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Report No: PAD4270

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED CREDIT

IN THE AMOUNT OF SDR 494.6 MILLION
(US$700.0 MILLION EQUIVALENT)

TO THE

FEDERAL REPUBLIC OF NIGERIA

FOR AN

AGRO-CLIMATIC RESILIENCE IN SEMI-ARID LANDSCAPES (ACReSAL) PROJECT

November 19, 2021

Environment, Natural Resources and The Blue Economy Global Practice
Western and Central Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2021)

Currency Unit =	Nigerian Naira (NGN)
US$1 =	NGN 410.56
US$1 =	SDR 0.70652404

FISCAL YEAR

January 1 - December 31

ABBREVIATIONS AND ACRONYMS

ACReSAL	Agro-Climatic Resilience in Semi-Arid Landscapes Project
AFOLU	Agriculture, Forestry and Other Land Use
ARMOR	Accelerating Resource Mobilization Reforms
AU	African Union
AWPB	Annual Work Plan and Budget
BCA	Benefit-Cost Analysis
CDP	Community Development Plan
CERC	Contingent Emergency Response Component
CGIAR	Consultative Group for International Agricultural Research
COVID-19	Coronavirus Disease 2019
CPF	Country Partnership Framework
CRF	Community Revolving Fund
CSDP	Community and Social Development Project
CSO	Civil Society Organization
DA	Designated Account
E&S	Environmental and Social
ERGP	Economic Recovery and Growth Plan
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESRS	Environmental and Social Review Summary
ESP	Economic Sustainable Plan
ESS	Environmental and Social Standard
FAO	United Nations Food and Agriculture Organization
FCT	Federal Capital Territory
FGN	Federal Government of Nigeria
FLID	Farmer-led Irrigation Development
FM	Financial Management
FMARD	Federal Ministry of Agriculture and Rural Development
FMEnv	Federal Ministry of Environment
FMFBNP	Federal Ministry of Finance, Budget and National Planning
FMWR	Federal Ministry of Water Resources
FPFMD	Federal Project Financial Management Department
FPMU	Federal Project Management Unit
FSC	Federal Steering Committee
FTC	Federal Technical Committee
GBV	Gender-based Violence
GDP	Gross Domestic Product
GGW	Great Green Wall
GGWSSI	Great Green Wall for the Sahara and the Sahel Initiative

GHG	Greenhouse Gas
GIS	Geographic Information System
GoN	Government of Nigeria
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
ICT	Information and Communication Technology
IDA	International Development Association
IDP	Internally Displaces Person
IFR	Interim Financial Report
IPF	Investment Project Financing
IPMP	Integrated Pest Management Plan
IR	Intermediate Results
IRR	Internal Rate of Return
LGA	Local Government Authority
LMP	Labor Management Procedure
LPRES	Livestock Productivity and Resilience Support Project
M&E	Monitoring and Evaluation
MDAs	Ministries, Departments, and Agencies
METT	Management Effectiveness Tracking Tool
MIS	Management Information System
MSME	Micro, Small and Medium Enterprises
MTR	Midterm Review
NASRDA	National Space Research and Development Agency
NDC	Nationally Determined Contribution
NDVI	Normalized Difference Vegetation Index
NEWMAP	Nigeria Erosion and Watershed Management Program
NGO	Nongovernmental Organization
NIHSA	Nigeria Hydrological Services Agency
NIMET	Nigeria Meteorological Agency
NIWRMC	Nigeria Integrated Water Resources Management Commission
NPV	Net Present Value
O&M	Operation and Maintenance
OHS	Occupational Health and Safety
OP/BP	Operations Policy/Bank Policy
PDO	Project Development Objective
PES	Payments for Ecosystem Services
PforR	Program for Results
PIM	Project Implementation Manual
PPSD	Project Procurement Strategy for Development
PSC	Project Steering Committee
RAP	Resettlement Action Plan
RF	Results Framework
RPF	Resettlement Policy Framework

SDR	Special Drawing Rights
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SFTAS	States' Fiscal Transparency, Accountability, and Sustainability Program
SH	Sexual Harassment
SLWM	Sustainable Land and Water Management
SMP	Security Management Plan
SORT	Systematic Operations Risk Rating Tool
SPFMU	State Project Financial Management Unit
SPMU	State Project Management Unit
STC	State Technical Committee
STEP	Systematic Tracking and Exchanges in Procurement
TRIMING	Transforming Irrigation Management in Nigeria Project
TTL	Task Team Leader
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
WBG	World Bank Group
WFA	World Bank Group Finance and Accounting
WOCAT	World Overview of Conservation Approaches and Technologies

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TABLE OF CONTENTS

DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Nigeria	Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL)	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P175237	Investment Project Financing	High

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach (MPA)	[✓] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[✓] Fragile State(s)
[ ] Performance-Based Conditions (PBCs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made Disaster
[ ] Alternate Procurement Arrangements (APA)	[ ] Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
16-Dec-2021	31-Mar-2028

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The PDO is to increase the implementation of sustainable landscape management practices in targeted watersheds in northern Nigeria and strengthen Nigeria's long-term enabling environment for integrated climate-resilient landscape management.

Components

Component Name	Cost (US$, millions)
Component A: Dryland Management	327.80
Component B: Community Climate Resilience	293.40
Component C: Institutional Strengthening and Project Management	78.80
Component D: Contingent Emergency Response	0.00

Organizations

Borrower:	The Federal Republic of Nigeria
Implementing Agency:	Federal Ministry of Environment

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	700.00
Total Financing	700.00
of which IBRD/IDA	700.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	700.00
IDA Credit	700.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Nigeria	700.00	0.00	0.00	700.00
National PBA	700.00	0.00	0.00	700.00

Total	**700.00**	**0.00**	**0.00**	**700.00**

INSTITUTIONAL DATA

Practice Area (Lead)

Environment, Natural Resources & the Blue Economy

Contributing Practice Areas

Agriculture and Food, Climate Change, Social Sustainability and Inclusion, Water

Climate Change and Disaster Screening

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

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Substantial
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Substantial
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Substantial
7. Environment and Social	High
8. Stakeholders	Substantial
9. Other	High
10. Overall	High

COMPLIANCE

Policy

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

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description

No later than six (6) months after the Effective Date, FMEnv shall enter into a memorandum or memoranda of understanding, in form and substance satisfactory to the Association, with each of the other Implementing Agencies at the Federal level setting out, among other things, the respective roles and responsibilities of such Implementing Agency(ies) and the modalities of cooperation between FME and such Implementing Agency(ies).

Sections and Description

The Recipient shall, no later than three (3) months after the Effective Date, duly establish and thereafter maintain throughout the Project implementation a Federal Steering Committee at federal level ("FSC") with functions, composition and resources satisfactory to the Association.

Sections and Description
The Recipient shall, [no later than [three (3) months] after the Effective Date,] duly establish and thereafter maintain throughout Project implementation a Federal Technical Committee ("FTC") with functions, composition and resources satisfactory to the Association.

Sections and Description
The Recipient shall furnish to the Association, as soon as available, but in any case not later than November 30 of each year, the consolidated annual work plan and budget for the Project for the first year of Project implementation, which shall be furnished no later than one month after the Effective Date.

Conditions

Type	Financing source	Description
Effectiveness	IBRD/IDA	Adoption of the Project Implementation Manual
Effectiveness	IBRD/IDA	Establishment of Federal Project Management Unit (FPMU)
Effectiveness	IBRD/IDA	Adoption of Federal-level Security Management Plan and Grievance Redress Mechanism in accordance with the ESCP
Disbursement	IBRD/IDA	No withdrawals shall be made for payments made prior to the Signature Date. With respect to any payment to a Participating State under Category (1), unless and until the Recipient and said Participating State has (i) executed a Subsidiary Agreement in accordance with the provisions of Section [I.C] of Schedule 2 to this Agreement; (ii) established an SSC, STC and SPMU in accordance with Section I.A.2 of this Schedule 2; and (iii) duly adopted the PIM, and a state-level Security Management Plan and a state-level Grievance Redress Mechanism in accordance with the ESCP.

I. STRATEGIC CONTEXT

A. Country Context

1. **Nigeria is central to the World Bank's mission of eliminating global poverty.** A multi-ethnic and diverse federation of 36 autonomous states, Nigeria is Africa's largest country (over 200 million people) and largest economy (nominal gross domestic product (GDP) of around US$405 billion in 2020). With an abundance of resources and a young and dynamic society, it has the potential to be a giant on the global stage. But with over 40 percent of its population (over 80 million people) in poverty, Nigeria is also among the countries with the largest number of people living below the poverty line. Economic growth, at -1.8 percent in 2020, has been below the rate of population growth since 2016, when Nigeria experienced its first recession in two decades. Fragility, conflict, and insecurity afflict many parts of the country, in particular the northeast. Insufficient capacity constrains the public sector, and on many human development indicators, Nigeria ranks amongst the lowest in the world. To realize its considerable potential, and to fulfill the Government's ambition to lift 100 million Nigerians out of poverty by 2030, Nigeria must make tangible progress on multiple fronts, at both the federal and sub-national levels.

2. **Nigeria's poor human capital outcomes reflect the low levels of public expenditure and weaknesses in service delivery.** In terms of the Human Capital Index (HCI), Nigeria was in 2020 the seventh lowest in the world—168th out of 174 countries. A baby born in Nigeria today will, if the levels, quality and coverage of human capital investments and service delivery remain unchanged, enter the labor force 18 years from now only 36 percent as productive as she would be if she were to enjoy the benefits of a complete quality education and full health. Human development outcomes are particularly low among girls and young women in Nigeria. Girls have fewer educational opportunities, more limited access to credit and productive resources, and poorer labor market outcomes even when gaps in human capital are considered.

3. **Nigeria experiences a diverse climate that ranges from arid in the north to tropical in much of the country and is listed among the countries most exposed to climate risks.**[1] Temperature increases of 0.03°C per decade were observed between 1901-2016, with stronger increases occurring over the last 30 years of 0.19°C per decade.[2] It is also projected that the duration of heat waves will increase, with the largest increases in the north. Projections indicate an increase in precipitation in all areas of Nigeria but the number of days with extreme rainfall will also increase. Climate change is profoundly affecting Nigeria's economy. It is estimated that 2-11 percent of GDP could be lost due to decline in agricultural productivity and activities related to agriculture. A decline of 10 to 25 percent in agricultural productivity and shrinking of GDP by 4.5 percent by the year 2080 has been projected.[3] Agricultural yield has already fallen by 50 percent in some parts of the north.

