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INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL CREDIT
IN THE AMOUNT OF SDR 208.7 MILLION
(US\$300 MILLION EQUIVALENT)

AND A PROPOSED SCALE-UP FACILITY ADDITIONAL CREDIT
IN THE AMOUNT OF US\$100 MILLION

TO THE

FEDERAL REPUBLIC OF NIGERIA

FOR THE

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT (NEWMAP)
May 31, 2018

Environment & Natural Resources Global Practice
Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective April 30, 2018)

Currency Unit = Nigeria naira

NGN 305 = US\$1

US\$ 1 = SDR 0.695

FISCAL YEAR

January 1 - December 31

Regional Vice President: Makhtar Diop

Country Director: Rachid Benmessaoud

Senior Global Practice Director: Karin Erika Kemper

Practice Manager: Benoit Bosquet

Task Team Leader(s): Amos Abu, Ruth Jane Kennedy-Walker, Grant Milne

ABBREVIATIONS AND ACRONYMS

| | |
|--------|---|
| AF | Additional Financing |
| ARAP | Abbreviated Resettlement Action Plan |
| CBA | Cost-Benefit Analysis |
| EIA | Environmental Impact Assessment |
| ESMF | Environmental and Social Management Framework |
| ESMP | Environmental and Social Management Plan |
| FEDQCF | Federal Quality Control Firm |
| FM | Financial Management |
| GBV | Gender Based Violence |
| GEF | Global Environment Facility |
| GIS | Geographic Information System |
| GRM | Grievance Redress Mechanism |
| GRS | Grievance Redress Service |
| IDA | International Development Association |
| IRR | Internal Rate of Return |
| ISR | Implementation Status and Results Report |
| MTR | Mid-Term Review |
| NARSDA | Nigeria Space Research and Development Agency |
| NDC | Nationally Determined Contribution |
| NEWMAP | Nigeria Erosion and Watershed Management Project |
| NPV | Net Present Value |
| PDO | Project Development Objective |
| PLR | Performance and Learning Review |
| PMU | Project Management Unit |
| PPSD | Project Procurement Strategy for Development |
| RAP | Resettlement Action Plan |
| RPF | Resettlement Policy Framework |
| SCCF | Special Climate Change Fund |
| SEA | Sexual Exploitation and Abuse |
| STEP | Systematic Tracking and Exchanges in Procurement |
| SUF | Scale-up Facility (reference to IDA 18 Scale-up Facility) |
| UNILAG | University of Lagos |



BASIC INFORMATION – PARENT (Nigeria Erosion and Watershed Management Project - P124905)

| | | | | |
|-----------------------|--|----------------------------|------------------------|---|
| Country Nigeria | Product Line IBRD/IDA | Team Leader(s) Amos Abu | | |
| Project ID P124905 | Financing Instrument Investment Project Financing | Resp CC GEN07 (9268) | Req CC AFCW2 (6548) | Practice Area (Lead) Environment & Natural Resources |

Implementing Agency: Federal Project Implementing Unit, Federal Ministry of Environment

| | |
|--|--|
| Is this a regionally tagged project? No | |
|--|--|

| |
|----------------------------------|
| Bank/IFC Collaboration No |
|----------------------------------|

| | | | |
|--|-----------------------------|---|--|
| Approval Date 08-May-2012 | Closing Date 30-Jun-2020 | Original Environmental Assessment Category Full Assessment (A) | Current EA Category Full Assessment (A) |
| <input type="checkbox"/> Situations of Urgent Need or Capacity Constraints | | <input type="checkbox"/> Financial Intermediaries (FI) | |
| <input type="checkbox"/> Series of Projects (SOP) | | <input type="checkbox"/> Project-Based Guarantees | |

Development Objective(s)

To reduce vulnerability to soil erosion in targeted sub-watersheds.

Ratings (from Parent ISR)

| | | |
|--|-----------------------|-------------------|
| | Implementation | Latest ISR |
|--|-----------------------|-------------------|



| | 07-Dec-2015 | 17-Jun-2016 | 26-Dec-2016 | 25-Jun-2017 | 26-Dec-2017 | 27-Apr-2018 |
|--------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Progress towards achievement of PDO | MS | MS | S | S | S | S |
| Overall Implementation Progress (IP) | MS | MU | MS | S | S | S |
| Overall Safeguards Rating | MS | MS | MS | MS | MS | MS |
| Overall Risk | H | H | H | H | H | H |

BASIC INFORMATION – ADDITIONAL FINANCING (Nigeria Erosion and Watershed Management Project (NEWMAP) - Additional Financing - P164082)

| | | | |
|--|--|---|---|
| Project ID P164082 | Project Name Nigeria Erosion and Watershed Management Project (NEWMAP) - Additional Financing | Additional Financing Type Restructuring, Scale Up | Urgent Need or Capacity Constraints No |
| Financing instrument Investment Project Financing | Product line IBRD/IDA | Approval Date 21-Jun-2018 | |
| Projected Date of Full Disbursement 30-Oct-2021 | Bank/IFC Collaboration No | | |
| Is this a regionally tagged project? No | | | |
| <input type="checkbox"/> Situations of Urgent Need or Capacity Constraints | | <input type="checkbox"/> Financial Intermediaries (FI) | |
| <input type="checkbox"/> Series of Projects (SOP) | | <input type="checkbox"/> Project-Based Guarantees | |
| <input type="checkbox"/> Disbursement-linked Indicators (DLIs) | | <input type="checkbox"/> Contingent Emergency Response Component (CERC) | |



[] Alternative Procurement Arrangements (APA)

Disbursement Summary (from Parent ISR)

| Source of Funds | Net Commitments | Total Disbursed | Remaining Balance | Disbursed |
|-----------------|-----------------|-----------------|-------------------|-----------|
| IBRD | | | | % |
| IDA | 500.00 | 349.54 | 101.79 | 77 % |
| Grants | 8.59 | 4.18 | 4.41 | 49 % |

PROJECT FINANCING DATA – ADDITIONAL FINANCING (Nigeria Erosion and Watershed Management Project (NEWMAP) - Additional Financing - P164082)

FINANCING DATA (US\$, Millions)

SUMMARY

| | |
|---------------------------|--------|
| Total Project Cost | 400.00 |
| Total Financing | 400.00 |
| of which IBRD/IDA | 400.00 |
| Financing Gap | 0.00 |

DETAILS

World Bank Group Financing

| | |
|---|--------|
| International Development Association (IDA) | 400.00 |
| IDA Credit | 400.00 |

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?



Yes No

Does the project require any other Policy waiver(s)?

Yes No

INSTITUTIONAL DATA

Practice Area (Lead)

Environment & Natural Resources

Contributing Practice Areas

Agriculture
Transport & Digital Development
Social, Urban, Rural and Resilience Global Practice
Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

No

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

No

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

No

PROJECT TEAM

Bank Staff

| Name | Role | Specialization | Unit |
|----------|-------------------|------------------|-------|
| Amos Abu | Team Leader (ADM) | Natural Resource | GEN07 |



| | Responsible) | Management | |
|------------------------------|--|------------------------------|-------|
| Grant Milne | Team Leader | Natural Resource Management | GFA12 |
| Ruth Jane Kennedy-Walker | Team Leader | Civil Engineer | GWA01 |
| Adebayo Adeniyi | Procurement Specialist (ADM Responsible) | Procurement | GGOPA |
| Bayo Awosemusi | Procurement Specialist | Procurement | GGOPA |
| Oyewole Oluyemi Afuye | Procurement Specialist | Procurement | GGOPA |
| Akinrinmola Oyenuga Akinyele | Financial Management Specialist | Financial Management | GGOAS |
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| Asha Nequia Johnson | Team Member | Operations | GEN07 |
| Chukwudi H. Okafor | Social Safeguards Specialist | Social Development | GSU20 |
| Emmanuel Ngollo | Environmental Safeguards Specialist | Environment | GEN07 |
| Faly Diallo | Team Member | WFALA | WFACS |
| George Ferreira Da Silva | Team Member | Finance Officer | WFACS |
| Georges Comair | Team Member | Civil Engineer | GWA07 |
| Jayne Angela Kwengwere | Team Member | Administration, Team Support | GEN07 |
| Joy Iganya Agene | Team Member | Geospatial Specialist | GFA12 |
| Joyce Chukwuma-Nwachukwu | Team Member | Procurement | AFCW2 |
| Maria Sarraf | Team Member | Economist | GEN07 |
| Mei Wang | Team Member | Country Lawyer | LEGAM |
| Mugambi Mugisha Mwendia | Team Member | Disbursement | WFACS |
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| Regina Uchenna Okonkwo | Team Member | Administration, Team Support | AFCW2 |
| Renganaden Soopramanien | Team Member | Lawyer | LEGAM |



| | | | |
|----------------------|--------------|--|-----------------|
| Sandra M Kuwaza | Team Member | Disbursement | WFACS |
| Sheu Salau | Team Member | Agriculture Specialist | GFA01 |
| Stephen D. Mink | Team Member | Climate Change | GWA05 |
| Susan Anne Harding | Team Member | Leadership | GGOAS |
| Toshihiro Sonoda | Team Member | Senior Disaster Risk Management Specialist | GEN07 |
| Extended Team | | | |
| Name | Title | Organization | Location |



NIGERIA

NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT (NEWMAP) - ADDITIONAL FINANCING

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I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

1. The proposed Additional Financing (AF) in the amount of US\$400 million, equivalent to SDR amount of 208.7 million (US\$300 million from IDA 18 and \$100 million from IDA 18 Scale-up Facility) for the Nigeria Erosion and Watershed Management Project (NEWMAP) seeks to scale up successful gully restoration and watershed management activities and add new activities that have emerged from implementation experience, global commitments, and country initiatives. The AF's closing date is June 30, 2021 and the parent project's closing date will be extended by one year to coincide with that. There will be a change in the results framework and the triggering of safeguard policies¹ as a result of the AF.

2. The project development objective (PDO) is "to reduce vulnerability to soil erosion in targeted sub-watersheds." NEWMAP is making significant progress in tackling land degradation and major gully erosion in Nigeria and has succeeded where earlier initiatives had failed, by adopting innovative, integrated approaches based on community participation. For the first time in Nigeria, NEWMAP introduced a holistic watershed management approach linking poverty alleviation with maintaining sustainable ecosystems and better disaster risk management. Blending physical and vegetative technologies has saved money, significantly reduced soil erosion, improved surface water availability over a longer period, and allowed for better percolation of rainwater into the soil. Above all, the integrated approach has improved, and even saved in some cases, the lives of people at risk living near existing gullies. The project's participatory approach and alternative livelihood activities have helped communities and policymakers see the value of an integrated approach. NEWMAP is currently working in seven states (referred to as tier 1 states) which have been participating in the project from the start (Anambra, Abia, Cross River, Ebonyi, Edo, Enugu, and Imo). An additional 12 states (referred to as tier 2 states) joined the project at a later stage during implementation (Akwa Ibom, Borno, Delta, Gombe, Kano, Katsina, Kogi, Nasarawa, Niger, Oyo, Plateau and Sokoto). See the project map in Annex 1.

3. **Component 1: Erosion and Watershed Management Infrastructure Investments** (Original US\$354.27 million-equivalent International Development Association (IDA), Global Environment Facility (GEF), and Special Climate Change Fund (SCCF)). This component supports on-the-ground interventions to restore major, high-risk gully systems and reduce vulnerability to further land degradation. The primary focus has been on addressing gully erosion and watershed management in Southeastern Nigeria while Northern states are developing their site intervention approaches and designs.

4. **Component 2: Erosion and Watershed Management Institutions and Information Services** (Original US\$34.90 million-equivalent IDA and SCCF). The objective is to strengthen the enabling environment and investment planning and readiness for effective implementation of erosion and watershed management. The component supports all three levels of government (federal, state and local) and the private sector, but with a special focus on states. The federal level serves primarily as facilitator, regulator, monitor, bench-marker, information broker, and aggregator.

5. **Component 3: Climate Change Response** (Original US\$26.37 million-equivalent IDA). 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 governments to become better equipped to respond to climate change; and on supporting demonstration projects to test the viability

¹ See Section F in the Appraisal Summary for further explanation on environmental safeguards.



and scaling-up potential of low-carbon development options. The parent project Mid-Term Review (MTR) in January 2016 recommended a Level 2 Restructuring so that the climate change response activities financed by the component would focus more on adaptation to climate change and extreme weather events in Nigeria. Accordingly, the restructuring limited activities dedicated to climate change mitigation to US\$12.6 million under Component 3B, from the US\$25 million that was originally allocated. The balance of US\$12.4 million was reallocated to implement approved designs for gully interventions in both existing tier 1 and tier 2 states, and for interventions to manage soil degradation in the dry and semi-arid landscapes of the tier 2 states; investment to strengthen the Environmental Impact Assessment (EIA) review functions of the federal government; and activities to include institutional capacity building to support the government of Nigeria to implement its framework for climate action—the Nationally Determined Contribution (NDC)—to mobilize financial resources for climate action priorities, including the issuance of green bonds.

6. **Component 4: Project Management** (Original US\$ 92.01 million-equivalent IDA). The component supports: (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 Monitoring & Evaluation, including two MTRs envisaged in the PAD (completed January 2016 and December 2017); and (e) impact evaluation (baseline completed).

7. The project is performing well and has made substantial progress in delivering results. Progress against the PDO is significant and both the DO and Implementation Progress ratings have been moderately satisfactory or higher since December 2016. Despite initial delays in the project’s effectiveness, disbursements are catching up with the original schedule. The project is in compliance with legal covenants and there are no outstanding fiduciary issues.

8. Appreciable progress has been made with key actions identified in the December 2017 MTR² across all four components:

- a. Component 1 implementation is Satisfactory, reflecting the significant improvement in state performance with the initial 21 sites under construction and the contract awarded for eight additional sites. A total of 55 detailed designs have been granted no-objection by the World Bank. The rating also reflects the initiation of catchment management planning in tier 1 states and progress with the livelihood activities.
- b. Component 2 implementation is Satisfactory. Major highlights include the installation of 19 meteorological stations and installation of 15 Hydro-Met Stations. Capacity building has been carried out for 25 staff on the installation, operation, and maintenance of the meteorological stations, and six early warning systems.
- c. Component 3 implementation is Satisfactory. Progress includes piloting three fuel-efficient bakery ovens in three local government areas in Jigawa state, and clean and efficient cook stoves in seven NEWMAP states. Several important studies were completed, e.g., a detailed feasibility report that provides clear guidelines and investment opportunities for solar renewable energy in

² During the design of the parent project, it was decided to have 2 MTRs given the duration of the project. One has taken place in February 2016 and the other in December 2017.



Nigeria. Other examples are the strengthening and upgrading of the central server of the Nigerian Meteorological Agency (including the provision of equipment and training); the preparation and submission of Nigeria's Nationally Appropriate Mitigation Action (NAMA); and, support for the issuance of the first-ever green bond in Africa in December 2017, and the second one in a developing country.

- d. Component 4 implementation is Moderately Satisfactory. While project implementation is largely done by the participating states, the Federal Project Management Unit plays a critical overall management and coordinating role. Implementation and institutional issues related to component 4 are outlined in the project appraisal section below.

