Landscapes: Reduce pressure on natural resources from competing land uses in the wider landscape.	Outcome 3.2: Integrated landscape management practices adopted by local communities.	Output 3.2 Integrated Natural Resources Management (INRM) tools and methodologies developed and tested. Output 3.4 Information on INRM technologies and best practice guidelines disseminated.
SCCF Adaption to Climate Change CCA-1: Reducing Vulnerability: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional, and global levels.	Outcome 1.2: Reduced vulnerability to climate change in development sectors	Output 1.2.1: Vulnerable physical, natural and social assets strengthened in response to climate change impacts, including variability.
SCCF Adaption to Climate Change CCA-1: Reducing Vulnerability: Reduce vulnerability to the adverse impacts of climate change, including variability, at local, national, regional, and global levels.	Outcome 1.3: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas.	Output 1.3.1: Targeted individuals and community livelihood strategies strengthened in relation to climate change impacts, including variability.
SCCF Adaption to Climate Change CCA-2: Increasing Adaptive Capacity: Increase adaptive capacity to respond to the impacts of climate change, including variability, at local, national, regional, and global levels.	Outcome 2.3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at the local level.	Output 2.3.1: Targeted population groups participating in adaptation and risk reduction awareness activities.
GEF Focal Area Biodiversity BD-2*:* Mainstream biodiversity conservation and sustainable use into production landscapes, seascapes and sectors.	Outcome 2.2: Measures to conserve and sustainably use biodiversity incorporated in policy and regulatory frameworks.	Output 2. Sub-national plans (number) that incorporate biodiversity and ecosystem service valuation.
GEF Focal Area Sustainable Forest Management SFM/REDD+ - 1: Forest Ecosystem Services: Reduce pressures on forest resources and generate sustainable flows of forest ecosystem services.	Outcome 1.3: Good management practices adopted by relevant economic actors.	Output 1.3: types and quantity of services generated through SFM.

D. Link with the Sahel and West Africa Program in support of the Great Green Wall Initiative

23. The project falls under the WB-GEF Sahel and West Africa Program in Support of the Great Green Wall Initiative (SAWAP) approved by the GEF and LDCF/SCCF Councils in May 2011. The Program addresses major issues related to land degradation, biodiversity and forests, including food security and climate change mitigation and adaptation in 12 countries: Burkina Faso, Chad, Ethiopia, Mali, Mauritania, Niger, Nigeria, Senegal, Sudan, Benin, Togo, and Ghana.

24. NEWMAP will directly contribute to the following regional SAWAP portfolio level performance indicators:

1. Increase in land area with sustainable land and water management (SLWM) practices in targeted areas (hectares, reported by crop, range, forest, wetlands, protected areas).
2. Change in vegetation cover in targeted areas (hectares).
3. Targeted institutions with increased adaptive capacity to reduce risks and respond to climate variability (#).

E. Description of baseline project

25. The combined GEF/SCCF resources of US$8,592,593 will be blended with NEWMAP's US$500M IDA envelope. NEWMAP's combined PDO and GEO is to reduce vulnerability to soil erosion in targeted sub-watersheds.

26. NEWMAP is an innovative 8-year multi-sectoral and multi-scale state-led project covering an estimated 30 sub-watersheds in 11 states. The project supports a transformation in how Nigerians relate to their land, which is needed to reduce immediate and long-term environmental risks to infrastructure, livelihoods, and economic growth. NEWMAP will take a comprehensive watershed management approach coupled with an initial investment focus on gully erosion prevention and rehabilitation in derived savannah and forested areas in the participating southern states. At the same time the project will initiate work in northern states to implement a comprehensive investment response to the north's unique dryland challenges, which differ from those of the south. The project is taking a phased approach to investment, with priority sites/sub-watersheds receiving investment support when states and their site plans are ready. The project will also provide resources for a range of agencies in participating states to ready their investment designs and mobilize communities. Via a cross-state planning and learning element, the project will be dynamic, visible, active, and transparent, push for reforms, and provide a framework for action that could be scaled out nationwide.

27. There are four components, summarized as follows:

Component 1. *Erosion and Watershed Management Infrastructure Investments (IDA US$395,880,000):* This component aims to support on-the-ground interventions to help reduce vulnerability to land degradation. Under the baseline scenario, the proposed component will support large and small civil works and land management technologies to slow gully expansion or prevent gully formation. Component 1 includes Gully Rapid Action and Slope Stabilization (GRASS) which can be used in emergency situations as a palliative to control damage and stop immediate threats to houses and critical infrastructure. At the same time, it plays the role of entry point into the local communities, to help secure their participation and ownership of the larger erosion and

watershed management planning and implementation activities that will bring a more permanent solution. Actions include: (i) emergency and temporary halting of gullies and landslide management, (ii) complementary structural erosion and water management works, and (iii) preventive erosion control works as well as associated community monitoring. Under the baseline scenario, the project will generate limited global benefits, and the local benefits will address the emergency situations without fully internalizing the added climate change induced risks.

Component 2. *Erosion and Watershed Management Institutions and Information Services (IDA US$38,200,000):* This component aims to strengthen the enabling environment for effective implementation of erosion and watershed management. Effective implementation of Nigeria's transformation agenda requires better institutional performance and information modernization. The component supports all three tiers of government and the private sector, but with a special focus on improving the effectiveness of states in investment design and supervision, with the federal level serving primarily as facilitator, regulator, monitor, bench marker, information broker, and aggregator. To reinforce good design and prioritization of investments, the component will help improve engineering and watershed and basin planning among states and federal actors, enhance the regulatory environment, data modernization and openness, information sharing, design and construction standards, development and application of analytical and monitoring tools, and watershed diagnostics. Under the baseline scenario, the project will strengthen the country's institutional capacity to address sustainable watershed management and erosion prevention measures. However, additional support is needed to mainstream climate adaptation parameters into urban land use and investment planning, which will help decision makers internalize the climate change induced risks in their long term planning.

Component 3. *Climate Change Response (IDA US$30,000,000):* This component aims to strengthen Nigeria's capacity to promote low carbon, climate resilient development. This component is defined as a framework, with broad areas of focus identified during project preparation and described below. The specific activities will be finalized during the first year of implementation through NEWMAP's multi-sector joint work programming process. Outcomes center on providing tools and approaches for government to become better equipped to respond to climate change. This component will finance goods, equipment, and consultant services, as well as limited works for demonstration activities (intended to test the viability of interventions to enhance climate resilience or support low carbon development).

Component 4. *Project management (IDA US$32,920,000):* This component aims to support the government at the federal and especially state levels to implement this project. This will include support for project management, including fiduciary aspects (procurement, financial management, environmental and social safeguards), project M&E, and strategic communications.

28. The total cost of baseline scenario through IDA financing will be US$500,000,000. Out of this envelope, a US$3,000,000 project preparation advance has been secured.

29. ***Scenario under the baseline project with regard to biodiversity, land and forest degradation.*** Under the baseline scenario, large and small civil works and vegetative land management will be implemented to slow gully expansion or prevent gully formation and soil

erosion. These include structural measures such as road cross drainage, gabions, and check dams), and biological measures such as grassing and re-vegetation. Furthermore, community land and water management approaches will also be supported, as well as livelihoods enhancements. As part of this work, the project includes support for: (i) community sensitization, mobilization and organization, and (ii) participatory sub-watershed management planning. Although these interventions are expected to generate global environment benefits, the incremental GEF resources would play a catalytic role in internalizing global environmental considerations in design and implementation of these activities that would further enhance the global environment benefits, in particular biodiversity and forest carbon, both of which are under threat in some candidate sites for investment intervention under the project. Without GEF support, concerted and well planned community conservation efforts to protect biodiversity assets and local forestlands would not achieve traction. This would result in continued loss of species as the southern Nigeria landscape continues to buckle from erosion and a heavy human footprint. Please see paras 1-20 above for more detail on the global relevance of land degradation, biodiversity, forest, and climate in Nigeria.

30. ***Scenario under the baseline project with regard to climate change impacts.*** There are two scenarios: (i) one relating to immediate, site specific investment and (ii) the second relating to longer-term urban land use planning and erosion prevention.

31. First, some site interventions will be carried out that would internalize some of the climatic variability. However, a more systematic intervention would be needed which internalizes climatic models. For example, climate change amplifies the situation in the country with extreme events, in particular precipitation intensity and floods. Because run-off is multiplied by up to a factor of two for every unit increase in rainfall intensity, more widespread erosion is expected. Therefore, there is a need to have tested investment activities that integrates extreme precipitation and associated run-off. The baseline scenario would be complemented by the SCCF financing to facilitate this particular aspect in 14-20 sites so that effective replicable models are designed.

32. Second, under the business as usual scenario, the way in which cities, roads, and their drainage are planned and developed to avoid floods and erosion in an era of greater climate variability would receive less attention without SCCF intervention. The story of erosion in southern Nigeria and land degradation and drought in northern Nigeria are largely stories centered on how land is managed in an increasingly more variable climate regime – a regime that has not been fully internalized in development planning, land use planning, natural resource management, or investment planning in a variety of sectors. The government, with support from IDA and others, have been working on the margins of this agenda, but with SCCF's additional intervention to improve planning in cities highly vulnerable to climate variability (water flows leading to flooding and massive, costly gully erosion -- which is a priority in Nigeria's UNFCCC National Communications), much more can be done to prevent these "man-made disasters" by improving urban planning with better climate risk management.

F. Description of GEF increment and SCCF addition

33. The combined GEF/SCCF resources of US$8,592,593 will be blended with the IDA financed activities totaling US$500M to generate additional adaptation benefits and incremental global benefits under the baseline scenario. The project's combined PDO and GEO is to reduce

vulnerability to soil erosion in targeted sub-watersheds. Table 7.2 below summarizes the GEF increment and SCCF addition including benefits these resources will catalyze.

34. *GEF incremental support* from the biodiversity, sustainable forest management (SFM), and land degradation focal areas will be combined with IDA financing to generate a range of global public environmental benefits in targeted watersheds by financing the establishment, maintenance and monitoring of Community Soil and Water Conservation zones in eligible communities and sites. The benefits include: (i) enhanced soil health and reduced erosion thereby strengthened ecosystem health, (ii) biodiversity conservation, (iii) accumulated terrestrial carbon from expanded or protected vegetation and tree cover, and (iv) strengthened capacity of the public sector to manage and regulate the use of biodiversity in productive landscapes.

35. GEF incremental activities will be an integral part of the community managed soil and water conservation zones that will be established as part of the sub-watershed plans. These soil and water conservation zones include a menu of community-driven forestland management activities that will protect and/or enhance vegetation cover in forestlands with degraded forests, forest fragments and areas with limited (but greater than zero) forest stocks. Sustainable land management practices such as grassing, low tillage and agroforestry will complement these forestland activities, but all of the natural resource management activities are presented together as a package of community responses depending on the natural assets, environmental risks, community needs, and local sub-watershed characteristics. A set of criteria has been agreed on for selection of sites and activities (see Annex 2, sub-component 1B). Eligible activities for GEF financing will be further reviewed against criteria that contribute to global environment benefits.

36. *SCCF additional support* will be combined with IDA financing to improve the climate resilience of eligible communities and sites by capturing rainwater among a critical mass of households, thereby reducing runoff, and hence, minimizing gully erosion risks in targeted areas, mostly urban and peri-urban areas. These gullies tend to quickly become massive, affecting thousands of people directly through landslides that destroy personal property, and millions indirectly through cut roads and flooding. In addition, the SCCF additional support will provide finance to Anambra state to develop an urban storm water master plan for Onitsha city. The SCCF intervention is directly in line with the vulnerability assessment of Nigeria's UNFCCC National Communications. Rainfall intensity is projected to rise in southern Nigeria, so it is imperative to put in place a range of measures to reduce the velocity and amount of water run-off using household, community and large-scale infrastructure measures (see below for details), especially measures that provide a built-in incentive to act such as the water harvesting activity described below does.

37. Components under the GEF Alternative and SCCF Additional support that build upon the Baseline are as follows:

Component 1: Erosion and Watershed Management Infrastructure Investments

38. The objective of this component is to support on-the-ground interventions to prevent and reverse land degradation. Key outcomes include stabilization of severe erosion sites, and/or preventing emerging erosion problems early when intervention costs are low. Interventions will include structural, vegetative, and natural resource based livelihood measures, coupled with sub-watershed planning. These interventions will generate important local, national, and global public goods related to disaster and climate risk reduction, ecosystem function, biodiversity, terrestrial carbon, soil health, and siltation reduction.

39. Key sub-components include*:*

Sub-component 1A. Gully Rapid Action and Slope Stabilization (GRASS): This sub-component will finance activities to stabilize and rehabilitate major erosion-related sites and causes in the targeted states using both structural and vegetative measures. GRASS could be used in emergency situations to control damage and stop immediate threats to lives, houses and critical infrastructure. Additional structural engineering works that will be included in the overall sub-watershed management plan developed under Sub-Component 1.B will also be financed through the GRASS sub-component. It will finance a substantial amount of works. It is essential that the design of these works takes account of: (a) the size and characteristics of the upstream sub-watershed and expected peak-flows of appropriate return period, (b) economic importance of infrastructure, and (c) settlement patterns of people living adjacent to the gully banks, and (d) downstream characteristics of the watershed system and beneficiaries as well as the streambed, to determine the dimensions of drainage structures and related works required. Other actions include: (i) emergency and temporary stabilization of gullies and landslide management, (ii) complementary structural erosion and water management works, and (iii) preventive erosion management works. This activity is envisaged under the baseline scenario, and will not receive GEF or SCCF resources.

Sub-component 1B. Integrated watershed management: This sub-component will apply a framework to integrate natural resource management with participatory sub-watershed planning to address ecosystem degradation including biodiversity loss, loss of forest and other biomass carbon, forest degradation, soil erosion especially gullying, landslide and flood risks, and water quantity and quality. Activities include: (i) Community mobilization and organization, (ii) integrated sub-watershed management planning and monitoring, and (iii) soil, water and biodiversity conservation. Subcomponent 1.B activities are complemented by subcomponent 1.A activities.

GEF increment to sub-component 1B: An incremental GEF grant of US$3,962,962 (integrating its windows for biodiversity, land degradation and sustainable forest management) will be matched 1:1 with IDA financing to provide sub-grants to Community Associations to identify, establish, maintain, and monitor ***community soil and water conservation zones*** in areas around an existing targeted gully system that also includes a biodiversity asset or a threatened community forest or sacred grove. It is estimated that up to 30 intervention sites could benefit from the incremental GEF support, at up to a maximum of US$200,000 per site. This will generate local and global environmental benefits by helping retain tree cover and forestland in the broader landscape which will also generate terrestrial carbon assets that could, at some future point, be monetized. Afforestation will not be among the GEF-financed activities in the soil and water conversation zones, as it cannot be supported by the GEF. By establishing these soil and water conservation zones and ensuring their continuation, communities could have sustainable access to woodlots, building materials, harvestable native plants for erosion control elsewhere, and other natural resource assets that can help secure or protect livelihoods. An effort should be made to formalize the Community Soil and Water Conservation zone through local by-laws and enforced by the community and local government. For example, some localities in Niger State have successfully enforced local bush burning bans.

The GEF and IDA will jointly finance eligible Community Associations in eligible sites to procure works, goods, services, operating costs and travel. The GEF cannot finance

afforestation. There will not be any SCCF financing under this activity, to avoid comingling of SCCF and GEF resources.

No parallel local implementation structure will be created for the GEF support, which is not financing any project management costs. See Annex 2 for a detailed description of the activity, and see Annex 3 for implementation arrangements.

Sub-component 1C. Livelihoods: The targeted intervention sites will include livelihood activities such as: (i) livelihood improvement (i.e., development of natural resource based enterprises such as local community geo-textile and gabion box manufacture, etc.), and (ii) employment and skills acquirement opportunities, for instance maximizing labor intensive public works and setting up shops to provide services such as small engine repair, etc. See Annex 2.

SCCF increment to sub-component 1C: An additional SCCF grant of US$3,129,630 matched 1:1 with IDA resources will support the installation of cisterns and associated equipment to capture rainwater from the roofs of houses, schools, and churches in vulnerable communities in specific zones threatened by gully erosion and who have mobilized to act on erosion and climate adaptation. If done on a large enough scale, this reduces total runoff, helping prevent gully formation or expansion. This is important given that rainfall intensity in the south is projected to increase. Recent regional climate modeling suggests that extreme precipitation events will be more intense in Nigeria's southern basins as much as 80% by 2060. Because run-off is multiplied by a factor of approximately two for each unit increase in rainfall, more widespread erosion and vulnerability to landslide risk is anticipated. This activity will procure household rainwater harvesting cisterns and associated equipment for each household mobilized in a vulnerable sub-watershed to act on gully erosion. An estimated direct 34,000 - 49,000 people directly vulnerable to water erosion could be reached, with many more beneficiaries from reduced downstream soil erosion. Reduction of 56,000m^3 of runoff is expected per annum per southern site, which represents a conservative figure of approximately 15% of total runoff per annum per site, depending on the location of the community in the gully system's immediate catchment and the catchment characteristics. Many villages and towns are also short of functioning drinking water supply. This innovative household water harvesting will have a positive additional local benefit on household livelihoods and income by reducing the need for households to purchase expensive water supplies. This strategy provides an important added incentive to communities to act. Below is a snapshot of the expected intervention:

- ✓ Targeted households per site: 350 on average (6 people per household);
- ✓ Cost of each household's water harvesting equipment: US$1.333;
- ✓ Average total cost per site: US$466,000;
- ✓ 14-20 sites could be reached.

The activity will finance equipment, goods and services to install the water harvesting structures, as well as provide advisory services to communities to maintain them. Demand for this additional support is expected to be high among the states, and greater than the total amount of SCCF and IDA financing available. Therefore, the project, through a participatory consultative process, has devised a set of criteria to be applied in financing complementary activities through SCCF funds. There is a maximum available of up to US$466,000 for a given intervention site. This support is integrated into the mainstream Component 1 activities of NEWMAP to help secure global environmental

benefits from a subset of NEWMAP's site interventions. See Project Document for details.

There will not be any GEF focal area financing under this activity to avoid comingling of SCCF and GEF resources.

40. **The total IDA/GEF/SCCF cost** of Component 1 is US$402,972,593 of which US$3,962,963 is financed through the incremental GEF grant (subcomponent 1.B), US$3,129,630 is financed through the additional SCCF grant (subcomponent 1.C), and US$395,880,000 is financed through IDA.

Component 2: Erosion and Watershed Management Institutions and Information Services

41. The objective of this component is to strengthen the enabling environment for effective implementation of erosion and watershed management. The component supports all three tiers of government and the private sector, but with a special focus on states, with the federal level serving primarily as facilitator, regulator, monitor, bench marker, information broker, and aggregator. It will contribute to a number of outcomes centered on enhanced capacities, modernization and coordination of relevant federal, state, and local institutions involved in planning, management, assessment, enforcement, and monitoring of watershed and erosion related activities and disaster risk management, from small sub-watersheds involving one or two LGAs to basin scale across states. It will contribute to government's efforts to transform institutional performance, focusing on actions that have not generally been done sufficiently by government in the past.

42. To reinforce good design and prioritization of investment, the component will contribute to enhancing the policy environment, data modernization, improved design and construction standards, development and application of analytical and monitoring tools, and watershed diagnostics. The component further includes provisions to train private and non-government entities in specific subject matters requiring capacity development, such as labor intensive construction methods of water and erosion control structures or natural resource management based enterprises. In addition, the component supports regional, south-south, and domestic exposure visits for relevant actors at technical levels (domestic and international) and policy levels (largely domestic). Lastly, while NEWMAP targets priority interventions to rehabilitate and secure gully erosion and landslide affected areas, effective disaster risk reduction and preparedness will include the strengthening of institutions and capacities, support risk adverse planning processes and enable communities, local, state and federal government to be prepared and rapidly respond to natural disasters. This approach is not limited to landslide hazards, but addresses all natural hazards related to extreme rainfall events integrated in the project's watershed approach.

43. Key sub-components include:

A. ***Federal MDAs Effectiveness and Investment Services for States:*** Key activities include: (i) Strengthening technical services and effectiveness of the Department of Erosion, Flood and Coastal Zone Management of the FME; (ii) Strengthening technical effectiveness of the EIA Division and the EA Department; (iii) Strengthening the monitoring and enforcement effectiveness of NESREA; (iv) Strengthening effectiveness of the National Emergency Management Agency (NEMA); (v) Erosion and Watershed Resource Network for Knowledge and Monitoring (FME); (vi) Basin and Watershed Planning (led by NIWRMC); (vii) Strengthening Effectiveness for Managing Environmental and Social Impacts from Federal Roads (FMW leads in collaboration with

FME and states); and (viii) Cross-cutting Public Investment Management (led by FPMU and contracted to independent entities.

B. ***State MDAs Effectiveness and Services:*** Key activities (i) Investment development support on erosion and watershed management; (ii) Strengthening effectiveness for managing environmental and social impacts in state roads and urban MDAs; (iii) Strengthening state and local preparedness on disaster risk management; and (iv) Urban drainage management planning. An additional SCCF grant will provide tools to support the modernization of city development plans, particularly focusing on effective management of stormwater (to appropriate design standards), stabilization/rehabilitation of urban gullies (many of which are priority sites), and land use zoning and city development planning to reduce further stress on land erosion. Benin City has, with the services from a South African firm, independently developed a storm water master plan that could be replicated in other cities in the project area depending on state and city interest and readiness to participate in NEWMAP. This will help cities in the project area adapt to climate variability and change by preventing gully formation -- via promotion of more rational drainage works that can accommodate the projected increased rainfall intensities in the project area.

SCCF increment to sub-component 2B. The SCCF will support development of 1-2 urban storm water master plans, covering an estimated 5-10 million people, starting with the city of Onitsha, Anambra state, which is one of West Africa's leading trading centers and a major gully erosion hotspot. These urban stormwater master plans will include identified investment priorities to reduce formation or recurrence of gullies. Priorities will include a mix of current and future road projects and cross drainage, urban drainage projects, as well as improved zoning such as to avoid building in flood plains or areas prone to landslides. In this way, this intervention complements the hard investments under sub-component 1.A above.

C. ***Effectiveness and Services of Local Government Areas:*** Under this sub-component, additional technical assistance will be provided on key issues to help sustain O&M for site interventions in specific targeted sub-watersheds treated under NEWMAP component 1. Key areas of action include improving the effectiveness of LGAs to provide services and extension to communities in solid waste removal, vegetative and structural land/water management measures. In addition, LGAs will be sensitized on civil engineering approaches, spatial planning, disaster preparedness, social accountability, and livelihoods work supported under NEWMAP. To save costs, training will be consolidated among LGAs at state levels; training will be managed by the SPMU.

D. ***Private and Non-Government Sector Institutions and Services:*** Contractors and/or NGOs may be short of understanding, experience and capacity to deliver services or tender for contracts along the lines of NEWMAP expectations. Therefore the project includes a training provision for contractors and other non-government entities that can be used as the need emerges. Such needs are likely to include: (i) labor intensive works; (ii) manufacture and installation of geo-textiles and gabion boxes; (iii) water harvesting and storage from rooftops; and (iv) natural resource management based enterprises. In addition, these contractors and NGOs will participate in events supported under sub-component 2.A).

44. **The total IDA/SCCF cost** of Component 2 is US$39,700,000 of which US$38,200,000 will be financed through IDA and US$1,500,000 will be financed through the SCCF grant.

Component 3: Climate Change Response

45. See baseline project description above for a summary of the component. The total IDA cost of this component is US$30,000,000. No GEF or SCCF resources will finance this component.

Component 4: Project Management

46. This component aims to ensure efficient and timely delivery of project resources in accordance with the project's objectives. The component will provide funds for: (a) project management and coordination at federal and state levels, including procurement and financial management; (b) social and environmental safeguards management and oversight; (c) strategic project communication and documentation; (d) project M&E, including two Mid-Term Reviews; and (e) impact evaluation. See Annex 3 for more details on project implementation, including detailed approaches for safeguards, M&E and impact evaluation.

47. The total cost of this component is US$32,920,000. No GEF or SCCF resources will finance this component.

G. Summary of benefits of GEF increment and SCCF addition

48. **GEF increment and GEBs:** To secure global environmental benefits the GEF increment will specifically finance the establishment of community soil and water conservation zones in areas prone to erosion. It will also enhance the country's effort to conserve its rich biodiversity assets. By protecting vegetation cover in the landscape, including forestland and forest fragments, or re-greening project sites, carbon will be accumulated in the biomass and soil.

49. Without incremental GEF support, there will be fewer specific conservation zones. Biodiversity assets and forestlands will likely not be identified or specifically targeted (except for their erosion control worth), and biomass carbon accumulation will not be prioritized as part of the local gully rehabilitation site investments.

50. **SCCF addition and adaptation benefits:** To secure adaptation benefits, the SCCF financing will specifically fund: (i) household water harvesting structures around targeted gullies that in aggregate will remove a significant amount of the erosive force of run-off; and (ii) the development of urban stormwater master plans in 1-2 cities that will set the stage for Nigeria's development of a new generation of erosion reduction and prevention investments on the ground, building on NEWMAP's best practices.