4. **The country faces a high-water scarcity hazard level, with droughts expected to occur on average every five years, with potential increased frequency due to climate change.**[4] Such water scarcity

[1] Nigeria is ranked 18 of 135 countries according to *GermanWatch's Climate Risk Index* (*https://germanwatch.org/sites/germanwatch.org/files/20-2-01e%20Global%20Climate%20Risk%20Index%202020_14.pdf*; the higher being more vulnerable) and 160 of 181 countries based on Notre Dame's Global Adaptation Initiative Index (*https://gain.nd.edu/our-work/country-index/rankings/*; the lower being more vulnerable).
[2] https://climateknowledgeportal.worldbank.org/country/nigeria/climate-data-historical.
[3] Updated Nationally Determined Contribution (NDC), page 10.
[4] Assessment of thinkhazard.org web-based tool developed by Global Facility for Disaster Reduction and Recovery (GFDRR).

not only threatens food security, livelihoods, and productivity, but also exacerbates fragility and increases the risk of violence. Seasonal variability in rainfall has affected groundwater recharge, availability of surface water for irrigation, power generation, navigation, and other economic activities. Persistent water shortages, especially in the extreme north, will continue to exacerbate land degradation, desertification, and habitat loss. Inaction (business-as-usual) could cost the country an estimated 2 to 11 percent of GDP by 2020 and between 6 and 30 percent by 2050, affecting the livelihoods of millions of households.[5] Other substantial climate-driven impacts include more frequent and harsher torrential rains and windstorms in the southern states in recent years than in the past 40 years; major floods in 2012, 2015, and 2016; and more heat in Nigeria's north.[6] Better environmental and water resources management and resilience against disaster and climate risks (largely water-related) are needed to sustain economic growth and protect the most vulnerable.

5. **The Government of Nigeria (GoN) launched the Economic Sustainability Plan (ESP) in July 2020, featuring an ambitious package of policy measures and programs over the next twelve to eighteen months.** These range from fiscal and monetary measures to mobilize revenues and maintain macro-financial stability to scaling up of social assistance and subsidized credit programs to support households and micro and small enterprises. It also includes large-scale initiatives to stimulate activity and create jobs through investments in agriculture, roads, renewables, housing, and water, sanitation, and hygiene (WASH). Nigeria's earlier multi-year plan, the 2017-2020 Economic Recovery and Growth Plan (ERGP), was formulated in the aftermath of the 2016-2017 recession. While the successor multi-year plan for 2021-2024 is being developed, and in the context of the COVID-19 crisis, the ESP serves as a bridge.

6. **The economic and human impact of the COVID-19 pandemic on Nigeria is severe, even if the country manages to contain the outbreak locally.** Because of Nigeria's vulnerability to oil price shocks, with the sharp fall in oil prices as a result of the COVID-19 crisis, the economy contracted by 1.8 percent in 2020, and consolidated government revenues fell from 8.2 percent of GDP in 2019 to 6.5 percent of GDP in 2020, at a time when fiscal resources were urgently needed to contain the outbreak and initiate counter-cyclical and pro-poor fiscal measures to protect the lives and livelihoods of the nearly 90 million Nigerians in extreme poverty and millions of others in urban areas who are dependent on the informal economy. Estimates suggest that the extreme poverty rate could go up by a couple of percentage points and that the number of poor could increase by between 10 to 15 million by 2022.[7] The human and economic costs would be amplified if the outbreak becomes more severe, leading to a deeper recession and greater health-related costs. The first COVID-19 infection case was identified in late February 2020; as of the 17th of November 2021, a total of 213,321 cases have been confirmed and 2,973 deaths across all the 36 States and the Federal Capital Territory (FCT).[8] Active cases stand at 4,185 with case fatality rate at 1.4 percent. The Government has responded proactively to contain the spread, mitigate adverse impacts of the crisis, and lay the groundwork for a robust recovery. The response has focused on containing the outbreak, marshaling the needed fiscal resources in the face of severe fiscal constraints, and taking steps to mitigate the adverse impact of the economic downturn by reprioritizing federal and state government spending and protecting social expenditures. Because of Nigeria's size, population, socioeconomic, and federal administrative structure, coupled with its weak public service provision and

[5] According to the 2017 climate assessment.
[6] Nigeria's third National Communication to the United Nations Framework Convention on Climate Change (2020).
[7] See World Bank (June 2020), Nigeria Development Update (Spring 2020)—Nigeria in Times of COVID-19: Laying Foundations for a Strong Recovery.
[8] World Health Organization (November 18, 2021). COVID-19 Emergency Dashboard.

longstanding unfinished structural reform agenda, implementation of the crisis response continuous to be challenging.

7. **Significant steps were taken during 2020 to address the macroeconomic and fiscal crisis.** These included: (a) adopting measures to safeguard and mobilize oil and nonoil revenues through initial steps towards establishing a market-based gasoline pricing mechanism and adjustment of electricity tariffs towards more cost-reflective levels; (b) announcing measures to subsidize loans to households and targeted sectors (housing and healthcare); and (c) providing prudential forbearance for banks to promote lending to the private sector. The Federal Government adopted an amendment budget which included a fiscal stimulus package, and with support from the World Bank-financed States' Fiscal Transparency, Accountability, and Sustainability (SFTAS) Program for Results (PforR) (P162009), the states also prepared supplementary budgets to reprioritize spending to protect social expenditures. However recent rises in oil prices have seen fuel subsidies reintroduced, and a reversal of fiscal consolidation efforts on the revenue side could threaten both macroeconomic sustainability and the Government's policy credibility and would further limit the Government's ability to address gaps in human and physical capital. Moreover, Nigeria is experiencing a rise in insecurity, and a tepid or uneven recovery could exacerbate social tensions and dampen investor enthusiasm.

8. **Nigeria is 139th out of 156 countries on the World Economic Forum's 2020 Global Gender Gap Index.**[9] Women's disadvantaged position and lack of decision-making power in the social, economic, and political spheres is reflected in policies, laws, and resource allocation that thwart progress towards gender equality in the country. More than 70 percent of women live below the poverty line, and maternal mortality ratio is among the highest in the world at 576 per 100,000. Female enrollment in school lags behind boys and represents one third to one quarter of classroom participants depending on the state; and two-thirds of the 10.5 million out-of-school children are girls. The wide diversity and distinct socio-economic, cultural, and political contexts across Nigerian geopolitical regions and states results in different gender-related vulnerabilities. While gender inequitable norms prevail throughout the country, these vary by region and interact with other structural, community, and individual factors exposing women, girls, and boys to some forms of gender-based violence (GBV) more than others.

9. **Women lag behind men in terms of earned income from self-employment and production in agriculture.** Self-employed women in the north earn 56 percent less than their male counterparts[10]. Two key factors are associated with the profit gap between male-managed and female managed enterprises: physical capital and target market. Self-employed women operate firms with significantly less capital than firms operated by men; on average, the value of the equipment owned by women-operated firms is only 16 percent of the value for firms operated by men. Their lower capital endowments impede their productivity but also limits their ability to purchase inputs, invest in new activities, and move up higher in the value chain. Women are also 25 percentage points less likely to manage an agricultural plot than men. Nationally, the value of the output per hectare on female-managed plots is 30 percent lower than comparably sized male-managed plots. Three key factors are associated with the productivity gap between male-managed and female-managed plots: input use, crop choice, and the composition of labor used on the plot. Women use fewer inputs; nationally, male farmers use over eight times more fertilizer and 50 percent more herbicide per hectare than their female counterparts, suggesting that equalizing input use could significantly increase female farmer productivity. In both the north and the south, women

[9] https://www3.weforum.org/docs/WEF_GGGR_2021.pdf.
[10] World Bank Nigeria Gender Diagnostic, 2020.

consistently farm less valuable root and tuber crops, holding back their agricultural productivity relative to male farmers. Access to machinery that decreases time and labor requirements on the farm could greatly aid women in reducing the productivity gap between themselves and male farmers, yet female farmers often lack financing to purchase valuable tools. Concerning gender profit gap related to target markets, over 95 percent of female entrepreneurs sell to final consumers despite these firms generating 46 percent lower profits than firms that sell to traders or small businesses. While most male entrepreneurs (90 percent) also sell to final consumers, the higher rate at which women are operating these less-profitable firms represents a key driver of the profitability gap between men and women's firms. Transitioning to selling to traders or businesses further up the supply chain may necessitate selling higher-value goods, a wider range of items, or larger quantities.

10. **Nigeria's Country Partnership Framework (CPF) for FY21-25, approved in December 2020, realigned the country program to emerging priorities and needs following the COVID-19 outbreak.** The World Bank Group (WBG) support for Nigeria's COVID-19 crisis response spans all pillars of the framework outlined in the WBG COVID-19 Approach Paper and covers both adjustments to existing operations and preparation of new operations. Based on the Government's request, a large multi-pronged package of support was approved in FY20 and FY21. The package included: (a) support for public health efforts of about US$950 million from existing and new operations; (b) support for the Federal Government focused on policy measures to maintain macro-financial stability and marshal the fiscal resources needed for the COVID-19 response; (c) support for results-based, proactive, crisis-responsive fiscal measures by the states; and (d) support for states' efforts to protect livelihoods, food security and local MSME activity. The following operations have been approved: (a) restructuring the SFTAS PforR (P162009) to incentivize an appropriate fiscal response by the states, with an additional financing of US$750 million; (b) the US$750 million Nigeria COVID-19 Action Response and Economic Stimulus (CARES) PforR (P174114) to support states' efforts to finance programs to support livelihoods, food security and local medium, small and micro-enterprise activity; (c) the US$700 million Sustainable Urban and Rural Water Supply, Sanitation and Hygiene (SURWASH) PforR (P170734) to improve access to basic water and sanitation; and (d) support of nearly US$200 million for the public health response by states comprised of US$82 million from an existing regional operation, the Second Regional Disease Surveillance Systems Enhancement Project (REDISSE) (P159040) and US$115 million from the COVID-19 Preparedness and Response Project (P173980). The latter operation also benefitted from an US$400 million additional financing, dedicated to vaccine supply. Finally, given the challenging and deteriorating macro-fiscal context, domestic revenue mobilization has become a top policy priority to facilitate required fiscal consolidation and finance the large development needs required for a sustainable recovery. To that end, a US$ 750 million Accelerating Resource Mobilization Reforms (ARMOR) PforR (P177308) is under preparation aimed at supporting the Government in its efforts to increase revenues and strengthen revenue administration.