9. There is huge demand by the federal and state governments for the scaling up of NEWMAP, as indicated in the official letter from the government requesting the Additional Financing from IDA. The opportunity for scaling up exists along two dimensions. First, gully remediation and watershed management interventions undertaken by tier 1 states in NEWMAP have demonstrated proof of concept, which has spurred state-level technical preparation for additional sites and requests for additional finance. Technical designs for a total of 55 sites have received World Bank no-objection and the preparation of bidding documents and calls for bids for a couple of these designs have been launched. A preliminary inventory conducted under NEWMAP identified 6,000 sites with land degradation in Nigeria, including both gully erosion and degradation of drylands, a number far beyond what single-project resources could address. Second, the demand for NEWMAP intervention comes from a broader geographical area. Whereas tier 1 states were mostly in the Southeast part of the country, tier 2 states cover a broader geographical spread.

II. DESCRIPTION OF ADDITIONAL FINANCING

10. The AF in the amount of US\$400 million (US\$300 million from IDA 18 and US\$100 million from the IDA 18 Scale-up Facility) will be used to scale up the financing of investments in gully rapid action and slope stabilization³, integrated watershed management, and supporting livelihoods consistent with sustainable land management practices. Activities that strengthen technical and coordination capacities of relevant federal, state, and local government agencies involved in planning, management, assessment, enforcement, and monitoring of watershed and erosion-related activities and disaster risk management will also continue to be supported. The AF will also continue to provide tools and approaches for governments to become better equipped to adapt to climate change with a secondary focus on mitigation activities such as demonstration projects to test the viability and scaling-up potential of low-carbon development options. The AF will build the capacity of tier 2 state PMUs to make them fully operational. It will also explore ways to supplement and support the capacities of the state and federal PMUs. Part of the AF will be used to analyze and develop opportunities for future watershed and landscape management support, including in the northern states. For example, such needs could relate to flooding, dam rehabilitation and environmental degradation in dry and semi-arid lands in northern Nigeria.

11. **The Additional Financing is in alignment with the objectives and priorities of the IDA 18 Scale-up Facility (SUF).** These include: i) the scaling-up of a well-tested approach in gully rehabilitation with demonstrated results in 21 sites to additional sites; ii) the adoption of innovative, integrated and transformational approaches to watershed management that blend physical and vegetative technologies

³ This relates to actions used to stabilize and rehabilitate majorly eroded sites and using both structural and vegetative measures.



with the close involvement of communities; iii) the promotion of disaster risk management awareness activities, given Nigeria's high vulnerability to climate change; iv) the promotion of low-carbon initiatives; v) the provision of opportunities for private sector financing in areas such as landscape bioremediation and solid waste management practices; and vi) the provision of 100% climate co-benefits.

12. The proposed activities are consistent with the Country Partnership Strategy (CPS) (FY14-17) as revised through two Performance and Learning Reviews (PLRs). The first PLR (report number 103616 of August 2016) did not extend the CPS. The second will extend it until 2019 and has a Board date of June 27, 2018. The proposed project will directly contribute to enhance Nigeria's resilience to current and future climate variability (one of the three focus areas of the CPS's First Strategic Cluster). The project will further enhance Nigeria's preparedness to respond to natural hazards and climate risks by mitigating and gradually preventing erosion. The project will contribute to achieving the Resilience to Shocks pillar (pillar 3) of the *World Bank's Africa Operational Framework for Growth and Poverty Reduction (2018)*. The project is also aligned with the Africa Climate Business Plan's priorities to create climate-resilient landscapes and promoting integrated watershed management. Specifically, the proposed activities will be added to the four components of the parent NEWMAP project, as follows:

13. **Component 1: Erosion and Watershed Management Infrastructure Investments.** Approximately 76 percent (US\$304 million equivalent) of the AF will be allocated to this component. Activities will be scaled up in the three existing areas of i) gully rapid action and slope stabilization; ii) integrated watershed management; and iii) supporting livelihoods consistent with sustainable land management such as establishment of woodlots, nurseries for plants, taking care of rehabilitated land, and small agribusinesses. The AF will only focus on investments in sites with watershed management issues (erosion and flooding-related risks) similar to those tackled by the parent project, as approaches to these types of risks have been proven through the parent project to date. The Northern states generally face different kinds of watershed management issues, which call for different interventions, due to the different climatic zones, soil characteristics, land use, topography, and precipitation. Therefore, activities that will be financed by the AF in Northern Nigeria will be limited to preparatory technical work.

14. A prioritization exercise was conducted to select high-priority sites for financing in each state (more detail is available in Annex 2). The criteria used in this exercise were designed to prioritize sites based on the severity of the problem. The approach was validated at a stakeholder workshop held in August 2017. The final selection of sites will be done in the early stages of the AF implementation. It should be noted that i) some of the sites may be funded using federal or state-level government funding, and ii) states that have not provided counterpart funding will not be eligible for additional financing.

15. Nigeria's landscapes vary widely due to different climatic zones, soil characteristics, land use, topography, and precipitation. Interventions to enhance landscape and watershed management differ accordingly. This AF will therefore fund preparatory work for future watershed and landscape management responding to a broader range of needs than those already addressed by NEWMAP. The focus will extend beyond gully erosion and flooding and include other forms of watershed management risks that compromise the natural resource base and associated livelihoods at a landscape scale. For example, interventions could include reforestation, construction and/or rehabilitation of small dams and reservoirs for irrigation and water storage, and soil conservation, where appropriate.



16. **Component 2: Erosion and Watershed Management Institutions and Information Services.** Approximately 10 percent (US\$40 million equivalent) of the AF will be allocated to this component. The AF will continue to strengthen the technical and coordination capacities of ministries, departments and agencies (MDAs) affiliated with NEWMAP. It will also finance new activities including support for national centers of excellence in erosion control, landscape management and environmental assessment; erosion risk mapping; enhancing climate readiness work and environmental impact assessment (EIA) capacities; facilitating completion of guidelines for road construction to reduce gully erosion; and addressing solid waste management in restored gullies in NEWMAP intervention catchment areas to ensure the investments are functioning to their design capacity and to prevent new gullies from forming as a result. The implementation of this technical assistance shall be consistent with the objectives and guidelines of the Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF). Details concerning each of these activities are presented below.

17. This component will support the development of improved erosion risk mapping for Nigeria to support more detailed planning at a sub-state level. The financing will allow the development of a new decision support tool using Geographical Information System (GIS) to help government and states identify risks for future gully formation. An erosion map of Nigeria using satellite data will be created. This erosion map can be very helpful in planning future erosion control work and other infrastructure projects, as well as in urban planning.

18. Investment to strengthen the EIA review functions of the government will also be provided within this component through training of MDA technical departments responsible for such reviews and the enhancement of quality control of such reviews through the mobilization of specialized technical expertise. The strengthening of EIA review capacity will be undertaken with the leadership of the Federal Ministry of Environment.

19. If road cut and fill slopes⁴ are not revegetated after road construction, gullies may form on both sides of the road. Inadequate drainage systems for roads (small number of culverts, insufficient capacity of road ditches, etc.) are also major cause of gully erosion.⁵ This component will include analysis, recommendations and piloting of measures to reduce road-related gully erosions in Nigeria. The outputs of this work will be: i) a diagnostic of key climate-related vulnerabilities caused by roads in Nigeria, explicitly identifying the different vulnerabilities faced between the North and South regions of the country; ii) the formulation of a guidance note to increase climate resilience through improved road design, construction, operation and maintenance practices. This guidance note will complement and update existing road standards in Nigeria; iii) development of a decision support tool to help sub-national governments identify urban and peri-urban areas that are at risk of gully formation from road service runoff; and iv) identification of solutions, potential investments and priority areas for intervention that will reduce road related gully erosion. The AF will not support physical interventions (e.g., road construction and rehabilitation) in component 2. The work will be conducted in close collaboration with colleagues from the Transport & Digital Development Global Practice and the Ministry of Works at federal and state levels. This component will enable the Ministry of Works to pilot and then gradually scale up measures that will reduce road-related gully erosion.

⁴ Cut and fill is a process of constructing roads, whereby ground material (e.g. soil/rock) from an elevated landscape is cut out to make way for the route of the road or fill is used to create embankments where required.

⁵ FAO, 1986 Watershed Management Field Manual: Gully Control.



20. Further, component 2 will look to address the ongoing problem of solid waste that has major implications on the sustainability of civil works due to clogging of drainage channels. Many of the project sites are located in heavily urbanized, rapidly growing areas or towns where poorly managed volumes of solid waste are increasingly generated. Whilst NEWMAP is not a solid waste management project, the issue of poor solid waste management needs to be addressed as it has a direct impact on the sustainability of project investments. The AF will build on the baseline data collected as part of the impact evaluation completed in November 2017 that identified improper solid waste management behaviors in NEWMAP host communities. The component will build on these data to design and implement behavioral change and social marketing campaigns to reduce improper solid waste management and dumping in areas of intervention and build technical capacity within the PMU. The AF will not support physical interventions (e.g., construction of disposal, reuse, or recycling infrastructure) in component 2.

21. In addition, a new sub-component (2E) will extend the capacity-building focus to activities involving national centers of excellence to provide training and other human resource development in the areas of erosion control, landscape management, and EIA. Specific support from two to three national institutions such as universities or research agencies will be mobilized, building on the existing agreements between NEWMAP and the Federal University of Technology Owerri, in addition to cooperation with research institutions in Nigeria⁶ and other technical universities which have extensively studied and written about soil erosion and gully formation in the country. This subcomponent will develop and foster collaboration with and between centers of excellence in Nigeria that will support environmental and social safeguards risks.⁷ Further institutional strengthening will link to activities already underway outside of the project with the Africa Centers of Excellence Regional Program and the South-South Knowledge Exchange Program involving Nigeria, China, and India.

22. **Component 3: Climate Change Response.** Approximately 6 percent (US\$24 million equivalent) of the AF will be allocated to this component to provide tools and approaches for government to become better equipped to adapt to climate change. A secondary focus will be on mitigation activities such as demonstration projects to test the viability and scaling-up potential of low-carbon development options. The AF will enable the component to expand support for technical assistance to advance preparation and initiation of activities identified under Nigeria's Nationally Determined Contribution (NDC) to the Paris Agreement on climate change and for the issuance, deployment, and monitoring of green bonds.⁸

23. Subsequent activities supported by the AF will include: institutional capacity building to prioritize investments identified under the NDC (including defining project eligibility criteria, establish a project selection process, and establish a reporting process).

24. **Component 4: Project Management.** Approximately 8 percent (US\$32 million equivalent) of the AF will be allocated to this component. There needs to be substantial scale-up with the establishment and operation of state PMUs beyond the initial seven states to the additional 12. Project management capacity will be expanded to supplement and support the capacities of the state and federal PMUs.

⁶ Such as: Alo-Terra Development Initiative in Imo State and Azikiwe University, and others.

⁷ Such as: (i) University of Lagos, (ii) University of Ibadan, (iii) Ahmadu-Bello University and other technical universities which have extensively studied and written about EIA, SESA, GIS, RS, Involuntary Resettlement, and land issues in Nigeria.

⁸ The project already supported the issuance of Nigeria's first green bond in December 2017.



25. The project results framework has been updated to reflect additional activities and define revised targets based on the additional financing. The changes are indicated in Annex 3. A project cost table with clear indication of what is financed under the parent project, AF and the overall project is detailed in Annex 4.

Private Sector Participation

26. Opportunities for the private sector to participate and contribute to project objectives have become apparent during project implementation and will be leveraged further as part of AF. For instance, solid waste dumping has persisted and negatively affects the effectiveness of gully remediation. Private sector mobilization for municipal solid waste collection and management is an available remedy. While it is not proposed that the AF finance solid waste management interventions, it can assist municipal governments in designing effective interventions.

27. Opportunities for co-financing by other organizations will also be leveraged further as part of the AF. A formal roundtable, with potential funding partners such as Ecological Fund (agency under the Nigerian presidency), European Investment Bank, Islamic Development Bank, African Development Bank, and Japan International Cooperation Agency will be organized in calendar year 2018. The mobilization and leveraging of other resources to support component 2 is especially important, to ensure an integrated approach between roads, watershed management and solid waste for the sustainability of the project's approach.

Sustainability and Exit Strategy

28. NEWMAP is structured around a phased implementation approach. The Bank will determine whether a state has met the criteria for graduating out of the project. A state will graduate from NEWMAP support when one of the following has been achieved: i) ten (10) intervention sites completed; ii) disbursement per State equivalent to 20% of the total project envelope (parent project and additional financing). Criteria for graduating out of the project will be further clarified in the revised PIM; iii) the state has accumulated sufficient capacity to intervene in gully remediation; or iv) the state Government has formally requested phasing out of the program. Phasing out of states will focus primarily on ending eligibility for project finance for physical investments, while all states will remain eligible for training and support services provided by the federal PMU. Phasing out of states will likely only apply to the project's tier 1 states in the anticipated time frame of the AF.

III. KEY RISKS

29. The overall risk to achieving the development objective is High.

30. The political and governance risk is substantial. Strong political and agency support exists for NEWMAP at federal and targeted state levels, evidenced by the rising demand from states to join the project. A phased approach has been used to enable tier 2 states to access some level of funding to build capacities, and develop catchment plans and gully restoration designs. The risk of corruption and fraud remains high and will continue to be mitigated by supporting the procurement, financial management, and oversight systems, building on the successful lessons in the earlier project states. The project has created a reasonably strong communication and consultation approach with communities to allow for



meaningful involvement of various stakeholders, beneficiary verification, and use of local civil society organizations. The security situation in some parts of the country has raised challenges for implementation in specific states. The project's use of a phased approach allows flexibility to move implementation to other sites should an area become too difficult to work in for short periods, and then reengaging when things stabilize. The project team and the CMU will continue to engage with the government to closely monitor the fluctuating security situation.

31. The macroeconomic risk is high as the country is facing fiscal constraints. The Nigerian economy emerged from recession with GDP growth of 0.8 percent in 2017. The recovery was driven by higher oil prices and production. Agriculture and non-oil industry grew by 3.4 percent and 0.6 percent, respectively. However, services, which account for over half of GDP, continued to contract (-0.9 percent). The recovery is expected to be slow, largely oil driven, and thus susceptible to oil production disruptions and oil price shocks. Fiscal sector outcomes will be subject to considerable uncertainty and the need for fiscal adjustment at all levels of Government remains. This might affect the ability of the government to pay their envisaged counterpart funds that are used for payment of involuntary resettlement and land acquisition. If this macroeconomic risk materializes, there might be delays in project implementation as civil works cannot commence until the compensation owed to Project Affected Persons is paid.

32. The sector strategies and policies risk is moderate. The project is implemented across several MDAs at the national and state levels, creating the risk for overlapping mandates or gaps in mandates. This issue has largely been addressed during the implementation to date by clarifying roles and responsibilities of agencies assigned to lead specific component, sub-components, and activities. This process will continue with the additional states as they engage with the project. Similar risks apply to working with the Ministry of public works on the road agenda. The same approach will be used whereby the team (long-standing transport specialists) will work closely with federal and respective state Ministry of Public Works to embed the technical assistance/pilots into their work. Significant levels of technical assistance for capacity building and support continue to be offered by the Bank and the Federal Quality Control Firm (FEDQCF) to the federal and state PMUs and other project stakeholders at federal, state, and local levels.