51. Without SCCF support, there will likely be fewer high quality urban stormwater master plans developed (there is currently one in the entire country), a less coherent portfolio of urban gully rehabilitation plans with specific climate adaptation measures, and lower uptake of household water harvesting structures and therefore higher run-off, erosion rates, gully formation, and loss of lives and property.

52. **The total cost of the GEF increment and SCCF addition** will be US$8,592,593 of which US$3,962,963 will be financed through the GEF grant and US$4,629,630 will be financed through the SCCF grant.

Table 7.2. Matrix of GEF incremental costs and SCCF additional costs

Activity	Baseline	GEF Increment or SCCF Addition	GEF Global Environmental Benefits and SCCF Climate Adaptation Benefits	Incremental and Additional Costs (US$)
Component 1. Erosion and Watershed Management Infrastructure Investments: US$402,972,593 of which US$3,962,963 is financed through the incremental GEF grant (subcomponent 1.B), and US$3,129,630 is financed through the additional SCCF grant (subcomponent 1.C), and US$395,880,000 is financed through IDA.				
Sub-component 1.A: Gully Rapid Action and Slope Stabilization	Large and small civil works and land management **technologies** to slow gully expansion or prevent gully formation and rill erosion. These include structural measures (such as road cross drainage, gabions, and check dams), and biological measures (grassing and revegetation). Subcomponent 1.A activities are complemented by subcomponent 1.B and subcomponent 1.C activities.	***The GEF and SCCF are not directly co-financing this sub-component.*** Nevertheless, the GEF and SCCF funded activities described below will be complemented by the investments made under sub-component 1A.	The GEF and SCCF are not directly co-financing this sub-component.	IDA Baseline: 340,230,000 Total: 340,230,000* * Indirect incremental GEF and additional SCCF support is found in sub-components 1B and 1C below, as all three sub-components are complementary, working on the same sites/sub-watersheds
Sub-component 1.B: Integrated Watershed Management	Support for improved land management regimes and approaches at local level, such as participatory sub-watershed planning, zoning, and monitoring. Includes support for: (i) community sensitization, mobilization and organization; (ii) participatory sub-watershed management planning; and (iii) land and water management	***GEF increment:*** Establish community soil and water conservation zones in areas threatened by loss of biodiversity, soil, and terrestrial carbon -- such as along riverbanks or in community forests in the derived savannah landscape. In the southeast, birds and tree species of global importance may be found such as *Milicia excelsa* and *Ceiba pentandra*. In Anambra state, for example, two candidate sites contain sizable secondary and tertiary forest, mixed vegetation, and traditional multi-story farming systems dominant	***GEF global environmental benefits:*** • Biodiversity assets identified and better protected in sub-watershed planning and site investment through the community managed soil and water conservation zones. They will otherwise likely not be included in erosion management measures or sub-watershed planning • Greater terrestrial carbon accumulation from vegetation expansion or protection and improved land use	IDA Baseline: 32,100,000 **GEF increment:* 3,962,963** Total:36,062,963 * GEF increment composed of three focal areas integrated into one support package: Land degradation: 555,556

	Subcomponent 1.B activities are complemented by subcomponent 1.A and subcomponent 1.C activities.	throughout the southeast. Vegetation removal and landslides in these sites are contributing to gully expansion and carbon emissions. In neighboring Imo state one site is contributing to over 3500 tonnes of annual emissions. This intervention will help retain tree and other vegetation cover and promote sustainable forest management. The GEF will finance extension support, seeds and other materiel, as well as technical training support and equipment for community planning, implementation, and monitoring. GEF financing comes from the land degradation, biodiversity, and sustainable forest management focal areas. Subcomponent 1.B activities are complemented by subcomponent 1.A activities.	• Improved soil structure and stability and reduced run-off • Improved watershed function from all the above	Biodiversity: 2,481,481 Sustainable forest mgt: 925,926
Sub-component 1.C: Livelihoods	Livelihoods alternatives, employment and skills training, and natural resource based enterprises Subcomponent 1.C activities are complemented by subcomponent 1.A and subcomponent 1.B activities.	***SCCF addition*** The SCCF will finance goods and services including provision and installation of up to 4,900 - 7,000 cisterns and related equipment for holding water on the roofs of homes, schools and other community buildings, and advisory services for households to maintain them. An estimated 4,900-7,000 households will be reached in 14-20 sites. This represents 34,000 - 49,000 people directly vulnerable to water erosion. Additional people downstream are also affected by erosion from siltation of waterways and severed roads. Through the lifetime of the project, up to 40 million people in seven southern states alone are expected to be economically impacted by erosion. This intervention complements the hard investments under sub-component 1.A above; however, these	***SCCF climate adaptation benefits*** In line with Nigeria's UNFCCC National Communications priority to investment in addressing southern gully erosion, the SCCF addition will generate tangible benefits for participating communities as follows: 34,000 - 49,000 people vulnerable to water erosion will directly benefit through reduced vulnerability to water erosion that is clearly linked to rainfall intensity. This number depends on the number of sites and population concentrations in them. Reduction of 56,000m^3 of runoff is expected per annum per southern site, which represents a conservative figure of approximately 15% of total runoff per annum per site, depending on the location of the	IDA Baseline: 23,540,000 **SCCF addition: 3,129,630** Total: 26,669,630

		hard investments are not directly counted as baseline here.	community in the gully system's immediate catchment and the catchment characteristics. New detailed projections by a 2012 World Bank ESW show up to 80% greater rainfall intensity in southern basins in by 2060, and this activity helps communities and their neighbors adapt to greater rainfall intensity and associated run-off that contributes to gully formation and expansion.	
Component 2. Erosion and Watershed Management Institutions and Information Services: US$39,700,000 of which US$38,200,000 will be financed through IDA and US$1,500,000 will be financed through the SCCF grant.				
Sub-component 2.A: Federal MDAs Effectiveness and Investment Services for States	Support in strengthening regulatory capacity of key environmental and disaster response institutions; and information and monitoring services and tools including a HydroMet system and state of the art erosion monitoring. In addition it will support in building an erosion and watershed management resource network; basin and watershed planning; and transforming the way in which federal roads and their cross drainage systems are regulated, designed, approved, budgeted, constructed and maintained	***The GEF and SCCF are not directly co-financing this sub-component.*** Nevertheless, the GEF and SCCF funded activities will be complemented by the investments made under sub-component 2A.	The GEF and SCCF are not directly co-financing this sub-component.	IDA Baseline: 24,340,000 Total: 24,340,000* * No direct GEF or SCCF support
Sub-component 2.B: State MDAs Effectiveness	Support for changes in the way in which state roads and their associated drainage systems are regulated, designed, approved,	***SCCF addition*** Southeastern gully erosion is a major priority in Nigeria's UNFCCC National Communications, with millions of vulnerable poor households	***SCCF climate adaptation benefits*** Gullies prevented and/or stabilized and urban flooding reduced in two of Nigeria's southeastern cities, starting with Onitsha, a	IDA Baseline: 11,840,000 **SCCF addition: 1,500,000** Total: 13,340,000

and Services	budgeted, constructed and maintained, with a view to reduce and prevent gully formation. Includes environmental and social impact assessments for state roads, training on best practices for road and urban drainage and other erosion prevention measures, and watershed planning. Benin City, the capital of Edo State, has already developed an urban stormwater master plan – the first in the project area -- with expertise procured from an international firm.	affected, mostly urban and peri-urban. Development of 1-2 urban stormwater master plans, covering an estimated 5-10 M people starting with Onitsha, a major West African trading hub. These plans will identify investment and land use priorities to reduce formation or recurrence of gullies. These priorities are anticipated to include a mix of current and future road projects and cross drainage, urban drainage projects, as well as improved zoning to avoid building in flood plains or areas prone to landslides which is currently common practice. Gullies are often caused by unplanned and unregulated urban development; this activity helps counter this and set the stage for greater sustainability by contributing directly to a transformation in investment design standards and siting. The SCCF will finance international standard services (working with selected cities) to produce urban stormwater master plans, starting with Onitsha city in Anambra State. These plans will (i) identify a portfolio of possible adaptive infrastructure investments, and (ii) the plans could also be replicated in additional cities in the project area. This intervention complements the hard investments under sub-component 1.A above; however, these hard investments are not directly counted as baseline here.	major West African trading hub. These cities and their estimated 5-10 million inhabitants are better adapted to an era of higher rainfall intensity that will otherwise have generated greater levels of erosion devastation to lives, property and the natural environment from gully erosion. New detailed projections by a 2012 World Bank ESW show up to 80% greater rainfall intensity in southern basins in the average 2030-2060 period.	
Sub-Component 2.C: Effectiveness and Services of Local Government	Additional technical assistance will be provided on key issues to help sustain O&M for site interventions in specific targeted sub-watersheds treated under NEWMAP component 1. It	***The GEF and SCCF are not directly co-financing this sub-component.*** Nevertheless, the GEF and SCCF funded activities will be complemented by the investments made under this sub-component.	The GEF and SCCF are not directly co-financing this sub-component.	IDA Baseline: 1,090,000 Total: 1,090,000*

Areas	will improve the effectiveness of LGAs to provide services and extension to communities in solid waste removal, vegetative and structural land/water management measures.			
Sub-Component 2.D: Private and Non-Government Sector Institutions and Services	Training contractors and other non-government entities that can be used as the need emerges, e.g., labor intensive works, manufacture and installation of geo-textiles and gabion boxes, water harvesting and storage from rooftops, and natural resource management based enterprises.	***The GEF and SCCF are not directly co-financing this sub-component.*** Nevertheless, the GEF and SCCF funded activities will be complemented by the investments made under this sub-component.	The GEF and SCCF are not directly co-financing this sub-component.	IDA Baseline: 930,000 Total: 930,000*
Component 3. Climate Change Response: US$30,000,000 total				
Component 3: Climate Change Response	Strengthen Nigeria's capacity to promote low carbon, climate resilient development. This component is defined as a framework, including key areas of focus, with specific activities in those areas to be further defined as part of the implementation process, in particular through the preparation of annual work programs implemented by climate change related federal institutions	***The GEF and SCCF are not directly co-financing this sub-component.*** Nevertheless, the GEF and SCCF funded activities will be complemented by the investments made under component 3.	The GEF and SCCF are not directly co-financing this component.	IDA Baseline: 30,000,000 Total: 30,000,000* * No direct GEF or SCCF support
Component 4. Project Management: US$32,920,000 total				

Component 4: Project Management	Support in effective and efficient implementation of project activities and oversight.	***The GEF and SCCF are not directly co-financing this sub-component.*** Nevertheless, the GEF and SCCF funded activities will be complemented by the investments made under component 4.	The GEF and SCCF are not directly co-financing this component.	Baseline: 32,920,000 Total: 32,920,000* * No direct GEF or SCCF support
TOTAL				**Total IDA baseline: 500,000,000** **Total GEF increment: 3,962,963** **Total SCCF addition: 4,629,630** **Total project: 508,592,593**

Annex 8: Technical Approach and Institutional Background to the Project

NIGERIA: Nigeria Erosion and Watershed Management Project

1. This annex includes details and background on the project situation and response. It is organized as follows:

Section A. Background
Section B. Policy and Institutional Context
Section C. Project Area
Section D. Technical Approach to NEWMAP Site Interventions in Southern Nigeria
Section E. Synergies with other Project and Programs

A. BACKGROUND

2. With a land area of 923,800 square kilometers, Nigeria is large and diverse. It has tropical rainforests and coastal plains in the far south (with rainfall from 1,500 to over 2,000 mm/yr), vast valleys in the Niger River and Benue tributary with under-utilized arable land, hills in the upstream areas of these rivers, a large savannah area (with 500-1,500 mm/yr rainfall), and the Sahel in the north (with less than 500 mm/yr rainfall). Land use challenges are found throughout the country, and manifest differently in the different ecological zones.

3. Gully erosion (see Photo) is an extreme form of land degradation affecting the country, in particular the southeast. In the north, water scarcity, wind erosion and soil infertility are taking their tolls. Climate risks aggravate land degradation in all areas, and will continue to do so as the south becomes much wetter and the north somewhat drier and hotter. Over two-thirds of Nigeria's 152 million people force out a living directly from land and water resources, often depleting renewable natural assets faster than can be replenished. These assets include grasslands, cropland, woodlands, forests, forest, and wetlands in all agro-ecological zones, as well as the flora, fauna and freshwater resources provided by or safeguarded by healthy terrestrial ecosystems. This process results in reduced capacity of the landscape to provide and filter fresh water; provide fuel wood, food, fiber and fodder; buffer the effects of Nigeria's more variable rainfall and temperature such as droughts, floods, and shifting growing seasons; contributes to loss of productive land, results in reduced floral and faunal biodiversity above ground and below ground (important for soil health and diverse livelihoods), and exacerbates conflict over land use.

4. Southeastern Nigeria is a hotspot for massive gully erosion, an advanced form of land degradation. Rapidly expanding gully complexes have resulted in extensive impacts including

loss of human life and loss of both built and natural assets (e.g., roads, drainage, housing, farmlands, community assets, silted waterways, and port). The estimated 3000 gullies vary in size and setting. Some are vast complexes eight kilometers long with fingers one or two kilometers long. Root causes for the gullies differ from site-to-site but are largely human-induced. These include improper road design and construction particularly for adequate cross-drainage; fragmented and inadequate scale of response; poor or incomplete rehabilitation works (often with major design or contract management issues) that often tend to either exacerbate the erosion problem or transfer it to another area; very inadequate land use planning and destructive and unsustainable land-use practices that remove protective vegetation cover (overgrazing, deforestation, cultivation of marginal lands), as well as weak preventive land management. Climate is a significant factor in erosion especially given the very high intensity rainfall in southern Nigeria. Historical climate variability (both droughts and floods) tends to exacerbate erosion and future climate change is only expected to worsen this situation via higher rainfall intensities and higher aggregate rainfall. The soils in the area are often highly erodible and lack cohesion and the steep slopes of the gullies are major contributing factors for the erosion. Poor solid waste management, especially in peri-urban and urban areas, chokes the already inadequate drainage and increase erosion.

5. Various manifestations of rural land degradation have led to the massive gullies along with siltation of waterways, riverbank collapse and river course re-routing, and have undermined existing infrastructure capacity (e.g., reservoirs, roads, drainage, urban development). Erosion is causing heavy sedimentation of Cross River, leading to riverbank erosion and attendant community vulnerability, and choking Calabar's largely non-functional port, with resulting high dredging costs. Nationwide, cropland degradation accounts for 1.7 – 6.4% of GDP. In some areas of southern Nigeria, land degradation has caused yield reductions of between 30 to 90%.[37] While Nigeria has depleted much of its tree cover, considerable stocks remain nationwide, especially in Cross River State, that generate non-timber products and services such as erosion prevention, watershed function, medicines, building material, and biomass energy. These forests also store carbon and house biodiversity assets. The value of lost forest cover has been estimated at US$750M annually at 1989 prices (FGN 2000), and the loss of it amplifies soil erosion and other forms of land degradation.

6. Such adverse economic and social ramifications will continue to grow and are not expected to abate on their own: by 2020 the country's total population will approach 200 million, reaching nearly 300 million around 2050. Nigeria's Vision 20:2020 recognizes that "population growth is placing undue stress on basic life-sustaining resources, resulting in diminished well-being and quality of life." In sum, unsustainable use of land and water resources is entrenching rural poverty and vulnerabilities, and the country is not fully equipped to respond without external assistance. It is no coincidence that the southeast has the highest population density in Nigeria.

7. At both policy and technical levels, the Government recognizes a need for a holistic and more robust investment response. The missing piece of the puzzle is large-scale investment in the country's renewable natural capital. Such an investment will likely generate a good return on investment, according to the Bank's 2006 publication, *Where Is the Wealth of Nations*, which found that "natural capital constitutes a quarter of total wealth in low-income countries, greater than the share of produced capital. This suggests that better management of ecosystems and natural resources will be key to sustaining development while countries build their infrastructure and human and institutional capital." In particular, the book reports that Nigeria would have had

[37] See page 1 for references.

a stock of produced capital five times higher than it did in 2000 if it had invested in sustaining its natural resource base in the previous thirty years[38].

B. POLICY AND INSTITUTIONAL CONTEXT

8. *Country priorities.* Nigeria has prioritized interventions to tackle soil erosion and improve land management via a number of strategies, policies, and action plans. These include: Vision 2020:20 strategy and action plan The project is in line with the growth and resilience goals of Nigeria's Vision 20:2020, under which the Bank provides financial and non-financial support. Following the 2010 elections, Nigeria has been putting in place an ambitious transformation agenda. This agenda is expected to prioritize job creation and implementation of strategies for resolving Nigeria's long-standing infrastructure problems, particularly in power and transportation, and will include far reaching reforms in agriculture and the oil and gas industries. The project has been specifically designed in response to the President of Nigeria's request to the Bank to support the country to address severe erosion in southeastern Nigeria, and is considered an integral part of Nigeria's transformation agenda.

9. *Responses to date are fragmented and inadequate.* State and local governments and their constituencies are overwhelmed by the scale and complexity of the gully erosion problem. Attempts at all tiers of government to prevent or rehabilitate gullies have been generally unsuccessful for the following reasons: (a) Unclear and overlapping mandates of federal and state institutions[39] responsible for erosion prevention and management and watershed management, (b) insufficient technical capacity in these institutions, (c) poor, incomplete or inadequate scale of response (such as an over-emphasis on inflexible civil engineering interventions without addressing water flows in the sub-watershed or building upon a strong evidence base); (d) absent or weak land-use planning; (e) weak regulatory compliance and enforcement; (f) weak community involvement in prevention and restoration activities; (g) insufficient attention to alternative livelihood issues; and (h) insufficient attention to transparent governance, corruption, and local participation. The different challenges are interwoven and require integrated solutions. However, institutions, information, and incentives are fragmented, weakening the ability of state and federal ministries, departments and agencies (MDAs) or the communities that they serve to address the issues in a strategic and integrated manner. In particular, the government's Ecological Fund has carried out gully erosion activities in different parts of Nigeria, among other environmental activities, but these have had mixed results due to the reasons above.

10. The Project is consistent with the Country Partnership Strategy II (2010-2013), which seeks to support sustainable and inclusive non-oil growth. Improved environmental and climate risk management is a central part of CPS II which acknowledges the need to address weak policy, institutional and incentive frameworks to support wider adoption of sustainable land use practices.

11. The project is well aligned with key government documents and action plan on erosion and watershed management including the Nigeria Erosion Control policy, Erosion and Flood

[38] Ecosystem services such as regulation of water flow by vegetation cover, pollination by insects, or coastal protection by mangroves, contribute to the productivity of farmland and fisheries in particular, as well as provide buffers from risks. But their economic contribution is generally unmeasured in national accounts. This puts the natural assets providing these services at risk when development decisions are taken.

[39] The country has a federal system, with 36 state governments and 774 local governments. Significant powers, resources, and responsibilities are decentralized. State and local governments control nearly half of public spending and are responsible for land use planning and management.

Control Action Plan, land degradation mapping and assessment for the prevention and control of potential erosion hazards in Nigeria.

12. Nigeria's major plans associated with multilateral environmental agreements including: UNFCCC National Communications which specifies southern gully erosion as among the highest priorities for investment and technical assistance, the UNCBD National Biodiversity Strategic Action Plan, UNCCD National Action Programme

13. A number of existing state action plans such as Anambra's Flood and Erosion Control Policy, Cross River's SLM Investment Framework, the Urban Stormwater Master Plan for Benin City in Imo State Flood and Erosion Control policy and so on. During project preparation, an *Institutional Needs Assessment for NEWMAP* was carried out, which identified institutional capacity challenges: (i) lack of clarity in roles and responsibilities of institutions involved in erosion and watershed management resulting in overlapping mandates and duplication of functions; (ii) lack of a coherent framework for coordination on policy and implementation in sustainable land management issues; (iii) poor implementation of policies and weak enforcement of legislation; (iv) exclusion of local government in state level decision making; (v) fragmented information and knowledge gaps; and (vi) lack of participatory approach in sustainable land management.

14. The study also pointed out that poor implementation of efforts to manage erosion is not only due to lack of capacity and resources, but also lack of transparency and accountability of project funds, unclear delegation of mandates between state and federal level and the creation of new institutions without adequate framework for coordination. On watershed management, there is no integrated approach to watershed management that has been untaken by any of the MDAs at any tier of government, although there are recent efforts to introduce it. While there is no separate policy or action plan for watershed management, it is addressed under several sub-sectoral policies within other environmental management plans and strategies. This current fragmented framework is a sharp contrast to the holistic approach necessary for integrated watershed management as institutions operating without clear guidance and focus are engaged in isolated activities addressing specific environmental issues. In addition, most watershed management activities, if any, are conducted in a "top down" approach with limited or no involvement of communities.

15. *Federal MDAs.* A number of key federal institutions are involved in soil erosion and watershed management: (a) the Federal Ministry of Environment (FME), with the Department of Erosion Control and Coastal Zone Management; and the National Environment Standards and Regulations Agency; (b) the Federal Ministry of Water Resources (FMWR), with the River Basin Development Authorities, the Nigeria Integrated Water Resources Management Commission, the Nigeria Hydrological Services Agency, and the National Water Resources Institute; (c) the Federal Ministry of Agriculture and Rural Development (FMARD), with the multi-sector National Sustainable Land Management Committee; (d) the National Emergency Management Agency, and (e) Federal Ministry of Works. Additional institutions are also involved including Nigeria Meteorological Agency (NIMET) and the Nigerian Space Research and Development Agency (NASRDA). The mandates and functions of many of the agencies above are not clearly defined which results in duplication of functions, conflict of interest and lack of inter sectoral coordination. In addition many are under-funded, lack stable leadership and have significant capacity constraints.

16. The **Federal Ministry of Environment** (FME) has the mandate to supervise all environmental activities as the central authority for soil erosion and watershed management, with as core functions: (i) defining the policy, legal and regulatory framework for environmental management; (ii) environmental monitoring, date collection and analysis; (iii) EIA review,

training, clearances including environmental education and public awareness; (iv) managing ecosystems and promoting sustainable use of natural resources and (v) setting and enforcing environmental quality norms, standards and rules. FME has several technical departments: (a) Forestry, (b) Drought and Desertification, (c) Environmental Assessment, (d) Pollution Control and Environmental Health, (e) the Special Climate Change Unit, (f) the Federal Forestry Department, and (g) Erosion, Flood and Coastal Zone Management. The latter is responsible for implementing environmental policies related to soil erosion.

17. The **Department of Erosion, Flood and Coastal Zone Management** (DEFCZM) comprises four divisions: (a) Soil Erosion Monitoring and Control, responsible for land degradation hazard assessment and monitoring and assessment of gully erosion areas; (b) Flood Forecasting Monitoring and Control, charged with flood plain mapping and monitoring and maintenance of flood control infrastructure; (c) Coastal Zone Management, responsible for monitoring and controlling coastal and river bank erosion, coastal land management, and dredging and reclamation of affected areas; and (d) Water Management and Harvesting. The mandate of the Division of Erosion Monitoring and Control includes: (i) monitoring and evaluation of erosion control projects; (ii) coordination with research, operation, and education agencies of federal, state and local governments as well as private institutions to develop and improve and use information pertinent to conservation planning; and (iii) construction of erosion control structures to reclaim eroded sites. Thus, the Department is directly involved in the implementation of projects as well as ensuring environmental compliance, this can create a potential conflict of interest.

18. DEFCZM receives funding from two sources: federal budget and the **Ecological Fund**, which is financed through an annual provision of 1.5% of the Federal Account. The Secretariat of the Fund is located in the Presidency and is responsible for processing all requests for funds, documentation of all disbursements, monitoring and co-ordination and general administration of the funds. The fund allocation is decided by the National Committee on Ecological Problems which is chaired by the Minister of Environment and includes the representatives from various line ministries and the RBDAs. While the annual earmark is sufficient to address a wide range of activities, there have been problems with mismanagement and misallocation of funds.

19. The **National Environment Standards and Regulation Agency** (NESREA), under the guardianship of FME, has one service and three technical Departments, one of which is the Department of Environmental Quality Control, which has three Divisions: (i) Environmental Quality Technology; (ii) Land Resources and Watershed Monitoring; and (iii) Conservation Monitoring. Soil erosion and watershed management issues are under the responsibility of the Land Resources and Watershed Monitoring division which is responsible for making regulations, guidelines or standards for the protection and enhancement of the quality of land resources, natural watersheds, coastal zone, dams and reservoirs including prevention of flood and erosion. The NESREA Act 2007 contains provisions for environmental monitoring, auditing and compliance enforcement. At the Regulatory Dialogue forum of 2011, with representatives by States Commissioners/Permanent Secretaries and Local Government Area Chairmen nationwide, Roles and Responsibilities of the Federal Government, the States and Local Government Areas were defined in respect to compliance monitoring and enforcement of the 24 National Environmental Regulations 2009 and 2011. Communities could be further utilized in compliance monitoring. The agency has no independent system of collecting baseline data on critical watersheds and/or erosion sites that is necessary for the implementation of its enforcement mandate.