11. **Support for the social and economic response is focused in the short term on protecting the poor and vulnerable, and in the medium term on limiting the cost to human capital and protecting livelihoods.** The US$820-million National Social Safety Nets Project (P151488) is supporting expanded registration to reach 20 million beneficiaries and additional financing is anticipated in late FY21 to support a time-limited package of welfare support to cushion the impact of COVID-19 on labor markets, and the impact of inflation on poverty. Nigeria CARES PforR (P174114) approved in December 2020 is the flagship vehicle to support states to protect the poor and vulnerable. Prior to its effectiveness in September 2021, two existing projects supporting youth employment and community based social protection schemes were extended beyond the planned closing date of June 30, 2020 to bridge the operational gap. Other active operations were reprogrammed to expand opportunities for community employment, such as

under the Rural Access and Agricultural Marketing Project (P163353). Projects in the education sector including the Adolescent Girls Initiative for Learning and Empowerment (AGILE) (P170664), approved by the Board in July 2020, have been adapted to support distance learning and mitigate the risk of children, particularly girls, not returning to school. The Better Education Service Delivery for All (BESDA) Project (P160430) has been restructured to support schools to gear up for reopening.

12. **Support to policies and institutions is focused on providing immediate fiscal relief and laying the ground for resilient recovery.** The planned Nigeria COVID-19 Federal Fiscal and Economic Response (CoFFER) DPO (P173993) will help maintain macro-financial stability and create the fiscal space for a pro-poor stimulus package to support the Government's overall COVID response. To strengthen macro-economic resilience for recovery the program supports bold reforms in three critical areas: (a) safeguarding revenues and financing flows; (b) reprioritizing spending and strengthening expenditure and debt management and (c) enhancing macroeconomic and financial sector stability. The ARMOR PforR under preparation and the SFTAS PforR has been restructured and scaled up to support states to introduce measures to mitigate fiscal shocks while protecting social expenditure, through additional disbursement-linked indicators at the state level. Nigeria's crisis-ridden power sector presents a twin barrier to resilient recovery: chronic power shortages stifle economic activity and job creation, and tariff subsidies impose a fiscally unsustainable burden on the federal budget. Both are being addressed through the Power Sector Recovery PforR (P164001) approved by the Board in June 2020, which was followed by Distribution Sector Recovery PforR (P172891) approved in February 2021. Sustainable Development Financing Policy actions anchored in the prior actions of the planned DPF were implemented in FY21, and new actions have been proposed for FY22.

B. Sectoral and Institutional Context

Northern Nigeria

13. **Focusing on drylands management, Agro-Climatic Resilience in Semi-Arid Landscapes Project (ACReSAL) will be implemented in the states of northern Nigeria.** The country's arid zones, or drylands, cover about the northern half of Nigeria's total land area of 92 million hectares, and comprise three belts that are classified, from north to south, as arid, semi-arid, and dry sub-humid, according to a leading aridity index.[11] Annex 4 provides more information on Nigeria's drylands (see also the map in Annex 10).

14. **Other than differences of climate and vegetation, there are striking differences between northern and southern parts of the country.** In highly erodible soils, predominant in parts of southern and central Nigeria, a key contribution to poverty is massive gully erosion, a focus of the ongoing Nigeria Erosion and Watershed Management Program (NEWMAP-P124905). In northern Nigeria, the challenges of sustainable land and water management (SLWM) primarily concern water resources management, declining fertility and degradation of agricultural soils, and impacts of climate change.

15. **In the semi-arid northern region, about 80 percent of people are involved in arable crop production and pastoral farming.** Most people derive their livelihoods from extensive, mixed rainfed cropping and livestock production systems, augmented where possible by off-farm income sources. Average household incomes from mixed cropping/pastoralism vary widely but can often be less than US$500 per year. Figure 2 shows the strikingly higher poverty rates in the north. Other causes of higher

[11] Consultative Group for International Agricultural Research's (CGIAR) Aridity Index.

poverty rates in the north are such factors as more erratic rainfall, more variability and changes in the climate, hostilities which have caused hundreds of thousands to migrate, as has climate change, and relatively less developed poor rural infrastructure and social services.

Drylands degradation

16. **The drylands of Nigeria are under stress due to growing human populations and climate change.** Nigeria's drylands have supported human communities for many centuries. Farmers and pastoralists historically had access to large areas of land, permitting long fallow periods and allowing for mobility to exploit forage and water resources both seasonally and in times of drought. Nigeria's population has however quadrupled in the last five decades. With increasing densification of populations along with climate change, traditional strategies to adapt to drylands are becoming less feasible, increasing vulnerability. With less land to farm, farmers must reduce fallow periods, resulting in a vicious cycle of soil degradation. Agricultural expansion into forestlands and rangelands reduces access to valuable forest products and to livestock forage, while also increasing erosion. Overexploitation of surface and groundwater coupled with the impacts of climate change reduces water availability for livestock and agriculture. Encroachment of agriculture into traditional pasturelands negatively impacts pastoralists.

17. **Climate change exacerbates drylands degradation.** Rainfall in northern Nigeria is becoming more variable, with more frequent extreme events, and temperatures are increasing. The dryland belts of northern Nigeria are expected to shift southward. Rainfall variability and extreme weather events, both flooding and droughts, can be expected to bring increasing pressure on vulnerable communities who will often be forced to exploit natural resources that they depend on more intensively, promoting a cycle of further land degradation. Annex 4 has further information on climate change impacts in the project area. Desertification advances, but changes are difficult to quantify in terms of hectares/year or movements of km/year. Desertification i s the process of degradation of drylands such that they become progressively less suitable to support human populations. Specifically, it is defined by the United Nations Convention to Combat Desertification (UNCCD) as "the degradation of land in arid, semi-arid, and dry sub-humid areas. It is a gradual process of soil productivity loss and the thinning out of the vegetative cover because of human activities and climatic variations such as prolonged droughts and floods." Desertification in northern Nigeria is a complex process with many interrelated proximal drivers (see Annex 4 for further background information on desertification and its drivers). Variability of rainfall from year to year can be significant and make it difficult to remotely measure vegetation cover. Better data, definitions, and monitoring (all to be supported under ACReSAL) will help to better quantify rates of desertification. Some current rough estimates are that more than half of the land area of the most northern states (Bauchi, Borno, Gombe, Adamawa, Jigawa, Kano, Katsina, Kebbi, Sokoto, Yobe, and Zamfara States) is undergoing significant desertification and up to 15 percent of the remaining more southerly buffer states of northern Nigeria. Behind the statistics of ever-increasing km^2 of degraded land are millions of households falling further and further into poverty.

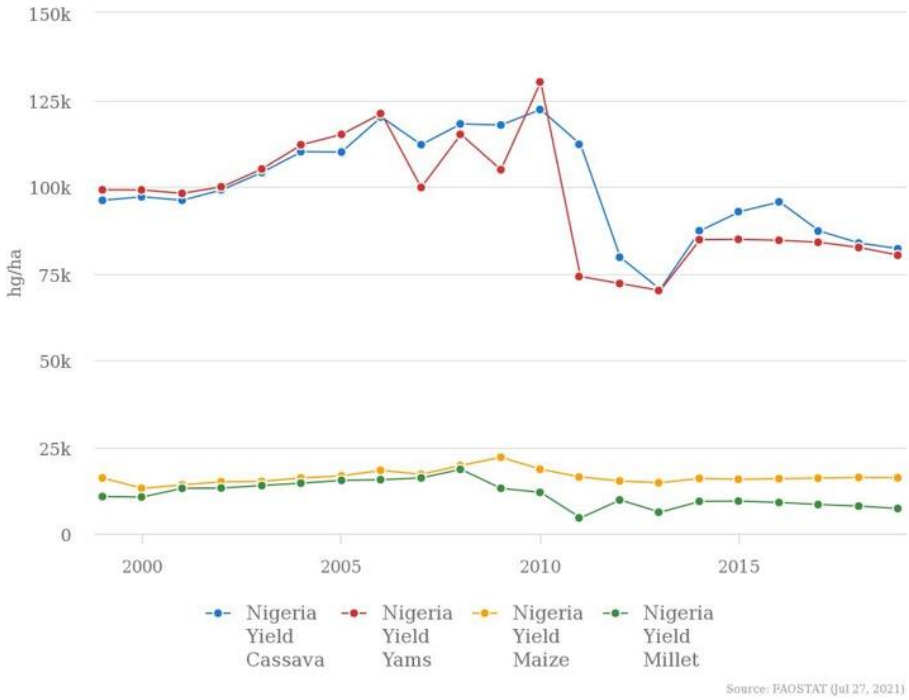
Impacts of drylands degradation

18. **The agricultural sector is the major economic driver of northern Nigeria.**[12] This sector accounts for the main livelihood strategies of most rural dwellers in the drylands of northern Nigeria. The country

[12] Nigeria Bureau of Statistics (2016). The Nigerian Economy: Past, Present and Future.

has 78 million ha of agricultural lands,[13] of which 38 million ha are under cultivation, mainly rainfed. Eighty percent of the land in the 20 states in the center and northern part of the country is agricultural land (57 percent cropland and 23 percent grassland). Nigeria has significant potential for irrigation expansion, an estimated 2.1 million ha of potentially irrigable area. However, the current irrigated area is only about 200,000 ha. In part because of climate change, the productivity of major crops in Nigeria has been steadily declining over the past two decades (Figure 1),[14] forcing an expansion of the area under agriculture and increased imports to meet the food needs of the country's growing population. Resource shortages, climate change, violent conflict, outdated agricultural systems not adapted to changing dryland conditions, lack of access to finance, weak value chain linkages, uncompetitive environment for agribusiness, and poor market access are key barriers to increased agricultural productivity in Nigeria.[15, 16]