33. The risk related to the technical design of the project is moderate. Gully restoration under NEWMAP is now a well-tested approach with demonstrated results in 21 sites across the tier 1 states. A broader catchment management approach is now being implemented after substantial training and the development of high quality watershed plans for sites in the tier 1 states. The fact that a proven methodology exists allows tier 2 states to shorten their learning curve by adopting best practices and seeing success stories from the tier 1 states. However, given the emergency nature of rapid gully formation, the lack of consistent design standards for gully rehabilitation will continue to exacerbate the menace of gully erosion in Nigeria. The standards that will be developed as part of the AF will aim to reduce gully erosion from roads.

34. The risk of institutional capacity for implementation and sustainability is substantial. The project continues to improve the capacity of state and federal implementing agencies for technical support and coordination. The project is also providing quality technical assistance for civil works design (through the FEDQCF) and appraisal support, continuous learning from past and ongoing interventions, and deeper community and state involvement. At the MTR of December 2017, the Steering and Technical Committee members expressed their concern on the issues of i) inadequate implementation support mission to states



by the Federal PMU, including the unavailability of the full pool of technical experts at the federal level, as was envisaged in the institutional arrangement of the project; and ii) delays in the payment of the counterpart funds by the federal government of Nigeria. With the acceleration of physical interventions in tier 2 states, it is imperative that the Federal Ministry of Finance and the Federal Ministry of Environment design efficient and effective mechanisms for supervision, quality enhancement and coordination. In parallel, the project will continue to support institutional capacity at state and community levels using tested training programs and materials. To this end, the Federal Project Management Unit will establish and retain an advisory pool of experts by November 30, 2018 and put in place a system that will strengthen the supervisory function of the state PMUs by December 28, 2018.

35. The fiduciary risk is high. The NEWMAP operation has built effective procurement and financial management capability in the tier 1 states and in the national implementing agency. With the phased approach, project staff in newly established PMUs in tier 2 states lack familiarity with IDA procurement and financial management guidelines and procedures. The financial management functions for both the federal and state PMUs will continue to be provided by the Federal Project Financial Management Division and each participating state's Project Financial Management Unit. The procurement and financial management functions are provided by qualified and experienced staff or consultants who are competitively recruited, with an emphasis on candidates that have experience with Bank fiduciary requirements. The federal and state PMUs are supported as needed by procurement consultants. Tier 2 PMUs will receive procurement, financial management, and project management training prior to implementing the project and throughout implementation as needed. NEWMAP, being large and complex, includes several large contracts and numerous small or CDD-type contracts. As project implementation continues to advance, procurement-related complaints to the Task Team are likely to continue. The procurement capacity of state PMUs, especially in tier 2 states will be enhanced through the engagement of additional procurement consultants and continuous training of state PMU procurement officers. In addition, the Grievance Redress Mechanism (GRM) of the project will be strengthened to anticipate, receive and resolve complaints in a timely and satisfactory manner.

36. Environmental and social safeguard risks are high. There is very little physical investment experience yet in tier 2 states and, as more sites are selected, they will put pressure on human and institutional resources to deal with increasing demand. The ESMF and RPF for tier 1 states were updated and redisclosed to include the tier 2 states in country on November 30, 2017 and in the World Bank InfoShop on February 20, 2018. Thus far the project has cleared and disclosed 46 site-specific Environment and Social Management Plans (ESMPs) and 42 Resettlement Action Plans (RAPs). A total of 2018 Project affected persons have been resettled and paid; with a total compensation paid of NGN 865,079,353 to date. Thanks to frequent capacity-building training held during project execution or during international safeguard workshops, site monitoring for the implementation of ESMPs has improved. These actions have resulted in the improvement of the knowledge base of the safeguards staff in the PMUs. Many lessons have been learnt from the implementation of various ESMPs which are feeding into the preparation of new ones.

37. The project has a GRM⁹ that includes the use of log books to track complaints as well as toll-free

⁹ Project Affected Persons can request information about the project or lodge a complaint; from the site committee, community traditional leader, the state PMU and the federal PMU. At every point in the system the PAP is informed of his/her rights including the right to escalate to the next/ higher level or seek redress in a law court if not satisfied with the outcome.



lines to provide stakeholders easy access to the GRM. However, there have been situations in which complaints were directly sent to the Bank bypassing the GRM of the project. As a result, and following the MTR of December 2017, it was decided that an ombudsman should be engaged (by October 2018) to work at both federal and state levels to strengthen the project in proactively anticipating, preventing and resolving conflicts and grievances in a timely manner. The client has updated the ESMF and RPF and outlined steps which will be followed in preparing site specific safeguards instruments (ESIA, ESMP, EMP, RAP) when the locations of the project activities are determined during implementation, including a mechanism for anticipating, recording Gender Based Violence (GBV) related risks and escalating, when necessary.

38. Supervision missions and midterm-review reports confirmed that the project activities are: being carried out in accordance with the ESMPs and RAPs; and adhering to safeguards policies, principles and procedures, and taking responsibility for social and environmental due diligence (including proper internal reporting, monitoring, and documentation). Qualified environmental and social specialists have been recruited, trained, and are responsible for environmental and social risk management of the project activities and have demonstrated commitment to incorporating environmental and social issues into overall project implementation. The tier 2 states will need additional capacity-building in assessing and managing environment and social risks.

39. The stakeholder risk is substantial. The project is implementing a more holistic approach for catchment management and gully restoration that is centered on community participation in planning, implementation, and livelihood improvement. In some areas, there may be risks from weak multisectoral coordination, such as potential elite capture of project benefits and exclusion of some stakeholders, particularly underserved members of targeted communities. To mitigate these risks, the project has implemented strong communication measures to mobilize and inform local communities using a strong consultation and participation approach, with the support of competent civil society organizations, that enhances transparency in project-supported activities and safeguards operational steps. These measures will need to be adopted in tier 2 states. Furthermore, the project's GRM, which has been functioning moderately satisfactorily to date, is being strengthened through the recruitment of an ombudsman (see paragraph 37). During revision of the PIM, specific details of how the GRM can be further enhanced will be defined.

40. Other risks. The project is rated as being moderately exposed to exogenous climate risks.¹⁰ Nigeria has experienced climate and geophysical hazards in the past and is expected to experience these in the future with high intensity, frequency, and duration. Climate and geophysical hazards that are relevant to the project include extreme droughts which lead to a reduction in vegetation (both natural and project implemented), while extreme precipitation and floods cause high water volume and intensity, which may cause flash floods or landslides and possible inundation of erosion control structures. This may result in exacerbated land degradation and erosion risks. In this project, physical infrastructure (including flexible engineering structures and vegetative measures) in the selected intervention sites will channel and contain water runoff in a bid to halt land degradation and erosion. The project also involves various technical assistance and institutional capacity-strengthening activities designed to build resilience to

¹⁰ The task team has used the Bank's climate and disaster risk screening tool to screen the project for climate and disaster risks.



climate shocks.¹¹ Although these interventions are expected to improve the resilience of selected sites and the overall sector, the overall risk to the project outcomes is assessed as Moderate. The risks posed by climate change cannot be fully addressed within the project's remit.

41. The project was assessed to have 100 percent climate co-benefits. All three project components primarily have adaptation co-benefits, as they were considered adaptation measures against climate risks such as droughts, flooding, erosion, and land degradation. Under component 1, the project will implement erosion and watershed management infrastructure investments in 55 targeted sub-watersheds (including slope stabilization, planting of grasses and trees, construction of drainages, rehabilitation/reconnection of roads that were cut off by erosion and earthworks). Under component 2, adaptation measures include: the installation of 100 meteorological and Hydro-Met stations; the development of 38 participatory sub-watershed management plans that provide plans to mitigate against erosion in project affected sub-watersheds; the development of three city storm water master plans which are informed by climate projections of increased rainfall intensity and risk assessments; the development of EIA guidelines for targeted investment types that affect erosion (road cross drainage, urban water supply and drainage); the establishment of three National Centers of Excellence in erosion control; and, to support improved erosion risk mapping in all 19 participating states. Activities under component 3 that support adaptation co-benefits are: the production of seven technical reports/guidelines that promote low carbon development or that enhance climate resilience; and the implementation of ten climate adaptation/low carbon demonstration projects (e.g., fuel-efficient bakery ovens, clean and efficient cook stoves and solar mini grid projects in remote areas).

42. A small percentage of activities were also eligible for mitigation co-benefits under afforestation and reforestation, the promotion of low carbon development and biosphere conservation and support to national, regional, or local policy, through technical assistance or policy lending. Activities include: 400 ha of area under bioremediation in targeted sub watersheds (through planting of trees and grasses); feasibility studies for a large-scale grid-connected solar power plants; demonstration projects of off-grid, low-carbon technologies to provide electricity access in rural areas (e.g., piloting energy efficient clean cook stoves and a fuel efficient bakery ovens); development of a framework for adoption of Liquefied Petroleum Gas as a low carbon alternative to firewood as a fuel source; and replication of clean cook stove piloting to the tier 2 states. The project has also supported the government in developing its first green bond which will enable capital-raising and investment for new and existing projects with environmentally sustainable benefits, and that have the capacity to meet Nigeria's NDC targets of 20 percent emission reduction by 2030.

43. A greenhouse gas (GHG) accounting analysis found that the project will reduce GHG emissions. The net emission reductions of the project (both parent project and AF) are estimated at 79,561 tCO₂-eq over the 30-year life of the design life of infrastructure investments due to the afforestation activities related to the project. On average, the project is estimated to reduce net emissions by 2,411 tCO₂-eq annually.

IV. APPRAISAL SUMMARY

¹¹ These include: (i) preparation of watershed management plans, which would incorporate climate risks such as flood and drought; (ii) preparation of erosion risk maps; and (iii) assessment and preparation of plans to reduce impacts of road design, construction, and operation & maintenance on environmental degradation.



A. Economic and Financial Analysis

44. The economic analysis uses the traditional “with and without project” approach to assess the economic viability of IDA resources. This section justifies public sector provision and includes the results of the cost-benefit analysis (CBA) carried out for the additional financing. More information is found in Annex 5.

45. **Justification for public sector provision and Bank value-added.** Soil erosion is an externality exacerbated by market failure as there is currently no cost or penalty for actions leading to soil degradation (such as improper road and drainage construction, poor waste management practices, unsustainable land use practices, excess deforestation and, mining). Without an intervention, these market failures would continue to generate negative externalities to the environment and to the population living nearby (causing landslides, flooding, loss of life, and damage to livelihoods). The private sector alone has no incentive to resolve the problem and, given the high investment cost associated with erosion control, it would be prohibitive, particularly for low-income households, to finance such large investments. Thus, using public sector funds to finance the project is considered appropriate. Furthermore, having designed and led the implementation of the parent project, the Bank is uniquely positioned to build on the experience already learnt from the parent operation to lead the rehabilitation of additional sites in Nigeria.

46. **Results of the CBA.** The CBA considers all project costs (i.e., US\$304 million in infrastructure investment and US\$96 million in technical assistance and management) as well as O&M costs (estimated at 10 percent of infrastructure costs). Project costs are expected to be disbursed as follow: 10 percent in 2019, 40 percent in 2020, and 50 percent in 2021; with O&M costs starting to accrue in 2022. The CBA attempts to quantify the following benefits that will result from gully rehabilitation and watershed protection in 30¹² sites: i) reduced loss of infrastructure; ii) reduced loss of lives; iii) reduced displacement; iv) improved mobility; and v) benefits from restoring vegetative cover. Reducing soil erosion will lead to many additional benefits (such as appreciation of land value once work is completed, reduction in sedimentation in ports, rivers, and canals therefore increasing their lifespan, reduction in river siltation, increase in carbon sequestration, etc.). However, data constraints prevented the analysis from capturing all benefits. As such, the estimation of benefits should be considered conservative (under-evaluated). The results of the analysis indicate a Net Present Value of US\$540 million and an Internal Rate of Return (IRR) of 16 percent.

B. Technical

47. The project intervention centers on physical, institutional, and community responses to reduce erosion vulnerabilities in specific sites prioritized by states, underpinned by improvements in planning, monitoring, information, and regulatory environments. Thus, it will follow the same successful approach described in the parent Project Appraisal Document. Activities that will be funded under the AF will be added to all four components from the parent NEWMAP project and lessons learned thereunder.

48. Component 1 will still emphasize the development and implementation of comprehensive site

¹² Since the final site selection has not yet been made, for the purpose of the economic analysis, the team conducted a CBA for 30 sites (out of 84 priority sites identified in Annex 2). These 30 sites were selected as high priority interventions during the prioritization exercise (Annex 2) and fit within the project budget envelop. It is important to emphasize that these sites may not be the final sites funded under the project.



designs that include three interdependent technical approaches: (i) apply a mix of flexible civil works with vegetative land management solutions, (ii) support adaptive livelihoods opportunities for affected communities, and (iii) incorporate local, participatory sub-watershed planning and climate variability data (e.g. rainfall intensity). The early NEWMAP site designs have served as models that can be replicated inside and outside NEWMAP. NEWMAP offered significant added value through its technical approach: NEWMAP's introduction of internationally-tested techniques calibrated to local conditions ensured impact and efficiency, as they can be replicated throughout the estimated 6,000 gully systems that exist. Implementing only when the technical designs are ready demonstrated success and ensured replicability. As mentioned earlier, additional criteria were brought into the design of the AF (see Annex 2).

49. Component 2 will reinforce environmental assessment and regulatory compliance, larger-scale watershed/basin planning and monitoring, use of more robust and more open data and tools, improved scientific and technical capacities, and establishment of a multisector institutional framework for up-scaling further investment. This component's technical approach relies on establishing a platform for mutual learning by leveraging monitoring and evaluation, data modernization, innovations, and the impact evaluation supported under the parent project to let project stakeholders know what is working and how to improve intervention site designs and incentives. The component provides support for activities involving diverse sectors at state and federal levels, which is necessary to build the multisector and multiscale framework needed for sustaining investment impact. For example, by developing guidelines for road construction and cross drainage at federal and state works ministries and by improving regulatory oversight at the Federal Ministry of Environment and its state counterparts as well as at Nigeria's National Environmental Standards and Regulations Enforcement Agency, the project can contribute to prevention of future erosion, as inappropriate road cross drainage is one of the chief causes of erosion. Further this institutional strengthening component has been designed to mobilize additional support from institutions such as universities or research agencies. Finally, the component will support the development of erosion risk mapping for Nigeria. Using the Revised Universal Soil Loss Equation model, the risk mapping will help standardize GIS Spatial Data Infrastructures, to predict any risk produced by gully formation sites in Nigeria. New solid waste and road drainage studies will also provide climate resilience measures to sustain national transport systems and support to states and communities to help identify the actions required to improve the solid waste management situation to ensure the sustainability of the civil works mentioned above.

50. Component 3 adds additional targeted technical assistance to the country's efforts to advance its low-carbon growth and climate adaptation agenda beyond the erosion and watershed issues addressed under the other two components. As recommended by the midterm review of January 2016, Component 3 would: focus more resources on activities in tier 2 states linked to climate change adaptation and resilience, support activities identified under Nigeria's NDC, and assist in the issuance, deployment, and monitoring of green bonds.