20. The mandate of the **Federal Ministry of Water Resources** (FMWR) is to harness underground and surface water resources for irrigation, recreation, navigation, hydro-power generation, water supply for industrial and domestic uses. It comprises: (a) twelve River Basin

Development Authorities (RBDAs); (b) Department of Dam and Reservoir Operations; (c) Department of Irrigation and Drainage; (d) Nigeria Hydrological Services Agency (NIHSA); and (e) the Nigeria Nigeria Integrated Water Resources Management Commission (NNIWRMC).

21. Under the **Department of Irrigation and Drainage**, the Division on Drainage and Flood Control is to: (i) provide guidance and support programs of RBDAs; (ii) carry out studies and research to ensure proper and regular review of comprehensive master plan for drainage and flood control projects and developments; (iii) provision of technical support and guidance for formulation, periodic review, development and implementation of national policies as it relates to planning, development, operations and maintenance of drainage and flood control policies. There is clear overlap of these functions with FME.

22. **River Basin Development Authorities (RBDAs)** are parastatals with as functions: (i) comprehensive development of both surface and groundwater resources for multipurpose use, with particular emphasis on the provision of irrigation infrastructure and the control of flood and erosion for watershed management; (ii) construct, operate and maintain reservoir dams, dykes, polders, wells, boreholes, irrigation and drainage systems and other works and to hand over all lands to be cultivated under irrigation schemes to the farmers; (iii) supply water to all users for a fee; and (iv) construct, operate and maintain infrastructural services such as roads and bridges linking projects sites. RBDAs functioning has not been without problems: (a) frequent changes in mandate and limited experience in water resource management; (b) weak performance, both in terms of service delivery and financial management; (c) overlap of mandates and lack of coordination between FME and RBDAs; and (d) weak data collection, though most RBDAs maintain hydrological stations within a basin the gauging stations are not calibrated neither are rating curves produced for these stations.

23. The soon to be established **Nigeria Integrated Water Resources Management Commission** (NIWRMC) will have a key role watershed management. The proposed Bill gives the NIWRMC the power and enforcement authority (under FMWR) *inter alia*: (a) implement regulatory policies related to water resources management activities; (b) responsibility for economic and technical regulation for all WR exploitation and provision (construction, O&M and tariffs) of public and private waters resources infrastructure; (c) ensure the safety and quality of waster resource development and public water services by regulating standards for execution and performance; (d) liaise with relevant agencies to conduct studies and surveys for the purpose of establishing water resources balance and catchment management plans and water efficiency strategies; (e) regulate advise and coordinate international trans-boundary cooperation and issue/conflict resolution; (f) effectively monitor and evaluate national water sector programs and advise the Minister on all matters including borrowing foreign TA & portfolio matter; (g) facilitate technical assistance in all aspects of integrated water resources management; and (h) be responsible for ensuring that the Act's provisions are carried with regard to the public interest. However, it is noted that NIWRMC will have representative offices within each of the basins, but these will report directly to the federal level NIWRMC and are not governed by a cooperative arrangement of the states, which is against the principles of devolution of management responsibility and does not build on the successful arrangements for basin management initiated by some states. The proposed Bill does not refer to existing RBDAs and relationships between the NIWRMC and both existing and proposed organizations are not clear.

24. The **National Hydrological Services Agency** (NIHSA) is the custodian of all water resources data, the location of water resources in time and space, their extent, dependability, quality and the possibilities of their utilization and control on a continuous basis on both surface and ground. The agency's activities and functions have direct relation to management of watersheds, for example studies on special catchment areas, program on gathering of sediment

transport data, hydrological mapping, collecting baseline data for all required flood plain mapping.etc. However, NIHSA suffers from a lack of autonomy and limited funding. Its Board is yet to be inaugurated, and it is headed by an Acting Director General.

25. The **National Water Resources Institute** (NWRI) in Kaduna is a parastatal under the FMWR, designated to provide training and education, data collection and dissemination services in the field of water resources development and management. In the context of integrated water resource management training and research, NWRI aims to focus on catchment management modeling, extreme hydrological events (floods and droughts), water resource assessment, coastal water management, water quality management and ecological problems such as erosion, sedimentation and pollution. However, the Institute's training and capacity building is mostly demand driven and currently much of its focus is on areas of sanitation and water supply issues. The national water resources data bank in NWRI is not fully functional.

26. The **Federal Ministry of Agriculture and Rural Development** (FMARD) is a key Ministry focusing on sustainable land management issues. The Ministry is responsible for the national agriculture policy, technical support to land use planning, soil management, soil capacity evaluation and soil resource management. Soil erosion and watershed management activities come under **the Department of Agriculture and Land Resources**, with as tasks: (a) continuous inventory and assessment of land resources, and monitor changes in their potential for agriculture; (b) rehabilitation of degraded land area affected by drought, desert encroachment, soil erosion and flood, and to prevent the spread of these disasters to other areas through effective protection measures; and (c) training of middle level management needs for the national land resource sub sector. The Department has four technical divisions dealing with: (i) soil erosion and watershed management issues; (ii) soil and fertility testing; (iii) soil survey and land evaluation; and (iv) soil fertility management and land use conservation. In addition, there is a specialized unit in GIS and remote sensing.

27. The **National Technical SLM Committee** is hosted by FMARD and draws its members from a number of federal MDAs agencies including Finance, Planning, Water, Environment, and NIMET. It is supported by the Bank financed Fadama III operation, and has set the stage for improving coordination at a technical level and mainstreaming of land management activities in MDAs. The SLM Committee is hoped to become a *formal* technical/working committee for the SLM agenda in Nigeria. The Committee worked with Cross River State which prepared a multi-sector SLM Investment Framework which includes costed priority actions prepared by the Cross River State Government's cabinet. However, the National SLM Committee has limited leverage to implement its formal mandate which centers on knowledge consolidation and generation to inform investment prioritization.

28. The **National Emergency Management Agency** (NEMA) was established to manage disasters through measures such as creating awareness and early warning systems. It has six zonal offices which in the last year have been strengthened by the recruitment of around 192 new staff. NEMA depends heavily on the coordination and collaboration of other relevant MDAs to effectively implement its mandate. This has been difficult at federal and state level and NEMA has been functioning mostly in isolation.

29. The **Federal Ministry of Works** has primary responsibility for federal roads including appropriate drainage. However, the Ministry's mandate only extends tens of meters on either side of road corridors, resulting in incomplete drainage works that cause significant erosion in humid southern soils. This situation necessitates close coordination with FME, state ministries, and local bodies to ensure that drainage is fully built to discharge water safely to the natural water body.

30. **The Nigeria Meteorological Agency (NIMET)** and the **Nigerian Space Research and Development Agency (NASRDA**) are both important agencies for the project's mission to modernize information and carry out evidence-based policy, planning and investment. Coordination among NIHSA, NIMET and NASRDA is critical for investment success by the participating states.

31. **State MDAs.** The institutional issues identified above are mirrored at state level, which have primary responsibility for land allocations and for regulating land use. State leadership in the southeast is highly motivated to address gully erosion and have dedicated considerable political and financial capital to do so. State ministries of environment are staffed mainly with civil engineers, which resulted in past and ongoing efforts to manage erosion being heavily dependent on a limited menu of civil engineering measures that have had mixed results. A more integrated and holistic approach is needed to address gully erosion and these departments or divisions lack sufficient multi-disciplinary teams and multi-sector coordination to bring about such approaches. State Ministries of Work rarely conduct EIAs for road and highway construction projects and if such EIAs have been carried out, then recommendations are often not implemented. When constructing roads especially in the urban areas, most designs do not include adequate drainage, which is one of the major causes of gully erosion. Further, communities are rarely included in decision making at the state level.

C. PROJECT AREA

32. **Land use and land cover change**. As part of the project preparation process, a study was carried out to map land use and land cover (LULC) change between 1976 and 2006[40]. The statistics for the land cover categories suggest gradual increase in built up areas from about 0.42% in 1976 to 2.13% in 2006. Forested area has been on gradual decline from about 22% in 1976 to around 18% in 2006. Rainfed cultivation/cropland accounts for over 60% of the total area which underscores the importance of agriculture as the primary occupation and livelihood source. Mosaic of grassland, farmland and bare surface increased from about 1.12% in 1976 to around 3% in 2006. Gullies and areas exposed to erosion also increased from about 0.21% in 1976 to about 0.76% in 2006. This means the total area affected by rill, sheet or gully erosion increased from about 1.33% (1,021km^2) in 1976 to about 3.7% (2,820km^2) in 2006.

33. Gullies and areas exposed to erosion and mosaic of grassland, farmland and bare surfaces suggests they are concentrated in areas around the eastern escarpment and around the Awka-Orlu cuesta. Erosion sites, gullies and mosaic of grassland and bare surfaces are extensive around the eastern escarpment which stretches from the Isiama-Ohafia axis (Abia State) through Nguzu-Eda (Ebonyi)/Okigwe (Imo) areas to Agwu, Udi and Nsukka areas in Enugu State. The deepest and most prominent gullies are localised to areas around Umundugba-Orlu-Urualla-Aguata-Abagana-Akwa areas on the cuesta (stretching from Imo to Anambra States). This is where some of the most dreaded gullies including the Agulu-Nanka-Ekwulobia and the Urualla-Orlu-Ikwerre complexes are found. Some mosaic of grassland, farmland and bare surfaces are also found in some areas around the northwest of Edo State (around Auchi). The actual gullies appeared too small to be detected at the current mapping scale.

34. Between 1976 and 2006, about 1,152km^2 and 175km^2 of rainfed cultivation/cropland and forest respectively transited into the mosaic of grassland, farmland and bare surface. In the same period, about 185km^2 and 26km^2 of rainfed cultivation/cropland and forest transited into gullies and areas exposed to erosion. About 52km^2 of wetland and 10km^2 of urban area also transited

[40] Mayowa Fasona, 2011: Mapping Landuse and Landcover Change. Nigeria: Erosion and Watershed Management Project (draft Final Report).

into gullies and areas exposed to erosion. This suggests that some settlements/communities have been dislocated by the erosion and gully problem. The loss of rainfed cropland and forest to gullies and bare surfaces is consistent through the periods 1976-2006. The spatial pattern of change confirms that the pattern of growth in erosion, gullies and other bare surfaces is clustered around the eastern escarpment and the Awka-Orlu cuesta.

35. The threat analysis suggests that the areas of intense and active erosion and gullies correlated with areas of very high population concentration. By inference, the high population concentration around the degraded areas suggests intense landuse pressure that results in some kind of unsustainable land practices which drive the degradation process. This suggests that while the population is probably the most vulnerable and constantly threatened asset by the gully and erosion process, it is also a very potent driver of the erosion and gully process.

36. Transport and communication infrastructure is a common asset that has continuously been lost to erosion and gully process in the SE. About 12 roads in Enugu State and 6 in Anambra/Imo axis have been identified to be under serious threat from erosion and gullies. These include dual-carriage highways such as the Onitsha-Awka-Enugu and the Enugu-Port Harcourt expressways, among others.

37. Arable lands around the escarpment and cuesta continues to face serious threat from the erosion and gully process. The degradation of arable lands is much more serious around Enugu State. Some industrial and commercial establishments also face threat of gullies and erosion in different parts of the states.

38. Analysis of drivers of erosion suggests that almost all the mapped erosion sites and gullies are found within comparatively higher elevation and higher slope about 6 to 27.

39. The erosion and gully sites also correspond to the source of rivers which suggests that headwater erosion cannot be ruled out. The drainage systems originate from both sides of the escarpment and cuesta. All the rivers that feed the two major drainage systems in the SE, the Anambra and Imo Rivers and the Ekulu and Anyaba Rivers that feed the Calabar River originate from the eastern escarpment. The Oji and Ezu Rivers which are major tributaries of the Anambra River appear to be the major carriers of eroded sediments into the Anambra River. These two rivers together with other smaller tributaries drain the entire gully and eroded areas right from the top of the escarpment in Enugu State to the gully areas around Abagana, Agulu, Nanka, Ekwulobia, Oko, Isuofia and Aguata areas.

40. Almost all the gullies and areas exposed to erosion are localized to the sandstone and shale, sandstone, mudstone and shale, sandy material and shale geological formations in that order. The sandstone and shale formation in particular underlay both the eastern escarpment and the Awka-Orlu cuesta. It is also found in the Auchi-Fugar-Agenebode axis and Agbor-Ehor-Ekpoma-Ubiaja axis in Edo State which are highly susceptible to erosion and gullying.

41. The logistic regression model suggests that population, slope, elevation, and geology are the most important variables (among the 8 variables tested) for predicting erosion and gully formation in the SE. This is consistent with some of the earlier visual observations.

42. The principal component analysis suggests a negative relationship between canopy cover characteristics and the likelihood of erosion and gully, which suggests that increased canopy cover will reduce erosion and gully. This medium and strong intervention scenario analysis suggests that ecosystems management that promotes strong canopy coverage has the potential to drastically reduce erosion and gully process.

D. TECHNICAL APPROACH TO NEWMAP SITE INTERVENTIONS IN SOUTHERN NIGERIA

The Gully Erosion Problem in Southern States

43. The **root causes of gully erosion** are complex. The soils in southeastern Nigeria are highly susceptible to water erosion. Once a gully starts, it expands rapidly and is difficult to control. The causes for gully formation differ by site, but are largely human, including: (a) improper road design and construction, in particular inadequate drainage of storm water, causing concentrated discharge of run-off from roadsides and residential areas (roofs) through drainage channels that cannot cope with this discharge; (b) poor solid waste management in urban and peri-urban areas, as a result of which garbage chokes the already inadequate drainage systems, and forces storm water to find alternative drainage paths, thereby further accelerating erosion; and (c) destructive and unsustainable land-use practices in peri-urban and rural areas, often linked to poverty, that remove protective vegetation cover including protective biodiversity and carbon rich areas, or disturb the fragile soil, such as: (i) overgrazing; (ii) deforestation; (iii) cultivation of marginal lands; and (iv) uncontrolled mining for building materials.

42. **Policy and institutional constraints**, particularly related to the mandate of the federal and state ministries of works, have been another challenge in addressing gully erosion. For example, the FMW's responsibility for safe disposal of storm water is limited to putting in place cross drainage a maximum distance of 20 meters from federal roads. In view of the crucial importance of properly managing roadside runoff, the lack of responsibility for the safe disposal of storm water after 20 meters distance is a critical policy constraint.

43. **Previous interventions aimed at preventing or reversing gully erosion in Nigeria have been largely unsustainable**. Numerous initiatives have failed for various reasons: (a) an over-reliance on construction of concrete and masonry drainage channels that generally failed to address the problem; (b) lack of capacity in: (i) basic engineering knowledge and technical skills; (ii) undertaking cost-benefit analyses; and (iii) quantifying root-causes of the problem and devising comprehensive and sustainable corrective measures; and (c) despite awareness at community level of the potential dangers of gully erosion, commitment to take action at the local level has generally been limited.

44. **Some past interventions, however, have provided examples of isolated good practices**, which could be considered for up-scaling as part of NEWMAP's holistic sub-watershed intervention. One such example is the vegetative land management measures combined with check dams that were implemented at the Madona gully site in Anambra State. In Enugu State a monastery was built in the erosion-prone area of Awhum where gully erosion was controlled by using sand bags, vegetative measures and gully reshaping. Another example comes from the community in Okwudu, in Imo State, where degraded areas were successfully rehabilitated by using vegetative measures combined with the construction of drainage channels. Thus, vegetative measures appear essential to stabilize slopes and gullies, but international experience shows that they will require regulated use of the treated areas to be effective and sustainable.

45. **Major gully control engineering design and implementation challenges to be addressed by the project** include:

a. Preventive measures to control erosion requiring large-scale interventions, time and the commitment of stakeholders (e.g. implementing labor-intensive on-farm terraces and agreements on regulated land, water and vegetation use). It should be noted that short-term civil works interventions financed under sub-component 1A (Gully Rapid Action

and Slope Stabilization, which serves to kick-start effective erosion control measures and build-up stakeholder commitment), may be difficult to achieve on its own. Follow-up activities will be required in subsequent years to ensure sustainability;

b. Provision of incentives for the communities living upstream of flood-prone areas and/or gully heads, to participate in interventions that primarily benefit those living downstream; and

c. The question of ownership/tenure/allocation of stabilized gully sites after reclamation. Although the watershed approach should not be compromised, it is necessary to take immediate action in some of the sites where major infrastructure, such as national express bridges, (e.g. New Heritage/Onitsha bridge and residential area) are on the brink of collapse.

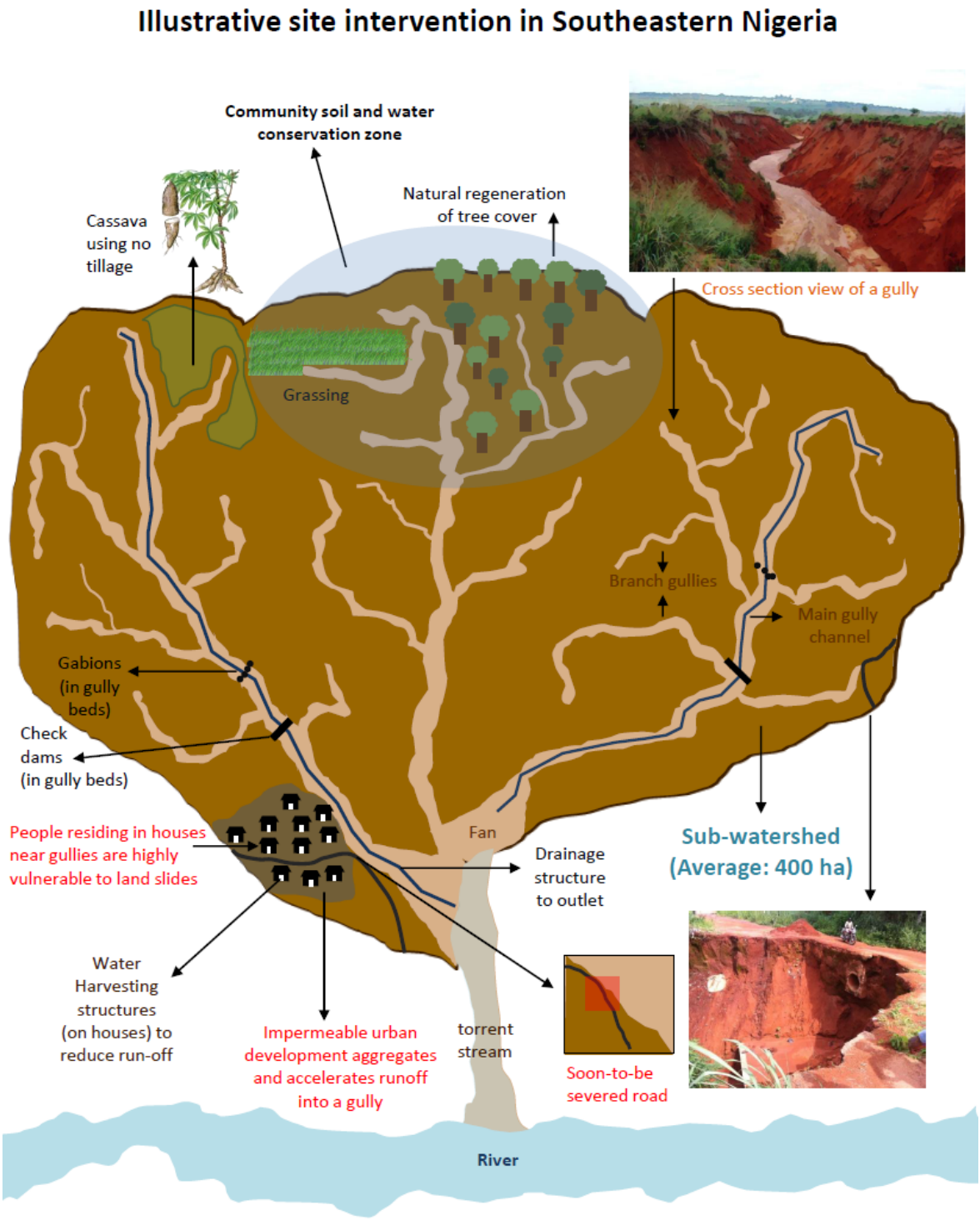
46. On the positive side, the project will capitalize on several **key opportunities** and the potential synergies between these such as: (i) a natural environment favoring rapid regeneration of vegetation, facilitating the large scale use of vegetative land management measures to control erosion and rehabilitate gullies; (ii) the availability of cost-effective, *flexible*, free drained and easy to construct and maintain structures (gabions for instance) which suit the highly fragile soil (to date hardly used in the project area); (iii) transforming the destructive storm-water runoff into water harvesting and storage opportunities in urban areas with poor water supply; (iv) improving coordination between MDAs and other stakeholders in particular roads ministries; and (v) creating widespread public awareness on the threat of gully erosion, including the link to poor solid waste management, (vi) capacitating local actors to participate such as through adaptive community livelihoods, community managed soil and water conservation zones, and beneficiary verification.

Component 1 – An Integrated Approach

47. The project approach to investment under Component 1 includes a strategic combination of activities financed under sub-component 1.A., *GRASS*, sub-component 1.B., *integrated sub-watershed management*, and sub-component 1.C., *adaptive livelihoods*. Under NEWMAP, a project site is equivalent to a gully system, encompassed within a surrounding sub-watershed where topography and drainage patterns channels surface and ground water to the gully system. An average sub-watershed under the project in southern states is approximately 400 hectares, although there is much variation in sites that may be included in the project[41]. Each sub-watershed will support an average of 2354 households. These sub-watersheds will be rural, peri-urban or urban area. The integrated, holistic approach of addressing a gully system within a surrounding sub-watershed builds on previous experiences and lessons learned nationally and internationally to ensure sustainability beyond the project lifespan. Figure 1 provides an illustrative sub-watershed and gully system that requires integrated measures to be followed at various stages of project implementation.

[41] In northern states, average sub-watersheds would be much larger and project interventions more focused on soil and water conservation activities and livelihoods rather than gully stabilization and restoration.

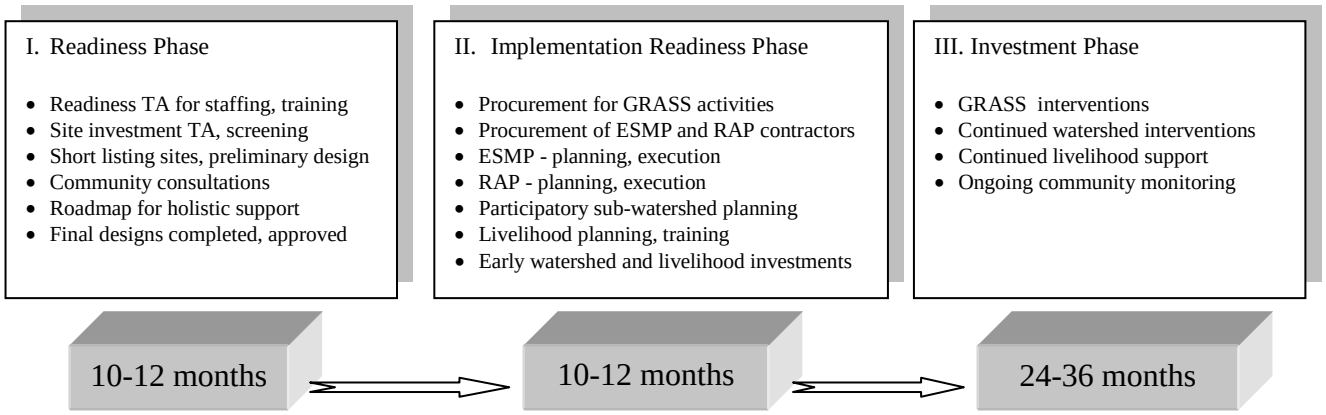
Figure 1. Integrated site management for component 1



Expected Timeline, Phasing and Average Costs of Component 1

48. Component 1 will be executed through three phases over a 4-5 year period (Figure 2).

Figure 2. Phasing of key component 1 activities



49. Phase I (Readiness) builds capacity in the state to select potential sites for project activities, develop and review site designs, and initiate consultations with participating communities. By the end of Phase I, final site designs will be completed and approved.

50. In Phase II (Implementation Readiness), the procurement process for highly qualified engineering firms will be completed. This could take 7-9 months for large contracts. In this Phase, the required social and environmental assessment work will be completed. In addition, initial community based livelihood support, including social mobilization, training and planning will be undertaken. Participatory sub-watershed plans will also be completed over a 7-9 month period. As the livelihood preparation and watershed planning work is completed, early implementation of investments in livelihood improvement and watershed management can begin, which will then be carried over into Phase III. Communities will be trained in simple techniques for gathering information that will contribute to field monitoring of activities, especially physical works.

51. Phase III (Investment) is focused on implementing the major ground investments for GRASS, and continuing with the sub-watershed management and livelihood support. Community inputs to the project monitoring program will begin to flow.