Figure 1. Yield of Four Major Crops in Nigeria (2009–2019)



19. **Desertification exacerbates declining agricultural productivity, food insecurity, and poverty challenges in northern Nigeria.** Desertification results in soil erosion, loss of soil nutrients, and low retention of soil water, which slows down plant growth and leads to a decline in the productivity of agricultural lands.[17] Increased use of inputs, such as fertilizers, to offset the loss of fertility, increases greenhouse gas (GHG) emissions and can increase soil deterioration. The GoN has established several initiatives in the agriculture sector to combat desertification including afforestation and reforestation programs, dissemination of proven agricultural technologies and sustainable agricultural practices, and

[13] United Nations (UN) Food and Agriculture Organization (FAO) defines agricultural land as the share of land that is arable, under permanent crops or pastures.
[14] FAOSTAT (2021), accessed in July 2021.
[15] Downie, R. (2019). Growing the agriculture sector in Nigeria. *Gates Open Res*, *3*(98), 98.
[16] Oyaniran, T. (2020, Sept. 29). *Current state of Nigeria agriculture and agribusiness sector* [Presentation]. AfCFTA Workshop. https://www.pwc.com/ng/en/publications/afcfta-series-ii-agriculture-agribusiness-workshop-presentations.html.
[17] UNCCD (2017). The global land outlook, first edition. Bonn, Germany. https://knowledge.unccd.int/publication/full-report.

promotion of efficient energy sources.[18] Efforts to stop and reverse desertification are complicated by the need to feed a rapidly increasing population in a region where natural resources are dwindling and over 90 percent of national food production depends on smallholder farmers who lack the capacity to increase food production without degrading land.

20. **The livestock population in Nigeria has been estimated to consist of 20.6 million cattle, 46.9 million sheep, 82 million goats, and 167 million poultry.**[19] The northern region of Nigeria supports a significant proportion of the country's livestock, hosting about 90 percent of the cattle population, two-thirds of the goats and sheep and almost all donkeys, camels, and horses.[20] The livestock sector mainly comprises smallholders using extensive animal production systems. The cattle population is predominantly managed by transhumant herdsmen and semi-sedentary pastoralists. The aggregate annual demand for milk and dairy products is estimated at 1.3 million tonnes out of which only 0.5 million tonnes are produced domestically.[21] Pastoral herds move along moisture gradient and with the seasons, southwards towards the deciduous forest during the dry season and northwards as far as the Sahel during the rainy season.[20] This system allows pastoralists to exploit the seasonal availability of pasture, accessing crop residue, fallow land and open range to produce beef and milk. Transhumance is also a successful strategy in coping with uncertainties due to diseases, climate change, and local conflicts. In the past, movement was mainly through designated stock routes with rest points in grazing grounds. However, desertification exacerbated by drought and climate change continue to push cattle herders further south in search of grazing land with sufficient forage yield. This change has caused friction between cattle herders migrating from the north and farmers in the south leading to the death of at least 10,000 people between 2011 and 2018.[22]

21. **Northern Nigeria is characterized by erratic availability of water resources.** Although Nigeria generally is endowed with abundant water resources, its occurrence is highly variable in time and space. Water situation in the north is often characterized by cycles of frequent flooding during the wet season and water scarcity during the dry season. This scarcity however is more economic than absolute. Over the years, Nigeria has invested in dams and storage infrastructures to mobilize water for use during periods of scarcity, but the inability to optimize the usage of the mobilized water is making society vulnerable to erratic rainfall. The Nigeria Water Resources Masterplan (2013)[23] estimates a potential of about 375 billion cubic meters (BCM)/year of surface water resources inclusive of external flows into the country and the groundwater resources potential as renewable resources is estimated at 156 BCM/year. These resources, though extensive, are unevenly distributed across the country. Also, the Intergovernmental Panel on Climate Change's (IPCC) Emissions Report suggests an increasingly drier north with an average decrease in rainfall of about 7.5 cm annually. With the twin effect of growing population and climate change, water resources availability for the mostly agrarian community in northern Nigeria is expected to become even more erratic.

[18] Federal Republic of Nigeria Ministry of Environment Nigeria (2012). Great green wall for the Sahara and Sahel initiative. National strategic action plan.
[19] FAOSTAT (July 28, 2021).
[20] Federal Ministry of Environment of Nigeria (2001). National Action Programme to combat desertification.
[21] FAO (2019). The Future of Livestock in Nigeria: Opportunities and Challenges in Face of Uncertainty.
[22] Nugent, C. (2018, June 28). Land conflict has long been a problem in Nigeria: Here's how climate change is making it worse. TIME. https://time.com/5324712/climate-change-nigeria/.
[23] FMWR. 2013. Nigeria Water Resources Master Plan (2013), supported by JICA.

22. **There is a need for improved water resources management to address water scarcity challenges in northern Nigeria.** Land degradation, compounded by the effects of climate change, reduces the water holding capacity of watersheds, increasing the impact of droughts and floods. Watershed management interventions and climate adaptation measures to better control erosion and sedimentation into existing dams include construction and rehabilitation of small storage reservoirs and rainwater harvesting structures to support communities, introduction of micro-irrigation, harnessing flood waters for productive uses, and identification of recharge areas to protect groundwater resources.

23. **Forests provide important sources of income to many rural people in the north.** Forest products such as fuelwood are gathered and traded at local markets, with charcoal generally destined for urban consumers. Forests also provide a great range of non-timber forest products (NTFP), including forage. They are the last refuges of much of the remaining biodiversity of northern Nigeria. Forests protect against desertification by providing alternative sources of income (especially in drought years), by enhancing climate adaptation, by slowing erosion and movement of sand, and constituting a source pool for dryland-adapted biodiversity. According to the UN FAO Global Forest Assessment 2020, only 16,000 ha/year has been reforested in the country from 2015-2020.

24. **A direct degradation of the productive capacity of forest lands can be an outcome of desertification.** This can occur because of climate change as natural and planted forests become less adapted to changing climatic conditions. Forests can also be degraded or destroyed as local populations are forced to overexploit resources, are affected by reduced availability of water, or are cut down for expansion of agricultural areas or for meeting energy demands.

25. **Natural drylands ecosystems of northern Nigeria have been significantly degraded.** Expansion of agriculture, overgrazing, and increasing demand for land along with climate change has directly affected native vegetation and biodiversity. Nigeria has one of the highest deforestation rates in the world, 3.4 percent per year[24] and annual losses due to burning have been estimated at 4.0 million ha.[25] The few remaining areas of natural vegetation in northern Nigeria harbor globally and national important biodiversity and are genetic reservoirs for many species of endangered flora and fauna which are also important for local livelihoods. Ecosystems in northern Nigeria important for conservation and providing ecosystem services include those in national parks, gazetted forests, wetlands, and oases. Natural ecosystems such as wetlands play particularly important functions in regulation of water flows and recharge of surface and groundwater and provision of critical ecosystem services to communities in the northern region.

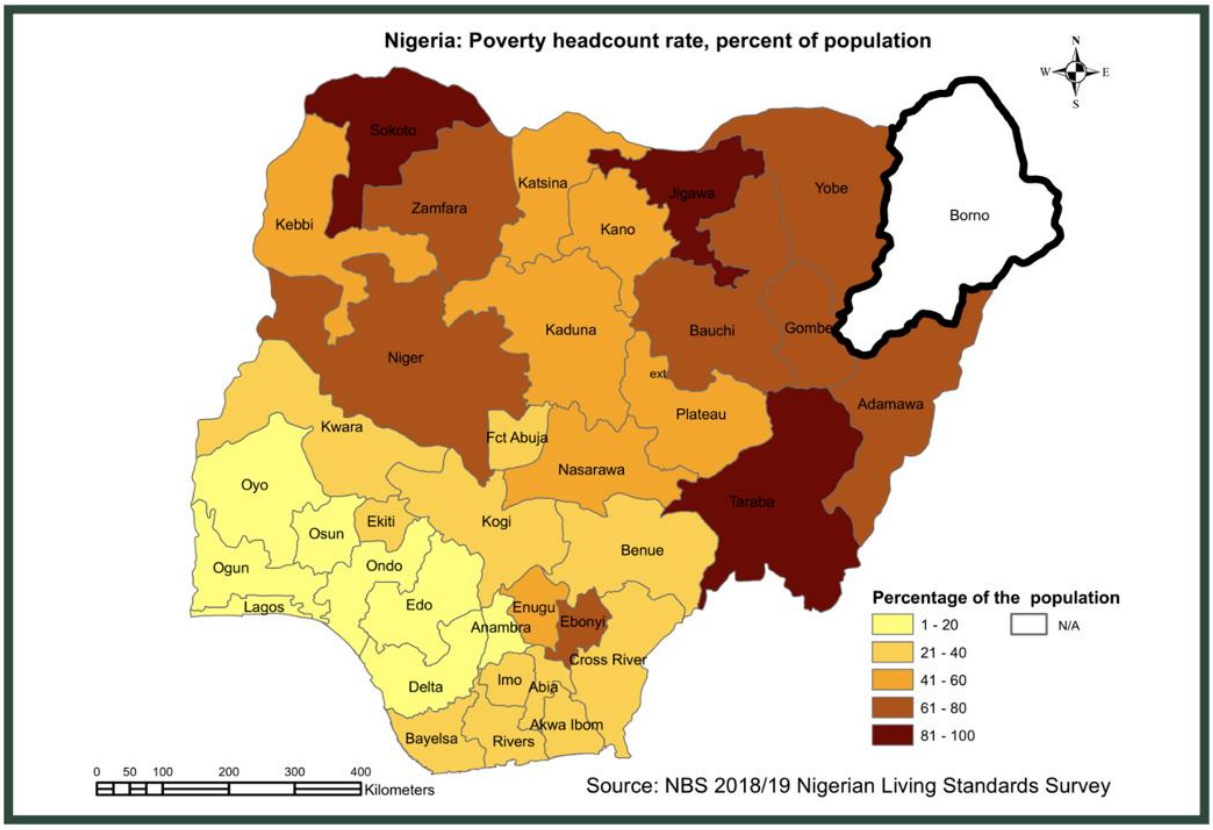
26. **A consequence of weakened coping strategies in fragile and drought-prone drylands is growing poverty.** About 40 percent of Nigeria's total population is living below the poverty line,[26] but poverty is strikingly rural – nationwide the urban poverty rate is 18 percent but 52 percent rural. Furthermore, the northern region is disproportionately poor. The northern states targeted by this project have the worst indices of poverty (Figure 2). In three of the northern states (Jigawa, Sokoto, and Taraba), the poverty rate exceeds 80 percent (data not available for Borno State).