C. Financial Management

51. The proposed AF will use the same Financial Management (FM) arrangements in place for the parent project. The Federal Project Financial Management Department and Project Financial Management Units at the federal and state levels respectively will be responsible for providing FM services for the AF. These units will, amongst other things, be responsible for ensuring compliance with the financial management requirements of the Bank and the government, including the submission of



biannual unaudited Interim Financial Reports to the federal PMU to consolidate and submit to the Bank within 45 days of the end of the relevant semester. The PIM will further clarify the required reporting periods. The federal PMU will also be responsible for ensuring that the project audit report and audited financial statements are submitted to the Bank within six months of the end of the government fiscal year. The Internal Audit Units of the Federal Project Financial Management and Project Financial Management Units will continue to be responsible for the internal audit of the project per the terms of reference agreed with the Bank. Consistent with Bank policy and directives, the adequacy and appropriateness of the Project FM arrangements will be reviewed using a risk-based approach for the on-site review, and routine desk review of periodic reports will be undertaken. For the project activities that will be implemented by both Nigeria Space Research and Development Agency (NARSDA) (Remote Sensing and Digital acquisition, analysis dissemination of land degradation dynamics) and the University of Lagos (UNILAG) (capacity building on Environmental and Social Safeguards, including the new World Bank Environmental and Social Framework), these institutions will open transaction accounts, i.e., Naira current account, with the Central Bank of Nigeria, into which the Federal PMU shall disburse according to the annual work plan. UNILAG and NARSDA will submit statements of expenditures for incurred eligible expenditures to FPMU for the replenishment of their accounts. To ensure the prompt transfer of funds from FPMU to the NARSDA and UNILAG, a service standard will be put in place, requiring the transfer of funds within 72 hours of receipt of funding request from these institutions. Both NARSDA and UNILAG have acceptable FM arrangements.

D. Procurement

52. The procurement arrangements for the proposed AF will be the same as those of the parent project. The Federal and State PMUs will be responsible for procurement implementation for the federal component and the state components respectively. Procurement under the AF will be in accordance with the World Bank Procurement Framework as specified in the World Bank's "Procurement Regulations for IPF Borrowers - Procurement in Investment Projects Financing" after July 1, 2016 while the main project will continue to apply the Procurement Guidelines dated January 2011. With the adoption of the Procurement Framework, the project will have the opportunity to utilize the new procurement flexibilities and innovations during project implementation. In addition to the new procurement framework, the new bidding documents for civil works, with dedicated sections on contractors' responsibilities and accountabilities on GBV and Labor Influx, will be used under this AF.

53. **Systematic Tracking and Exchanges in Procurement (STEP).** In accordance with paragraph 5.9 of the "World Bank Procurement Regulations for IPF Borrowers" ("Procurement Regulations") the Bank's STEP system has been and will continue to be used to prepare, clear, and update procurement plans and conduct all procurement transactions for the project. The system will cover all the procurement transactions, both prior and post review contracts. The World Bank Standard Procurement Documents will be used for all International Competitive Bidding procurements, while national procedures will be used for packages below international competitive bidding contracts.

54. **Project Procurement Strategy for Development (PPSD).** With support from the Bank, a PPDS has been prepared during appraisal and finalized during negotiations. A summary of the PPDS findings is provided below: i) An 18 months procurement plan has been successfully prepared with input from all states. In view of their high estimated cost, some packages will require regional procurement management and operational procurement review committee clearances; ii) the Nigerian Government is currently implementing a public procurement reforms to strengthen its institutions and reform its existing



system; iii) the major procurement packages include: reclamation, channeling and remediation works at various gully erosion and flood sites, storm water harvesting and flood control structures, and preliminary earthworks and soil stabilization; iv) for consultancy contracts, there are several experienced local public and private firms that will be willing to express interest in activities funded by the AF. Similarly, for works contracts, there are many experienced local engineering firms that would be showing interest in bidding opportunities; v) to assure quality of project implementation, a procurement consulting firm will be hired at the federal level to provide the required technical support to the state PMUs. This is in addition to the engagement of qualified professionals as consultants to support the PMU. State PMU staff will also be trained on the World Bank New Procurement Framework. The procurement implementation will be closely monitored and supported by the World Bank to ensure transparency, accountability and value for money and vi) the main identified risks include: political interference, frequent changes of political appointees (Honorable Minister, Permanent Secretary, Commissioners) and volatile exchange rate. Adequate mitigation measures have been provided in the PPSD.

E. Social (including Safeguards)

55. Community Mobilization, Communication, and Benefits. All preparation studies and site visits (of the parent project) concluded that project success depends on mobilizing communities to ensure sustainability. Mobilization is financed in project components 1 and 4 using communication, 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.

56. 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 benefit from livelihood programs. Communication activities will clearly convey this point.

57. 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 trees with potential economic value (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. Steps and ways that these decisions will be made will be detailed in the revised PIM immediately after board approval and prior to the commencement of civil works.

58. Resettlement Policy Framework. Local residents might seek compensation under the resettlement plan for damage or loss to erosion that occurred prior to project intervention. It was agreed and understood by the Federal Government of Nigeria 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. 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. Accordingly, the RPF excludes such “legacy” cases from compensation for losses. However, 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. As with the parent project, government counterpart funding is used to pay compensation to project affected people, with no IDA resources being used to pay for resettlement and compensation.

59. 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 state PMU 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.

60. **ESMF/RPF.** At the time of appraisal, the design of some specific investments under Component 1 in tier 2 states was not known, hence the ESMF and RPF prepared under the parent project have been updated to include tier 2 states. The updated ESMF and RPF were disclosed in-country on November 30, 2017 and on the World Bank website on February 20, 2018. Gender-Based Violence (GBV), like in other jurisdictions, remains a challenge in Nigeria. The Environmental and Social Framework includes measures aimed at protecting children from the social risks of labor influx, including GBV/Sexual Exploitation and Abuse (SEA). This includes a Code of Conduct for contractor employees and contract workers, acknowledging a zero-tolerance policy towards child labor and child sexual exploitation. In addition, there will be sanctions in the contracts for non-compliance (e.g. termination). Finally, the project will include training of workforce about refraining from unacceptable conduct as well as informing workers about national laws. As site specific Environmental and Social Management Plans are developed for the project, they may include additional specific measures, where required. This will include incorporation of a GBV/SEA sensitive protocol in the project GRM and appropriate requirements in the bid documents for the proposed civil work activities.

61. **ESMPs/RAPs.** For tier 1 states, where detailed designs have been prepared, the ESMPs and RAPs have, where possible, been prepared and cleared by the World Bank. These include screening processes to determine the appropriate environmental and social instruments to be prepared, approved, and disclosed prior to implementation of individual interventions. 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 has been completed and disclosed. Effective integration of project management and ESMF implementation should result from the fact that the Federal Ministry of Environment and state ministries of environment are the lead executing agencies for NEWMAP.



F. Environment (including Safeguards)

62. As indicated earlier, an ESMF for the parent project was completed and publicly disclosed in Nigeria and on the World Bank website (on January 4, 2012). For the purpose of this additional financing, it was updated and redisclosed (November 30, 2017 & February 20, 2018). For each site which has a detailed design prepared, an ESMP and a RAP were prepared, reviewed and cleared by the Bank. This process will continue in the additional financing. The parent project triggered a number of safeguards policies (Environmental Assessment (OP/BP 4.01); Natural Habitats (OP/BP 4.04); Forests (OP/BP 4.36); Pest Management (OP 4.09); Physical Cultural Resources (OP/BP 4.11); Involuntary Resettlement (OP/BP 4.12); Safety of Dams (OP/BP 4.37); and Projects on International Waterways (OP/BP 7.50)), in anticipation of possible safeguards risks when the site locations were yet unknown. During implementation, no issues arose with respect to a number of these policies and therefore they are not triggered under the AF. The AF triggers: Environmental Assessment (OP/BP 4.01); Involuntary Resettlement (OP/BP 4.12); and Projects on International Waterways (OP/BP 7.50). The parent project, in an anticipatory manner triggered Policy OP 7.50 on International Waters and riparian notification was issued on December 22, 2011. During implementation, the project has not impacted any international water. The AF has triggered Policy OP 7.50 and obtained an exception to the riparian notification requirement.

63. The Moderately Satisfactory environmental safeguard performance at this stage reflects the fact that the implementation of the project in some states encounters some environmental safeguards issues. Progress is still needed in terms of i) reporting environmental safeguards, ii) integrating state PMU environmental safeguard officers into broader project planning, design and implementation activities, iii) strengthening the capacity of safeguard officers on how to better monitor the implementation of ESMPs iv) clarifying implementation of the ESMPs in the Project Implementation Manual, and v) addressing the solid waste issue in some subproject sites.

64. The project design has considered exogenous climate and disaster risks. Nigeria has experienced climate and geophysical hazards in the past and is expected to experience these in the future with high intensity, frequency, or duration. Climate risks that are relevant to the project include extreme temperature and droughts, extreme precipitation, and urban floods. Climate change adaptation and mitigation measures have been incorporated into the project design to moderate the impact on physical infrastructure implemented in case of drought events and flooding. The project has considered water scarcity/drought and floods in the planning and design of all infrastructure. Project interventions are expected to reduce the impacts of erosion by adequately collecting and channeling water to reduce its impact on land degradation. The project will use flood-resilient materials and design for erosion control infrastructure. Watershed management plans to be prepared under the project will also incorporate climate risks. The project also involves support for preparation of assessments and plans, as well as institutional capacity strengthening in the areas of watershed management, erosion risk mapping, road design, construction and operation and maintenance, and solid waste management—all of which are critical for building federal and state level resilience to climate risks. As described in this project paper, the technical assistance on roads and solid waste management will be limited and consistent with the ESMF and RPF.

G. Other Safeguard Policies

N/A



V. WORLD BANK GRIEVANCE REDRESS

65. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project-affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org



VI. SUMMARY TABLE OF CHANGES

| | Changed | Not Changed |
|--|---------|-------------|
| Change in Results Framework | ✓ | |
| Change in Components and Cost | ✓ | |
| Change in Loan Closing Date(s) | ✓ | |
| Change in Safeguard Policies Triggered | ✓ | |
| Change in Procurement | ✓ | |
| Change in Implementing Agency | | ✓ |
| Change in Project's Development Objectives | | ✓ |
| Cancellations Proposed | | ✓ |
| Reallocation between Disbursement Categories | | ✓ |
| Change in Disbursements Arrangements | | ✓ |
| Change of EA category | | ✓ |
| Change in Legal Covenants | | ✓ |
| Change in Institutional Arrangements | | ✓ |
| Change in APA Reliance | | ✓ |
| Other Change(s) | | ✓ |

VII. DETAILED CHANGE(S)

RESULTS FRAMEWORK

Project Development Objective Indicators

Targeted gully complexes and other erosion sites treated with 100% of planned measures for targeted subwatersheds.

Unit of Measure: Number

Indicator Type: Custom



| | Baseline | Actual (Current) | End Target | Action |
|---|-------------|------------------|-------------|---------------------|
| Value | 0.00 | 18.00 | 55.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| Targeted gully complexes and other erosion sites with reduced severity level after treatment. Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 18.00 | 55.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| Area under bioremediation in targeted subwatersheds. Unit of Measure: Hectare(Ha) Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 241.00 | 400.00 | Revised |
| Date | 08-Jun-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| Direct project beneficiaries Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 7,313,858.00 | 681,000.00 | Marked for Deletion |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2020 | |
| Land area under sustainable landscape management practices Unit of Measure: Hectare(Ha) Indicator Type: Core | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 241.00 | 400.00 | New |
| Date | 12-Apr-2012 | 30-Apr-2018 | 30-Jun-2021 | |
| Net greenhouse gas emissions Unit of Measure: Tones/year Indicator Type: Core | | | | |



| | Baseline | Actual (Current) | End Target | Action |
|-------|-------------|------------------|-------------|--------|
| Value | 0.00 | -1,736.00 | -2,411.00 | New |
| Date | 30-Apr-2012 | 30-Apr-2018 | 30-Jun-2021 | |

Intermediate Indicators

| <p>Targeted land treated for erosion with selected measures in targeted sub-watersheds. Unit of Measure: Hectare(Ha) Indicator Type: Custom</p> | | | | |
|---|-------------|------------------|-------------|---------|
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 682.35 | 20,000.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| <p>Participatory sub-watershed management plans developed under the project for targeted erosion-affected sub-watersheds Unit of Measure: Number Indicator Type: Custom</p> | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 14.00 | 38.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| <p>People receiving project-supported advisory support services in integrated land/water management practices, planning, and/or monitoring under the Project Unit of Measure: Number Indicator Type: Custom</p> | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 5,137.00 | 90,000.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| <p>Number, of which 40% are female Unit of Measure: Number Indicator Type: Custom Supplement</p> | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 2,055.00 | 36,000.00 | New |



| | | | | |
|--|-------------|------------------|-------------|---------------------|
| Households benefitting from livelihoods enhancement activities under the Project | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 9,230.00 | 12,000.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| GEF and Special Climate Change Fund tracking tools updated | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 4.00 | 1.00 | 4.00 | Marked for Deletion |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2020 | |
| Spatial Knowledge Management Information System on erosion and watershed operational | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 0.00 | 1.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| Upgraded and newly installed stations providing data for integrated catchment planning. | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 75.00 | 100.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| City stormwater master plans developed which are informed by climate projections of increased rainfall intensity and risk assessments | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 1.00 | 1.00 | 3.00 | Revised |



| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
|--|-------------|------------------|-------------|---------------------|
| Application of multisector management effectiveness tool by state and federal governments | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 21.00 | 9.00 | Marked for Deletion |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2020 | |
| EIA guidelines developed for targeted investment types that affect erosion (road cross drainage, urban water supply and drainage) | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 0.00 | 1.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| Duration for approving EIAs for category 1 projects (average working days) | | | | |
| Unit of Measure: Days | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 180.00 | 180.00 | 130.00 | Marked for Deletion |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2020 | |
| Technical reports/guidelines on promoting low carbon development or enhancing climate resilience completed | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 6.00 | 7.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2020 | |
| Climate adaptation/low carbon demonstration projects. | | | | |
| Unit of Measure: Number | | | | |
| Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |



| | | | | |
|--|-------------|------------------|-------------|---------------------|
| Value | 0.00 | 5.00 | 10.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| Reports produced on project progress at federal and state levels Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 16.00 | 18.00 | Revised |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2021 | |
| Participating states with at least 75% of the activities in its current joint work program are under implementation Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 14.00 | 8.00 | Marked for Deletion |
| Date | 08-May-2012 | 20-Dec-2017 | 30-Jun-2020 | |
| Packages with detailed design for treatment of gully complexes and erosion sites in targeted subwatersheds prepared under the project that have received WBG Bo-Objection but not financed by NEWMAP Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 0.00 | 30.00 | New |
| Date | 08-May-2012 | 30-Apr-2018 | 30-Jun-2021 | |
| Number of Centers of Excellence in erosion control established, operational and functional. Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 0.00 | 3.00 | New |
| Date | 08-May-2012 | 30-Apr-2018 | 30-Jun-2021 | |
| States with improved erosion risk mapping. Unit of Measure: Amount(USD) Indicator Type: Custom | | | | |



| | Baseline | Actual (Current) | End Target | Action |
|---|-------------|------------------|-------------|--------|
| Value | 0.00 | 0.00 | 19.00 | New |
| Date | 08-May-2012 | 30-Apr-2018 | 30-Jun-2021 | |
| Community Interest Group collecting municipal solid waste in project intervention sites. Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 0.00 | 50.00 | New |
| Date | 08-May-2012 | 30-Apr-2018 | 30-Jun-2021 | |
| Development of Green Bond. Unit of Measure: Number Indicator Type: Custom | | | | |
| | Baseline | Actual (Current) | End Target | Action |
| Value | 0.00 | 0.00 | 1.00 | New |
| Date | 08-May-2012 | 30-Apr-2018 | 30-Jun-2021 | |