52. It should be noted that the project cycle is flexible, and will likely be reduced as experience is gained and lessons are learned through implementation in the first few sites. For sites that already have near-to-ready designs, at project effectiveness, they will enter the process at Phase II. For new sites that come on stream later in the project, they will pass through the entire process. In terms of community expectations, while consultations occur with communities in prospective sites during Phase I, full engagement begins in Phase II when sites are formally selected. In Phase II, communities will see immediate inputs, support, and some benefits, which will then be expanded on in Phase III as the major physical works begin.

53. For sites selected for implementation in southern states, an estimate of US$10 million per site has been established for overall project implementation. Given the limited experiences the states have in delivering integrated gully erosion control planning and design, the initial sites selected for design are not the most complex and challenging. The average cost of US$4M per intervention site (i.e., the sub-watershed) is considered as the usual minimum figure for most

sites. Some sites with smaller gully systems could cost as low as US$1M. Some large and very complex sites can cost as much as US$30M. It should be noted that some sites may be so technically and/or socially complex that they cannot be addressed within the financial parameters of this project.

54. NEWMAP will develop a Project Implementation Manual (PIM) and more detailed manuals on technical topics that will guide the PMUs at federal and state levels, and concerned stakeholders and MDAs in the day-to-day implementation of the activities throughout the erosion and gully control sub-project processing cycle.

55. The PIM is an important tool for site intervention planning and implementation comprising: (i) the approach to detailed project planning and implementation, community participation and mobilization; (ii) criteria for intervention site eligibility, identification (selection); (iii) preparation of intervention plans and designs; (iv) sub-project appraisal and approval; (v) implementation and supervision; and (vi) M&E. The PIM will also include all the necessary formats and tools to be used by the ministries and consultants of potential site intervention applicant states as well as the procedures to be followed at all stages of the project processing cycle.

56. The draft *Good Practice Guidance Note (GPGN) for Gully Erosion Control & Slope Stabilization in Southeast Nigeria,* developed during project preparation, will be updated for use by engineers and other practitioners.

Key Steps in the Implementation of Component 1

Site selection

57. Site selection will be done by the participating states in a step-wise manner, blending technical and community input at appropriate intervals. Initially, states will identify a range of possible sites for the project from the existing national/state data bases of gullies. At this strategic level, decisions over site selection and broad technical interventions will be guided by the collection and analysis of data on the bio-physical and socio-economic conditions in the surrounding sub-watershed. Site selection criteria at this strategic level are as follows:

- State of gully erosion (stable, slight, moderate, severe, or catastrophic);
- Size of affected population (disaggregated by poverty rate);
- Risk to human life;
- Risk to physical assets;
- Risk to natural assets;
- Replicability potential of the site;
- Readiness of the state to cover the cost of resettlement (if required); and
- No on-going competing intervention in the same sub-watershed.

58. After a site has been included in the strategic or “long” list, it will undergo more detailed site assessments, design development, and community consultations.

59. The **detailed site assessments** will include: (i) sub-watershed mapping and analysis; (ii) detailed topographic survey (for gully sites); (iii) land use/land cover; (iv) soils and geo-technical; (v) rainfall (history and projections) and hydrology; (v) population and socio-economic assessments; (vi) livelihoods; (vii) biological and engineering (structural) designs; and (v) engineering drawings, bill of quantities and cost estimates.

60. Based on the information from the detailed site assessments, **preliminary designs and plans** will be developed for the selected sites on the long list that include gully stabilization and restoration, soil and water management in the surrounding sub-watershed, and potential livelihood improvements. The gully system will be used as a key entry point for integrated local interventions that directly address the gully system itself, soil and water conservation in the surrounding sub-watershed, and adaptive livelihoods. The planning, design and implementation tasks for each selected site on the long list should clearly describe the links between the gully system, the more time consuming soil and water conservation activities in upstream watersheds, and improving local livelihoods.

61. A critical step in this process will be **consultations with communities** to determine their receptiveness to their sub-watershed being included in the project, and gather input on the preliminary design/plan. These consultations will be facilitated by a national NGO hired by the FPMU, drawing in community members and appropriate state government departments.

62. Based on these assessments and consultations, **a site may move to a short list** for possible financing if it meets remaining technical, social and environmental requirements. A critical requirement will be for the state to agree to finance expected resettlement costs.

Final site designs for selected sites

63. For sites shifted to a short list and for which financing has been agreed, final **detailed site designs** will then be prepared and approved by the state and federal PIUs. These plans should include integrated design elements across the three main elements including the gully system itself, interventions in the broader, surrounding sub-watershed, and livelihood improvement. For a subset of community level work, sub-grants will be provided to NEWMAP Community Associations to implement sub-projects on livelihoods and soil and water conservation. For the gully system, the main design aspects include:

(i) **Integrate structural and vegetative land management measures**. The following vegetative measures will be introduced as an integral part of gully and erosion control interventions: (a) grass sodding of embankments; (b) planting of bamboos, elephant grass and vetiver grass inside and around gullies; (c) afforestation, reforestation, natural forest/vegetation regeneration, and agro-forestry; (d) controlled use and area closures for animals and humans (to allow re-vegetation and reduce the risk of embankment collapse), (e) establishment of community managed soil and water conservation zones and implementation of appropriate interventions; and (f) gully and embankment stabilization using geo-textiles, and (e) other locally appropriate measures.

(ii) **Structural land management measures.** Physical interventions that reduce erosive runoff, promote safe conveyance/disposal of storm water, stabilize gullies and minimize channel sedimentation will be supported. These include, but are not limited to: (a) concrete drainage channels and pipes for safe disposal of urban storm water; (b) energy dissipating concrete chute structure at gully heads; (c) gabion check dams and retaining walls inside and around gullies and rip-raps; (d) gabion drainage channels (in rural settings usually) and rip-raps downstream of chute structures, inside and around gullies; (e) earth work (including gully reshaping, back filling and compaction, if economically justified); (f) household rainwater harvesting to reduce and divert run-off; (h) runoff diversion cutoff drains; and (i) flood management and river training works. As indicated, these physical interventions will be designed and implemented in tandem with selected vegetative and social/community measures.

(iii) **Access roads to construction sites** (including emergency detour and mobile steel bridges) will also be supported. As indicated, these structural interventions will be designed and implemented in tandem with selected vegetative and social/community measures.

(iv) **Other design considerations**: Importantly, structural measures should not be limited to impermeable concrete and masonry structures in drainage canals, but should include – where appropriate – extensive permeable and flexible structure (such as gabions) to allow for the safe drainage of groundwater and to minimize structural breakdown. In addition, complementary structures, such as flood protection dikes and runoff storage cisterns for domestic water use as well as runoff utilization for spate irrigation or other purposes will be considered. The intervention plans and designs will pay due attention to: (a) ensure that water retention structures/dikes and unlined cutoff drains are located sufficiently far away from gully edges to minimize landslide risk; (b) design of cutoff drains (flood diversion channels) need careful design and construction techniques to avoid the otherwise potentially destructive consequences (due to erosive or silting velocity); (c) careful choice between graded or contour terraces and moisture retention structures; (d) activities involving land acquisition, such as area closure, access to construction sites, and re-vegetation, need careful community consultation; (e) the interface between site designs and the likely interventions in the sub-watershed as identified in a sub-watershed and livelihoods roadmap to be developed during community and local consultations as part of site design work; (f) analysis of alternative designs considered and the reason for rejection; and (g) ensure the willingness of the owners of rehabilitated gullies to abide by the proposed land use plan.

(v) **Integrated watershed planning and management**. This second element of the integrated approach will address watershed management priorities in the surrounding and wider sub-watershed of the immediate gully system. In predominantly rural sub-watersheds, the focus will be more on soil and water conservation. In predominantly urban or peri-urban sub-watersheds, the focus will be more on rainwater, surface water, and storm water management. In both cases, the primary objective is to reduce the volume and velocity of water flowing downhill to the gully system. The preliminary site design will identify priority areas requiring physical interventions in the wider sub-watershed. More detailed professional watershed plans will be developed through a highly participatory process with communities and other local actors. The sub-watershed plans will integrate community perceived needs, priorities and technical considerations. The community engagement process will be guided by a credible field NGO, working in association with relevant line departments, LGAs, and communities. The SPMU will competitively secure a skilled provider – which could be the same NGO, a firm, or a government agency -- to develop the sub-watershed plan. Sub-grants to Community Associations will finance communities in eligible sub-watersheds/sites to designate, implement, and monitor soil and water conservation zones.

(vi) **Community livelihoods.** This third element of the integrated approach will be facilitated by the same field NGOs, working in association with relevant line departments and community groups. While a prospective menu of potential livelihood activities will be developed early in the project implementation phase in collaboration with communities and field NGOs, a number of potential activities have been identified during preliminary studies that could be eligible for community sub-projects financed by

sub-grants to the Community Associations. These include: (a) geo-textile manufacturing from coconut/palm/crop residue and other materials; (b) gabion box making; (c) construction skill training on gabion box installation/erection and other masonry/concrete works for the affected communities to work on the project; (d) horticulture on reclaimed lands; (e) seedling and/or fruit tree nurseries, managed by women; (f) grasscutter, mushroom, and snail production; (g) planting of moringa trees (*moringa olifera*) for soil stabilization and food products; (h) beekeeping and honey production; developing vetiver grass for use in gully stabilization; and (i) small shops, service providers, etc. The field NGOs will provide technical support to targeted community members[42] in developing suitable, market driven livelihood options. The project will provide grant financing to selected beneficiaries or beneficiary groups for livelihood development, with the beneficiaries providing agreed in-kind contributions.

Community sensitization, mobilization and organization

64. Community sensitization, mobilization, and organization form an integral and essential part of gully and erosion control, and is described in more detail in Annexes 2 and 3 of the PAD. Previous interventions at gully stabilization/restoration by government often lacked sufficient investment, capacity building, institutional support and commitment at the local and community levels. Meaningful community participation at all stages of the component 1 implementation process will be ensured through a partnership between communities, suitable field NGOs, and the NEWMAP Technical Officer sitting at the respective LGA.

65. A state NGO will be contracted by the state PMU to deliver high quality services and inputs to communities in project sites, working with field NGOs through internal service contracts. The state NGO will establish a menu of livelihood options for livelihood development, guidelines for disbursement of grant financing, etc. The state NGO will also provide technical quality assurance and oversight over the field NGO operations and ensure the field NGOs are trained in all community-based processes.

66. It is expected that on average, one field NGO will be assigned to each site to deliver a range of services at the community level including: sensitization around the project; social mobilization; facilitating formation of and strengthening the NEWMAP Community Association and facilitating formation of Community Interest Groups as appropriate under the Community Association; extensive capacity building, and facilitating key participatory processes associated with gully stabilization/restoration, watershed management and livelihood development. In some areas, it is possible that a field NGO could work across more than one site. With the livelihoods process, the field NGO will establish mechanisms for the community to target beneficiaries based on agreed criteria that include (i) impact from gully erosion, (ii) poverty level, and (iii) gender. Each field NGO will likely include a team leader; two social mobilization specialists (one male and one female); livelihood specialist; technical specialist with familiarity with watershed management issues; and a general assistant.

67. Engagement with selected communities will begin as early as possible in the project cycle. After first engagement with the community and its leaders, the NGO community team will hold a series of informational meetings leading to the formation of a legally registered Community Association, or alternatively, building on local institutions that may already exist. The Community Association will be part of a broader Site Committee that includes a range of

[42] Possible selection criteria could be those people most affected most by gully erosion, the poorest in the community, and women.

stakeholders including local leaders, local organizations such as age grades and town associations, men and women, erosion-affected people, poor people and others. Depending on local conditions, Community Associations may establish Community Interest Groups to deal with specific issues. These groups will be based on how the community is or is not presently organized, to help reduce "committee fatigue."

68. Community Interest Groups will work with the field NGO and relevant technical specialists to develop plans or verify activities, and will periodically report to the Community Association and broader Site Committee which will be responsible for developing the full integrated sub-watershed plan that is technically feasible, financially viable and socially sustainable. Each Community Interest Groups will focus on a discrete activity. For example, one group may focus on livelihoods and as such will develop specific eligibility criteria consistent with local needs, but targeting especially: (a) people affected by gullies, (b) people needing assistance but having the capacity to acquire new skills and economic activities, and (c) women, orphans and the elderly to the extent possible. Another example may be a Community Interest Group that will participate in the technical and financial workings of project activities in the sub-watershed. It will have access to contracts and contract performance and will provide information to the community at large at regular intervals through readily accessible media such as newsletters or billboards. Other Community Interest Groups will interact with engineers and technical staff to help assure that works are compliant with community demands.

69. A national service provider will be contracted by the federal PMU at the beginning of the project for one year to develop a comprehensive field manual covering processes associated with community participation for all three sub-components in component 1. Essentially, the field manual will provide a step-by-step guide for participatory gully interventions and monitoring, watershed planning and implementation, and adaptive livelihoods. The national organization will also develop standard terms of reference for SPMUs to contract the state NGOs, and create consistent curriculum and training materials for the state NGOs to ensure high quality support across all project sites.

70. The ***role of the community, organized into an existing or new Community Association,*** at various stage of the site intervention cycle includes:

(i) *Sub-grant and sub-project implementation throughout the intervention cycle:* Under sub-components 1.B.3 and 1.C.2 sub-grants will be provided by the SPMU to legally registered Community Associations to finance community driven sub-projects to be developed, implemented, and monitored by Community Associations and their Community Interest Groups (if any). The NGO will facilitate this process and provide technical assistance. For more detail, see Annex 3 Component 1 implementation.

(ii) *At site identification stage*: site prioritization and request for the project and, provision of local level information as well as security coverage.

(iii) *At design stage*: participate in sensitization sessions, provide information on local data/information and knowledge sharing as well as logistical support during survey/ investigation and security coverage (including land access); and participate in the assessment of demands for livelihood activities.

(iv) *At implementation stage*: facilitate access to construction site, quarries, and security. Ensure community contribution in cash and in-kind, conform to plans and agreements.

(v) *During supervision and M&E*: verification of structural and vegetative measures, and provision of services for carrying out livelihoods activities under the project. A national 3rd party agency will be contracted by the federal PMU to support comprehensive, concurrent input-output and process monitoring, and periodic impact assessment. The 3rd

party M&E agency will work with field NGOs and communities to establish a credible and functional system for collecting community-based monitoring information for selected indicators.

(vi) *During O&M*: maintenance of vegetative measures (in close collaboration with LGAs), maintenance of works such as drainage (i.e., removal of solid waste), on-farm water/soil conservation structures, water harvesting cisterns, and operation of livelihood activities.

71. **Capacity development is a cross-cutting issue**: the need to strengthen the capacity of staff from the various ministries and states involved is relevant for all phases of the project. Given the limited capacity at all tiers of government, the need for continued capacity development of staff, as well as national consultants is being addressed by the project, largely under Component 2, Erosion and Watershed Management Institutions and Information services. For technical design and implementation issues, the project will, for example:

(i) Provide on-going training in structural and vegetative land management, geo-technical investigation, hydrology, and watershed management to States and other actors, and maintain a roster of professional, qualified engineers, consultants, NGOs, and contractors,

(ii) Promote quality technical design, implementation, and supervision, through the Expert Advisory Services Pool (EASP),

(iii) Provide short- and long-term capacity building for national staff and consultants on project management and monitoring (in particular contract management and supervision of works),

(iv) Sensitize communities on how to respond to emerging erosion hazards early enough to prevent gully formation,

(v) Support participatory watershed mapping and building the planning capacity at state level, including using critical tools such as GIS, high resolution, maps remote sensing, Digital Elevation Model (DEM) and related mapping equipment, and

(vi) Prepare and regularly update relevant sections of the Project Implementation Manual, which will include the *Good Practice Guidance Note* (GPGN) which expands on the technical engineering design parameters described in this annex.

72. ***Other cross cutting issues:*** particular attention will be given at various stages of the site intervention processing cycle to address such cross-cutting issues as: (i) climate change; (ii) gender; and (iii) other cultural considerations. To reduce climate risks, structural measures must take into account the projected increases in rainfall intensity. To address gender issues, community consultations and empowerment must demonstrably target women, building on community practice for gender roles and preferences.

73. ***Sustainability:*** Particular attention with be given to the following key issues to ensure sustainability of project deliverables: (i) ensuring community participation and ownership; (ii) defining clear responsibilities and commitments for operation and maintenance (O&M); (iii) rigorous M&E for site interventions; (iv) ensuring and encouraging replicability; (v) providing capacity building at all levels; and (vi) sharing knowledge and information.

74. ***Responsibilities for O&M of activities:*** Each site intervention will address essential O&M factors of sustainability by assigning clear roles and responsibilities to key stakeholders as described in each site's workplan and more broadly, in each States joint work program. These workplans and work programs include specific, costed actions for each MDA and other actors involved in project implementation. For example, this *could* include: (i) cleaning of drainage channels by communities, (ii) de-silting of drainage canals by LGAs; (iii) repair of concrete and masonry structures by the State Ministry of Environment); (iv) maintenance of on-farm

water/soil retention structures by beneficiary households; (vi) maintenance of water harvesting cisterns to beneficiary households. In addition, the Site Committee will gather feedback from communities to help ensure that work is being carried out as intended; the State PMU will verify implementation of all activities. Random spot checks to confirm good progress could also take place, supported by the state or even federal technical/steering committees or the FPMU.

E. SYNERGIES WITH OTHER PROJECTS AND PROGRAMS

75. There are a number of complementary investment operations on-going funded by the Bank, domestically or by international partners. Highlights include:

- Nigeria's Ecological Fund Office finances a range of environmental projects including erosion management works. NEWMAP interventions will coordinate with the Ecological Fund activities to avoid duplications. NEWMAP also has an important role to play in convening methods and expertise from around the world to establish replicable intervention models that can be scaled up by the Ecological Fund and other sources of financing.

- Climate Change Diagnostics: A major piece of analytical work on Climate Change Assessment undertaken by the World Bank in collaboration with the FGN is scheduled for completion in the spring of 2012. Preliminary results seem to suggest that climate change is likely to be a significant contributor to land degradation and other forms of economic and social vulnerability. The result of this important study is informing the design of the project. Some of the recommended activities of the CC study will be implemented by NEWMAP. For instance NEWMAP includes a dedicated component aimed at assisting the country to address the broader climate change agenda. Results of this studies such as the projected rainfall variation in the project area will informed the designs of the civil works intervention including the volume of suffice runoff to be expected from a given catchment area, the return period, the sizes of the drains, choice and strength of materials to ensure that they are climate proof enough for lasting results.

- Bank financed Federal Roads and Rural Assess Road projects provide excellent opportunity for cooperation and building synergies. Most of the devastating and spectacular gullies result from poorly designed and executed infrastructure especially roads. NEWMAP will complement these and other related projects by ensuring that road designs make adequate provision for the proper termination of drains. NEWMAP's capacity building support to environmental enforcement institutions such as the EA department NESREA will ensure the enforcement of regulatory compliance in this regard.

- The Bank-financed Fadama III, and associated SLM information and institutions project is supporting the uptake by communities of improved land management nationwide. IDA funds support community driven investment that helps retain soil protecting vegetation cover, while GEF grants cover information and institutional development on SLM. NEWMAP will add value to the existing effort to build up the land management knowledge base across sectors.

- NEWMAP will work in close coordination with NIWRMC, which is with JICA support currently preparing an integrated water resources master plan for Nigeria. For instance it has been agreed in principle that that JICA will support the development of hydromet systems in the north and south west of the country while NEWMAP will support hydromet system development in the south-south and/or southeast.

- The *WB-GEF Sahel and West Africa Program (SAWAP) in Support of the Great Green Wall* is channeling GEF and SCCF funds to NEWMAP implementation to secure global biodiversity and SLM benefits and enhance climate resilience. A regional project will provide a platform for NEWMAP team to engage in mutual learning with other project teams in the SAWAP portfolio. NEWMAP results will be aggregated at regional program level.
- The TerrAfrica program is financing NEWMAP preparation and provides a continent-wide platform for NEWMAP team to pursue mutual learning during implementation. During implementation, NEWMAP results will also be aggregated at continental level.

Annex 9: Integrated Watershed Management and Global Best Practices

NIGERIA: Nigeria Erosion and Watershed Management Project

Defining Watershed Management

1. For purposes of this discussion, watershed management (WSM) is defined as the integrated use/management of land, vegetation and water in a geographically discrete drainage area for the benefit of its residents, with the objective of protecting or conserving the hydrologic services which the watershed provides and of reducing or avoiding negative downstream or groundwater impacts (Smyle, Milne, and Quaddumi 2009).

2. Watershed management means putting in place systems that ensure land resources are preserved, conserved and exploited sustainably now and for future generations (FAO 2004). The watershed management approach integrates various aspects of forestry, agriculture, hydrology, ecology, soils, physical climatology and other sciences. But it is more than natural science methods and tools. Rather, watershed management is a continuous and participatory process that involves people and aims to improve their livelihoods. A watershed approach can be a coordinating framework for management that attempts to focus public and private, community and individual efforts toward addressing high priority land and water-related issues within the hydrologically-defined geographic area (for example, see Box 1). Watersheds are being considered as a unit of management for many natural resource related issues including land degradation, water conservation[43], non-point source pollution, etc. Watershed management is simultaneously a technical and social undertaking (see Box 2). From a technical perspective, it involves reducing soil erosion and rehabilitating severely eroded areas such as gullies, promoting vegetative cover, and harnessing rainwater resources. From a socioeconomic perspective, it involves coordinating the actions of numerous land users in a watershed who may have multiple, conflicting objectives. Prior to the 1990s, watershed management was treated largely as a technical problem with top-down engineering solutions, but lack of attention to socioeconomic complications undermined numerous projects because people refused to go along with technical plans that conflicted with their diverse interests. From the 1990s, more successful programs tended to adopt various participatory approaches.

Box 9.1. Watersheds & Groundwater Basins

A **watershed** is an area that supplies water by surface or sub-surface flow to a given drainage system or body of water. Size is not a factor in the definition. Watersheds vary from a few hectares (or less) to millions of square kilometers (e.g., Amazon River basin). Unless a watershed discharges directly into the ocean it is part of a larger watershed that does, and may be referred to as sub-watershed.

Whereas a watershed is defined by surface drainage, a **groundwater basin** or catchment is defined by the below ground area from which groundwater drains. Therefore a groundwater divide may not follow the watershed divide. The boundary between two adjacent groundwater basins, which is represented by a high point in the water table, is constituted by a geologic or hydrologic boundary.

[43] How water moves through a watershed is the product of the interactions between a number of factors, which include the watershed's underlying geology, climate and precipitation patterns, slope, soils, vegetative cover and land use. "Watershed hydrology", as a term, encompasses these interactions.

3. The largest watershed management unit is the **basin**, which drains to a major receiving water such as a large river, estuary or lake. Basin drainage areas typically exceed 10-20 thousand square kilometers and often include major portions of a single state or even a group of states. Within each basin are a group of **sub-basins** that extend over a few thousand square kilometers. Sub-basins are a mosaic of many diverse land uses, including forest, agriculture, range, and urban areas. Sub-basins are composed of a group of **watersheds**, which, in turn, are composed of a group of **sub-watersheds**. Within sub-watersheds are **micro-watersheds**, which are the smallest units in a watershed. A micro-watershed is often defined as the area that drains an individual development site to its first intersection with a stream (Centre for Environmental Protection 2006). The terms *watershed* and *catchment* are often interchangeable, depending on country usage.

Box 9.2. Are watersheds "a natural unit" for natural resource management and/or rural development?

The common wisdom says "yes" but experience says "not necessarily". While watersheds are one of the most basic units of natural organization in landscapes, they are not natural units of social organization. People and institutions have generally organized around other types of political, administrative, geographic and/or territorial/natural units (e.g., forest, grazing lands, agro-ecological zones). Organizing around watersheds, on the other hand, is most relevant when there are land/water or water-related externalities of sufficient concern that they are driving forces in the setting of objectives, decision-making and investment. Rather than trying to force a watershed framework, other alternatives and organizational schemes may be more sensible and cost effective.

4. Watershed management is complex, owing to the complexity of ecosystem dynamics and interactions (Figure 1). This includes hydrological, energy, nutrient cycles, complicated even further when human habitation, interventions and impacts are thrown into the mix.

General Approaches to Watershed Management

5. In practice, there are two basic approaches to WSM — targeted and mainstreamed. The former has very specific objectives and indicators related to water resources and hydrologic outcomes and the management interventions and the instruments applied are designed to address these. In the latter there are broader goals and objectives, such as sustainable land/natural resources management and restoration, poverty alleviation, and/or rural development. Here, WSM practice and concerns are integrated (mainstreamed) into planning and investment as a contribution to overall WSM and to conserving or restoring the integrity of the watershed system. Most development-oriented WSM programs and projects are of this latter type.

Box 9.3. Matching approach to objectives

Many WSM projects state a series of hydrologic objectives but subsequently fail to pursue these in any substantive fashion. A common example is projects with objectives of soil conservation and reduction of downstream sedimentation from agricultural watersheds. If sedimentation is an issue, it cannot simply be assumed that on-farm interventions will resolve the problem. Rather, it is first necessary to evaluate and identify the principal sources of sediments, and only then specify the interventions required to address these. Commonly the principal sources of sediments in a rural watershed will be the road systems, major active gullies, sediments stored in flood plains and riparian zones, and/or stream bank erosion. It is not common, however, to find these sources actually targeted by WSM projects with stated goals of downstream sediment reduction. Concern for sustainable land management and soil productivity are ample justifications for supporting on-farm soil and moisture conservation; a "watershed management project" is not required to address these. However, if off-farm and downstream impacts are real issues, the approach and instruments must be relevant to and support the stated WSM objectives.