[24] National REDD (2019). Nigeria REDD+ Programme Terminal Evaluation Programme. *https://www.unredd.net/documents/un-redd-partner-countries-181/africa-335/nigeria-336/national-programme-document-and-related-1079/17407-un-redd-national-programme-final-evaluation-report-june-2019/file.html*.

[25] Global Forest Watch.

[26] Poverty and Inequality in Nigeria: Executive Summary (2019). National Bureau of Statistics, May 2020.

Figure 2. Poverty Headcount Rate in Nigeria



27. **Increasing competition over access to declining natural resources caused by climate change, desertification and population growth contribute to conflicts, insurgencies, and violence.** Northern Nigeria has experienced multiple conflicts over the past decade, including a decade of armed insurgency in the northeast by Boko Haram and the Islamic State – West Africa Province (ISWAP), farmer-herder conflicts in the northwest, and increased banditry and armed violence across large parts of the north. This region has seen ongoing conflicts (through the mobilization of local militias), increased competition over natural resources, and opportunistic crime in a weakened security environment. These conflicts have led to devastating consequences for the civilian population with large-scale displacements (estimates show about 2.2 million people displaced in the north-east), destruction of productive assets and livelihoods creating widespread food insecurity and humanitarian needs (with the UN Office for the Coordination of Humanitarian Affairs estimating about 8 million people facing urgent needs), and criminal gangs proliferating, including in the northwest. Beyond their human toll, these conflicts in turn have often exacerbated the exploitation of dwindling natural resources, resulting in worsening cycles of misuse of resources and further conflict. In parallel to security efforts, increased resilience at the community level requires peacebuilding efforts that are grounded in sound land and natural resource management to support conflict prevention, mitigation, resolution, and recovery.

Nigeria's multisectoral Sustainable Land and Water Management (SLWM) approach

28. **Many projects and initiatives have been undertaken in northern Nigeria over the past decades to combat the growing crisis of desertification.** Responses embarked upon by the Government include:

(a) sand dune fixation; (b) rangeland establishment; (c) oasis inventory and restoration; (d) drought forecasting; (e) better adapting agriculture to drylands; and (f) increase of water storage and management through dams. Some sector-based responses have been successful, and Nigeria has built up a rich experience in addressing challenges of climate change and dryland management.

29. **The Federal Government of Nigeria (FGN) is increasingly moving toward an integrated and multisectoral approach to address the challenges of dryland management.**[27] Key policies and planning documents of the Government include the following: (a) Drought and Desertification Policy; (b) National Drought Preparedness Plan; (c) National Action Plan to Combat Desertification; and (d) Land Degradation Neutrality Process. The national commitment is evidenced by Nigeria's intention to restore 4 million hectares of degraded land by 2030 as part of the AFR100 Initiative and the Bonn Challenge. With respect to mitigation, Nigeria's commitments as outlined in its NDC and Land Degradation Neutrality (LDN) targets are to unconditionally reduce GHG emission by 20 percent compared to Business-as-Usual scenario (BAU) and 47 percent compared to BAU with international support by 2030.[28]

30. **Because of policy and institutional constraints at the federal and state levels, multisectoral initiatives have not always achieved the anticipated success and results.** Best practice integrated watershed management usually includes a participatory planning approach at both landscape and micro-scales, with management plans utilizing high quality scientific data from both field and geospatial sources. Based on approved SLWM plans, targeted interventions can then be delivered to address natural resource priorities and build climate resilience which in northern regions could include reducing land degradation and erosion, increasing vegetative cover, improving agricultural productivity, increasing availability and access to water, and improving pasture management and nomadic grazing practices. In addition, an integrated watershed management approach should include activities to improve farm and non-farm livelihoods to broaden economic activity, particularly for women and vulnerable groups, and reduce the community's dependency on, and inappropriate use of natural resources. Overall, as the natural resource and economic base are put on a more sustainable footing, conflict over natural resources is expected to decline.

31. **Past operations have delivered important results and lessons—these are described in more detail in Annex 8.** There is now a critical need to build on these experiences and address land degradation, increase climate change adaptation and mitigation measures, improve the quality and values generated by the natural resource base, strengthen climate resiliency, and lessen livelihood vulnerabilities in dry, semi-arid and semi-humid regions in the northern states.

C. Relevance to Higher Level Objectives

32. **The proposed project is a core element of the *Reducing Fragility and Building Agro-Climatic Resilience* pillar of the 2021-2025 CPF.**[29] The proposed ACReSAL project accounts for a large part of the FGN's objective of restoring one million ha degraded land out of the 4 million ha target set for broader landscape restoration by 2030. The project will also help reduce the vulnerability of millions of the extreme poor in northern Nigeria, strengthening their own role in the management of their territories.

[27] Cervigni R. and Michael M., editors (2016). Confronting Drought in Africa's Drylands: Opportunities for Enhancing Resilience. Africa Development Forum series. Washington, DC: World Bank. doi:10.1596/978-1-4648-0817-3. License: Creative Commons Attribution CC BY 3.0 IGO.
[28] http://www.fao.org/faolex/results/details/en/c/LEX-FAOC187295/.
[29] Report Number 153873-NG: *Country Partnership Framework for The Federal Republic of Nigeria (2021-2025)*

Annex 8 includes further information on the CPF and the World Bank's programmatic approach to development challenges of northern Nigeria.

33. **The project is well aligned with key World Bank strategies.** The proposed project aligns with the World Bank's Next Generation Africa Climate Business Plan (NGACBP) of 2020. The expected results of ACReSAL are consistent with the five Strategic Directions of the NGACBP: (a) Delivering Food Security; (b) Securing Environmental Stability; (c) Driving Clean Energy; (d) Building Resilient Green Cities; and (e) Protecting against Climate Shocks; and two Special Areas of Emphasis: Promoting Climate-Informed Macroeconomic Policies; and Securing Green and Resilient Infrastructure. The proposed project is also consistent with the World Bank's Western and Central Africa Region Priorities (2021-2025) as it contributes to Goal 4 (Increase Climate Resilience) by aiming to reduce the vulnerability of rural populations to the negative impacts of land degradation and climate change. In a similar manner, the project will contribute to achieving the Region's objective of increasing climate co-benefits in financing to an average of 35 percent over FY21-25. Furthermore, the proposed project aligns with the Sahel Initiative. In the Sahelian region, environmental crises have very serious economic, social, and security-related consequences. The project activities are supportive of the WBG Environment Strategy by improving the "green" aspects of natural resources management (especially related to land and vegetation) to improve food security and healthy ecosystems, leveraging innovative, green growth (including climate smart agriculture) and climate resilient approaches. supporting water security through sustaining water resources, delivering watershed services, and building resilience in contributing to Sustainable Development Goal (SDG) 6 ("Ensure access to water and sanitation for all"). ACReSAL will also support the objectives of the Great Green Wall, Africa Forest Landscape Restoration Initiative (AFR100) and Bonn Challenge initiatives in Nigeria. The project also works to support the World Bank agricultural thrusts on climate-smart agriculture, improving livelihoods and better jobs, including for women and youth, boost agribusiness value chains and improve food security. Importantly, the project will contribute towards achieving the World Bank's corporate commitment of increasing its new climate lending portfolio from 28 percent to 35 percent over the period FY21-25.

34. **Relationship with the key Corporate Filters:** The project will address employment creation and rural income support and generate "durable natural assets" that would enhance multiple ecosystems services such as water supply, drought proofing, micro-irrigation, or flood control in the semi-arid landscapes, which underpin economic and social development. The proposed project also responds to the COVID 19 pandemic by addressing socio-economic impacts on people in areas that are hardest hit. ACReSAL will also support the Government to implement their biodiversity commitments under international conventions by targeting investments in protection and restoration, payments for ecosystem services (PES), and policy changes to reduce biodiversity loss and increase its resilience.

II. PROJECT DESCRIPTION

A. Project Development Objective

35. **The Project Development Objective (PDO)** is to increase the implementation of sustainable landscape management practices in targeted watersheds in northern Nigeria and strengthen Nigeria's long-term enabling environment for integrated climate-resilient landscape management.

36. The **PDO-level indicators are as follows:**

(a) Land area under sustainable landscape management practices (ha);
- Area under improved catchment management (ha);
- Area under community-led landscape restoration (ha);
- Protected areas under improved management (ha);
- Area provided with new/improved irrigation or drainage services (ha);
- Area under improved rainwater harvesting (ha);

(b) Enabling environment for integrated landscape management strengthened (text);

(c) Increase in Normalized Difference Vegetation Index (NDVI) in targeted areas, correcting for natural variability (percentage);

(d) Direct project beneficiaries (number);
- Number of direct project beneficiaries - female.

B. Project Components

37. **The project has four components and will be implemented over a period of six years.** A six-year duration was considered appropriate because of what is expected to be a slow trajectory in the first two years as the project helps build the institutional and policy enabling environment for strategic watershed planning. Additionally, significant security constraints could slow project implementation. The project components are presented briefly in this section; Annex 3 presents a more detailed description of the components and subcomponents.

38. **The IDA financing is US$700 million.** In addition, the FGN will contribute to staff costs, operating costs, and payments for resettlement and compensation for civil works. Beneficiaries will participate in the financing of subprojects and community activities through revolving funds or in-kind contributions.