COMPONENTS

| Current Component Name | Current Cost (US\$, millions) | Action | Proposed Component Name | Proposed Cost (US\$, millions) |
|---|-------------------------------|---------|---|--------------------------------|
| Component 1: Erosion and Watershed Management Infrastructure Investments | 395.88 | Revised | Component 1: Erosion and Watershed Management Infrastructure Investments | 659.20 |
| Component 2: Erosion and Watershed Management Institutions and Information Services | 38.20 | Revised | Component 2: Erosion and Watershed Management Institutions and Information Services | 74.99 |
| Component 3: Climate Change Response | 30.00 | Revised | Component 3: Climate Change Response | 50.38 |
| Component 4: Project Management | 32.92 | Revised | Component 4: Project Management | 124.02 |



| | | | | |
|--------------|---------------|--|--|---------------|
| TOTAL | 497.00 | | | 908.59 |
|--------------|---------------|--|--|---------------|

LOAN CLOSING DATE(S)

| Ln/Cr/Tf | Status | Original Closing | Current Closing(s) | Proposed Closing | Proposed Deadline for Withdrawal Applications |
|-----------|-----------|------------------|--------------------|------------------|---|
| IDA-51050 | Effective | 30-Jun-2020 | 30-Jun-2020 | 30-Jun-2021 | 30-Oct-2021 |

Expected Disbursements (in US\$, millions)

| Fiscal Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|-------------------|------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| Annual | 0.00 | 10.00 | 43.00 | 88.00 | 102.00 | 110.00 | 70.00 | 134.00 | 243.00 | 108.59 |
| Cumulative | 0.00 | 10.00 | 53.00 | 141.00 | 243.00 | 353.00 | 423.00 | 557.00 | 800.00 | 908.59 |

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

| Risk Category | Latest ISR Rating | Current Rating |
|--|-------------------|----------------|
| Political and Governance | ● Substantial | ● Substantial |
| Macroeconomic | ● High | ● High |
| Sector Strategies and Policies | ● Moderate | ● Moderate |
| Technical Design of Project or Program | ● Moderate | ● Moderate |
| Institutional Capacity for Implementation and Sustainability | ● Substantial | ● Substantial |
| Fiduciary | ● High | ● High |
| Environment and Social | ● High | ● High |
| Stakeholders | ● Substantial | ● Substantial |
| Other | | ● Substantial |
| Overall | ● High | ● High |

COMPLIANCE

Change in Safeguard Policies Triggered

Yes



| Safeguard Policies Triggered | Current | Proposed |
|--|---------|----------|
| Environmental Assessment OP/BP 4.01 | Yes | Yes |
| Performance Standards for Private Sector Activities OP/BP 4.03 | No | No |
| Natural Habitats OP/BP 4.04 | Yes | No |
| Forests OP/BP 4.36 | Yes | No |
| Pest Management OP 4.09 | Yes | No |
| Physical Cultural Resources OP/BP 4.11 | Yes | No |
| Indigenous Peoples OP/BP 4.10 | No | No |
| Involuntary Resettlement OP/BP 4.12 | Yes | Yes |
| Safety of Dams OP/BP 4.37 | Yes | No |
| Projects on International Waterways OP/BP 7.50 | Yes | Yes |
| Projects in Disputed Areas OP/BP 7.60 | No | No |

LEGAL COVENANTS – Nigeria Erosion and Watershed Management Project (NEWMAP) - Additional Financing (P164082)

Sections and Description

No information available

Conditions

Type
Effectiveness

Description

Article IV. 4.01. (both FAs) The Additional Condition of Effectiveness consists of the following, namely, that the Financing Agreement dated the same date as this Agreement, between the Recipient and the Association, providing a credit in support of the Project (“SUF Financing Agreement”), has been executed and delivered, and all conditions precedent to its effectiveness or to the right of the



| | |
|----------------------|---|
| | Recipient to make withdrawals under it (other than the effectiveness of this Agreement), have been fulfilled. |
| Type Disbursement | Description Section III B.1. Notwithstanding the provisions of Part A, no withdrawal shall be made: (b) under Categories (2) through (5) 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. |



VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY : Nigeria

Nigeria Erosion and Watershed Management Project (NEWMAP) - Additional Financing

Project Development Objectives

To reduce vulnerability to soil erosion in targeted sub-watersheds.

Project Development Objective Indicators

| Action | Indicator Name | Core | Unit of Measure | Baseline | End Target | Frequency | Data Source / Methodology | Responsibility for Data Collection |
|---------|---|------|-----------------|----------|------------|-----------|--|--|
| Revised | Name: Targeted gully complexes and other erosion sites treated with 100% of planned measures for targeted subwatersheds. | | Number | 0.00 | 55.00 | Quarterly | State PMU Project Records , supplemented by beneficiary verification | Federal and State PMUs, with LGA technical Project Officers. |

Description: This indicator tracks the total number of gully complexes that have been treated with planned measures to generate multiple benefits. Planned measures could be site specific combinations which include slope stabilization, planting of grasses and trees, construction of drainages, road rehabilitation, earthworks etc.



| | | | | | | | | |
|---------|--|--|--------|------|-------|-----------|---------------------------|------------------------|
| Revised | Name: Targeted gully complexes and other erosion sites with reduced severity level after treatment. | | Number | 0.00 | 55.00 | Quarterly | State PMU Project Records | Federal and State PMUs |
|---------|--|--|--------|------|-------|-----------|---------------------------|------------------------|

Description: Tracks the number of gully complexes that have reduced in severity using the classification system from level 5 (catastrophic) to level 1 (stable).

| | | | | | | | | |
|---------|---|--|-------------|------|--------|-----------|--|---|
| Revised | Name: Area under bioremediation in targeted subwatersheds. | | Hectare(Ha) | 0.00 | 400.00 | Quarterly | State PMU Project Records. Remote sensing using a refractive vegetative index. Data sources could include LandSat, Aster, NigerianSat 2, GeoEye and DigiGlobe, local photo monitoring. | Federal and State PMUs (National Resource Officers), with NASRDA and/or other service providers |
|---------|---|--|-------------|------|--------|-----------|--|---|

Description: Hectares of land that have been reclaimed in targeted sub-watersheds as a result of bio-remediation. This also include hectares of land as a result of afforestation (tree planting in Northern States). This indicator is also intended to track land use and land cover. The indicator has been revised for clarity and to better capture what can be attributed to the project.

| | | | | | | | | |
|-----|---|---|-------------|------|--------|-------------|---------------------------|------------------------|
| New | Name: Land area under sustainable landscape management practices | ✓ | Hectare(Ha) | 0.00 | 400.00 | Bi-Annually | State PMU Project Records | Federal and State PMUs |
|-----|---|---|-------------|------|--------|-------------|---------------------------|------------------------|

Description: The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes;



Adoption refers to change of practice or change in the use of a technology promoted or introduced by the project; Sustainable landscape management (SLM) practices refers to a combination of at least two technologies and approaches to increase land quality and restore degraded lands for example, agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land, rangeland, and agriculture land.

| | | | | | | | | |
|-----|---|---|------------|------|-----------|----------|---|---|
| New | Name: Net greenhouse gas emissions | ✓ | Tones/year | 0.00 | -2,411.00 | Annually | Federal PMU Project Records; inventory to be conducted by consultant. | Federal PMU, Department of Climate Change (FMEnv) |
|-----|---|---|------------|------|-----------|----------|---|---|

Description:

Intermediate Results Indicators

| Action | Indicator Name | Core | Unit of Measure | Baseline | End Target | Frequency | Data Source / Methodology | Responsibility for Data Collection |
|---------|---|------|-----------------|----------|------------|-----------|---|--|
| Revised | Name: Targeted land treated for erosion with selected measures in targeted sub-watersheds. | | Hectare(Ha) | 0.00 | 20,000.00 | Annual | Project records, supplemented by beneficiary verification | Federal and State PMUs, with LGA NEWMAP Technical Officers |

Description: Total hectares of land that have been reclaimed in targeted sub-watersheds. Planned measures could be site specific combinations which include slope stabilization, planting of grasses and trees, construction of drainages, road rehabilitation, earthworks etc.

| | | | | | | | | |
|---------|---|--|--------|------|-------|--------|--|------------------------|
| Revised | Name: Participatory sub-watershed management plans developed under the | | Number | 0.00 | 38.00 | Annual | Project records, supplemented by beneficiary | Federal and State PMUs |
|---------|---|--|--------|------|-------|--------|--|------------------------|



| | | | | | | | | |
|--|--|--|--|--|--|--|--------------|--|
| | project for targeted erosion-affected sub-watersheds | | | | | | verification | |
|--|--|--|--|--|--|--|--------------|--|

Description: This is a citizen engagement indicator and linked to a beneficiary feedback mechanism. Through a two way interaction between citizens and government implementing agencies, citizens will be given a stake in planning and decision-making around watersheds and therefore will contribute to achieve reduced vulnerability. The indicator measures the number of sub-watershed management plans developed under the project developed in a participatory manner (involving communities), that provide plans to mitigate against erosion in project affected sub-watersheds.

| | | | | | | | | |
|---------|--|--|--------|------|-----------|--------|---|------------------|
| Revised | Name: People receiving project-supported advisory support services in integrated land/water management practices, planning, and/or monitoring under the Project | | Number | 0.00 | 90,000.00 | Annual | Survey and project records, supplemented by beneficiary verification. | State PMUs, NGOs |
| New | Number, of which 40% are female | | Number | 0.00 | 36,000.00 | | | |

Description: This indicator monitors the number of people receiving specific support which enhances their land/water management practices, planning and/or monitoring. For example, the installation of hydromet stations which provide rainfall data to farmers.

| | | | | | | | | |
|---------|---|--|--------|------|-----------|--------|---|------------------|
| Revised | Name: Households benefitting from livelihoods enhancement activities under the Project | | Number | 0.00 | 12,000.00 | Annual | Survey and project records, supplemented by beneficiary verification. | State PMUs, NGOs |
|---------|---|--|--------|------|-----------|--------|---|------------------|

Description: Livelihoods enhancement activities to be carried out with households are for example sub-grants, distribution of cook stoves, distribution of economic trees, training on skills acquisition and economic empowerment.

| | | | | | | | | |
|---------|--------------------------------|--|--------|------|------|--------|-----------------|-------------|
| Revised | Name: Spatial Knowledge | | Number | 0.00 | 1.00 | Annual | Project records | Federal PMU |
|---------|--------------------------------|--|--------|------|------|--------|-----------------|-------------|



| | | | | | | | | |
|--|--|--|--------|------|--------|-----------|---------------------------------|---|
| | Management Information System on erosion and watershed operational | | | | | | | |
| Description: | | | | | | | | |
| Revised | Name: Upgraded and newly installed stations providing data for integrated catchment planning. | | Number | 0.00 | 100.00 | Quarterly | Project records | Federal PMU |
| Description: Number of upgraded and newly installed hydrological and meteorological stations within River Basins. The stations are expected to provide climate data and rainfall projections. They River Basins include Upper Benue, Lower Benue, Anambra-Imo, Cross River, Hadejia-Jama'are, Sokoto-Rima, Benin-Owena, Ogun-Osun. | | | | | | | | |
| Revised | Name: City stormwater master plans developed which are informed by climate projections of increased rainfall intensity and risk assessments | | Number | 1.00 | 3.00 | Annual | Project, State and city records | State PMUs working with city government |
| Description: This indicator monitors the number of city stormwater master plans developed under the project, which are directly informed by climate projections. | | | | | | | | |
| Revised | Name: EIA guidelines developed for targeted investment types that affect erosion (road cross drainage, urban water supply and drainage) | | Number | 0.00 | 1.00 | Annual | Project records | Federal and State PMUs |
| Description: This indicator monitors the development of specific EIA guidelines that relate to erosion control aspects (e.g. road cross drainage, urban | | | | | | | | |



| | | | | | | | | |
|---|---|--|--------|------|-------|------------|------------------------------------|--|
| water supply and drainage) | | | | | | | | |
| Revised | Name: Technical reports/guidelines on promoting low carbon development or enhancing climate resilience completed | | Number | 0.00 | 7.00 | Annual | Project and administrative records | Federal PMU |
| Description: This indicator monitors the number of Technical reports/guidelines produced that promote low carbon development or enhance climate resilience. | | | | | | | | |
| Revised | Name: Climate adaptation/low carbon demonstration projects. | | Number | 0.00 | 10.00 | Quarterly | Project and administrative records | Federal PMU (Climate change specialist) |
| Description: Tracks the number of projects being implemented which are to contribute to the reduction of carbon emissions | | | | | | | | |
| Revised | Name: Reports produced on project progress at federal and state levels | | Number | 0.00 | 18.00 | Bi- Annual | Project records | State PMUs and Federal PMU |
| Description: This indicator monitors the number of progress reports produced bi-annually. Each state PMU is to submit progress reports regularly to the federal PMU who compile this information to produce bi-annual, project wide progress reports, for the 9 years of project duration. | | | | | | | | |
| New | Name: Packages with detailed design for treatment of gully complexes and erosion sites in targeted subwatersheds prepared under the project that have received WBG Bo- | | Number | 0.00 | 30.00 | Annually | Project Records | State and Federal PMUs (project engineers) |



| | | | | | | | | |
|---|---|--|-------------|------|-------|-------------|-----------------------------|---|
| | Objection but not financed by NEWMAP | | | | | | | |
| Description: Number of packages with detailed design that will be left with Government to carry on erosion control beyond project closing. These packages will be prepared under the project and would have received No-Objection but not financed by NEWMAP. | | | | | | | | |
| New | Name: Number of Centers of Excellence in erosion control established, operational and functional. | | Number | 0.00 | 3.00 | Annually | Federal PMU Records | Federal PMU, Federal Ministry of Environment |
| Description: Number of centers that will be institutionalized to offer expert services such as training, publications and advisory support | | | | | | | | |
| New | Name: States with improved erosion risk mapping. | | Amount(USD) | 0.00 | 19.00 | Annually | Project Records | State and Federal PMUs |
| Description: Tracks the number of States that have put in place disaster contingency plan in terms of identifying major hazards, areas and infrastructure at risk as well as appropriate risk reduction measures, as well as high quality mapping. | | | | | | | | |
| New | Name: Community Interest Group collecting municipal solid waste in project intervention sites. | | Number | 0.00 | 50.00 | Quarterly | Project Records | State PMUs (social livelihood and environmental safeguard officers) |
| Description: This indicator tracks the number of CIGs that have been formed and are responsible for collection of solid waste within the sub-watershed/site. | | | | | | | | |
| New | Name: Development of Green Bond. | | Number | 0.00 | 1.00 | Bi-Annually | Federal PMU Project Records | Federal PMU, Department of Climate Change |



| | | | | | | | | |
|--|--|--|--|--|--|--|--|---|
| | | | | | | | | (Federal Ministry of Environment), Debt Management Office |
| <p>Description: Indicator is to track and measure the implementation of Green Bond through the issuance of bonds for projects which are expected to create environmentally sustainable benefits.</p> | | | | | | | | |