6. Irrespective of the approach, a number of factors are (or should be) common to the two approaches. These include:

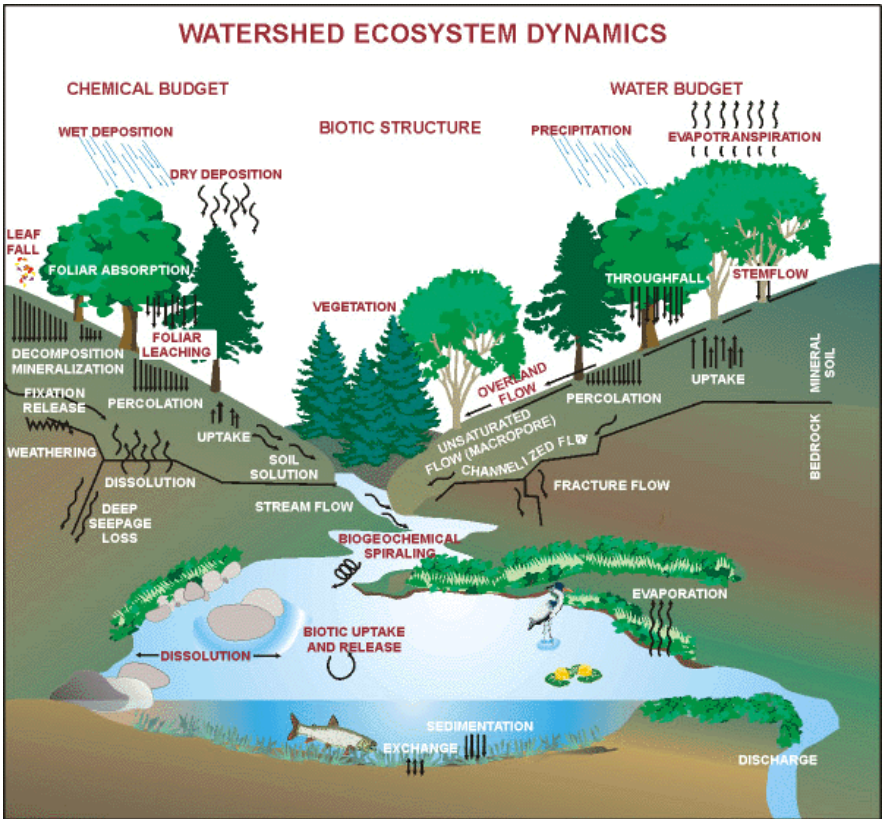
(i) Clarity of objectives as regards WSM issues and desired outcomes, *viz.* water resources and the interactions with land and vegetation;

(ii) Appropriate matching of management interventions and instruments to the defined hydrologic objectives. See Box 3.

(iii) Adaptation of approach and interventions to local conditions and needs; to the dynamics of natural resources use, climate and environment; and to the social, economic, and institutional imperative that are both context and drivers for the proposed interventions. Note that "local conditions" also include those that are relevant to the watershed's hydrology[i].

(iv) Stakeholder management. The management of water resources generally affects the personal and institutional interests of a multiplicity of stakeholders. Successful WSM requires strong attention to stakeholder management and communications in all phases (e.g., problem identification; planning, prioritization and goal setting; decision-making; implementation; and follow-up.

Figure 9.1. Watershed ecosystem dynamics



Source: Environment Protection Agency, 2010

Scales of Intervention

7. Physical scales. WSM programs have tended to adopt the sub- or micro-watershed as the basic unit and focus for implementation. This has proven to be a flexible, practical, and economical unit for project intervention. Within a sub- or micro-watershed all stakeholders can be readily identified and included in participatory processes to establish a consensus vision on problems, needs and priorities. Management at this level is not overly complex such that local capacity can be built to plan and manage the interventions and to administer funds for the

execution of the plans. Also, linkages between the stakeholders' income, livelihood and welfare and the water and land resources are more readily apparent, facilitating the identification of potential win-win management scenarios that can provide positive incentives and align local stakeholder's interests with the broader watershed protection and conservation goals. Finally, collective actions at the sub- and micro-watershed level can result in lower costs and better use of financial and human resources, especially for the management of common resources.

8. At the same time however, a micro-watershed approach done in isolation– i.e., carried out as a patchwork of individual micro-watershed interventions and lacking prioritization or planning within the context of the larger watershed – will be uncertain of achieving broader goals of protecting and conserving the hydrologic services of interest and/or of managing negative downstream or groundwater impacts. Working at the micro-watershed scale alone does not necessarily aggregate up to watershed management or capture upstream/ downstream interactions. An example of this will be to rehabilitate a major gully without also addressing the surrounding land use issues that are causing the gully problem.

9. Therefore, it is important to undertake a higher-level, larger scale assessment to understand basic hydrological services, land cover and use, upstream and downstream linkages, etc. This larger-scale assessment will also identify hotspots such as major gullies, where interventions must be made both in the gully and in surrounding areas. The higher level assessment can then guide more effective lower level micro-watershed planning, and implementation of specific soil and water conservation interventions.

10. Table 1 provides an illustration of how aggregation from the micro-watershed level to larger scales introduces changes in focus, management approach, instruments, and the key stakeholders who must be involved. Note that objectives may often change with scale.

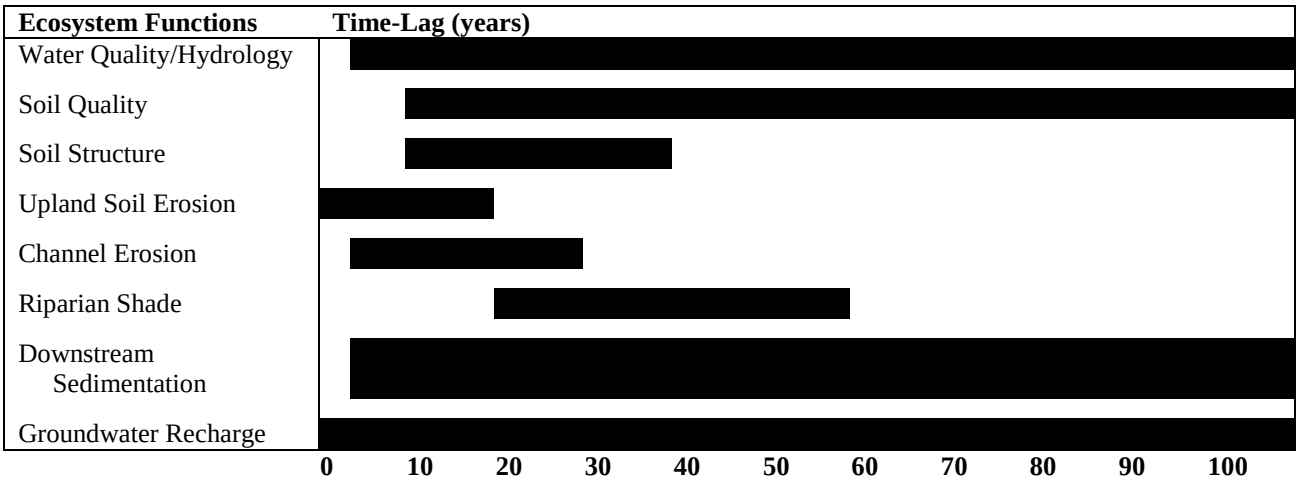
11. For example, at the micro-watershed scale the objective may be to improve livelihoods through intensifying and diversifying agricultural production in an environmentally sustainable manner whereas objectives at the watershed scale might be flood prevention, gully rehabilitation, protecting water quality for human consumption, and maintaining environmental flows. In this example, interventions at the micro-watershed scale may require orientation to ensure compatibility with broader watershed objectives. Note also that the relative ability to influence and manage some hydrologic factors will also vary scale. Best practices will thus include mechanisms for (i) planning in which stakeholders have a voice and are able to agree on measures that can achieve both local and larger scale objectives and (ii) inter-agency collaboration and local-regional-state level coordination.

12. Temporal Scales. In watershed management, there can be significant time lags between cause-and-effect for parameters of interest, with scale being one of the determining factors in the length of the time lag. The smaller the scale, the more immediate the impact. A common example of this is sediments derived from inappropriate practices or activities in the upper watershed. These may take decades or centuries to work their way through the watershed system. Since most WSM projects assume they can have short-to-medium term impact on overall watershed health, it is important to understand that a problem encountered today may be the result of a causal factor that no longer exists or that a solution implemented tomorrow may take years or decades to achieve its desired downstream objective (Table 2).

Table 9.1. An Idealized Scheme of Changes in WSM Approach and Focus with Scale

Watershed Management Unit	Indicative Size (km^2)	Influence of Rural Land Use on Watershed Hydrology	Primary Stakeholders	Typical Management Focus/Instruments
Micro-watershed	0.01 – 2.5	Very Strong	Property owners (local)	Participatory planning; BMPs; site design
Sub-watershed	2.5 – 25	Very Strong to Strong	Local government w/ principal local stakeholders	Stream classification; land use planning/zoning; land, water resources & stakeholder mgmt.
Watershed	25 – 250	Strong to Moderate	Local or multiple local governments w/principal local and regional stakeholders	Watershed-based zoning; land use & water resources planning; stakeholder mgmt; policy, norms, regulations & incentives
Sub-basin	250 - 2,500	Moderate to Weak	Local, regional or state w/principal regional stakeholders	Basin planning; stakeholder mgmt; policy, legal framework & incentives
Basin	2,500 - 25,000 +	Weak to Very Weak	State, multi-state, or federal w/principal regional & state stakeholders	Basin planning; stakeholder mgmt; policy, legal framework & incentives

Table 9.2. An Illustration of Time Lag for Ecosystem Response at Sub-Basin/Basin Scale



Global Best Practices in Watershed Management

Introduction

13. The 2008 World Bank report *Watershed Management Approaches, Policies and Operations: Lessons for Scaling-up* offers a body of learning on best-practices in watershed management approaches. The review of some 15 years of practices identified factors of success for achieving goals of upland soil and water conservation and of intensification of natural resource use to increase the incomes of upland populations in a sustainable way. Even though there were significant variations in practice and performance, and although adaptation and flexibility are hallmarks of all good projects, some principal factors of success were common. These are detailed below, and augmented with material from other sources[44], and will serve as the framework for benchmarking of the Nigeria Erosion and Watershed Management Project (NEWMAP) operation.

Technical Benchmarks

14. *Watershed management versus other approaches.* Watershed management approaches are often more complex and costly both for natural resources management (dealing with the myriad interactions of land, water, and people within a complex system), and in implementation (requiring elaborate decentralized and participatory approaches, complex financial and subsidy arrangements, and organizational setups involving many different agencies). Therefore there should be a clear rationale for pursuing this approach. The WSM approach is not a panacea that can or should be applied to every situation where natural resource management and/or rural poverty objectives or problems exist. Sometimes it will make more sense to follow approaches based on more socially, politically, administratively or ecologically meaningful land units or affiliations.

15. *Begin watershed planning with a larger scale assessment.* Water-related and downstream externalities are the central justification for applying a WSM approach, yet linking and orienting upstream activities to management objectives at the broader watershed level is a major challenge. Too commonly WSM projects fail to pay attention this factor, resulting in micro-watershed activities and institutions not contributing to improved conditions at the watershed-scale or even accounting for their impacts on water resources. If micro-watershed approaches are to be scaled up such that they affect significant areas of watersheds, then their planning and implementation will have to proceed within the broader context of watershed-level (or sub-basin/basin) assessment/planning processes. The larger-scale processes, among others, should:

(i) Identify water resources issues and the linkages between upstream water and land uses and practices and downstream conditions;

(ii) Use readily available models for basin or sub-basin level planning and analyses – then connect to micro-watershed delivery

(iii) Involve key stakeholders and deal with institutional challenges of interagency collaboration and local-regional level coordination;

(iv) Identify relevant socioeconomic and environmental characteristics, issues and parameters; and

[44] Many of these lessons are drawn from Dargouth et al (2009); Smyle and Lobo (2011); FAO/TerrAfrica 2009; Liniger et al (2011).

(v) Define broad criteria to target critical watersheds/sub-watersheds and the menu of potential interventions within these.

16. *Implement projects from the building block of the micro-watershed.* Watershed management programs undertaken at the micro-watershed level clearly allow the needs and concerns of all stakeholders to be taken into account and an integrated package of land, water, and infrastructure to be developed that is responsive to those needs.

17. *Target actions to both livelihoods and WSM/natural resource objectives*. Although difficult, it is feasible to target both improved livelihoods and conservation objectives. Best results are obtained where conservation techniques that are profitable for stakeholders can be developed, and a menu of interventions can be offered that combines income and conservation objectives. Since conservation will not always be in the interests of some or all stakeholders and local interests may conflict with downstream interests, approaches are required that include such elements as:

(i) Stakeholder analysis to identify potential winners and losers, and assess losses to be incurred by different community groups because of conservation practices.

(ii) Addressing equity concerns so that the distribution of costs and benefits do not disproportionately accrue to some groups of stakeholders;

(iii) A focus on generating positive income streams for affected, key stakeholders groups through intensification, diversification, downstream processing and marketing, and the creation of new income-generating activities;

(iv) Technical analysis of the potential for improving resource conservation within livelihood systems;

(v) Financial and economic analysis to establish the basis for project incentives, identify interventions, and to provide clarity on if and how subsidies and other incentives will create sustainable watershed management outcomes;

(vi) Participatory approaches to developing and adopting new technologies and, as required, local research and development to construct least-cost and maximum-benefit technical packages;

(vii) Where common pool resources exist, providing relevant stakeholders a secure stake in the benefits from improved management and, where restrictions to access or use are involved, provision of viable income alternatives; and

(viii) Promoting interventions that reduced risk, such as improving water sources.

18. *Monitoring and evaluation is critical.* Monitor the project to ensure that it is on track to achieve the desired livelihood and environmental objectives, and adapt plans as needed. Watershed management programs require effective monitoring and evaluation systems to track performance against objectives and provide information to help managers at all levels with implementation. Although measurement of externalities is difficult, they are fundamental to the justification of many watershed management programs, and projects should be careful to measure baseline data, define expected outcomes, and monitor results. Useful and affordable tools, such as remote sensing, are increasingly being made available for measurement of externalities. Modeling is also being used successfully, in particular to study dynamic phenomena at the basin, watershed, and even micro-watershed scales.

19. *Hydrological monitoring is critical.* Establishment of M&E systems for *on-site* achievement of economic, environmental, and institutional objectives is relatively straightforward and well-documented. There is less experience with M&E systems to track downstream outcomes and the challenge of measurement is much harder. Yet M&E of off-site outcomes is essential to both the justification and the management of watersheds. Advances in dynamic modeling at the basin level coupled with more affordable monitoring tools, such as remote sensing, provide the capability to define upstream-downstream relations, set and monitor targets, and value benefits. Where possible, the impacts of watershed management on basin hydrology need to be integrated into planning and monitoring. Again, modern tools, such as modeling and remote sensing, can help understand and study these critical phenomena. In large or complex hydrological systems, an integrated approach all along the watershed may be needed, with institutions for basin-wide management.

20. *M&E systems should be as simple and as low cost as possible.* They should provide information needed to track performance against targets. Stakeholders who have a "need to know" are people living in the project area who are affected by the project, managers who need information for implementation, and promoters (government and external financiers) interested in results. Systems should call on a mix of quantitative and qualitative techniques, and participatory M&E is an effective way to collect and analyze information and to get stakeholders more involved. Given the complexities and externalities, the process should ideally be long term within a permanent public agency.

21. *Other best practices to be considered in M&E include:*

(i) Timely collection of baseline data, i.e., before or at project/program startup;

(ii) Careful design of baseline data to capture outcomes and impacts relevant to stated WSM objectives;

(iii) Physical monitoring to capture outcomes and impacts, not just inputs and outputs;

(iv) Design of M&E system, indicators and institutional and implementation arrangements that ensure sustainability (e.g., is relevant to institutional needs, recurrent costs of operation and maintenance are affordable) and use as a management tool to support day-to-day management. This latter is especially important in the multi-level matrix management structures that characterize most watershed management projects.

(v) To the extent possible monitoring systems should rely on low-cost, easy-to-use, and effective techniques for collection of both: (i) quantitative data involving measurement of physical indicators and household surveys and (ii) qualitative data involving interviews and observations of stakeholders about perceived progress and challenges in project implementation. Hard science data assessments should be matched with feedback from stakeholders.

(vi) Remote sensing offers good opportunities for generating data at low cost. The use of maps is a good way to have an overview of project progress and to communicate with stakeholders. Participatory M&E is a very useful way to collect information about projects, analyze information, and get stakeholders more involved.

(vii) Gullies represent a situation where more than one indicator for measuring project performance may be required and can include: a) tracking the rate of change in the erosion of surrounding surface area; b) estimating on site soil loss directly

through sampling points; c) estimating the volumetric change in gully size and converting these estimates to overall soil loss over time; measuring suspended sediment loads in watercourses downstream of the gully.

(viii) There is considerable merit is having a third party organization support M&E efforts by the implementing agency, particularly where capacity may be weak, especially in the application of new technology such as remote sensing, GIS, etc.

Institutional Benchmarks

22. *At the national and state-levels*. Government commitment is an important ingredient for success as are supportive policies and legal frameworks. This is particularly true for (i) decentralized and participatory development; (ii) ensuring institutional and implementation arrangements that allow and encourage public agencies at all levels to work together; and (iii) securing access to natural resources in a manner that reflects local legislation and tenure practices and problems – to allow for planning and management. Projects may need to contribute to the development of more supportive policy frameworks.

23. *Effective interagency collaboration is critical to success.* Successful approaches allow for decentralized implementation and set up institutional arrangements for multidisciplinary and multiagency collaboration across ministries. Decentralization and multiagency collaboration do not work well when dominated by a single institution.

24. *Mainstream watershed management concerns and practices within relevant institutions.* The complexity and burden of achieving WSM objectives across the broad range of institutional actors who are concerned by or who affect watershed hydrology – e.g., power and transport sectors, agriculture, forestry, agribusiness, and local governments – can be reduced when these agencies internalize and develop their own sectoral approaches for avoiding and/or mitigating their impacts on water and land resources (e.g., within their EIA processes, development and specification of BMPs, monitoring indicators, etc.).

25. *Institutional and implementation arrangements.* These should be focused upon and supportive of local level implementation. It is preferable that responsibilities be placed upon permanent agencies, with clear arrangements for integration between local and higher level agencies, and for interagency collaboration. Simplicity and clarity on responsibilities are key factors in success. Integration within permanent agencies and structures increases the potential for sustainability and for scaling up of program actions. Watershed management programs should contribute, as needed, to frameworks for overall watershed planning and management.

26. *Institutional mechanisms* are necessary to integrate micro-watershed programs into higher-level objectives at the watershed, sub-basin and/or basin-levels, as well as to measure and monitor outcomes and impacts. WSM programs need to work toward an integrated institutional process with three complementary components:

(i) A process of watershed planning to engage on issues of water and land resource dynamics within the broader watershed of interest, identify critical hydrologic externalities to be addressed and/or services to be conserved and protected, and to establish higher-level objectives. The level and complexity of this planning process will vary, but new institutional arrangements and a broader range of planning tools may be required that will be adapted to the particular context. These tools may range from basic water balance and water accounting through environmental and social analysis to evaluate broader considerations and responses to basin-level hydrological and groundwater modeling to a comprehensive basin-wide Integrated Water Resources Management planning framework incorporating land and water resources together with other aspects of spatial planning. See Box 4. Irrespective of the level and complexity, appropriate stakeholder management approaches involving consultations and mechanisms for multi-sectoral, participatory diagnosis need to be integrated into the process.

(ii) A bottom-up institutional and investment process to set objectives and priorities, negotiate between stakeholders, and to develop and measure the impact of a set of interventions that can fulfill both upstream objectives (at the local community level and also between upstream communities) and broader downstream objectives.

(iii) Improved M&E methodologies, incorporating research, measurement, and monitoring to provide the scientific, economic and social knowledge for managing and evaluating watershed management programs and for, among others, assessing sustainability and pricing costs and benefits. New modeling and satellite imagery tools can be of great value in this.

Box 9.4. Integrated Water Resources Management

IWRM has been defined by the Technical Committee of the Global Water Partnership (GWP) as "*a process which promotes the coordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems*." IWRM is a comprehensive, participatory planning and implementation tool for managing and developing water resources in a way that balances social and economic needs, and ensures the protection of ecosystems for future generations. Water's many different uses − for agriculture, for healthy ecosystems, for people and livelihoods − are the subject of an open, flexible process that brings together decision-makers across the various sectors that impact water resources and all the relevant stakeholders to set policy and seek to make sound, balanced decisions in response to the specific water challenges faced.

The four principles on which IWRM is based are the 1992 Dublin Principles for Water:

1. Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment.
2. Water development and management should be based on a participatory approach, involving users, planners and policymakers at all levels.
3. Women play a central part in the provision, management and safe-guarding of water.
4. Water has an economic value in all its competing uses and should be recognized as an economic good as well as social good.

Source: Adapted from GWP Tool Box for IWRM (undated) and Integrated Water Resources Management, Wikipedia (undated).

27. *Participatory/decentralized approaches*. Although effective participation imposes demanding requirements, participatory approaches and the use of community watershed management plans have often been effective in empowering communities and in gaining ownership of watershed management programs. At the watershed level, develop and implement watershed management plans in partnership with government agencies and local stakeholders. However, since decentralization is an ongoing process in many countries, local-level participatory approaches for governance of resources, planning, management and technical functions should reinforce− rather than conflict with − the broader processes to de centralize responsibilities for local development.

28. *Implementing participatory approaches*. This requires appropriate sequencing, inclusion of all stakeholders in the process, political commitment, public agencies that understand the rationale and process of participation, and sustained capacity building at all levels for both stakeholders and public agencies.

29. *Decentralized service delivery*. Approaches and structures that effectively partner local communities are generally more successful. The interface between the decentralized delivery structure for watershed management, local government, technical agencies and community organizations needs to be carefully defined and managed, and capacity building may be needed for all stakeholders. Further, since partnership approaches require time to evolve. The gestation period can be lengthy, particularly for joint management of common resources.

30. *Demand-driven research and dissemination*. Successful programs are characterized by relative simplicity and demand-driven, by participatory research and learning, and by careful up-front organization and incentives to ensure institutional cooperation.

31. *Common pool resource issues*. Frameworks are required for assessing and dealing with the policy, institutional, and programmatic aspects of land tenure and common pool resources. Although land tenure and common pool resources have long been identified as critical in developing a sustainable incentive and institutional framework for watershed management, generally too little systematic attention has been paid to handling these issues at the policy, institutional, and program levels.

Social Benchmarks

32. *Poverty reduction*. Poverty reduction is not the objective of watershed management *per se*. However, where poverty is an issue, it must be recognized that WSM projects are by nature asset-based interventions that will tend to direct their efforts to enhancing the value and productivity of land and water to which the better-off segments have more access or ownership. Further, the poor may actually be losers under WSM approaches that, for conservation purposes, restrict access to common resources upon which the poor disproportionately depend for their livelihoods. It cannot be simply assumed that employing participatory approaches will solve this issue; there is little evidence that communal decision-making mechanisms are inherently pro-poor and, indeed, the opposite may be true. The challenge is to develop mechanisms that can reach three potentially conflicting objectives: (i) to target the needs of the poor; (ii) to adopt a participatory approach inclusive of all stakeholders; and (iii) to reach watershed management objectives. Among others, it is important to know who the poor are, how are they affected by proposed WSM interventions, incorporate actions and mechanisms to include the poor in project benefits and governance; and include the means to encourage communities to adopt pro-poor approaches. Finally, stakeholder management approaches should ensure that the concerns of the

poor as regards water resources are brought out in the planning processes. In the implementation these should receive the same attention as the concerns of other stakeholders. Commonly the non-land resource concerns of the poor will be more focused on issues of access to potable water and water for domestic use and livestock as well as issues of health (water-borne diseases) and sanitation. Avoiding a too narrow focus on land and land management in WSM will be another means of enhancing pro-poor aspects.

33. *Stakeholder management*. Targeting only the poor is generally neither possible nor desirable as effective WSM has to be inclusive of all stakeholders in the watershed. In best-practice examples, the role of stakeholders is analyzed within a watershed and institutional mechanisms and the stakeholder communication process are designed to include all relevant actors. When management issues arise in the larger watershed, approaches may be required to strengthen the voice of more vulnerable or marginalized stakeholders or communities so that they − and the poor within them − do not bear inequitably bear costs of providing environmental services to downstream stakeholders and communities. As strictly necessary, watershed or higher-level committees (e.g., basin-level) that both empower stakeholders through participatory processes and provide spaces for negotiation, consensus-building and transparency in decision-making are one possible approach.