Table 1. Total IDA Financing (US$, millions)

Components	IDA
Component A. Dryland Management	**327.8**
A1 Strategic Watershed Planning	33.0
A2 Landscape Investments	244.8
A3 Special Ecosystems	50.0
Component B. Community Climate Resilience	**293.4**
B1 Community Strengthening	22.0
B2 Community Investments	271.4
Component C. Institutional Strengthening and Project Management	**78.8**
C1 Institutional and Policy Strengthening	45.6
C2 Project Management	33.2
Component D. Contingent Emergency Response	**0.0**
Total	**700.0**

39. **Component A. Dryland Management (US$327.8 million equivalent).** This component will implement integrated watershed management planning and addresses challenges of large-scale watershed degradation in northern Nigeria. It will support the following subcomponents:

40. **A1. Strategic Watershed Planning (US$33.0 million):** This subcomponent will support large-scale integrated watershed management planning. Plans will be prepared for up to 20 watersheds, covering all of northern Nigeria. Rapid initial versions will be prepared in less than a year, with refined updates to be prepared throughout the project lifetime. The planning will be carried out using analytical approaches and through development of a modern knowledge base (including collation of existing data from in situ and earth observation and biophysical surveys). Extensive participatory stakeholder consultations will be fundamental. ACReSAL will strengthen multisectorality at the institutional and policy level but the project's design additionally emphasizes the importance of multisectoral SLWM planning. The multisectoral planning process will prioritize project investments, expected to include those related to information, institutions, and those required for desertification control, SLWM in drylands, and improved natural resource-based livelihoods. The strategic watershed plans will also provide a framework and guidance to the micro-watershed-level planning in Component B and will be a foundation for the longer-term dryland management framework of Nigeria supported under Subcomponent C1.

41. **A2. Landscape Investments (US$244.8 million):** This subcomponent will support landscape-level investments, as prioritized in the strategic watershed plans. These may include those related to water resources management (for example, surface and groundwater storage, managed aquifer recharge, riverbank restoration, gully rehabilitation, and irrigation), to nature-based solutions for environmental management (for example, stabilization of sand dunes, vegetation management, reforestation). Additionally, the subcomponent will support large-scale agriculture investments for rangeland management and for a range of agricultural extension services such as the promotion of integrated pest management (IPM) and knowledge and data services. The subcomponent is expected to include both state- and federally implemented investments, depending on the scope of the subprojects. A considerable pipeline of investments has already been identified and prepared under NEWMAP and some of these will be financed under ACReSAL, provided they are consistent with ACReSAL objectives and requirements.

42. **A3. Special Ecosystems (US$50.0 million):** Investments under this subcomponent will support better management and conservation of special ecosystems in all participating states, including wetlands, desert oases, and protected areas. Investments could include those related to wetland improvements, monitoring systems, inventories of the current status of these ecosystems,[30] stabilization and restoration of wetlands, forest reserves, and oases. Traditional uses of wetlands and oases have been impacted by overuse of water for agriculture and other uses. The project will support investments for community work in restoration activities (for example , including women and youth participation in restoration action plans such as tree planting), creation of demonstration gardens, knowledge sharing of traditional uses of wetlands and oases, and pest management, among others. Actions to increase application of current policies and regulations applicable to special ecosystems, the review or improvement of these policies and capacity building of institutions responsible for their management and conservation are included under Subcomponent C1.

43. **Component B. Community Climate Resilience (US$293.4 million equivalent).** Most of the challenges of dryland management are to be found at the local level, where they constitute the day-to-day reality of communities and farmers. Communities need support to be more resilient and communites

[30] The Wetlands Act requires states to perform inventories of the status of wetlands and riverbanks to define priority interventions in these areas.

and households need targeted investments to put new approaches into effect. In targeted micro-watersheds, this component will support the following subcomponents:

44. **B1. Community Strengthening (US$22.0 million):** This subcomponent aims to strengthen the capacity of communities for sustainable natural resource use and management. Support will be provided to "local project implementation committees", or their local equivalent. Building on the outcomes of the higher-level strategic watershed planning (Subcomponent A1), micro-watershed planning will be supported to prioritize investments. Social cohesion and peace building will be strengthened by addressing gender inequalities, the needs of vulnerable and marginalized groups, and by improving conflict resolution capacities at the local level, all through joint planning and implementation across stakeholder groups to foster mutual understanding. Activities such as participatory planning processes, capacity building, and establishment of community revolving fund (CRF) management committees will be implemented in a gender-inclusive manner to help improve women's voice and agency in participating communities.

45. **B2. Community Investments (US$271.4 million):** This subcomponent will finance physical investments as prioritized through the micro-watershed planning process. Although the menu of potential investments will vary from community to community based on their priorities, three groups can be described:

- **Landscape restoration in community-selected degraded areas** will promote hybrid agroforestry models on communal lands, using plant species chosen by the communities. These investments produce non-timber forestry products, such as: fodder, acacia (gum Arabic), balanites, beekeeping, nuts, mushrooms, and grains such as millet and sorghum. Improved pasture and rangeland management and restoration could also be included. Prioritized community infrastructure investments can also be supported.
- **Climate-smart rainfed agriculture.** Support to farmers at the household level to optimize climate-smart rainfed agriculture practices, particularly relating to crops. Investments could include water and soil conservation, optimizing farm management (improved crop varieties, Integrated Pest Management; soil and water testing technologies), controlling invasive species, and supporting value chains. The project will support these investments by providing loans from CRFs to registered community/farmer groups and cooperatives. The project will address gender inequalities in access to funding for enterprises by prioritizing subproject proposals from groups/cooperatives that have women beneficiaries as members and/or leaders.
- **Farmer-led irrigation development (FLID).** North and central Nigeria is rich in shallow groundwater resources, with about 7 million ha of cropland with groundwater resources within a depth of 25 m. The project will support farmers at the household level to increase irrigation, including small-scale solar-powered irrigation.

46. **Component C. Institutional Strengthening and Project Management (US$78.8 million equivalent).** This component includes investments to improve the enabling institutional and policy foundation for multisectoral integrated landscape management and climate resilence, as well as support to project management. It will include the following subcomponents:

47. **C1. Institutional and Policy Strengthening (US$45.6 million):** This subcomponent aims to improve the enabling institutional and policy foundation for integrated landscape management and climate change

resilience in Nigeria – with an initial focus on ACReSAL activities but also for a longer-term enabling environment for dryland management. This subcomponent will include support to federal-level MDAs and to all states in northern Nigeria for monitoring infrastructure, institutional infrastructure, specialized consultancies, knowledge products, policy environment, capacity-building and outreach, and PES. Support will be included for systems for improving remote preparation and supervision of investments (for example, through use of satellite imagery, drones, cameras, and videoconferencing).

48. **C2. Project Management (US$33.2 million):** This subcomponent will support overall project monitoring and management, for the Federal Project Management Unit (FPMU) and for the State Project Management Units (SPMUs). It will provide support for incremental operating costs (e.g., for specialized expertise, project-related travel, meetings, and documentation). It will also support the development of monitoring systems and dashboards and improvement of workflow processes to facilitate coordination across agencies at the central and state levels and public versions to improve transparency and outreach. Activities under this component would also include monitoring of conflict impacts in the project area, including through aggregation and analysis of community and localized data to inform project activities. Given the dynamic situation on the ground, including the evolving security situation, the project's monitoring systems and documentation of lessons learned on an ongoing basis will be used to support adaptive project management, especially to identify activities that can be scaled-up depending on implementation performance and feedback.

49. **Component D: Contingent Emergency Response (US$0.0 million).** A Contingent Emergency Response Component (CERC) is a financing mechanism available to Borrowers in Investment Project Financing (IPF) operations to enable quick deployment of uncommitted funds to respond to an eligible crisis or emergency. An operations manual will describe in detail the implementation arrangements for the emergency response mechanism.

C. Project Beneficiaries

50. **ACReSAL interventions will improve land use planning and help a wide range of communities adapt to evolving dryland conditions with an end target of 3.4 million direct project beneficiaries.** Communities and households that are most dependent on natural resources for their survival and vulnerable to desertification are expected to most benefit from ACReSAL. In the communities that will receive project investments, additional benefits can be expected for residents in terms of community cohesion and peacebuilding, including through improved capacity for local conflict resolution.

51. **ACReSAL will specifically target the inclusion of vulnerable and marginalized groups, including women, youth, the elderly, persons with disabilities, internally displaced people, and ethnic and religious minorities.** This will help ensure their full participation in community level structures established or supported under the project. As well, agricultural support interventions under Subcomponent B2 will be partially targeted to vulnerable and marginalized groups.

52. **Government institutions at federal and state levels and other partners from governmental and nongovernmental agencies will be beneficiaries of the institutional modernization and policy support investments.** The project intends to improve the capacity of the country to adapt to a changing climate, largely through modernized access and use of data, and through the establishment of sustainable programs that will survive the project – these investments will benefit all Nigerians.

53. **Although not explicitly a regional project, there will be significant regional benefits accruing from the project.** Nigeria participates actively in regional fora concerned with dryland management in western Africa, such as the Great Green Wall (GGW), the Lake Chad Basin Commission (LCBC), and the Niger Basin Authority (NBA). ACReSAL-supported advances in data management and analysis and knowledge platforms could be advantageously deployed in other countries.