**Target Values****Project Development Objective Indicators**

| Action | Indicator Name | End Target |
|---------|--|------------|
| Revised | Targeted gully complexes and other erosion sites treated with 100% of planned measures for targeted subwatersheds. | 55.00 |
| Revised | Targeted gully complexes and other erosion sites with reduced severity level after treatment. | 55.00 |
| Revised | Area under bioremediation in targeted subwatersheds. | 400.00 |
| New | Land area under sustainable landscape management practices | 400.00 |
| New | Net greenhouse gas emissions | -2,411.00 |

Intermediate Results Indicators

| Action | Indicator Name | Baseline | End Target |
|---------|---|----------|------------|
| Revised | Targeted land treated for erosion with selected measures in targeted sub-watersheds. | 0.00 | 20,000.00 |
| Revised | Participatory sub-watershed management plans developed under the project for targeted erosion-affected sub-watersheds | 0.00 | 38.00 |
| Revised | People receiving project-supported advisory support services in integrated land/water management practices, planning, and/or monitoring under the Project | 0.00 | 90,000.00 |
| New | Number, of which 40% are female | 0.00 | 36,000.00 |
| Revised | Households benefitting from livelihoods enhancement | 0.00 | 12,000.00 |



| | activities under the Project | | |
|---------|--|------|--------|
| Revised | Spatial Knowledge Management Information System on erosion and watershed operational | 0.00 | 1.00 |
| Revised | Upgraded and newly installed stations providing data for integrated catchment planning. | 0.00 | 100.00 |
| Revised | City stormwater master plans developed which are informed by climate projections of increased rainfall intensity and risk assessments | 1.00 | 3.00 |
| Revised | EIA guidelines developed for targeted investment types that affect erosion (road cross drainage, urban water supply and drainage) | 0.00 | 1.00 |
| Revised | Technical reports/guidelines on promoting low carbon development or enhancing climate resilience completed | 0.00 | 7.00 |
| Revised | Climate adaptation/low carbon demonstration projects. | 0.00 | 10.00 |
| Revised | Reports produced on project progress at federal and state levels | 0.00 | 18.00 |
| New | Packages with detailed design for treatment of gully complexes and erosion sites in targeted subwatersheds prepared under the project that have received WBG Bo-Objection but not financed by NEWMAP | 0.00 | 30.00 |
| New | Number of Centers of Excellence in erosion control established, operational and functional. | 0.00 | 3.00 |
| New | States with improved erosion risk mapping. | 0.00 | 19.00 |
| New | Community Interest Group collecting municipal solid waste in project intervention sites. | 0.00 | 50.00 |
| New | Development of Green Bond. | 0.00 | 1.00 |



ANNEX 1. MAP OF NIGERIA EROSION AND WATERSHED MANAGEMENT PROJECT STATES





ANNEX 2. DETAILED DESCRIPTION OF THE PRIORITIZATION PROCESS AND PROJECTED EXPENSES FOR THE NEWMAP ADDITIONAL FINANCING (COMPONENT 1)

Background

66. The Government of Nigeria requested AF of US\$1 billion in IDA funding to NEWMAP on May 30, 2017 and June 23, 2017. A workshop for the prioritization, selection, and sequencing of fund disbursement was held in Enugu on August 13-19, 2017. The main objective of the workshop was to prioritize sites¹³ for consideration under the NEWMAP AF (Component 1). This annex provides further clarity on the prioritization exercise that was undertaken during the workshop and the resulting estimation of NEWMAP projected expenses for 2017-2021.

Prioritization Exercise

67. During the workshop, the seven tier 1 states (Anambra, Abia, Cross River, Ebonyi, Edo, Enugu, and Imo) plus the 12 tier 2 states (Akwa Ibom, Borno, Delta, Gombe, Kano, Katsina, Kogi, Nasarawa, Niger, Oyo, Plateau and Sokoto) were involved in a site selection and prioritization exercise. All states had representatives from their project management units in the workshop and confirmed their approval for the sites selected and the associated contract sums submitted.

68. Prior to the workshop, each state had identified potential sites to be financed by the project (far beyond the available funding envelope – US\$2.2 billion – see table 2.1 below). The state project management units were advised to work with state-level stakeholders (communities, technical and steering committees, and governors), to confirm that all identified sites met the procedures for site selection defined in the Project Implementation Manual. The site selection criteria used were: 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; replication potential of the site treatment; readiness of the state to cover the cost of resettlement (if required); and no on-going competing intervention in

Figure 2.1 Prioritization criteria from method 1

| Assigned Risk value for each threat | | |
|---|----------|-------------------|
| Low | Moderate | Severe |
| 1 | 2 | 3 |
| Risk to human life | | Risk value |
| Immediate threat (house collapse) | | 3 |
| Not immediate threat (house within 100 m of the gully) | | 2 |
| Not an immediate threat (gully affecting only infrastructure works) | | 1 |
| Current structural defects (if applicable) | | Risk value |
| Minor destruction | | 1 |
| Between 20 and 50% destruction | | 2 |
| >50% destruction | | 3 |
| Proximity to vital infrastructure (water-electricity-gas) | | Risk value |
| No infrastructure or distance > 100 m | | 1 |
| Distance between 50 and 100 m | | 2 |
| Distance less than 50 m | | 3 |
| Catchment area | | Risk value |
| <10 km ² | | 1 |
| 10 km ² < Area < 15 km ² | | 2 |
| >15 km ² | | 3 |

¹³ Using the priority criteria developed by the World Bank during the last implementation and supervision mission as detailed in the Aide Memoire for June 5 - 19, 2017.



the same sub-watershed. All states undertook this exercise and came to the workshop with a list of priority sites that they had agreed upon with state-level stakeholders.

69. During the workshop, the state-identified intervention sites were further prioritized using additional criteria. These criteria allowed the project to score each identified site and then prioritize sites based on the score received (see figures 2.1 and 2.2). The values obtained from Method 1 and Method 2 were converted to percentages and summed to create an average value for both. This value was later ranked based on the following risk values: (1) Low [<35%], (2) Moderate [>35%], (3) Severe [>70%] and (4) Critical [>90%]. The prioritization criteria were used for each site and the resulting scoring was confirmed during the MTR (December 2017) by World Bank engineers, federal PMU, and FEDQCF.

Figure 2.2: Prioritization criteria from method 2

| Criteria | Categories |
|---|----------------------|
| State of Erosion/ Problem | Stable (0%) |
| | Slight (7.5%) |
| | Moderate (15%) |
| | Severe (22.5%) |
| | Catastrophic (30%) |
| Size of affected population (disaggregated by poverty rate) | 0-99 people (5%) |
| | 100-999 (10%) |
| | 1000- + people (15%) |
| Risk to human life | None (0%) |
| | Slight (7.5%) |
| | Moderate (15%) |
| | Severe (22.5%) |
| | Catastrophic (30%) |
| Risk to physical assets | None (0%) |
| | Slight (2.5%) |
| | Moderate (5%) |
| | Severe (7.5%) |
| | Catastrophic (10%) |
| Risk to natural assets | None (0%) |
| | Slight (2.5%) |
| | Moderate (5%) |
| | Severe (7.5%) |
| | Catastrophic (10%) |
| Replicability potential | Yes (5%) |
| | No (0%) |

70. Tables 2.1 and 2.2 provide projected sums for all potential sites from both tier 1 and tier 2 sites before and after the prioritization exercise. For tier 1 states and Akwa Ibom state, all sites were included that had received no-objection from the World Bank. The sums were based on detailed engineering and associated Bill of Engineering Measurement and Evaluations. For tier 2 state sites, only those that were ranked “high priority” were included. The contract sum estimates for these sites were developed by the state’s Project Management Units, based on past experiences and contract sums for similar works in the tier 1 states. The contract sums submitted have taken into consideration, where appropriate, the likely changes to the site conditions due to the dynamic nature of the erosion processes. However, a contingency of 15 percent has been included in the total sum allocated to component 1, based on the changeable nature of erosion sites and guidance from the procurement team.



Table 2.1: Projected project sums before and after prioritization exercise

| Stages of Prioritization process | Sum | No. of Sites | Explanation |
|--|-----------------|--------------|---|
| Cost of all potential sites across Nigeria within the NEWMAP frame | \$2,208,269,451 | 279 | All potential sites reported by the states to date. No priority exercise completed. |
| Final projected estimated cost of selected sites after prioritization workshop | \$569,085,473 | 84 | Sum for final prioritized sites after completing the prioritization exercise. ^{14, 11} |

Table 2.2: Breakdown of projected sums required per state after prioritization exercise¹⁵

| Summary of Total Sums | | No. of Sites |
|-------------------------|----------------------|--------------|
| States | Sum | |
| <i>Tier 1 states</i> | | |
| Abia | \$5,426,016 | 1 |
| Anambra | \$127,558,092 | 9 |
| Cross River | \$10,529,303 | 4 |
| Ebonyi | \$36,369,812 | 4 |
| Edo | \$71,152,448 | 8 |
| Enugu | \$14,249,727 | 8 |
| Imo | \$32,937,222 | 3 |
| Sub-Total tier 1 | \$298,222,620 | 37 |
| <i>Tier 2 states</i> | | |
| Akwa Ibom | \$22,107,752 | 2 |
| Borno | \$26,056,338 | 5 |
| Delta | \$44,783,451 | 5 |
| Gombe | \$17,869,735 | 5 |
| Kano | \$16,319,648 | 5 |
| Katsina | \$9,320,563 | 6 |
| Kogi | \$72,516,113 | 7 |
| Nasarawa | \$21,408,451 | 6 |
| Plateau | \$10,410,380 | 3 |
| Sokoto | \$30,070,423 | 3 |
| Sub-Total tier 2 | \$270,862,854 | 47 |
| Grand Total | \$569,085,474 | 84 |

71. Further prioritization is required due to the AF envelope of US\$400 million, of which US\$304 million is available for infrastructure works related to Component 1. The final list of sites will be selected during project implementation, through consultation with the federal and state-level representatives. In addition to the above technical criteria, other criteria will include: (i) availability of counterpart funds and political commitment demonstrated by the inclusion of a minimum of N500 million Readiness Fund in State annual budgets; (ii) institutionalizing the project with legal backing by upgrading the project into an Agency; and (iii) the provision of current baseline data and other information on erosion and watershed management issues in each State. The AF will focus on interventions that are in line with the parent project, focusing on erosion and flood risk remediation. States/sites with different watershed management characteristics and issues will be addressed under the proposed technical and socioeconomic analysis (under component 1).

¹⁴ Final sum includes estimated expenses of cost of interventions in 37 sites in tier 1 states and 47 sites in tier 2 states.

¹⁵ Niger and Oyo States have not identified sites to date.



ANNEX 3. NEWMAP AF REVISIONS TO THE RESULTS FRAMEWORK

The table below indicates changes made to the results framework as a reflection of the additional activities proposed under the AF and the revised targets based on the additional financing.

| Original | Changes | Rationale |
|--|---|--|
| PDO | | |
| To reduce vulnerability to soil erosion in targeted sub-watersheds | Continued | The PDO is clear and outcome-focused and remains relevant and achievable. |
| PDO Indicators | | |
| Targeted gully complexes and other erosion sites treated with at least 75% of planned measures for targeted subwatersheds (number) | Revised – ‘ <i>Targeted gully complexes and other erosion sites treated with 100 % of planned measures for targeted subwatersheds (number)</i> ’ and revision of end-of-project targets | Revised target: 55 Wording of the indicator has been clarified so that all construction work needs to be completed to avoid erosion and flooding impacts. The end-of-project target has been revised to reflect the additional funds made available. The revision of targets is based on the following (April 2018): <ul style="list-style-type: none"> •21 active sites •8 awarded sites •30 new sites with AF (based on representative sample used for the EFA) |
| Targeted gully complexes and other erosion sites with reduced severity level after treatment (number) | Revised – end-of-project targets | Revised target: 55 The end-of-project target has been revised to reflect the additional funds made available. The revision of targets is based on the following (April 2018): <ul style="list-style-type: none"> •21 active sites •8 awarded sites •30 new sites with AF (based on representative sample used for the EFA) |
| Vegetation cover in treated sub-watersheds (%) | Change Unit of Measurement from % to ha and wording of indicator ‘Area under bio remediation in targeted subwatersheds (ha)’ | Revised target: 400 ha The indicator has been revised for clarity and to better capture what can be attributed to the project. This is based on the area under bioremediation in the active sites under the parent project (241 ha), states that have indicated bioremediation activities (Gombe and Kano (100ha each), and the representative sample of sites identified to be founded under the AF. |
| Direct project beneficiaries (number), of which female (#) | Dropped | The indicator has been dropped as the core indicator on direct project beneficiaries is no longer mandatory. Direct measurement of people benefitting from project interventions is captured by two intermediate indicators, i.e. ‘People receiving project-supported advisory support services’ and ‘Households benefitting from livelihoods enhancement activities’ |
| | New – ‘ <i>Land area under sustainable landscape management practices (ha)</i> ’ – | Proposed target: 400 ha The indicator has been added as this is an applicable corporate results indicator. This is based on the area |



| | | |
|--|--|--|
| | Corporate Results Indicator | under bioremediation in the active sites under the parent project (241 ha), states that have indicated bioremediation activities (Gombe and Kano (100ha each) and the representative sample of sites identified to be founded under the AF. |
| | New – ‘Net Greenhouse Emissions’ (tCO2 -eq annually) – Corporate Results Indicator | Proposed target: -2,411 tCO ₂ -eq annually. The indicator has been added as this is an applicable corporate results indicator. Greenhouse gas (GHG) accounting analysis found that the project will have emission reductions based on the target Area under bioeremediation in targeted subwatersheds (400 ha). |
| Intermediate Results Indicators | | |
| 1.1.1. Targeted land treated for erosion with selected measures in targeted subwatersheds (ha) | Revised – end-of-project targets | Revised target: 20,000 ha The end-of-project target has been revised to reflect the additional funds made available. The revision of targets is based on the following (April 2018): <ul style="list-style-type: none"> • 1557.81 ha from 20 active sites • 3594.55 ha from 8 awarded sites • 34,528 ha from 30 new sites under AF. The target is a prudent estimate as the new sites are representative sample and are not the final list of sites, which could cover a much smaller area. |
| 1.1.2. Participatory subwatershed Management plans developed under the project for targeted erosion affected sub-watersheds (Number) | Revised – end-of-project targets | Revised target: 38 This is a citizen engagement indicator and linked to a beneficiary feedback mechanism. Through a two-way interaction between citizens and government implementing agencies, citizens will be given a stake in planning and decision-making around watersheds and therefore will contribute to achieve reduced vulnerability. The end-of-project target has been revised to 38 to reflect the additional funds made available. The revision of targets is based on the following (April 2018), 19 states participating and two plans per state. |
| 1.2.1. People receiving project-supported advisory support services in integrated land/water management practices, planning, and/or monitoring under the Project (Number, of which 40% female) | Revised – end-of-project targets | Revised target: 90,000 The end-of-project target has been revised to reflect the additional funds made available and expansion of the project in to new States and installation of hydromet stations (rainfall data to farmers and other advice). |
| 1.2.2. Households benefitting from livelihoods enhancement activities under the Project | Revised – end-of-project targets | Revised target: 12,000 The end-of-project target has been revised to reflect the additional funds made available and expansion of the project in to new States. Activities to be carried out with households are for example sub-grants, distribution of cook stoves, distribution of economic trees, training on skills acquisition and economic empowerment. Disaggregation by sex has been removed as this is unclear. |
| 1.3.1. GEF and Special Climate | Dropped | The indicator has been dropped as tracking tools are not directly linked to the PDO. |