34. *Participation.* Project management has to foster participation, and benefits must be apparent to the local people. This is not straightforward. Participation is not a neutral concept as it involves shifts in decision-making power between the state and local communities, and also between different segments of the local community. Participatory processes need equitable rules and the rules have to be designed for the specific development and distributional outcomes desired.

35. *Participatory processes***.** These tend to be more successful where: (i) common purposes can interest all or most of the population; (ii) the processes and organization are flexible and enough time and resources are provided for capacity building and genuine empowerment, and (iii) where there were income and livelihoods incentives. Conversely, processes that do not take account of local social dynamics or do not genuinely empower local communities are unsuccessful.

36. *Flexibility***.** Although projects will have targets for inputs, outputs, and outcomes; these targets have to be flexibly interpreted, since the community has the ultimate decision over the choice of investment. Often the lag between planning and implementation and the learning that comes with experience will result in the need to adjust targets. Appropriate mechanisms to allow for such flexibility in the implementation are necessary.

Economic Benchmarks

37. *Financial and economic analysis.* Profitability is fundamental to engaging stakeholders in conservation, however, many watershed management interventions may not in themselves be profitable. Financial and economic analysis is thus an important tool for designing watershed management investment programs. While it is true that establishing accurate estimates of financial costs and benefits at the farm level may be difficult, simple step-by-step methodologies are available for farm-level analysis. For other impacts beyond the farm-level, quantification and valuation should be pursued to allow for the types of economic analysis that is valuable for choosing between different policy options and to test assumption and validate if technical choices are profitable and/or of economic value to society.

38. *Externalities.* Accounting for externalities is needed to demonstrate the potential costs and benefits of watershed management interventions, which is important to their economic justification. As one of the main attributes of watershed management is the potential to improve the management of externalities resulting from land and water interactions, the relationships between upstream investments (costs) and expected downstream impacts (benefits) should be clarified and analyzed. Valuation of externalities is also important for defining incentive structures for watershed management and providing a clear rationale any proposed incentive structures. Over time, monitoring will be critical to (i) ensure that upstream intervention are not resulting in unintended downstream costs; (ii) provide insight into the downstream benefits and/or costs, such that economic analysis may value environmental benefits; and (iii) to test if the incentives used to internalize externalities − most commonly investment subsidies − are effective and if they should or can be sustained after the investment period ends. Alternative compensation approaches such as "payment for environmental services" (PES) may become incrementally possible for sustaining incentive structures to the extent that monitoring and valuation demonstrate the linkages, desirability and feasibility.

39. *Incentives for sustainability.* Sustainable watershed management requires an incentive structure that continues beyond the project period and that is supported by economic instruments that assign costs and benefits according to public and private goods. The design of the incentive structure requires analysis of both local level incentives (what technologies, for example, could both achieve resource conservation objectives and justify stakeholder investment and effort) and the public good characteristic of conservation activities. Incentive structures must incorporate concerns for both equity and sustainability and be built upon a quantified assessment of externalities. Experimentation with innovative instruments, such as payment for environmental services (PES) is desirable. Research will generally be required to understand the relationship between land use and the generation of environmental services, to develop simple technical and economic tools for measuring costs and benefits and their distribution, and to define options for low-cost and practical institutional frameworks for PES.

Operational Best Practices

40. **Increasing land productivity and ecosystem services** through expansion, intensification and diversification is based on: Increasing water productivity (water use efficiency); enhancing soil organic matter and soil fertility (carbon and nutrient cycling); improving plant material (species and varieties), and; producing more favorable micro-climates.

41. **Best practices for improving management of rainwater** include:

- Divert / drain runoff & run-on. Where there is excess water in humid environments, or at the height of the wet seasons in sub-humid conditions, the soil and ground water can become saturated, or the soil's infiltration capacity can be exceeded. Thus safe discharge of surplus water is necessary. This helps avoid leaching of nutrients, soil erosion, or landslides. It can be achieved through the use of graded terraces, cut-off drains and diversion ditches etc.

- Impede runoff (slow down runoff). Uncontrolled runoff causes erosion - and represents a net loss of moisture to plants where rainfall limits. The strategy here is to slow runoff, allowing more time for the water to infiltrate into the soil and reducing the damaging impact of runoff through soil erosion. It is applicable to all climates. This can be accomplished through the use of vegetative strips, earth and stone bunds, terraces etc.

- Retain runoff (avoid runoff). In situations where rainfall limits plant growth, the strategy is to avoid any movement of water on the land in order to encourage rainfall infiltration. Thus water storage is improved within the rooting depth of plants, and groundwater tables are recharged. This is crucial in sub-humid to semi-arid areas. The technologies involved are cross-slope barriers, mulching, vegetative cover, minimum / no tillage etc.

- Trap runoff (harvest runoff). Harvesting runoff water is appropriate where rainfall is insufficient and runoff needs to be concentrated to improve plant performance. Planting pits, half moons etc. can be used. This can also be applied in environments with excess water during wet seasons, followed by water shortage: dams and ponds can further be used for irrigation, flood control or even hydropower generation.

- Reduce soil evaporation loss. Water loss from the soil surface can be reduced through soil cover by mulch and vegetation, windbreaks, shade etc. This is mainly appropriate in drier conditions where evaporation losses can be more than half of the rainfall.

42. **Best practices for irrigated agriculture** include the following:

- Increased water use efficiency: in conveying and distributing irrigation water as well as applying it in the field. Conveyance and distribution can be improved through well maintained, lined canals and piping systems – and above all avoiding leakages. In the field, reducing evaporation losses can be achieved by using low pressure sprinkler irrigation during the night or early morning, and avoiding irrigation when windy. Additionally, deep seepage of water beyond rooting depth needs to be avoided.

- Spread of limited irrigation water over a larger area, thereby not fully satisfying the crop water requirements i.e. deficit irrigation. It allows achieving considerably higher total crop yields and water use efficiency compared to using water for full irrigation on a smaller area.

- Supplementary irrigation by complementing rain during periods of water deficits, at water-stress sensitivity stages in plant growth. Supplementary irrigation is a key strategy, still underused, for unlocking rainfed yield potential and water productivity / water use efficiency.

- Water harvesting and improved water storage for irrigation during times of surplus and using the water for (supplementary) irrigation during times of water stress. Small dams and other storage facilities, which are combined with community level water management, need to be explored as alternatives to large-scale irrigation projects.

- Integrated irrigation management is a wider concept going beyond technical aspects and including all dimensions of sustainability. It embraces coordinated water management, maximized economic and social welfare, assured equitable access to water and water services, without compromising the sustainability of ecosystems.

43. **Enhancing and improving soil fertility** through sustainable land management (SLM): SLM practices should maintain or improve a balanced soil organic material-nutrient cycle, meaning that net losses should be eliminated and organic matter and / or nutrients added to stabilize or improve the soil fertility. Replenishment and reduced loss of soil nutrients can be achieved through the following options:

- Improved fallow-systems: The deliberate planting of fast-growing species - usually leguminous - into a fallow for rapid replenishment of soil fertility. These can range from forest to bush, savannas, grass and legume fallows. There are numerous cases

showing the importance of nutrient fixing plants planted either in sequence, intercropped or in rotation.

- Residue management: A practice that ideally leaves 30 percent or more of the soil surface covered with crop residues after harvest. It requires residue from the previous crop as the main resource (thus burning is discouraged) – it also helps reducing erosion, improving water infiltration and therefore moisture conservation. There are positive impacts also on soil structure and surface water quality.

- Application of improved compost and manure: Compost (mainly from plant residues) and manure (from domestic livestock) help to close the nutrient cycle by ensuring that these do not become losses to the system. By building up soil organic material, they help maintain soil structure and health, as well as fertility. Furthermore they are within the reach of the poorest farmers.

- Tapping nutrients: This takes place through the roots of trees and other perennial plants when mixed with annual crops (e.g. in agro-forestry systems). Trees act as nutrient pumps: that is they take up nutrients from the deep subsoil below the rooting depth of annual crops and return them to the topsoil in the form of mulch and litter. This enhances the availability of nutrients for annual crops.

- Application of inorganic fertilizer: Without a combination of organic matter application and inorganic fertilizer, soil fertility is unlikely to meet production demands: thus the concept of 'Integrated Soil Fertility Management' should be supported. It is possible to substantially increase millet and sorghum yields and profitability by using micro-doses of inorganic fertilizer in combination with techniques that conserve and concentrate soil moisture and organic matter.

- Minimum soil disturbance: Tillage systems with minimum soil disturbance such as reduced or zero tillage systems leave more biological surface residues, provide environments for enhanced soil biotic activity, and maintain more intact and interconnected pores and better soil aggregates, which are able to withstand raindrop impact (and thus reduce splash erosion). Water can infiltrate more readily and rapidly into the soil with reduced tillage, and this also helps protect the soil from erosion. In addition, organic matter decomposes less rapidly under these systems. Carbon dioxide emissions are thus reduced. No tillage has proven especially useful for maintaining and increasing soil organic matter.

44. **Sequestering carbon** above and below ground can be achieved through:

- Afforestation, reforestation and improved forest management practices;

- Agro-forestry and silvopastoral systems, integrated crop-livestock systems which combine crops, grazing lands and trees;

- Improved management of pastures and grazing practices on natural grasslands, including optimizing stock numbers and utilizing rotational grazing to maintain ground cover and plant biodiversity;

- Improved tillage practices – such as conservation agriculture – to increase soil organic carbon (SOC) content through permanent soil cover with crops and mulch, minimum soil disturbance, fallows, green manures, and crop rotations; and

- Micro-dosing with fertilizer to increase biomass production, yields and soil organic carbon.

45. **Large gullies** can become serious environmental problems, causing road damage, sedimentation of streams, and other hazards to built and natural assets and people dependent on them. In many projects (including NEWMAP), gullies need to be given major attention. Some key points include:

- *Understand the cause of major gullies*[45]. For rehabilitating major gullies, the first step is to identify the problem causing the gully formation. A gully is typically a symptom of some other problem, such as a poorly placed culvert or some other factor that has concentrated and increased water flow over the land. In some cases a stream will downcut, initially creating a gully, in response to the downcutting of the stream it feeds. If the source of the problem cannot be addressed, then the technical restoration of the gully is likely to be a temporary fix. Understanding the causal factors also means taking into account the size of the surrounding watershed, soil conditions, where the major erosion is taking place (gully head, floor or walls), and the potential for diverting water safely around the gully to permit more effective and lower cost restoration.

- *Prevention is cheaper than the cure*. As with much of land degradation, preventing new gullies from forming is usually more cost-effective than repairing new gullies. This guideline does not however, reduce the need to rehabilitate major gullies that are causing serious downstream erosion during rainy periods, loss of surface land for multiple uses, and pose serious safety risks.

- *Top-down Gully Repair*. 'Top-down' gullies are typically associated with roads. On many roads, the runoff is concentrated into an inboard ditch and is transported under the road through a culvert, which discharges the water onto the land below. Installing these culverts without regard to the natural topography directs a large amount of water where it never flowed before. The result is a gully that will eventually affect the stability of the road and downstream land erosion. Fixing the culvert and water drainage is essential before dealing with the land erosion below the road.

- *Bottom-up Gully Repair*. This is where a stream channel may be changing direction. This is a natural process so there may not be merit in putting money and time into trying to stop it. What is more critical is to stabilize the newly formed and most likely steep stream banks that result from the downcutting. Best practices for stream bank stabilization can include live staking, pole planting, willow wattles, coir rolls, brush mattress, brush layering, geotextiles, and many others.

- *Treating the gully itself*. Once the source of the runoff that caused the gully is identified and treated, the task of repairing the gully remains. If the gully formed in a previously existing stream channel or swale (i.e. someplace water naturally flows), the priority is to stabilize the headcut and the banks of the gully. If the gully formed where water wouldn't naturally flow and water flows have redirected the runoff discharging into the gully to a more appropriate location, the best practice repair would be to fill in and restore the natural landform. The ground work should be followed by seeding native perennial grasses, legumes, and wildflowers and covering the disturbed soil with straw mulch. If the landform is not completely restored and a swale exists where the gully was, runoff may collect in the swale and eventually cut a new gully.

[45] These points are drawn largely from Howard and Robins (2002), and State of Queensland (2006)

- *When filling in the gully is not feasible*. In these cases, stabilizing the headcut and the banks of the gully is the best solution. In situations where the gully is dry most of the year, the banks should be pulled back to at least a 2:1 slope, smoothed, seeded with native perennial grasses, legumes, and wildflowers and covered with straw mulch. If adequate soil moisture exists in the gully throughout the year, vegetation can be installed across the channel at regular intervals along the length of the gully. This will help capture sediment as it is transported down the gully and slowly build up the elevation of the bottom of the gully.

Design Benchmarks

- *Resist the 'flavor of the day' in project design*. Some trends in project design can lead to implementation problems when applied in inappropriate circumstances, such as avoidance of PMUs in countries with particularly low implementation capacity in the public sector. Similarly, projects requiring coordination of activities across multiple sectors is unlikely to work when the coordinating agency and the sectoral agencies have low capacity, little history of cooperation, and potentially conflicting interests. *Considerable convening authority is required*, in addition to project funding, to bring the agencies together into cooperation.

- *Avoid omnibus projects.* Avoid the 'Christmas tree' projects attempting to tackle all important issues at once through many components and complex design. (Note: NEAP-based projects have tended to be of this kind). Don't assume that non-performing components can easily be dropped during implementation. Prioritize and focus on a limited number of clearly defined issues -- to the extent possible when undertaking integrated watershed approaches across sectors and geographic boundaries.

- *Assess institutional capacity.* In projects with a significant institutional development aspect, base the project design on a realistic assessment of the Borrower's existing and potential future institutional capacity. Remember that both the Bank and the Borrower typically overestimate Borrower's current and potential capacity.

- *Respond effectively to risks identified at entry.* Ensure that risks identified at entry are tracked and mitigated on an ongoing basis, and that responses are commensurate – in timing and magnitude – to the seriousness of the risks.

- "*Upstream" in-depth implementation review*. Carry out a detailed implementation review early (before mid-term) to allow ample time for identifying and addressing potential problems, and ensuring that measures mitigating against risks identified at entry are adequate. In longer-term projects (such as NEWMAP's 8-year horizon) that may have two MTRs, the first MTR could perform that function.

- *Focus on building applied capacity.* Clarify the objectives of any capacity-building activities in terms of enhanced ability to perform in specific areas, rather than simply gaining knowledge. Base indicators of capacity building on application of new skills (output/outcome) rather than training or equipment/facilities provided (inputs). Stress practical hands-on experience and targeted skills-building over general academic training. Stretch capacity-building budgets by emphasizing in-country and on-the-job training over external courses.

- *Consider risk of failed donor coordination*. Effective coordination of support from different donors may fail because it is beyond the capacity of the Borrower or, sometimes, against the interests of particular agencies or individuals. While donor

coordination is the Borrower's responsibility, donors should also take care to promote complementarity and consistency of their support, avoid overwhelming government agencies, and avoid creating opportunities and incentives for "double-dipping" (two or more donors funding the same activity) or other inefficient use of resources.

References

Center for Environmental Protection 2006. *Basic concepts in watershed planning*. CEP, Ellicott City, Maryland.

Darghouth, S., Ward, C., Gambarelli, G., Styger, E., and Julienne Roux, 2008. *Watershed Management Approaches, Policies and Operations: Lessons for Scaling-up*, Water Sector Board Discussion Paper Series 11, World Bank, Washington, DC.

United States Environment Protection Agency 2010. *Watershed Management Field Notes.* Washington DC.

FAO 2004. *Factsheet – Participatory Watershed Management*. FAO, Rome.

Liniger, H.P., R. Mekdaschi Studer, C. Hauert and M. Gurtner. 2011. *Sustainable Land Management in Practice – Guidelines and Best Practices for Sub-Saharan Africa*. A TerrAfrica publication by World Overview of Conservation Approaches and Technologies (WOCAT) and FAO.

FAO and TerrAfrica 2009. *Using Sustainable Land Management Practices to Adapt to and Mitigate Climate Change in Sub-Saharan Africa.*

Howard, V., and P. Robins 2002. *Capay Valley Conservation and Restoration Manual – a Handbook for Landowners. Yolo County Resource Conservation District*, Woodland, California.

Smyle, J., and C. Lobo 2011. *Watershed development in India – an evolving approach*. Internal discussion paper, Agriculture and Rural Development Department, South Asia. World Bank, Washington D.C.

Smyle, J., Milne, G., and Halla Qaddumi 2009. *Rural Watershed Management - The Power of Integration*. Water P-Notes, Issue 28, 2009. World Bank.

State of Queensland 2006. *Gully Erosion.* Land series fact sheet number L81. Department of Natural Resources, Queensland, Australia.

Annex 10: Project Governance Measures

NIGERIA: Nigeria Erosion and Watershed Management Project

A. General Governance Issues

1. After twelve years of uninterrupted civil democracy, governance in Nigeria remains a challenge. Coming from a history of military authoritarianism for a greater part of its post-independence years, the transition from a culture of weak accountability and widespread corruption particularly in the public sector, though progressing, remains however slow. To illustrate, the country has lately been losing grounds on the Corruption Perception Index of Transparency International. From a ranking of 121 out of 180 countries in 2008, the country slipped to 130, 134, and 143 in 2009, 2010 and 2011 respectively. Similarly, the 2010 Mo Ibrahim Index which measures African countries on a number of governance indicators also ranked Nigeria 37 out of 53 countries. In the area of budget transparency, the Open Budget survey (2010) suggests Nigeria is one of the 25 countries that provide very scant information on the budget and other financial information with a rank of 18 out 94.

B. Recent Efforts by Government to Improve Governance

2. Long years of military rule had its toll on governance and development in the country, characterized by flagrant abuse of office, weak accountability and probity and widespread corruption. Since the return to democracy in 1999, Nigeria has made efforts to improve governance in general. This is being done principally in a two-pronged manner: (i) through legislative and policy reforms at the national and state levels, and (ii) the strengthening of public institutions with the mandate and potential to enhance governance and service delivery.

3. *Legislative and Policy Reforms*: Achievements in public financial management reforms include the enactment of public procurement and fiscal responsibility legislation in 2007, as well as the introduction of medium-term and policy-based expenditure frameworks at the federal level. The passage of the procurement law was followed by the establishment of the Bureau of Public Procurement, the development of procurement tools and the establishment of a professional procurement cadre in the public service. Since September 2010, the Nigeria Accounting Standards Board has mandated the adoption of the International Financial Reporting Standards (IFRS) for publicly listed entities with effect from January 1, 2012, while all other public interest entities and SMEs are to use same standards for their accounts for the financial years ending December 31, 2013 and 2014 respectively. In 2011 the Freedom of Information Act was enacted in the country giving greater access to documentation on government transactions, including financial records, for public scrutiny. Though some of these reforms are not automatically applicable to sub-national levels of government as a result of Nigeria's federal structure, several states are, on their own, putting in place similar frameworks to give effect to these reforms. Furthermore, governments at both the federal and state levels now ensure that all resources expended in any given year are reflected in the budget to avoid double-dipping and allow for public scrutiny.

4. In addition to the these measures, both the federal and some state governments in Nigeria, with support from the Bank and other donors, are now making significant progress in strengthening external audit functions in the public service. This is being done through the process of revising the obsolete audit legislation currently applied by the different tiers of government as well as supporting the efforts at building adequate and sustainable capacity for

the thorough performance of this function. It is intended that audits will now go beyond the statutory and routine financial audits hitherto carried out by the Auditors-General on MDAs at the different tiers but will now include "value for money" audits.

5. *Institutional Strengthening*: Among the early measures adopted by the post-military federal Government of Nigeria to tackle corruption were the establishment of the Independent Corrupt Practices and other Related Offences Commission (ICPC) and the Economic and Financial Crimes Commission (EFCC). These two Commissions were given extensive powers to fight official corruption as well as money laundering and all forms of economic crime. Lately too, the Government has strengthened the operations of the Code of Conduct Bureau and the Code of Conduct Tribunal, with the former adopting a more proactive approach to assets declaration and verification, particularly for politically exposed persons.

6. In order to improve service delivery to Nigerians, a Service Compact with all Nigerians (SERVICOM) was launched in 2004 by the federal government of Nigeria. While this initiative is yet to become formally operational in most States of Nigeria, the governments at the different level continue to strive, though at different paces, to improve service delivery to their citizens.

C. World Bank Efforts to Improve Governance

7. The first Country Partnership Strategy (2005) of the World Bank and the UK DFID had governance as one of its three pillars. The second Country Partnership Strategy (2010) of the World Bank, AfDB, UK DFID and USAID elevated governance to be, both a core theme and a cross-cutting theme, based on the acknowledgement that improved governance is fundamental to achieving results in the other two areas i.e. Human Development and Non-Oil Growth. Consequently, two key tools were adopted by the partners to help achieve better governance i.e. (i) ensuring transparency and accountability in the use of public resources and (ii) mainstreaming the participation of communities in decision making and oversight of public resources. The Bank has over time advanced this agenda by investing significant funds in promoting reforms in the public financial management sectors at both federal and state levels of government. Lately too, the Bank has encouraged the involvement of Civil Society Organizations (CSOs) and Community Based Organizations (CBOs) in monitoring of budget expenditures and service delivery at the federal and state levels.

8. In light of the forgoing, the Bank has in collaboration with other donors, committed significant resources to support the Government of Nigeria to improve governance. Some of the Bank's interventions include (i) the Economic Reform and Governance Project which is providing the equivalent of about US$140M for governance reforms at the federal level, while the State Governance and Capacity-Building Project is providing the equivalent of about US$18.1M at the state level; (ii) The Lagos Metropolitan Development and Governance Project, also currently underway, is providing about US$5.97M for governance reforms in Lagos State; (iii) A Public Sector Governance and Reform Development Project in the amount of US$80M has been approved, and (iv) By end of June 2011, 17 states had completed one or more of PER, PEFA or PEMFAR leading to reform action plans have also been conducted in about ten states which several more already scheduled; (iv) The State Employment and Expenditure for Results Project, with a component (US$200M) on governance has also been approved. These projects/funds are deployed to help strengthen governance institutions and build the capacity of the public officers who run them.

9. In the implementation of World Bank-assisted projects, a system of fiduciary controls of procurement, financial management, and disbursement procedures are in place, overseen by Bank staff who are members of the task teams. Based on a risk assessment of the project and its implementing agencies, larger contracts are subject to prior review by the Bank at key stages of the processes, while smaller expenditures are subject to post-review on a sample basis, to confirm that procurement and financial management procedures adopted by the implementing agencies are consistent with Bank policies. Where government implementation capacity is limited, the projects are allowed to engage consultants who provide support services as well as on-the-job capacity-building.

10. In the area of financial management, projects are obligated to submit periodic Interim Financial Reports to the Bank for review, while Bank staff carry out periodic Financial Management missions to carry out financial reviews of project financial management.

11. Implementation support missions are periodically made to the projects and Activity Implementing Agencies, where reviews are conducted on physical achievements, funds utilization, and development impacts of project expenditures. Audit reports are also made periodically and exceptions are examined by Bank FM staff. Where anomalies are noted, the implementing agencies are requested to follow up and report on remedial actions.

D. Project Governance Issues for NEWMAP

12. In the course of the preparation of this project, a political economy study was undertaken to give an insight into the possible issues and challenges that could constrain implementation and the achievement of the development objectives. Some of the findings of the study include the fact that in the sectors where this project will be implemented, the perception of lack of accountability is pervasive. Over time huge budgetary allocations have been made from year to year for tackling erosion and other environmental problems in most of the affected states. Similarly, substantial grants have been drawn by states from the ecological fund centrally created at the federal level for the management of environmental problems. In spite of these huge budgets and drawings erosion and other watershed management problems continue to ravage in disastrous proportions, with significant losses of lives and properties.

13. Another major finding from the political economy analysis is the multiplicity of agencies involved in watershed management and erosion. At the federal level, some of these agencies include the Federal Ministry of Environment, the Federal Ministry of Water Resources, the Federal Ministry of Agriculture and Rural Development, 3 River Basin Development Authorities, Nigeria Integrated Water Resources Management Commission, National Hydrological Services Agency, National Environmental Standards and Regulation Agency, and the national Emergency Management Agency. Most of these agencies are also replicated at the State level. This state of affairs has on one hand resulted in lack of clarity as to who has responsibility or should take the lead for certain responsibilities. On another hand, where responsibilities have even been given, there are several instances of overlapping responsibilities and functions, thus creating room for weak accountability for public funds allocated to some of these agencies for projects.

14. While the reforms generally being introduced in Nigeria in recent years to curb corruption are gradually taking hold in various sectors, the performance of the various tiers and agencies of government in tackling erosion and watershed challenges continue to be disappointing in spite of the huge resources that have been allocated to it and are released for the control of same.

Preliminary analytical work undertaken by the Bank alludes to the fact that beyond design flaws, serious governance gaps in the sector are also responsible for its persistent underperformance. Hence, in the design of this project measures will be introduced to help address these governance challenges that could arise in the course of implementation. A host of stakeholders will be responsible for promoting transparency, achievement of effective standards in project implementation.