D. Results Chain

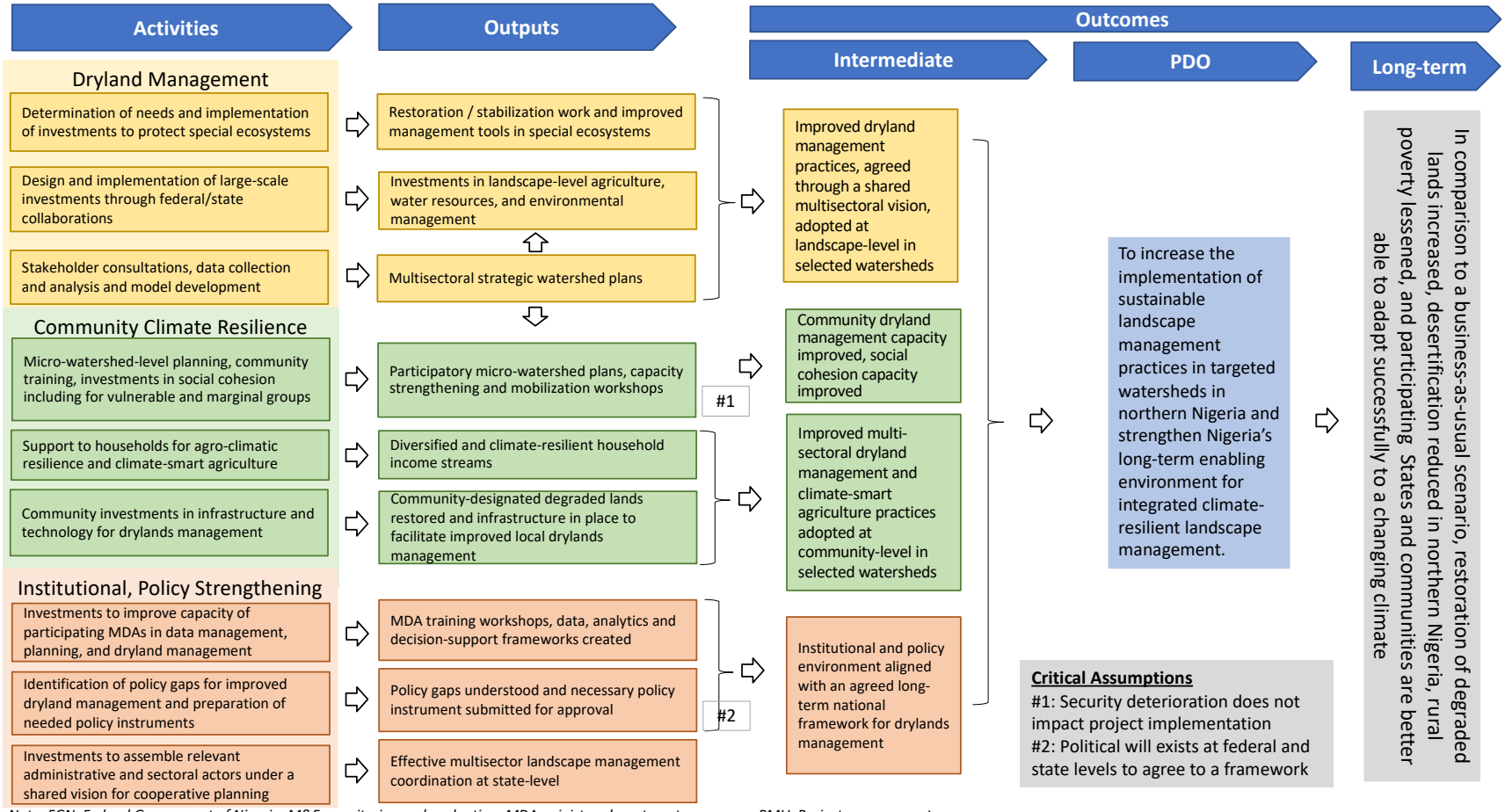
54. **Figure 3 presents the project's Theory of Change including critical assumptions.**

E. Rationale for World Bank Involvement and Role of Partners

55. **The World Bank is an important partner of Nigeria on a range of challenges specific to the north of the country as captured in the CPF.** Annex 8 provides further information on these World Bank-financed projects, which include support in the areas of restoration of degraded land, forestry, livestock, agriculture, water resources management and irrigation, livelihoods, crisis recovery, and peacebuilding. This project specifically supports the FGN's choice to prioritize a multisectoral and watershed level approach to enhance dryland and community resilience against desertification, under impacts related to climate change and human activity. Through the NEWMAP Project, the World Bank successfully partnered with the Federal Ministry of Environment (FMEnv) on pioneering an approach in the integrated management of watersheds. Beyond Nigeria, the World Bank has a diversified experience in sustainable water and land management in the drylands of Africa and elsewhere in the world.

56. **The role of partners is critical to promote multisectoral coordination and cooperation for building climate resilience and better management of drylands natural resources across northern Nigeria.** Federal and state agencies responsible for environment, agriculture, and water management will be the implementing agencies, through the project management units. The project will need to develop partnerships with other governmental and non-governmental actors. During project preparation missions, consultations were held with many Ministries, Departments, and Agencies (MDAs). Consultations have been held with representatives of academia, nongovernmental organization (NGOs), and civil society organizations (CSOs). Further consultations mechanisms will be developed to ensure the continuing input and contributions of these groups during project implementation. The project will continue to explore synergies with other development partners on various landscape management initiatives relevant to project activities.

Figure 3. Project Theory of Change



Note: FGN: Federal Government of Nigeria; M&E: monitoring and evaluation; MDA: ministry, department, or agency; PMU: Project management unit; WB: World Bank.

F. Lessons Learned and Reflected in the Project Design

57. **Decades of dryland management interventions in northern Nigeria have shown the critical importance of community support for sustainable impact.** Among the rich legacy of lessons learned by these interventions is that landscape interventions to manage dryland environments fail if they do not have community support and engagement. Community support in turn is often a function of designing investments that bring real and tangible benefits to vulnerable communities as well as engagement with communities to ensure they understand and support adaptations to ensure sustainable resource use. ACReSAL thus emphasizes a process of highly consultative SLWM planning, in tandem with a solid process of community consultation and engagement. Another important lesson learned from landscape management projects is that it is challenging to demonstrate improvement in land management and use of natural resources without proper baseline data and monitoring systems. ACReSAL will support development of innovative tools and monitoring systems to demonstrate outcomes of investments for improving climate resilience and for landscape and forest management.

58. **Weakly integrated, single-sector projects such as forestry projects, or dam construction projects, have had limited success in harnessing multisectoral benefits.** The experience of the GGW brought home that dryland management projects need to be tackled in an integrated manner, bringing together different viewpoints and interests. ACReSAL will be implemented through three different sectors, environment, agriculture, and water resources; although there are other sectors that are also important in management of drylands, these three are the most critical and no previous major project in Nigeria has brought them all together in this manner.

59. **Strong inter-institutional coordination among government departments and agencies as well as with other stakeholders with key project implementation roles helps attain desired outcomes.** Instead of relying on ad hoc collaborative arrangements, it will be important to ensure collaboration between implementing agencies backed up by high-level commitments, MOUs, and plans. The Project Steering Committees and Project Technical Committees at federal and state levels described under implementation arrangements (see Section IV) will help with integration and collaboration across the institutional landscape.

60. **For water resources management, clear assignments of responsibilities and accountabilities between federal, river basin, state, and local actors, and water users' associations is necessary, given the centralized and federated character of the country.** The plethora of institutions results in overlapping mandates, confusion, and a context in which no single agency or individual can be held responsible and accountable. Collective visions, results-based institutional arrangements, performance incentives and strong accountability frameworks are needed to move such sectors to a more performance-based way of doing business. It is not sufficient to limit discussion on SLWM plans to technical experts only; policy makers need to be part of the dialogue. ACReSAL will improve the enabling institutional and policy foundation for multisectoral and multistakeholder integrated landscape management that would facilitate shared vision initiatives among many institutions with overlapping mandates in Nigeria.

61. **Achieving long-term goals of natural resources management projects is often dependent on initiatives in other sectors, well beyond the scope of the project.** For example, the World Bank's Confronting Drought in Africa's Drylands,[31] conclude that a twin strategy is needed: "enhancing the

[31] Cervigni and Morris, op. cit.

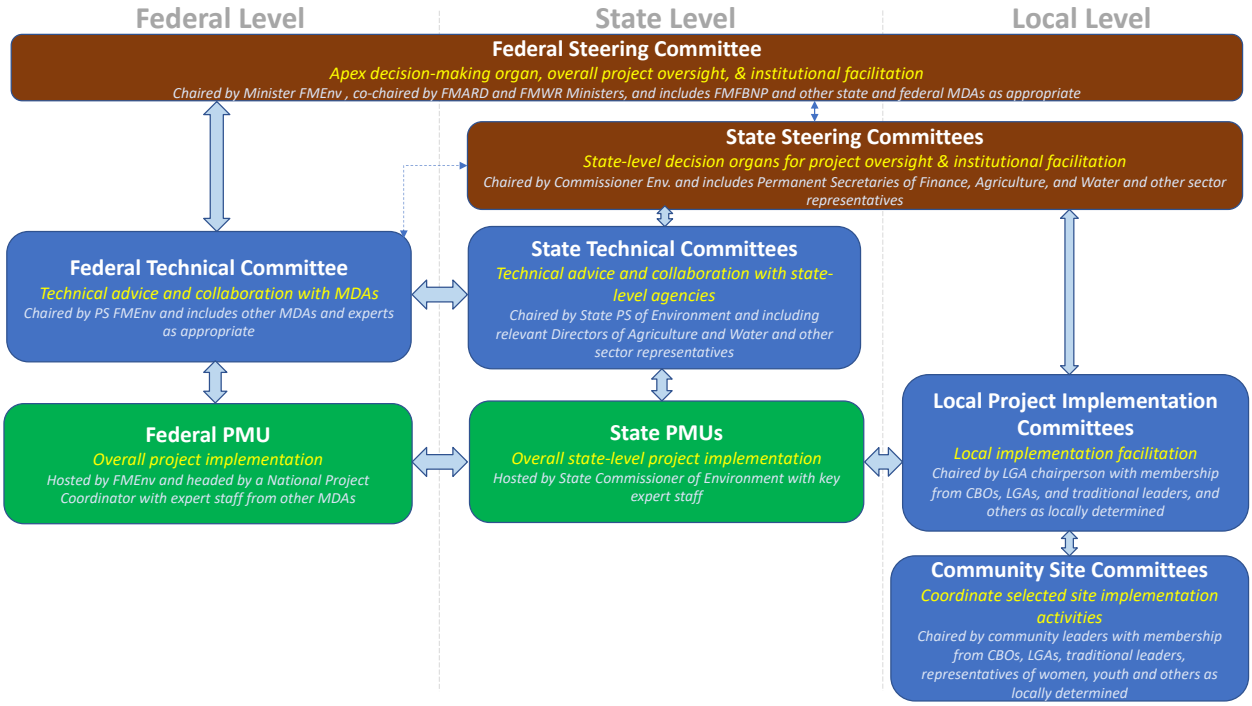
resilience of people living in the drylands will require a combination of interventions to improve current livelihoods and interventions to strengthen safety nets". ACReSAL will support the establishment of longer-term national frameworks for integrated landscape management in Nigeria that future interventions can adopt to improve climate-smart and sustainable landscape management.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

62. **The FMEnv is the lead implementing ministry for the project, in collaboration with the Federal Ministry of Water Resources (FMWR) and the Federal Ministry of Agriculture and Rural Development (FMARD).** Figure 4 presents the project institutional arrangements. A Federal Steering Committee (FSC) and Federal Technical Committee (FTC) will provide overall policy and technical guidance respectively. The FSC will be chaired by the Minister of Environment, co-chaired by the Ministers of Agriculture and Rural Development and Water Resources, and will include the Federal Ministry of Finance, Budget and National Planning (FMFBNP), Commissioners of the Environment of the Participating States, and other state- and federal-level MDAs as appropriate. Similarly, a State Steering Committee (SSC) and State Technical Committee (STC) will provide overall policy and technical guidance respectively. The SSC will be chaired by State Commissioners for Environment and includes Permanent Secretaries of Finance, Agriculture, Water and other sector representatives. The STC will be chaired by the Permanent Secretary of the Environment and including relevant Directors of Agriculture, Water and other sector representatives. Seconded ministry staff and consultants, only as needed, will constitute the PMU both at the Federal and State levels. The FPMU and SPMUs will have appropriate capacity to lead, facilitate, and support project implementation at federal and state levels, including for overall project management, procurement, contract management, financial management (FM), environmental and social (E&S) issues, data analytics, and monitoring and evaluation (M&E), environment and natural resource management, agriculture and water. Annex 1 provides more details on the project's implementation arrangements.