| | | |
|---|--|--|
| Change Fund16 tracking tools updated (Number) | | |
| | New – ‘ <i>Packages with detailed design for treatment of gully complexes and erosion sites in targeted subwatersheds prepared under the project that have received WBG No-Objection but not financed by NEWMAP (number)</i> ’ | Proposed target: 30 The indicator has been added to reflect the additional funds made available and the forward look as these detailed design packages will be left with Government to carry on erosion control beyond project closing. The setting of the end-of-project target is based on the following (April 2018) <ul style="list-style-type: none"> • 55 designs with no objections given • 8 of the 55 designs awarded and will be constructed under parent project • Estimated that 12 of the 55 designs will be constructed under AF |
| 2.1.1. Spatial Knowledge Management Information System on erosion and watersheds operational (Number) | Continued | Original target: 1 This indicator has been continued as original as the target and indicator still reflects what can be achieved under the project scope (including AF). |
| 2.1.2. Proportion of upgraded or new HydroMet stations providing data that is published annually and uploaded to the web (%) | Revised – ‘ <i>Upgraded and newly installed stations providing data for integrated catchment planning (number)</i> ’ | Revised target: 100 The indicator has been revised for clarity. The end-of-project is set at 100 based on (April 2018) an average of 3- 4 installations in each of the following River Basins: Upper Benue, Lower Benue, Hadejia-Jama’are, Sokoto-Rima, Benin-Owena, Ogun-Osun. |
| 2.2.1. City stormwater master plans developed which are informed by climate projections of increased rainfall intensity and risk assessments (Number) | Revised – end-of-project targets | Revised target: 3 The end-of-project target has been revised to reflect the additional funds made available. The revision of targets is based on the following master plans that will be completed (April 2018): Onitsha in Anambra State, Aba in Abia State and Abakaliki in Ebonyi State. |
| 2.2.2. Application of multisector Management effectiveness tool by state and federal governments (Number) | Dropped | The indicator has been dropped as this activity is no longer relevant. |
| 2.3.1. EIA guidelines developed for targeted investment types that affect erosion (road cross drainage, urban water supply and drainage) (Number) | Continued | Original target: 1 This indicator has been continued as original as the target and indicator still reflects what can be achieved under the project scope (including AF). |
| 2.3.2. Duration for approving EIAs for category 1 projects (average working days) | Dropped | The indicator has been dropped as EIA approval time cannot be easily attributed to and monitored through the project activities. |
| | New – ‘ <i>National Centers of Excellence in erosion control established, operational and functional (number)</i> ’ | Proposed target: 3 The indicator has been added to reflect the institutional progress envisaged under the additional financing. The term ‘operational’ is defined in terms of training, publications and advisory support (e.g. safeguards, |



| | | |
|---|--|---|
| | 'Operational': training and publications, advisory support (e.g. safeguards, erosion risk mapping) | erosion risk mapping). |
| | New – ' <i>States with improved erosion risk mapping (number)</i> ' | Proposed target: 19 The indicator has been added to reflect the institutional progress envisaged under the additional financing. The end-of-project target is set as 19, i.e. one per State. |
| | New – ' <i>Community Interest Group collecting municipal solid waste in project intervention areas (number)</i> ' | Proposed target: 50 The indicator has been added to reflect investment in sustainability of project interventions. The target is set at 50 envisaging that nearly all intervention sites will have these groups set up. |
| 3.1.1. Technical reports/ guidelines on promoting low carbon development or enhancing climate resilience completed (Number) | Continued | |
| 3.1.2 Low carbon demonstration projects under implementation (Number) | Revised – ' <i>Climate adaptation /low carbon demonstration projects (Number)</i> ' and end-of-project targets | Revised target: 10 The indicator has been revised to reflect scaling up the activities in demonstration, e.g. distribution of clean cook stoves and solar mini grid project in remote areas. |
| 4.1.1 Monitoring and reporting systems producing data on project progress at federal and state levels | Revised- ' <i>Reports produced on project progress at federal and state levels (Number)</i> ' and end-of-project targets | Proposed target: 18 The indicator has been added to reflect bi-annual reporting (compiled by Federal PMU) during the project length. |
| | New – ' <i>Development of Green Bond (Number)</i> ' | Proposed target: 1 The indicator has been added to reflect realistic achievement of green bond development under the project. The Green Bond will enable capital-raising and investment for new and existing projects with environmentally sustainable benefits, and that have the capacity to meet Nigeria's NDC targets of 20% emission reduction by 2030. |



ANNEX 4. STATUS OF FUNDS FOR PARENT PROJECT AND PROPOSED FOR AF BY COMPONENT

| Component | Parent project Counterpart funding (US\$ millions) | Parent project IDA (US\$ millions) | Parent project disbursement ¹⁶ (US\$ millions) | Additional Financing (% total sum) | Additional Financing Proposed Cost (US\$ millions) | Total Proposed Cost for NEWMAP (Parent+ AF) (US\$ millions) |
|--|--|------------------------------------|---|------------------------------------|--|---|
| Component 1: Erosion and Watershed Management Infrastructure Investments | 75.8 | 395.88 | [229.6] | 76 | 304 | 659.20 |
| 1A: Infrastructure investments (excluding 15 percent contingency) | | | | | 258.4 | |
| Component 2: Erosion and Watershed Management Institutions and Information Services | | 38.20 | [34.4] | 10 | 40 | 74.99 |
| Component 3: Climate Change Response | | 30.00 | [11.00] | 6 | 24 | 50.38 |
| Component 4: Project Management | 74.2 | 32.92 | [72.4] | 8 | 32 | 124.02 |
| TOTAL | 150.0 | 497.00 | [347.4] | 100 | 400 | 908.59 |

¹⁶ Information as of April 30, 2018.



ANNEX 5. ECONOMIC ANALYSIS

72. A CBA was conducted to determine the economic feasibility of the additional financing. The economic analysis shows that the project generates benefits in excess of component costs, with an IRR of 16 percent.

APPROACH

73. **Objective and Approach.** The objective of the project is to reduce vulnerability to soil erosion in targeted sub watersheds. The main intervention consists of hard (infrastructure) and soft (plantation) investment to rehabilitate gullies in Nigeria. Since the final site selection has not yet been made, for the purpose of the economic analysis, the team conducted a CBA for 30 sites (out of 84 priority sites identified in Annex 2). These 30 sites were selected as high priority interventions from the prioritization exercise (Annex 2) and fit within the project budget envelop. It is important to emphasize that these sites may or may not be the final sites selected under the project. The project also funds accompanying measures to ensure the sustainability of these investments such as: improvement in institutional setup, information services, climate resilience, and project management. Although most benefits accrue directly to component 1, the CBA is conducted for the entire project. The analysis considers a 30-year time horizon, 6 percent discount rate, and an average population growth of 2.6 percent per year (World Bank, 2018)¹⁷. The economic analysis uses the traditional “with and without project” approach to assess the economic viability of IDA resources (OPCS, 2014).

74. **Justification for public sector provision.** Soil erosion is an externality caused by market failure as there is currently no cost or penalty for actions leading to soil degradation (such as improper road and drainage construction, poor waste management practices, unsustainable land use practices, excess deforestation and, mining). Without an intervention, these market failures would continue to generate negative externalities to the environment and to the population living nearby (causing landslides, flooding, loss of life, and damage to livelihoods). The private sector alone has no incentive to resolve the problem and, given the high investment cost associated with erosion control, it would be prohibitive, particularly for low-income households, to finance such large investments. Thus, using public sector funds to finance the project is considered appropriate.

75. **Bank value-added.** Having designed and led the implementation of the parent project, the Bank is uniquely positioned to build on the experience already learnt from the parent operation to lead the rehabilitation of additional sites in Nigeria.

PROJECT COSTS

76. **Costs.** The CBA considers all project costs (i.e. US\$304 million in infrastructure investment and US\$96 million in technical assistance and management) as well as Operation and Maintenance (O&M) costs (estimated at 10 percent of infrastructure costs). Project costs are expected to be disbursed as follow: 10 percent in 2019, 40 percent in 2020, and 50 percent in 2021; with O&M costs starting to accrue in 2022.

¹⁷ The World Bank (2018). World Development Indicators. <http://databank.worldbank.org/>



Table 5.1: Costs by Component

| Component Name | Proposed Cost (US\$, millions) | % of total |
|---|--------------------------------|------------|
| Component 1: Erosion and Watershed Management Infrastructure Investments (incl. 15% contingency) | 304,000,000 | 76% |
| Component 2: Erosion and Watershed Management Institutions and Information Services | 40,000,000 | 10% |
| Component 3: Climate Change Response | 24,000,000 | 6% |
| Component 4: Project Management | 32,000,000 | 8% |
| TOTAL | 400,000,000 | 100 |

Table 5.2: Estimated Costs by Project Site

| No. Site | States | State Population 2016* | State Land Area (Ha)** | SITES | Project Catchment area (Ha)*** | Scheme cost (USD) | Main Project Interventions | | | |
|------------------------------------|-------------|------------------------|------------------------|--|--------------------------------|--------------------|----------------------------|-------------------------|--------------------------|--------------------------|
| | | | | | | | Main Intervention | Road Rehabilitation (m) | Afforestation Grass (Ha) | Afforestation Trees (Ha) |
| 1 | Abia | 3,727,000 | 18,344 | Aba Flood, Uratta | 349 | 5,426,016 | Flood control | 1,065 | 2.78 | 0.11 |
| 2 | Akwa Ibom | 5,482,000 | 690,000 | St Luke Hospital, Annua | 109 | 9,061,147 | Erosion control | 182 | 2.5 | 0.16 |
| 3 | | | | At Etim Umanah Close | 74 | 13,046,605 | Erosion control | | | 6.67 |
| 4 | Anambra | 5,528,000 | 486,500 | Nnewichi | 2,893 | 12,620,260 | Erosion control | 50 | 8.15 | |
| 5 | | | | Nkpor Flyover | 256 | 6,383,358 | Erosion control | | 4.46 | |
| 6 | Cross River | 3,866,000 | 2,178,700 | Ikot Uduak (Ndidem) | 180 | 3,355,331 | Erosion control | 1,800 | | 0.17 |
| 7 | | | | Ikot Effanga | 142 | 4,761,599 | Erosion control | 83 | 2.5 | |
| 8 | Ebonyi | 2,880,000 | 640,000 | Ebia River | 13,424 | 12,086,229 | Flood control | Bridge | 3.05 | |
| 9 | | | | Iyokwu Abakaliki | 3,641 | 8,436,658 | Flood control | | 2.3 | 0.26 |
| 10 | | | | Iyudele River | 1,195 | 11,400,095 | Flood control | | 4.49 | 0.5 |
| 11 | | | | Odunukwe - Nkaliki | 2,155 | 4,446,830 | Flood control | 827 | 1.81 | |
| 12 | Imo | 5,409,000 | 528,800 | Umuomeji-Umuturu-Ezumazu-Urualla | 957 | 27,707,660 | Erosion control | | 9.38 | 3 |
| 13 | Delta | 5,336,000 | 1,710,800 | Midoma/ Iweriobor Erosion | 299 | 11,297,887 | Erosion control | 931 | 2.50 | 0 |
| 14 | | | | Jesse Flood Site | 430 | 10,524,648 | Flood control | 5,568 | 1.00 | 0 |
| 15 | | | | Obomkpa Erosion Site | 270 | 6,980,634 | Erosion control | 1,988 | 2.30 | 1.28 |
| 16 | | | | Ogbe Okwe Ukwu Nzu | 103 | 7,088,028 | Erosion control | 2,385 | 2.80 | 1.26 |
| 17 | | | | Onicha Uku Road, Ubulu-Uku | 1,680 | 8,892,254 | Flood/Erosion control | 2,832 | 3.00 | 0 |
| 18 | Gombe | 3,257,000 | 1,710,000 | Wuro Bajoga- Barunde | 184 | 6,412,045 | Erosion control | 3,000 | 27.6 | 9.22 |
| 19 | | | | Federal College of Education Staff School - Railway Line | 465 | 4,304,366 | Erosion control | 5,000 | 69.8 | 23.26 |
| 20 | | | | Gombe State University | 71 | 1,865,741 | Erosion control | 3,000 | 11 | 3.54 |
| 21 | Kano | 13,077,000 | 2,028,000 | Bulbula/ Gayawa Ungogo / Nassarawa LGA | 1,272 | 2,795,690 | Flood control | 12,000 | 450 | 82.2 |
| 22 | | | | Rarin Dawakin Tofa LGA | 1,591 | 4,648,887 | Flood control | 8,000 | 530 | 106 |
| 23 | Kogi | 4,473,000 | 2,774,700 | Adumu Road Erosion Site, | 4 | 10,204,183 | Erosion control | 6,500 | 1.50 | 0.1 |
| 24 | | | | Ankpa Township Erosion Site | 159 | 11,146,676 | Erosion control | 7,500 | 1.20 | 0 |
| 25 | | | | Omigbo River Channelization | 58 | 11,302,183 | Flood control | 4,500 | 7.02 | 2.1 |
| 26 | | | | Ogane- Aju Gully Erosion Site | 3 | 8,247,028 | Erosion control | 5,700 | 0.20 | 0.1 |
| 27 | Nassarawa | 2,523,000 | 2,873,500 | Angwan Kilema (Lafia) | 50 | 3,943,662 | Watershed/Ero | | | |
| 28 | | | | Dadin Kowa(Doma) | 120 | 2,535,211 | Watershed/Erosion | | | |
| 29 | Sokoto | 4,998,000 | 2,782,500 | Yarbulutu (Sabon Birni) | 1,500 | 15,464,789 | Erosion control | | 350 | 30 |
| 30 | | | | Tudun Wada | 1,400 | 12,028,169 | Flood control | | 350 | 30 |
| Total (Figures are rounded) | | | | | 35,040 | 258,400,000 | | 72,911 | 1,851 | 300 |
| Contingency (17.5%) | | | | | | 304,000,000 | | | | |

* Source: Nigeria Data Portal for 2016 (figures are rounded)

** Source: Federal Republic of Nigeria: National Bureau of Statistics. Annual Abstract fo Statistics 2010

*** Source: Detail design studies, PIUs and author estimate



PROJECT BENEFITS

77. **Benefits.** The economic analysis attempts to quantify the following benefits that will result from gully rehabilitation and watershed protection in 30 sites: i) reduced loss of infrastructure, ii) reduced loss of lives, iii) reduced displacement; iv) improved mobility, and v) forest benefits from restoring vegetative cover. Reducing soil erosion will lead to many additional benefits (such as appreciation of land value once work is completed, reduction in sedimentation in ports, rivers and canals therefore increasing their lifespan, reduction in river siltation, increase in carbon sequestration, etc.). However, data constraint did not allow the analysis to capture all benefits. As such, the estimation of benefits should be considered conservative (under-evaluated). However, data constraints prevented the analysis from capturing all benefits. As such, the estimation of benefits should be considered conservative (under evaluated). A summary of all benefits is provided in Table 5.3.