15. The NEWMAP Governance and Accountability Action Plan aims at institutionalizing systems for promoting and ensuring transparency and accountability in the erosion and watershed management sector. In the area of financial scrutiny, the project will have a dedicated Project Management Unit (PMU) with its own complement of financial management staff. The PMU will be answerable to higher level Steering Committee at the federal and state levels. Project expenditure will be subject to two distinct audits: (i) the routine audit of the project, as stipulated in the Financing Agreement, and (ii) the annual statutory audit usually conducted by the Offices of the Auditors-General of the Federation and participating states on the annual accounts of the Government for the year, bearing in mind that the grant/project funds will reflect in the budgeted expenditure of the Government for the financial year.

16. To mitigate the likelihood of corruption in the implementation of the project, the Bank's fiduciary controls and systems outlined in paragraphs 8 - 10 above will be applicable. In addition to the Banks general fiduciary (Procurement and Financial Management) guidelines, this project will introduce a few additional governance and accountability measures which are listed here in the governance and accountability action plan. To further ensure transparency in project procurement, the projects will be required to publish all their procurements at key stages of the process and, finally, when a contractor is selected for any works, goods or services. The process will include the publication/notification by the PIU to all beneficiary-communities, through the registered community associations, the final procurement details, including the contractors' names, contract amount and expected deliverables. This will ensure that information is available to real beneficiaries and non-state actors for external oversight, as well as to participants in the procurement process, to ensure a level playing ground in all procurement dealings and provides an opportunity for aggrieved persons to seek redress.

17. A key finding from the PE analysis which is very useful for mainstreaming governance in this operation is the cooption or integration of Town/Community Associations (T/CAs) into the implementation monitoring arrangements. Thus, in line with the current CPS II (2010-2013) and the Africa Regional Strategy of the Bank (2011), the Bank will encourage the participation of external stakeholders, including CSOs, CBOs and Faith Based Organizations (which are legally registered, properly organized and particularly influential in the south-eastern region of Nigeria) in the monitoring of the implementation of this project. Though there are no known traditional Civil Society Organizations (CSOs) operating in the erosion and watershed management sector in Nigeria, other CSOs ordinarily interested in promoting good governance and accountability as well as other external actors will be encouraged to engage in this sector. These organizations will be allowed to independently monitor project implementation and provide feedback to Government, as well as be provided the opportunity to give feedback on supervisions reports produced during implementation.

18. The media plays a key role in informing the public and exposing governance and accountability challenges. The project will build on the role of the media for enthroning accountability in the project and this will be done by leveraging on the existence of a large community of actors/institutions in the electronic media, particularly the community radio

stations which operate in the target/beneficiary states to disseminate critical information on project implementation on a timely basis. The communication strategy (see Annex 12) developed for this provides more details on the specific channels and modalities for the utilization of this medium in strengthening accountability in the project.

19. Considering the depth of ICT penetration in the country today, these external stakeholders will be able to leverage on same to provide information on progress and quality of infrastructure and social services delivered. The project implementation units will be required to provide platforms for the use of ICT and the social media, such as face-book, for information sharing and implementation monitoring. With the availability of project information, stakeholders and beneficiaries will be encouraged to act as whistleblowers against breaches of due process and project fiduciary arrangements.

Table 10.1. Governance and Accountability Action Plan

Key Issue	**Proposed Action**	**Indicators of Performance**	**Responsibility**
Financial Management	• Interim Financial Reports to be published on Project website • Audits carried out as stipulated in the Financing Agreement	• Quarterly IFRs submitted to the Bank • Report ready within 6 months of year end	• PMUs (Federal/State) • FPFMD/SPFMU
Procurement	• Publication at key stages, i.e. EOI, BER and award on Project website • Documentation of selected complaints received in relation to project implementation • Publication on Project website of actions taken on selected complaints received in relation to project implementation	• Report every 6 months to the Bank on the publications • Monitored MIS/Database on complaints • Monitored MIS/Database on complaints	• PMUs (Federal)
Cross-cutting	• Independent Project Ombudsman reporting to Federal Steering Committee but active project-wide to direct those stakeholders with grievances or questions to the appropriate channel (such as the social or procurement grievance mechanisms), and following up	• Ombudsman Report every 6 months to FSC and Bank	• Project Ombudsman
Multiple Agencies involved	• Coordination of MDAs and participation in project through Technical and Steering Committees and joint annual work program	• Minutes of Steering Committee Meetings every six months and Technical Committee meetings each quarter • Agreed annual multi-sector work program	• Technical and Steering Committees (Federal/State)
Stakeholder participation	• Financial management and procurement information availability to T/CAs, CSOs, FBOs • Dissemination of Reports generated through the project	• Audit, Annual Financial Statements and contract awards displayed on project website not later than 30 days after publication.	• PMUs (Federal/State)
Dissemination of Information	• Establishment of project website • Set-up of other project social media platforms i.e. Facebook, Twitter	• 100% up-time of project website • 90% of contract awards posted on social media platforms	• PMUs (Federal/State)

Annex 11: Communications

NIGERIA: Nigeria Erosion and Watershed Management Project

1. This annex outlines the overall communications strategy for NEWMAP. It provides an overview of communications objectives and activities at various levels. It also identifies key stakeholders targeted by the communications strategy, key messages with supporting data, specific channels of communication, and outcome indicators.

2. *Context and Rationale*. A communications assessment carried out during project preparation shows that over 70% of the populace in the benefiting states does not know the causes of erosion nor the proper methods for prevention. On the other hand, over 60% agree that erosion problems affect them, with over 62 % seeing themselves as stakeholders.

3. To support the NEWMAP development objective, the Communication Objectives are: (i) to raise public awareness, increase knowledge and understanding on erosion and environmental issues, and change stakeholder attitudes and behaviors for adoption of erosion control measures in targeted states of Nigeria over eight years; and (ii) to generate community ownership and participation in erosion and watershed management and livelihoods activities under NEWMAP.

4. Key stakeholders identified for targeting through the communications strategy include farmers, community members (rural and urban), community/opinion leaders, government officials, legislators, media, construction firms, and contractors.

5. *Implementation arrangements*. To achieve the communications objectives, a National NEWMAP Communications Officer will be appointed as part of the FPMU, and this person will head the FPMU's Communications Unit. This arrangement will be mirrored at the State level. The project will also work at local levels in key sites, working closely with Local Government Areas. A sustained community mobilization and participation approach s supported under Component 1 which includes communications work. An NGO will be secured to interact with participating communities (see Component 1 description in Annex 2).

Communications Approach

6. *External Communications Strategy.* The component will support the design of National, State, Local, and Community-based external communication strategies, action plans, and timelines. These strategies will be based on M&E and impact evaluation results as they become available, research findings, communications audits/needs assessments, and participatory rural communication appraisals (PRCAs). Communications strategies will be updated on yearly basis.

7. *Internal and Corporate Communications.* To enhance the image and credibility of the Project, increase buy-in by staff and the public, and cultivate third party champions for the project, an internal and corporate communications strategy will be designed and implemented. This will be used to educate project staff on the PAD, PID and PIM to improve understanding of the project and ensure buy-in, support, and participation. Corporate communications tools will be used to publicize NEWMAP activities and recruitment processes to institutionalize transparency, accountability, and openness and enhancing the positive image of PMUs. This will be achieved through, first, a NEWMAP website with links for federal, state, LGA and community activities, and second, through other communications tools using a variety of media, materials, and channels.

8. *Message Development.* Client-centered rather than organization-centered messages will be developed to effectively provide stakeholders with key behavior change communications. Through regular communications research, motivational factors and barriers to achieving behavior change will be identified, and methods to enhance the adoption of the new erosion control ideas proposed under NEWMAP will be recommended to the FPMU and SPMUs. Messaging will need to be customized to address the erosion and watershed issues important to the local region.

9. *Community-based Communication*. At the community level, the Project will consider the formation and appointment of Community-Based NEWMAP communication liaisons to address community-specific information needs. This will enable the flow of information from the community to the local, state, and federal levels, and vice-versa. They will work in collaboration with the LGA and State Communication Officers, as well as SPMU M&E specialists and technical specialists, to ensure consistent flow of information on NEWMAP activities to and from the community levels. Local communication liaisons will be expected to provide qualitative data (such as stories/case studies and photographs) on erosion and watershed issues at the community level. This will serve to (i) provide a consistent flow of information about NEWMAP activities from the intended beneficiaries' perspective; and (ii) provide ongoing feedback from the community/grassroots level.

10. *Capacity Building.* Capacity and skills building for Communication Officers at the local, state, and federal levels and for community-based Communication/Information Officers will be supported. This will focus on the gathering, processing, and dissemination of information on the project to reach audiences at different levels.

11. *Channels of communication.* The component will encourage the use of effective communication tools and channels including: traditional rulers; drama; face-to-face interactions; radio; town criers; farmers associations; churches; mosques; ADP extension agents; handbills; field visits; community meetings; age groups; television; picture exhibitions; schools; women's associations; family heads; field visits; internet (social media, websites); publications; workshops; local newspapers; conferences; retreats; national newspapers; House Committee on Environment; Environmental Journalists Association; and Ministers and Commissioners for Works. These channels and tools will be used to raise awareness, educate targeted stakeholders and beneficiaries to improve their understanding of the project, and identify and change attitudes and behaviors necessary for adoption and buy-in to ensure the success of the project. \

12. *Downstream and Upstream Communication*. For effective targeting and upstream/downstream communication, the component will identify and segment primary, secondary and tertiary stakeholders/audiences. Upstream communications will be used to inform and sensitize policy makers, CSOs, opinion leaders, traditional leaders, parliamentarians, and key government officials on the project's objectives. Downstream communications will be used to inform intended beneficiaries about the project's components and sub-components, and to educate communities/end-users on how to form associations and groups to participate in the project.

13. *Monitoring and Evaluation*. Communications Officers at all levels will collaborate and work in partnership with Monitoring and Evaluation Officers to track and evaluate the performance of the communications strategy along the 4-stages of the behavioral change process: Awareness, Knowledge, Attitude, and Behavior Change.

14. *Mobilizing Partnership*. The Project will support and assist NEWMAP the FPMU and State PMUs to establish and strengthen partnerships with MDAs including the Ministry of Information and Communications, National Orientation Agency (NOA), Civil Society Organizations (CSOs), Non Governmental Organizations (NGOs), Community Based Organizations (CBOs), State Ministries of Agriculture, Agricultural Development Projects (ADPs), and National Emergency Management Agency Communication Offices in the implementation of the communication program.

15. *Key messages.* The following table highlights target audiences, desired behaviors, key messages and supporting data, communications channels, and outcome indicators.

Messages

Audience	Behaviors	Take Away Message	Supporting Data	Channels	Evaluation
Farmers	• **Engage** in farming practices (no-till, contour, agroforestry, etc) that protect fragile soil from being eroded by water or wind • **Report** rill and sheet erosion, new gullies, and water siltation • **Seek** more information and knowledge on causes and prevention of erosion and improvement of water quality and availability • **Plant** trees • **Avoid** cutting of trees and exposing the soil to erosion	• My farm will be protected from erosion • Increase in area of degraded land area returned to productive use • Increase in yields • Protecting your downstream neighbors from farming activities that may cause erosion or reduce their water quality and availability • Trees on farms have many benefits: medicines, fodder, soil fertility, reduced erosion, fruit, shade, water filtering for creeks, biological diversity and overall environmental health, etc. • Improvement in income	• Records from agriculture and environment ministries • Market Surveys • Sales Records • Interviews	• Traditional rulers • Traditional methods such as face to face • Target groups • Radio • Farmer-to-farmer field schools and other participatory peer-to-peer learning events • Farmers associations • Churches • Public (ADPs) and commercial extensionists • Handbills • Field visits • Crowd sourcing • Drama • Film shows	• Number of farmers adopting methods that check erosion • Number of farmers engaged in educating other farmers • Number of farmers reporting incidences of gully erosion • Number of farmers seeking information on erosion management measures • Number of farmers joining erosion/watershed campaigns
Members of the Communities (Urban and Rural)	• **Dispose** refuse responsibly and **prevent** blockage of urban drainage channels • **Report** incipient gullies • **Seek** more information and knowledge on causes and prevention of erosion. • **Participate** in simple erosion *remedial activities* and in the *appraisal* of work done within the community	• Prevent Flooding • Prevent untimely deaths for self and loved ones • Protect my buildings, investments and property • Live healthy life and avoid waterborne disease which deplete income • Save lives • Avoid dislocation of communities • Sustain livelihood	• Records from Ministry of Agriculture, ADPs, Ministry of Environment, Hospitals and Ministries of Health.	• Traditional Rulers • Community meetings • Age groups • Radio • TV • Handbills • Awareness campaign • Churches, schools, age groups, women associations, family heads • Participatory environmental monitoring and/or more general field visits	• Number of community members joining erosion/watershed campaigns • Frequency and number of people reporting erosion in the communities • Number of people seeking information on erosion management measures

				• Crowd sourcing • Website • Social media (Facebook, Twitter, YouTube, Flickr, etc.) • Drama and film	
Community Leaders/ Opinion leaders	• **Provide advice** and **advocate** against negative land use practices • **Talk** to community members against blockage of drainages with wastes and refuse • **Monitor** and check road construction firms	• Greater respect, prestige and appreciation from community members • Increased popularity with communities • Save lives • Avoid dislocation of communities • Receive blessings from God	• Vox Pop • Community associations election records • Focus group discussions	• TV • Radio • Publications • Workshops • Local Newspapers • Handbills • Field visits	• Number of elders and opinion leaders talking about negative land use practices and erosion issues • Number and frequency of reach of messages on erosion and solid waste disposal by opinion leaders
Government (Federal, State, Local Governments • **Ministry of Works** • **Works Departments of LGCs**	• **Provide** adequate storm water drainage with proper termination • **Strictly enforce** Environmental Impact Assessment (EIAs) in urban development. • **Provide adequate drainages** and **proper planning** of urban and semi-urban Centers • **Provide** prompt waste disposal services to residents • **Provide** adequate refuse dumps in urban and semi-urban centers • **Check** uncontrolled soil mining by builders and construction firms	• Reduce Government spending on gullies and erosion and compensation for destroyed properties and flood • Reduce mortality and achievement of MDGs • Reduce loss of lives due to floods • Appreciation by the public	• Government Budgets • Records from Ministries of Health, hospitals and MDG Offices	• Meetings • Conferences • Radio • Churches • Face-to-face • Retreat • TV • Handbills • Newspapers • Field visits	• Number of Government officials who conduct dialogue with farmers and communities • Survey of Public opinion • Quality and frequency of waste disposal services provided by Governments or their agents • Frequency and number of reports on soil mining by communities • Frequency and number of responses on soil mining reports by Government officials
Lawmakers	• **Make** Laws and Policies on environmental Protection • **Provide** oversight on implementation of laws	• Popularity and prestige • Appreciation by the public • More Votes	• Vox Pops • Public interviews • INEC Records	• Meetings • Conferences • TV • Retreats • Newspapers • Radio	• Number of laws made on environmental issues • Number and frequency of campaigns by lawmakers • Frequency and number

				• Field Visits • Community Forum	of visits made by lawmakers of gully, flood and erosion sites by lawmakers
Media	• **Learn** and understand more about erosion and environmental issues • **Source** for more information on climate change and erosion • **Write** and produce programs on erosion to sensitize and educate the public, governments and lawmakers	• Appreciation by farmers, communities and Governments • Increase readership and listenership • More income for the media organization • Be a reference point for climate change and erosion issues • Become friend of communities and farmers.	• Interviews with farmers, readers, listeners and viewers • Advert records and sales • Vox Pops	• Workshop • Retreat • Environmental Journalists Association • Handbills • Field Visits	• Number of Journalists and media organizations seeking more information on erosion and environmental issues • Increase in number of reports on erosion • Consistency of reports on environmental issues • Increase in awareness, knowledge and reach of messages on erosion and flooding among communities, farmers, Government officials, contractors and lawmakers.
Building and road construction firms	• **Stop** breaking and packing soils without Environmental Impact Assessment and permission of residents and governments • **Construct** quality and durable drainage systems. • Work across MDAs and with local people to ensure **proper termination of drainage systems** • **Use a mix of site-specific measures** including permeable, impermeable structural measures and vegetative land management measures.	• Appreciation and endorsement by communities and government • More contracts • Better reputation of firm • Increase in income • Development of a unique and specialized professional body of knowledge	• Interviews with environmentalists and communities • Records of contracts from ministries of works and Transport • Records from state procurement officers of tenders boards	• Meeting • Face-to-face • Works Minister and Commissioners • Newspapers • TV and Radio • Professional Associations	• Assessment studies • Public opinion surveys

Annex 12: Environmental and Social Safeguards

NIGERIA: Nigeria Erosion and Watershed Management Project

Resettlement

1. The Involuntary Resettlement Policy (OP/BP 4.12) is triggered by this project. Because specific site interventions to be financed under the project have not been identified at the time of appraisal, the government of Nigeria commissioned a Resettlement Policy Framework. This framework, as well as a model Terms of Reference for the preparation of Resettlement Action Plans, will be available to the States as guidance on the management of resettlement issues.

2. *Screening Criteria:* Any project intervention that involves the taking of land or loss of access to land in order to carry out the site intervention will trigger the resettlement policy. This includes land acquisition even when people are not displaced. It also includes the loss of access to resources caused by the designation of areas as off limits for specific activities, e.g. construction, farming, grazing, or other. Land-use plans that lead to the loss of access to resources in such areas, for example, prohibition of livestock grazing on fragile areas, also trigger the policy. The policy also covers temporary loss of access, for example, such as blocked access to land (urban or rural) during construction.

3. For all such cases, the resettlement policy is triggered and the site intervention proponent is required to submit a detailed resettlement action plan (RAP) or an Abbreviated Resettlement Action Plan (ARAP) when the total number of affected people is less than 200. Submission of such plans satisfactory to the PMU and the Bank is required prior to disbursement for civil works (planning activities for civil works may be supported before such plans are submitted). RAPs will be prepared for each site intervention along with the engineering design for civil works, bio-remediation and other plans. The policy does not cover losses that do not involve the taking of land. For example, if a road is rerouted as part of a project-financed site design, causing a loss of customers for a business located along the road, compensation for such losses is not covered by OP4.12 although the policy does not prohibit making allowances for such losses. Legacy losses, i.e. those caused by erosive processes prior to the implementation of a site intervention are also not covered by the policy. Persons affected by losses caused by erosion or other natural processes may be eligible for assistance under livelihood programs supported by the project but there is no payment of compensation for past losses prior to NEWMAP.

4. *Objectives:* The objective of resettlement plans is to restore persons affected by a site intervention to a condition equivalent to or better than the pre-intervention situation. This does not guarantee the restoration of a particular level of livelihood because the contextual conditions may change, but the intervention should at least provide *the opportunity* to restore a previous level of living. For example, a farmer who receives a plot of land similar in size and quality to the one he lost may have lower income for a year because crop prices may fall.

5. *Resettlement planning:* Resettlement planning and implementation shall be considered as an activity within site interventions under which affected persons have the opportunity to benefit. The first task in resettlement planning is to reach out to the community involved during the design of the engineering works and other measures. The local community shall participate in the design of the resettlement activities and the decisions made along the way. In most cases,

SPMUs assisted by an NGO will carry out site visits to ascertain the extent of any land take that will be caused by the site intervention and to meet with community members. Involuntary resettlement shall be avoided or minimized in project design. *Displacement is considered to be involuntary if the affected party does not have the option to remain in place even when he/she may prefer to move.*

6. After the engineering design is in place, a detailed household census and inventory of fixed assets shall be carried out within the polygon affected by project works[46], with a survey of each household, farm or business affected by the project, including temporary structures such as kiosks or squatters' shacks. Detailed information on the families, kin groups, renters, business employees and others who depend on the land for their livelihood must be collected including basic demographic data on age, sex, occupation, livelihood, income, educational level, and preference for resettlement. The inventory of assets shall include the size and construction of dwellings, other buildings, wells and other infrastructure or assets such as fencing, ancestral gravesites or sacred groves, woodlots, and permanent crops such as fruit trees. Each structure or asset will be photographed, georeferenced, and located on a map. Public infrastructure including schools, roads, churches, mosques, and health posts shall be recorded and mapped together with information on the catchment areas of people who frequent these. At the conclusion of the census, a cutoff date will be declared after which no newly arrived persons or families will be eligible for resettlement benefits; improvements to housing or other structures or assets made after that date will not be eligible for compensation (repairs are permissible).

7. In addition to the census and inventory, the responsible team will carry out a socioeconomic assessment of the affected community or communities. Among the topics that should be investigated are ethnic differences within the community, the livelihoods of the affected people, the social ties that bind the community together (such as kinship, friendship, ethnic ties, debt-credit relationships), conflicts within the community and with other communities, and other pertinent social characteristics that characterize the affected community. The analysis should focus on how the site intervention and the resettlement activities therein will impact the community, and also how local society can be mobilized to implement the intervention in the best possible way.

8. Based on the data collected, the team will construct an eligibility matrix that matches different categories of displaced people or land losses with specific entitlements designed to compensate people for losses caused by project works. The entitlements may consist of replacement housing, replacement land, building lots, or cash compensation. *Cash compensation is only appropriate when there is an active market in land or housing and where such assets are actually available for purchase*. There are three basic categories of eligibility for resettlement benefits:

[46] In some cases, the exact alignment of a road or canal is not known at the time a resettlement plan is being prepared. This is not necessarily an obstacle to preparing a detailed plan. The census and inventory should be inclusive of all areas, farms, people and businesses that could potentially be affected by project works. The people interviewed should be clearly advised that the resettlement plan is not final so that they will not expect to be resettled with certainty. The population should be kept informed as plans evolved and, when the final design is ready, the affected area should be marked off with pickets or flags and a cutoff date declared. This "fuzzy" approach to resettlement has risks including the possibility that rent-seekers will build new structures and extensions to existing ones simply in order to become eligible for additional resettlement benefits.

(a) Persons holding legal title (or the equivalent in customary-law) to the land they occupy or use to derive their livelihood;
(b) Persons lacking title but with legal rights that can ratified by recognized legal process, e.g. heirs to an estate.
(c) Persons with no legal or legalizable claim to the land they occupy or use.

9. Persons having legal rights shall be entitled to receive compensation for their assets; those having legalizable rights shall receive assistance to regularize their status and shall be treated just as those having legal rights. Persons lacking legal rights to land may not be compensated for the land they occupy, but they are entitled to compensation for other assets (e.g. housing) and to receive assistance in order to achieve the objectives of this policy. In practice, this may mean that squatters and other non-legal occupants receive the same entitlement as those having legal rights. When cash compensation is used for very poor people, it is strongly recommended that supervision be provided so that such compensation is not used for consumption or other unsustainable expenditures.

10. Tenants may be granted resettlement entitlements along with owners or they may be given a subsidy to find a new rental property. Entitlements shall include transitional support such as moving expenses, assistance with food and childcare during a move and other needed support.

11. It is necessary to identify vulnerable people who may need additional support. Some examples are widows, orphans, female-headed households, the elderly, persons with disabilities and others. Regardless of the form of compensation adopted, special consideration shall be given to vulnerable people who lack an alternative means of social support. This requires the presence of social specialists on the scene before, during and after the actual move to ensure that some people are not driven back into poverty and misery.

12. *Timing of RAPs.* If two or more years go by after the census and inventory of assets have been done without the site interventions having begun, the census and inventory should be updated and a new cutoff date declared.

13. It is necessary to assess the value of lost assets correctly. The appropriate measure to apply is replacement cost, i.e. the cost on the existing market of replacing the lost asset in a nearby location with similar characteristics. For this reason, depreciation is not considered in computing the value of an asset. Asset values should be based on recent nearby sales of similar assets, not on tax records or arbitrary tables of values that do not reflect actual replacement cost. Business owners are entitled to receive compensation for lost profits for a limited time during which they find a new business location and reestablish their business.

14. During the resettlement period, a timetable shall be prepared that coordinates resettlement with the underlying civil works. No one shall be obliged to move prior to receiving full compensation for lost assets. Temporary resettlement will be avoided except in cases where people may be obliged to move away during construction and then move back to their previous location.

15. *Nature of benefits.* It is anticipated that all residents in a targeted sub-watershed will benefit from a given project-financed site intervention through various project activities. The

precise nature of the benefits depend on the site and in particular the sub-watershed characteristics and the location of households in the sub-watershed. Some people within the sub-watershed may compare their respective benefits or entitlements. For example, in view of the great losses from erosion suffered by some residents in the past, it is understandable that such people with legacy losses will feel entitled to receive benefits similar to some of their neighbors. However, it is impossible to provide financing for legacy cases of this sort because of the difficulty of establishing and applying clear eligibility criteria and because of lack of resources. Local communities will be able to consult on ways in which land redistribution and livelihood restoration activities could include those adversely affected by gullies in the past.

16. At regular intervals during the resettlement process, monitoring reports shall be filed that indicate adherence to the timetable, problems encountered and benchmarks achieved. At the time the resettlement program is expected to have achieved its goals of resettlement and restoration of livelihood opportunities, an evaluation shall be carried out that assesses the degree to which the resettlement objectives have been achieved. The principal issue in evaluation is not the expressed satisfaction of the affected parties but rather their having received a fair opportunity to reestablish themselves under conditions comparable to or better than they had previously.

Environmental Safeguards

17. *Environmental and Social Impacts.* As mentioned in the PAD, the project triggers several environmental safeguards policies, including environmental assessment (OP 4.01), natural habitats (OP 4.04), pest management (OP 4.09), physical cultural resources (OP 4.11), forests (OP 4.36), and dam safety (OP 4.37), as well as a legal safeguards policy projects on international waterways (OP 7.50). The ESMF lists the following positive impacts for NEWMAP:

- Provision of employment
- Reduction in hunger through the harnessing of previously degraded land for agricultural purposes
- Improved agricultural productivity
- Community development programs
- Reintegration of community and diversification of sources of livelihood
- Improved health statistics
- Promotion of afforestation programs (with all its benefits)
- Minimization of flooding and control of coastal overflow
- Provision of proper and well designed road drainage systems
- Rehabilitation of affected lands, vegetation and forests
- Reduced fear perception of loss of property, inhabitation and ancestral origins of the communities
- Increased financial and technical collaboration between projects affected states and the NEWMAP PMU
- Control and reduction of water body sedimentation rates due to erosion
- Reduction in siltation of rivers due to improved vegetation cover and decrease in slope instability
- Reduction in mortality/morbidity from landslides

- Creation of engineered travel routes and access roads
- Increase in the life span of roads
- Increased opportunities for easy inter-state movement and business development
- Initiation/ kick-off of rapid production systems and agricultural practices
- Increase in social interactions
- Improved livelihood enhancing activities
- Creation of land mass for new development projects (farms, fruits farms,, healthcare facilities, etc)
- Improvement in the eco-balance
- Improvement on aquatic environment and fishing practices
- Increase in urbanization
- Reduced level of land disputes and ethnic violence
- Increase in business/commerce during and after the construction works
- Job creation opportunities.

18. Potential adverse impacts that could be associated with various NEWMAP interventions are grouped in the ESMF by project phase – preconstruction, construction, and operation and maintenance. The ESMF includes recommendations for typical mitigation measures for each type of impact. Impacts and mitigation measures are summarized in Table 12.1.

19. *Screening.* The ESMF includes an environmental and social screening checklist that has been designed using the World Bank environmental and social safeguards guidelines, and Nigerian EIA guidelines as checklist benchmarks to assist in the evaluation of proposed interventions under NEWMAP. The screening checklist is designed to place information in the hands of reviewers so that mitigation measures, if any, can be identified and/or that requirements for further environmental analysis and safeguards instruments (i.e., ESMP, ESIA) can be determined. The screening checklist also identifies potential socioeconomic impacts that will require mitigation measures.

Table 12.1: Typical Environmental and Social Impacts and Mitigation Measures

Project Phase	Potential Impact source	Potential Impact	Mitigation Measure
Pre-construction phase	Land acquisition from members of the communities before the construction phase	• Negative perception and discontent expressions by members of the community • Decrease in accruable income Hostile and unfriendly community attitudes • Unresolved issues with land acquisition extending into the construction phase	• Contact local stakeholders in time to address and identify issues on land acquisition during this phase • Ensure that adequate public notices are provided for planned activities • RAP activities should be included • Development of project level grievance mechanisms to alleviate responses from affected communities • Community involvement will be included through persuasion and provision of guidance if need be • Adequate and timely information will be provided to affected owners • Creating proper complaints procedure • Providing for compensation on damage to property outside the actual project corridor. In the event that impacts occur on land outside that compensated for, compensation will be evaluated and settled as soon as it is reasonably possible after the damage is suffered • Making sure the land acquisition activities will where possible, be scheduled with due regard for crop cycles to minimize unnecessary impacts on livelihoods and enable the continuation of economic agricultural activities
	Excavation, grading, compaction, filling and other civil works	• Excavation and compaction activities through construction works will alter the soil properties including loss of valuable top soils	• as water bars, gabions, straw bales, and re-vegetation will be implemented during and after construction phases • Re-vegetation efforts will be implemented

Construction Phase			to ensure long-term recovery of the area and to prevent significant soil erosion problems
	Channelization of flood waters	• Presence of undercutting in roads • Increase flooding in other areas, which can lead to destruction of lands, crops and properties	• Good watershed management practices will be established such as planting buffer width of trees along each side of the stream(s)
	Increased sedimentation and runoff during the construction activities such as grading, dredging and filling of the roads etc.	• Impairment in the health of local residents of the community especially cases of respiratory infection and respiratory disease symptoms • Incidence of occular disease symptoms • Presence of suspended particulates exceeding acceptable limits • Complaints from members of the community	• Regular inspection of the project sites will be needed • Construction such as dykes and sediment basins should be considered to divert the flow of sediments • Define watershed boundaries and pollutants of concern, and conduct resource inventory and information analysis • Identify sensitive areas in order to protect surface water and prevent non-point source pollution
	Noise and Vibration from construction activities	• Complaints of disturbance from members of the community • Damage to structures over time as a result of the vibration caused by heavy machinery	• A traffic management plan should be used to address movement of vehicles during the early hours of the morning when local residents are still asleep • Keeping proper records of complaints in the complaints register
	Water quality from Project activities; from construction works, seepage of fuel from powered machineries into the watershed, Discharge of effluent from workers in the campsites will impact on the water quality	• Change in the water colour • Change in pH levels • Eutrophication • Increased cases of disease, illnesses (especially waterborne diseases) • Odor • Eutrophication in water bodies • Presence of sediments can build up in stream channels and thus lower the water flow capacity	• Mobile toilet facilities that will be provided for the workforce should be maintained, emptied daily and disposed of at approved sites • Sewage can be composted in compost bin (mixtures of sewage, straws and hays), which can benefit the local community's soils as a source of manure • The Contractor should ensure that proper storage facilities are provided at worksites. They should be leak proof and fitted round with bunds to prevent leakage into the water streams • Development and implementation of proper Waste Management Plans (WMPs) by the Contractor (s)

	Impact on flora and fauna During mobilization of equipment, construction activities such as grading, dredging, filling, excavation etc. Weed invasion/proliferation of opportunist species (weeds & pests) Impact on Wildlife during land clearing, civil works, deforestation, hunting activities.	• Reduction of the richness in the number of species • Reduction in the number and spread of native species • Presence of wildlife on community, State, Federal, and privately held land	• Identify any Site of Special Scientific Interest • Co-operate with relevant MDAs such as the Federal Department of Livestock, Privately owned wildlife conservation parks, Zoos and Zoological departments of Universities, for the housing of possible animals that may be relocated as a result of the construction • Ensure that affected flora species are transferred and raised in available nurseries • Ensure that the necessary safeguards policies such the OP 4.04 on Natural Habitats and OP 4.36 Forests and relevant legislatives are used in addressing the issue of wildlife • Liaise with Zoos Management Authorities in the affected States and Universities to provide temporary habitats for accommodating animal species until new habitats are provided • Afforestation practices should be encouraged
	Transportation & Traffic impact: Existing travel patterns will be negatively impacted during the construction phase of the project in the states	• Complaints from members of the community • Increase in noise and air pollution • Increase in roadside hazards and accidents	• Carefully site stock piling areas, work depots and work sites in good locations, which will alleviate possible traffic congestions • Information on road closure should be made publicly on local radio stations and television. Signage advising on closures and detours should be strategically placed along the roadsides. • Ensuring that all road signs are put in place and detours made possible to divert traffic • Ensure alternative footpaths are provided for local residents • Relevant Federal Government Agencies such as the Federal Road Safety

			Commission will be engaged by the contractor all through the construction period to ensure that safety is maintained throughout the construction phase
Construction Phase	Accidents may occur during the construction phase as a result of increased vehicular movement	• Increase in total number of accidents during the construction phase	• A good traffic management plan should be developed which will specify; safety rules on speed limits while driving, trainings to enable drivers to be responsive to local conditions, procedures for dealing with accidents involving injury to local people and livestock and restriction of heavy vehicle movements to specific access roads
	Human Displacement Impact Source: Civil activities, re-vegetative activities, watershed management	• Relocation of people and their sources of economy	• Resettlement Plan (RAP) activities should be considered in the affected areas • World Bank OP 4.12 addressing involuntary resettlement will be applied for this impact in the affected communities • Compensatory activities should be established based on replacement value or market value and affected person could be employed based on experience and qualification
	Archeological & Cultural loss Impact Source: Excavation/earth works, deforestation activities and other engineering activities e.g water channelling	• Loss of valuable archaeological and historical artefacts • Complaints from members of the community	• The Social Officer needs to ensure that thorough discussions are carried out during the Focus Group meeting addressing issues on Archaeology and cultural. • The World Bank Operational Policies relevant to this situation such as OP 4.11 Physical and Cultural Resources will be applied to enable the Social Officer administer the right tool to avoid cases of conflicts in the communities.
	Occupational Health & Safety	Exposure of workers to accidents, working in potential weather extremes, contact with natural hazards such as animals, insects, and poisonous plants	• The contractor will ensure that Personal Protective Equipment (PPE) are made available to all workers. • The Contractor should ensure that necessary measures to avoid and minimize the negative health and safety impacts such

			as trainings for employees be established. • Contractors should develop Occupational Health and Safety Systems (OHSMSs), which will include policies, plans, procedures, processes and programs. • Contractors should posses operating practices for the following: - Accident investigation and control - Hazards investigation and analysis - Hazard communication programme - Work place violence - Work stress management plans - Ergonomics - Heavy equipment safety - Fire and fuel safety • Ensure that workers use protective gear during all working activities • Proper disposal of construction spoil and any hazardous waste will be stored in areas clearly designated and labeled • It will be very appropriate if a good health care unit is made available in the campsites • First Aid Services should be provided at the campsites to provide immediate attention to accident victims before referring them to nearby clinics if need arises
	Aesthetics Impact Source: Construction works	• Diminished aesthetic levels	• Proper use engineering best practice; • Employ an aesthetics expert to the contractor team
Operation & Maintenance Phase	Topography Impact Source • Construction activities including movement of goods and services • Agricultural activities	• Scarification of landscape • Increase in vehicular accidents	• Embarking on tree planting exercises, which can serve as a wind barrier and help stabilise soils • Training activities targeted at local farmers to improve awareness • The affected population identified will participate in the planning and/or decision making process for the alternative livelihood options and the process and agreement will be in line with relevant

			operational policies • Good engineering practices to be included in contract documents and contractor's performance will be monitored and reported
	Air Quality <u>Impact Source:</u> Increase in vehicular traffic	• Complaints from members of the community • Complaint from local residents on cases of respiratory problems • Increase in particulate matter more than 10 microns in size (PM-10) and dust above the ambient air quality levels	• Ensure that the air quality levels are constantly monitored which can be obtained from relevant local air pollution control agencies/ metrology units in the states. • Surrounding the roadsides with vegetation will be encouraged as the trees will serve as windbreaks and keep dust from spreading long distances
	Noise and Vibration <u>Impact Source:</u> increase in vehicular traffic	• Reported cases of noise and vibration disturbance by local residents	• The traffic management plan should be used to address movement of vehicles during the early hours of the morning when members of the community are still asleep • Keeping proper records of complaints in the complaints register
	Water Quality <u>Impact Source:</u> Roadway runoff, wastes (municipal solid wastes, agricultural wastes, effluent, hazardous wastes e.t.c)	• Changes in pH levels • Turbidity • Change in water color • Smell	• Development of proper waste management plans by the Contractor(s) • Roadway runoff will not be placed directly into watercourses but allowed to flow over grassed or pervious pavement to permit the settling out of fine materials • Divert the flow of surface water around the site to prevent contamination from storm water (by pollutants, soil or any other material from the site) • Develop a site drainage plan to reduce storm water flow and sediment load before storm water is discharged from the site
	Traffic and Transportation <u>Impact Source:</u> Increase in traffic on roads and access roads in the project areas	• An increase in traffic in the areas around the site interventions during works implementation	• Ensure all road signs are completed with speed limits zones and traffic signs in place • Provide alternate pedestrian pathways • Measures suggested for the construction phase should be carried forward to the maintenance stage

Table 12.2 Screening Checklist Questions:

Physical data:	***Yes/No answers and bullet lists preferred except where descriptive detail is essential.***	
Site area in hectares		
Extension of or changes to existing alignment		
Any existing property to transfer to sub-project		
Any plans for new construction		

Preliminary Environmental Information:	*Yes/No answers and bullet lists preferred except where descriptive detail is essential*
State the source of information available at this stage (i.e., proponent's report, EIA, or other environmental study)	
Has there been litigation or complaints of any environmental nature directed against the proponent or sub-project?	

Identify type of activities and likely environmental impacts:	*Yes/No answers and bullet lists preferred except where descriptive detail is essential*
What are the likely environmental impacts, opportunities, risks, and liabilities associated with the sub-project?	

Determine environmental screening category:	*Yes/No answers and bullet lists preferred except where descriptive detail is essential*
After compiling the above, determine which category the site intervention falls under based on the environmental categories A, B, and C.	

Mitigation of Potential Pollution:	*Yes*	*No*
Does the sub-project have the potential to pollute the environment or contravene any environmental laws and regulations?		
Will the sub-project require pesticide use?		
If so, then the proposal must detail the methodology and equipment incorporated in the design to constrain pollution within the laws and regulations and address pesticide use, storage, and handling		
Does the design adequately detail mitigating measures?		

Environmental Assessment Report or environmental studies required:	*Yes/No answers and bullet lists preferred except where descriptive detail is essential*
If screening identifies environmental issues that require an EIA or a study, does the	

proposal include the EIA or study?	
Indicate the scope and time frame of any outstanding environmental study.	
Required Environmental Monitoring Plan:	
If the screening identifies environmental issues that require long term or intermittent monitoring (e.g., effluent, gaseous discharges, water quality, soil quality, air quality, noise), does the proposal detail adequate monitoring requirements?	

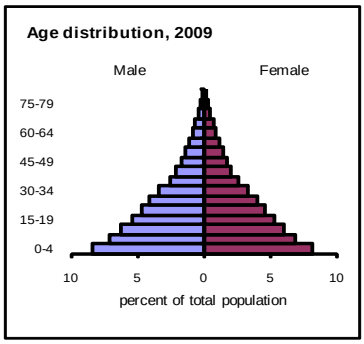
Public participation/information requirements:	*Yes/No answers and bullet lists preferred except where descriptive detail is essential*
Does the proposal require, under national or local laws, the public to be informed, consulted, or involved?	
Has consultation been completed?	
Indicate the time frame of any outstanding consultation process	

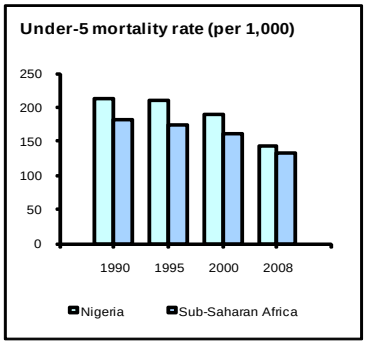
Land and resettlement:	*Yes/No answers and bullet lists preferred except where descriptive detail is essential*
What is the likelihood of land purchase for the sub-project?	
How will the proponent go about land purchase?	
What level or type of compensation is planned?	
Who will monitor actual payments?	
Actions:	
List outstanding actions to be cleared before sub-project appraisal	
Approval/rejection	*Yes/No answers and bullet lists preferred except where descriptive detail is essential*
If proposal is rejected for environmental reasons, should the site intervention be reconsidered? What additional data will be required for re-consideration?	

Annex 13: Country at a Glance

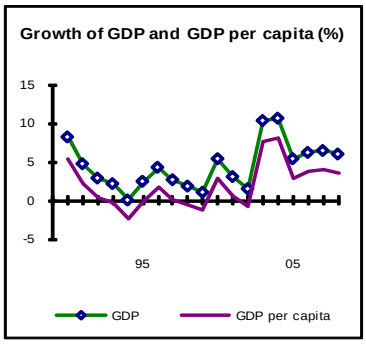
NIGERIA: Nigeria Erosion and Watershed Management Project

Key Development Indicators	Nigeria	Sub-Saharan Africa	Lower middle income
(2009)			
Population, mid-year (millions)	154.7	819	3,767
Surface area (thousand sq. km)	*924*	24,242	31,923
Population growth (%)	2.3	2.5	1.2
Urban population (% of total population)	49	36	40
GNI (Atlas method, US$ billions)	184.6	897	7,682
GNI per capita (Atlas method, US$)	1,190	1,095	2,039
GNI per capita (PPP, international $)	2,070	1,981	4,502
GDP growth (%)	5.6	5.2	7.5
GDP per capita growth (%)	3.2	2.7	6.3
(most recent estimate, 2003–2008)			
Poverty headcount ratio at $1.25 a day (PPP, %)	64	51	..
Poverty headcount ratio at $2.00 a day (PPP, %)	84	73	..
Life expectancy at birth (years)	48	52	68
Infant mortality (per 1,000 live births)	86	83	44
Child malnutrition (% of children under 5)	27	25	25
Adult literacy, male (% of ages 15 and older)	72	72	87
Adult literacy, female (% of ages 15 and older)	49	54	73
Gross primary enrollment, male (% of age group)	99	105	109
Gross primary enrollment, female (% of age group)	87	95	105
Access to an improved water source (% of population)	58	60	86
Access to improved sanitation facilities (% of population)	32	31	50



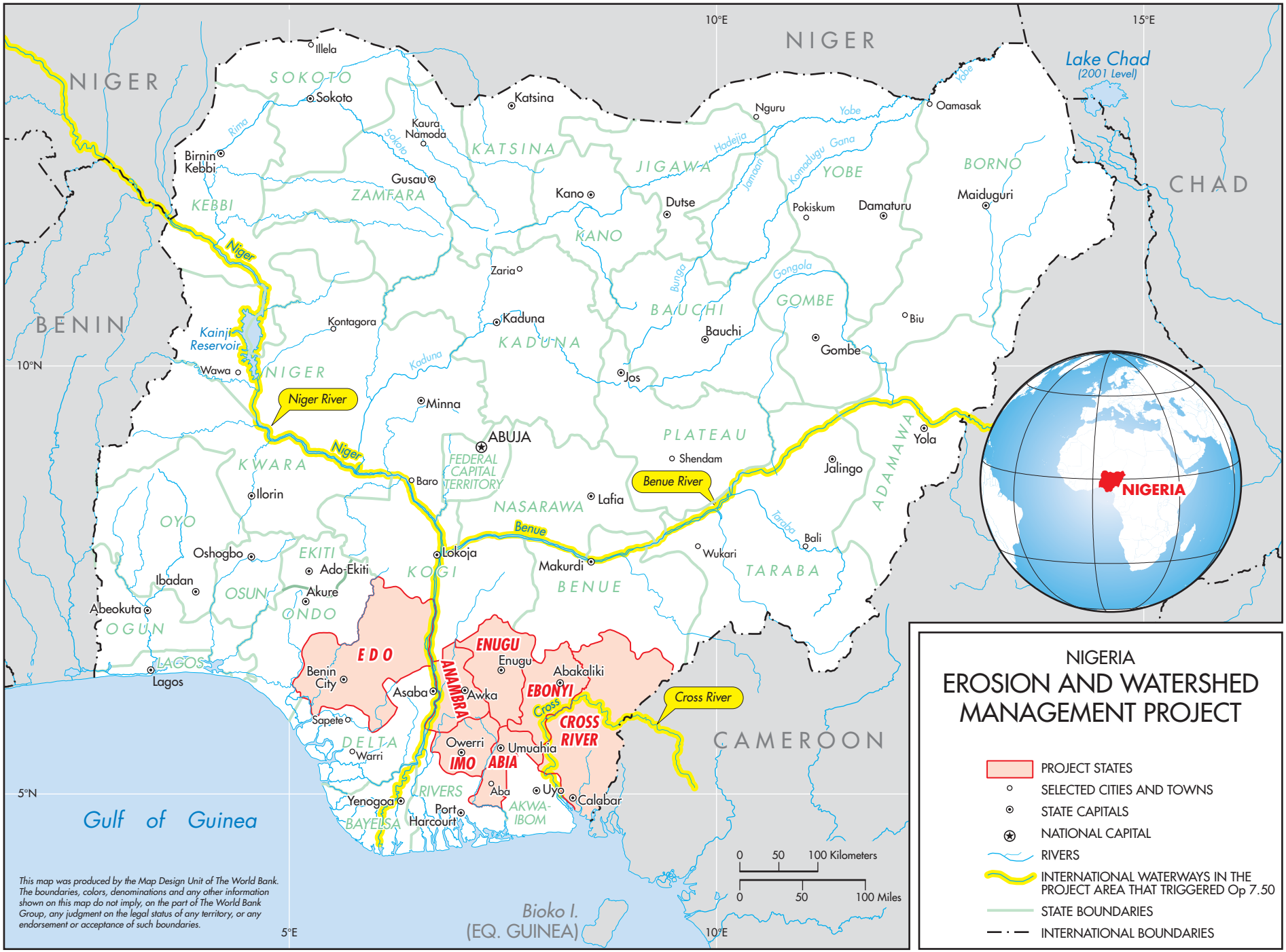


Net Aid Flows	1980	1990	2000	2009 [a]
(US$ millions)				
Net ODA and official aid	34	255	174	1,290
Top 3 donors (in 2007):				
United States	-1	22	33	364
European Commission	1	23	-8	91
Denmark	0	0	3	82
Aid (% of GNI)	0.1	1.0	0.4	0.7
Aid per capita (US$)	0	3	1	9



Long-Term Economic Trends					1980–90	1990–2000	2000–09
					(average annual growth %)		
Consumer prices (annual % change)	10.0	7.4	6.9	12.4			
GDP implicit deflator (annual % change)	12.4	7.2	38.2	-0.6			
Exchange rate (annual average, local per US$)	0.8	9.2	101.7	148.9			
Terms of trade index (2000 = 100)	165	87	100	*155*			
Population, mid-year (millions)	74.5	97.3	124.8	154.7	2.7	2.5	2.4
GDP (US$ millions)	64,202	28,472	45,984	173,004	1.6	2.5	6.6
		(% of GDP)					
Agriculture	..	..	*48.6*	*32.7*	..	..	*7.0*
Industry	..	..	*30.5*	*40.7*	..	..	*3.8*
Manufacturing	..	..	*3.4*	*2.6*	..	..	..
Services	..	..	*20.9*	*26.6*	..	..	*14.4*
Household final consumption expenditure	..	..	..	..	..	..	..
General gov't final consumption expenditure	..	..	..	..	..	..	..
Gross capital formation	..	..	..	..	..	..	..
Exports of goods and services	29.4	43.4	54.0	35.9	..	..	..
Imports of goods and services	19.2	28.8	32.0	27.2	..	..	..
Gross savings	..	..	..	..			

Note: Figures in italics are for years other than those specified. 2009 data are preliminary. .. indicates data are not available.
a. Aid data are for 2008.
Development Economics, Development Data Group (DECDG).


NIGERIA
EROSION AND WATERSHED MANAGEMENT PROJECT
PROJECT STATES
SELECTED CITIES AND TOWNS
STATE CAPITALS
NATIONAL CAPITAL
RIVERS
INTERNATIONAL WATERWAYS IN THE PROJECT AREA THAT TRIGGERED Op 7.50
STATE BOUNDARIES
INTERNATIONAL BOUNDARIES
NIGER
CHAD
BENIN
CAMEROON
Gulf of Guinea
Bioko I. (EQ. GUINEA)
Lake Chad (2001 Level)
Kainji Reservoir
Niger River
Benue River
Cross River
Niger
Benue
Yobe
Cross
SOKOTO
KEBBI
ZAMFARA
KATSINA
KANO
JIGAWA
YOBE
BORNO
KWARA
KADUNA
BAUCHI
GOMBE
ADAMAWA
FEDERAL CAPITAL TERRITORY
NASARAWA
PLATEAU
BENUE
TARABA
KOGI
OYO
EKITI
OSUN
ONDO
OGUN
LAGOS
DELTA
RIVERS
BAYELSA
AKWA-IBOM
ABIA
IMO
ANAMBRA
ENUGU
EBONYI
CROSS RIVER
EDO
Illela
Sokoto
Birnin Kebbi
Kaura Namoda
Gusau
Katsina
Kano
Dutse
Nguru
Oamasak
Pokiskum
Damaturu
Maiduguri
Zaria
Kaduna
Kontagora
Wawa
Bauchi
Gombe
Biu
Jos
Minna
ABUJA
Shendam
Yola
Jalingo
Baro
Lafia
Ilorin
Bali
Wukari
Makurdi
Lokoja
Oshogbo
Ado-Ekiti
Akure
Ibadan
Abeokuta
Lagos
Benin City
Asaba
Awka
Enugu
Abakaliki
Sapete
Warri
Owerri
Umuahia
Aba
Uyo
Calabar
Yenogoa
Port Harcourt
NIGERIA
10°E
15°E
10°N
5°N
5°E
0 50 100 Kilometers
0 50 100 Miles
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