78. **Benefit i. Avoided Infrastructure Loss “with project”.** Without project intervention, gully erosion will worsen leading to additional destruction of infrastructure. This damage will be avoided by stabilizing the gully through civil works and vegetation restoration as well as by ensuring long-term monitoring and proper management of the sites. Benefits of project intervention are equal to damages avoided. The Project Management Unit (PMU) in each state estimated the number of houses that will be protected through the project. A total of 52,500 houses was reported to be protected in the project catchment area. While the value of a house varies widely depending on the state as well the type of structure, for the purpose of this CBA, we consider an average house size of 55m² and an average price of residential land of US\$187 per square meter¹⁸. As such, the average house price is estimated at US\$10,290.

79. **Benefit ii. Avoided death “with project”.** Sever gully erosion has been reported to lead to death especially during landslides and heavy flooding. A recent study in Gombé metropolis revealed that 15 persons died because of gully erosion between 1996 to 2011 (Danladi and Ray, 2014).¹⁹ Another recent article indicated that in Zik’s residential area (in Nsukka metropolis) no less than 2 persons die each year because of gully erosion.²⁰ While it is difficult to forecast the loss of life that will be prevented thanks to project intervention, the PMU in each state provided their best estimate of lives that can be saved over the next 30 years. It was estimated that about 2,600 deaths would be avoided in the project intervention sites. A Value of Statistical Life (VSL) is then used to monetize fatality risks in the CBA. As no reliable revealed or stated preference of the VSL has been undertaken in Nigeria, we use the findings of a recent meta-analysis that uses a US VSL as a basis and adjust it to reflect labor and income differential among countries. The study estimates the VSL for Nigeria to US\$485,000 (Viscusi and Masterman, 2017).²¹

¹⁸NEWMAP Resettlement Action Plan (RAP). Draft Compensation Schedule for Etim Uman Gully Erosion Intervention Project: Buildings, structures and improvements.

¹⁹Danladi and Ray (2014). Socio-economic effect of gully erosion on land use in Gombe Metropolis, Gombe State, Nigeria. *Journal of Geography and Regional Planning*. Vol. 7 (5) pp. 97-105.

²⁰Ujumadu, Okoli, Nkwopara, Igat, Nwaiwu and Ozor (2016). Gully Erosion: As rains begin, South-East communities already under threat. Article appeared in *Vanguard* in March 2016.

²¹W. Kip Viscusi and Clayton J. Masterman (2017). *Income Elasticities and Global Values of a Statistical Life*. Society for Benefit-Cost Analysis.



80. **Benefit iii. Avoided displacement “with project”.** Similar to above, the PMU in each state estimated that project intervention will avoid the displacement of about 254,000 persons. The cost of relocating a person in Nigeria varies drastically from place to place. For this analysis, we looked at the compensation cost for relocating people as calculated in the project’s Resettlement Action Plans²². We found that the cost of relocating a person varies between an average of US\$3,200 in Nnewichi and US\$12,300 in Ojoto. An average relocation cost of US\$7,790 per person was applied in this analysis.

81. **Benefit iv. Reduced time spent in traffic.** The rehabilitation and construction of 72.9 km of roads will increase connectivity and mobility of people, which in turn results in increased productivity. A study on the effect of congestion on travel time along Abuja-Keffi corridor (about 40km) in Nigeria ²³ revealed that during congestion, the road is typically travelled in 27 minutes (compared to 3.5 minutes in non-congested time) adding an estimated 23.5 minutes to the same commute. Most roads targeted by the project may not be as congested as the Abuja-Keffi corridor, therefore the team used a more conservative estimate of time spent in traffic (12 minutes) on roads in the project area. This translates into an average time lost per passenger per year (on a 40 km road) of about 6.5 days (assuming an eight-hour working day and traffic occurring only on weekdays). Further assuming an average of three passengers (of working age) per car, and considering the national Annual Average Daily Traffic (AADT) for Nigeria of 1,772²⁴ [The AADT measures the total volume of vehicle traffic of a road for a year divided by 365]; the team estimates the time avoided in traffic along the 20 roads rehabilitated by the project to about 63,000 days per year. Considering an average GDP per capita of US\$6/person, the estimated time saved in traffic is about US\$375,000 a year.

82. **Benefit v. Reforestation.** As indicated in Table 5.2, the project intends to finance the reforestation of about 300 hectares of land. For the purpose of this analysis the CBA assumes that all hectares are planted with mango trees. A recent study in Nigeria estimated the net economic benefit of a hectare of mango trees at US\$780 per year (Jekayinfa et al., 2013).²⁵ In the project sites, once mango trees have been planted and are bearing fruits (typically three to four years), we estimate the net return at US\$0.2 million per year.

83. **Benefit vi) Emission Reduction.** Consistent with the latest *Guidance Note on the Shadow Price of Carbon in Economic Analysis*²⁶ the economic analysis considers three scenarios: i) the “without project” scenario which entails zero emission reduction as further destruction of vegetative cover will be expected in the sites, ii) a “with project” scenario with a low shadow price of carbon and iii) a “with project” scenario with a high shadow price of carbon. The following estimate have been used: low shadow price of carbon US\$40 tCO₂e by 2020, US\$50 by 2030, and US\$78 by 2050; and a high shadow price of carbon of US\$80 by 2020, US\$100 by 2030, and US\$156 by 2050.

²²Final RAP for Nnewichi, Anambra State (September 2017) and Final RAP Ojoto Gully Erosion, Anambra State (September 2017).

²³Ibitoye et al. (2012) Effects of Congestion and Travel Time Variability along Abuja-Keffi Corridor in Nigeria. Global Journal of Researches in Engineering. Volume 12 Issue 3 Version 1.0.

²⁴Foster and Pushka (2011). Nigeria’s Infrastructure: A Continental Perspective. Policy Research Working Paper 5686. The World Bank.

²⁵S.O. Jekayinfa, A.O. Adebayo, S.O. Afolayan, E. Daramola (2013) On-farm energetics of mango production in Nigeria. Renewable Energy 51 (2013) 60-63. Science Direct. Elsevier.

²⁶Guidance Note on Shadow Price of Carbon in Economic Analysis, World Bank November 12, 2017.



Table 5.3 Estimated Project Benefits

| No. Site | States | State Population 2016* | State Land Area (Ha)** | SITES | Main Project Benefits | | | | | | | |
|----------|-------------|------------------------|------------------------|--|---|--------------------------|--|----------------------------------|---|---|---|---|
| | | | | | No of houses not destroyed "with project" over 30 years | Value of houses (USD/yr) | No of death avoided "with project" over 30 years | Estimated value of avoided death | No of avoided displacement "with project" over 30 years | Estimated value of avoided displacement | Estimated value of time saved in traffic (USD/yr) | Estimated value of reforestation (USD/yr) |
| 1 | Abia | 3,727,000 | 18,344 | Aba Flood, Uratta | 500 | 171,500 | 90 | 1,455,000 | 8,130 | 2,111,090 | 5,482 | 86 |
| 2 | Akwa Ibom | 5,482,000 | 690,000 | St Luke Hospital, Annua | 10 | 3,430 | 50 | 808,333 | 16,855 | 4,376,733 | 937 | 125 |
| 3 | | | | At Etim Umanah Close | 85 | 29,155 | 0 | 0 | 2,592 | 673,056 | | 5,203 |
| 4 | Anambra | 5,528,000 | 486,500 | Nnewichi | 8,804 | 3,019,775 | 15 | 242,500 | 6,275 | 1,629,408 | 257 | |
| 5 | | | | Nkpor Flyover | 24 | 8,396 | 2 | 24,733 | 2,052 | 532,960 | | |
| 6 | Cross River | 3,866,000 | 2,178,700 | Ikot Uduak (Ndidem) | 20 | 6,860 | 5 | 80,833 | 2,600 | 675,133 | 9,266 | 133 |
| 7 | | | | Ikot Effanga | 15 | 5,145 | 3 | 48,500 | 1,850 | 480,383 | 425 | |
| 8 | Ebonyi | 2,880,000 | 640,000 | Ebia River | 1,981 | 679,484 | 200 | 3,233,333 | 8,321 | 2,160,686 | | |
| 9 | | | | Iyiokwu Abakaliki | 2,278 | 781,355 | 330 | 5,335,000 | 11,233 | 2,916,836 | | 203 |
| 10 | | | | Iyudele River | 2,674 | 917,183 | 295 | 4,769,167 | 9,569 | 2,484,750 | | 390 |
| 11 | | | | Odonukwe - Nkaliki | 2,397 | 822,172 | 450 | 7,275,000 | 10,068 | 2,614,324 | 4,257 | |
| 12 | Imo | 5,409,000 | 528,800 | Umuomeji-Umuturu-Ezumazu-Urualla | 478 | 164,106 | 30 | 483,426 | 40,117 | 10,416,941 | | 2,340 |
| 13 | Delta | 5,336,000 | 1,710,800 | Midoma/ Iweriobor Erosion | 2,000 | 686,001 | 11 | 177,833 | 18,000 | 4,674,000 | 4,792 | |
| 14 | | | | Jesse Flood Site | 3,015 | 1,034,146 | 5 | 80,833 | 22,000 | 5,712,667 | 28,662 | |
| 15 | | | | Obomkpa Erosion Site | 1,000 | 343,000 | 4 | 64,667 | 5,500 | 1,428,167 | 10,233 | 998 |
| 16 | | | | Ogbe Okwe Ukwu Nzu | 1,000 | 343,000 | 5 | 80,833 | 5,000 | 1,298,333 | 12,277 | 983 |
| 17 | | | | Onicha Uku Road, Ubulu-Uku | 2,000 | 686,001 | 4 | 64,667 | 17,000 | 4,414,333 | 14,578 | |
| 18 | Gombe | 3,257,000 | 1,710,000 | Wuro Bajoga- Barunde Bridge with Fingers Gully | 1,500 | 514,501 | 1 | 21,788 | 9,000 | 2,337,000 | 15,443 | 7,192 |
| 19 | | | | Federal College of Education Staff School - Railway Line | 2,243 | 769,350 | 3 | 54,982 | 13,458 | 3,494,594 | 25,738 | 18,143 |
| 20 | | | | Gombe State University | 520 | 178,360 | 1 | 8,390 | 3,120 | 810,160 | 15,443 | 2,761 |
| 21 | Kano | 13,077,000 | 2,028,000 | Bulbula/ Gayawa Ungogo / Nassarawa LGA | 269 | 92,267 | 240 | 3,880,000 | 2,152 | 558,803 | 61,771 | 64,116 |
| 22 | Kogi | 4,473,000 | 2,774,700 | Rarin Dawakin Tofa LGA | 118 | 40,474 | 150 | 2,425,000 | 944 | 245,125 | 41,181 | 82,747 |
| 23 | | | | Adumu Road Erosion Site, | 660 | 226,380 | 6 | 97,000 | 3,588 | 931,684 | 33,459 | 78 |
| 24 | | | | Ankpa Township Erosion Site | 936 | 321,048 | 12 | 194,000 | 2,250 | 584,250 | 38,607 | |
| 25 | | | | Omigbo River Channelization | 720 | 246,960 | 10 | 161,667 | 3,200 | 830,933 | 23,164 | 1,638 |
| 26 | | | | Ogane- Aju Gully Erosion Site | 230 | 78,890 | 12 | 194,000 | 1,571 | 407,936 | 29,341 | 78 |
| 27 | Nassarawa | 2,523,000 | 2,873,500 | Angwan Kilema (Lafia) | 23 | 7,747 | 1 | 22,822 | 1,894 | 491,777 | | |
| 28 | | | | Dadin Kowa(Doma) | 19 | 6,488 | 1 | 19,112 | 1,586 | 411,833 | | |
| 29 | Sokoto | 4,998,000 | 2,782,500 | Yarbulutu (Sabon Birni) | 7,000 | 2,401,002 | 210 | 3,402,420 | 4,000 | 1,038,667 | | 23,400 |
| 30 | | | | Tudun Wada | 10,000 | 3,430,004 | 440 | 7,112,209 | 20,000 | 5,193,333 | | 23,400 |
| | | | | Total (Figures are rounded) | 52,500 | 18,014,000 | 2,600 | 41,800,000 | 254,000 | 65,900,000 | 375,300 | 234,000 |



RESULT OF THE CBA

84. The results of the CBA indicate that the project’s NPV is estimated at US\$540 million and the IRR at 16 percent.

Table 5.4: Cost-benefit Analysis (US\$, millions)

| Years | COSTS | | | BENEFITS | | | | | | | NET | |
|-------|---------------|------|-------|---------------|-------------------|---------------|----------------------|---------------------|---------------|------------------------|------------|--------------|
| | Project costs | O&M | Total | Benefit index | Avoided inf. Loss | Avoided death | Avoided displacement | Saving time traffic | Afforestation | GHG Emission Reduction | | Total |
| 2018 | 0 | 0 | 0.0 | | | | | | | | | 0 |
| 2019 | 40 | 0.0 | 40.0 | | | | | | | | 0.0 | -40.0 |
| 2020 | 160 | 0.0 | 160.0 | | | | | | | | 0.0 | -160.0 |
| 2021 | 200 | 0.0 | 200.0 | | | | | | | | 0.0 | -200.0 |
| 2022 | | 30.4 | 30.4 | 0.1 | 1.8 | 4.2 | 6.6 | 0.0 | 0.0 | 0.0 | 12.7 | -17.7 |
| 2023 | | 30.4 | 30.4 | 0.4 | 7.2 | 16.7 | 26.4 | 0.2 | 0.1 | 0.1 | 50.6 | 20.2 |
| 2024 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.2 | 126.5 | 96.1 |
| 2025 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.2 | 126.5 | 96.1 |
| 2026 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.2 | 126.5 | 96.1 |
| 2027 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.2 | 126.5 | 96.1 |
| 2028 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.2 | 126.5 | 96.1 |
| 2029 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.2 | 126.5 | 96.1 |
| 2030 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.2 | 126.5 | 96.1 |
| 2031 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2032 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2033 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2034 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2035 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2036 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2037 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2038 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2039 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2040 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2041 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2042 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2043 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2044 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2045 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2046 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| 2047 | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| | | 30.4 | 30.4 | 1.0 | 18.0 | 41.8 | 65.9 | 0.4 | 0.2 | 0.3 | 126.6 | 96.2 |
| | | | | | | | | | | | NPV | 539.2 |
| | | | | | | | | | | | IRR | 16% |

Note: O&M represent 5 percent of infrastructure costs; NPV = Net Present Value = NPV of Benefits – NPV of Costs