Figure 4. Institutional and Implementation Arrangements



63. **Project components, subcomponents, and activities will be implemented through relevant departments, other ministries, states, and local governments, as appropriate.** FMEnv will sign a memorandum of understanding with each federal-level MDA. Subsidiary agreements will be signed with participating states. A robust annual joint work programming process will be facilitated by the FPMU and SPMUs.

64. **State selection, investment staging and dynamic fund allocation.** The 19 states of northern Nigeria and the FCT have been deemed eligible to participate in ACReSAL based on a technical aridity criterion. The participating states have also been ranked based on demonstrated commitment and implementation readiness criteria. Performance-based conditions will apply to the staging of investments by each state, and the dynamic allocation of project funds, as further described in Annex 2.

B. Results Monitoring and Evaluation Arrangements

65. **M&E and results-based management of ACReSAL will build upon and strengthen the M&E system developed for NEWMAP.** The system will support results-based and adaptive management to guide project implementation and compare and verify results, serve as a mechanism for periodic assessment of project performance, provide a learning platform for project stakeholders to strengthen their contributions, and engage the public in supporting and contributing to the goals of ACReSAL. Additionally, the M&E system will strengthen the capacity of the country to collect, manage, and disseminate data related to management of erosion, climate risk, and watersheds.

66. **The FPMU will be responsible for overall project M&E and will work closely with SPMUs.** M&E specialists will be retained at FPMU and SPMUs to coordinate all M&E activities under the project, including creating an M&E Manual. Additionally, the project will engage relevant government agencies,

stakeholders, implementers, and community-based organizations to monitor and report on project indicators. Where necessary, the project will finance the development of M&E capacity of these partners, particularly with respect to the innovative digital technologies described below. The Project Implementation Manual (PIM) and the associated M&E Manual will detail organizational and technical arrangements at national and state levels that will govern the project's M&E procedures to ensure they satisfy World Bank requirements, including the grievance redress mechanism (GRM).

67. **The Results Framework (RF) (see section VII) will form the basis for tracking progress on project outcomes through PDO and intermediate results (IR) indicators.** Process monitoring will focus on management processes that are critical to achieving the project's objectives, such as procurement, FM, E&S activities, capacity building, and institutional strengthening activities. All indicators have attendant definitions, baselines, targets, data sources, frequency of data collection, and data collection methods.

68. **The project will adopt a mixed-methods approach to adequately monitor and verify results.** Field-level data collection will utilize ICT[32]-enabled tools and geotagged photos where possible. Geographic information system (GIS) systems will be used to delineate and track the progress of restoration and agriculture-based interventions. Remote sensing will provide data on land use and vegetative health, and this data will be triangulated by field-level monitoring employing unmanned aerial vehicles (UAVs) and field surveys when security allows; methodologies will be defined in the PIM and adjusted in implementation. The M&E system will focus explicitly on disaggregating results by gender wherever possible.

69. **A midterm review (MTR) will be undertaken in year three to review progress and if necessary, adjust project design.** The MTR will be preceded by an independent study to identify key areas for the MTR to focus on. An impact evaluation will provide statistically reliable evidence on the causal impact of the project and its interventions on targeted outcomes. The detailed methodology (for example, use of control groups, variables, and geographic focus) will be developed in the first year of the project. The MTR and impact evaluation will be contracted to a third party.

70. **The FPMU will be required to prepare and submit to the World Bank semi-annual progress reports on achievement against project objectives at the PDO and IR levels, as well the state of implementation of annual work plans and budgets (AWPBs).** The progress report will contain information on progress by component based on data for the corresponding indicators, a populated RF, the status of procurement and disbursements, the status of ESSs implementation, a summary of the implementation challenges encountered, and the measures proposed to counteract them. Progress reports will be reviewed during semi-annual joint implementation support missions with representatives from the World Bank and the GoN and will ensure compliance with legal covenants and assess the status of key project documents. An Implementation Completion and Results Report (ICR) will be prepared respectively by the GoN and by the World Bank, at the latest within six months after the project closes.

71. **A robust Management Information System (MIS) will be set-up at national and state levels.** The MIS will be designed to track implementation progress including disbursement, procurement, and the implementation of planned activities. The MIS will be funded by the project and will have separate but interlinked modules for the FPMU and all SPMUs.

[32] Information and Communication Technology.

C. Sustainability

72. **The sustainability of the project investments depends on three pillars:** local support for sustaining and maintaining investments (requiring rigorous design and screening of prospective investments based on sustainability criteria), solidification of a long-term program in Nigeria to comprehensively tackle climate change and dryland management challenges, and, most difficult, adequately addressing constraints to achieving project results that are beyond the scope of the project.

73. **Insufficient community involvement in designing and maintaining investments can compromise long-term achievements and results of any project.** The reasons can be multiple – insufficient perceived economic benefits, poorly planned investments, insufficient training or knowledge, minimal incentives to invest time and money due to uncertain tenure, and impediments arising from conflict situations. During preparation, led by a FAO team, considerable emphasis has been put on the selection and finetuning of investments to prioritize those that are most economically viable (see Annex 7 on the Economic and Financial Analysis), addressing the concern about real economic benefits to stakeholders. Investment subprojects will be rigorously designed and independently assessed for technical, financial, social, and environmental viability to increase the likelihood that they will be sustainable. Building on best-practice projects in the region, ACReSAL will only fund investments that are identified in consulted and well prepared SLWM plans; more critically, the project includes funding to support extensive consultations and training at the community level. Impediments to sustainability arising from conflict and violence are difficult to anticipate and resolve but Component B1 includes explicit investments to address root causes of conflict and to support peacebuilding initiatives.

74. **The project's multisectoral approach to better managing the drylands of northern Nigeria can only be sustained if it is anchored with respect to long-term institutional priorities and the policy environment.** The Nigerian Government has made such commitments and institutions are mandated federally and at the state level to lead such efforts. However, adoption of a national or subnational approach has been hindered by poor access to real-time and usable data and poor institutional capacity. In Component C1, ACReSAL includes funding to consolidate a long-term national strategy for dryland management, modernize institutional capacity and optimize data collection and analysis.

75. **Multiple factors beyond the scope of the project have the potential to both improve or to impact better management of drylands to reduce vulnerability and poverty in natural resource-dependent communities in northern Nigeria.** These could include the climate changing more quickly than anticipated, droughts, social safety nets, outbreaks of local or regional conflicts, demographic trends, or consequences of the ongoing COVID-19 crisis. Addressing these multiple challenges is beyond the scope of this project. The strengthened national program on dryland management will be explicitly designed to bring attention and solutions to bear on any challenge to the long-term goal of dryland sustainability and to enhance collaboration and cooperation with other actors as needed.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

76. **Technical.** As a large and complex project, rooted in a nationally innovative multisectoral approach to integrated landscape management and climate change resilience, the ACReSAL project will

certainly face challenges during implementation. A review undertaken as part of project appraisal confirmed however the FGN's readiness to move quickly toward implementation. Focal persons from various ministries, including the existing multisectoral technical team under NEWMAP, comprising staff from various ministries and departments, will function as the FPMU. Similarly, states with agencies and units handling climate change resilience agendas and watershed management will be able to quickly assume responsibilities for the new project. The selection of staff for the FPMU and SPMUs will however be competitive and subject to recruitment procedures outlined in the PIM.

77. **Economic and Financial.** 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 benefit-cost analysis (BCA) carried out. Details are available in Annex 7.

78. **Justification for public sector provision and World Bank value-addition.** Land degradation and soil erosion are externalities caused by market failure, as there are no costs or penalties for activities leading to these outcomes (for example, unsustainable agriculture and other land use practices, excessive deforestation, and improper road and drainage construction). Without intervention, these market failures will continue to generate negative externalities to the environment and the population living in these areas (worsening desertification, droughts, famines, farmer-herder conflicts, resultant displacement and loss of life, and loss of livelihoods). Given the high investment costs associated with appropriate landscape management and soil erosion control, the private sector alone has no incentive to undertake these investments, while the affected populations (the majority of whom are low-income communities) would find the costs to be prohibitive. Thus, using public sector funds to finance the project is appropriate.

79. **Results of the BCA.** The BCA considers all project costs (that is, US$700 million over six years) as well as operation and maintenance (O&M) costs (estimated at 10 percent of total project costs). The BCA attempts to quantify the following project benefits across 19 states and the FCT in northern Nigeria: (a) incremental benefits from landscape restoration; (b) incremental profits from climate-smart irrigated agriculture; (c) reduced damages from soil erosion; (d) reduced deaths due to herder-farmer conflicts over grazing land and water; (e) reduced drought-related human mortality; and (f) reduced GHG emissions. All benefits are assumed to accrue after the project implementation ends, that is, from year 7 after the project begins, even though benefits will begin to accrue earlier. The project activities would also have several benefits that are not easily monetizable: (a) an improved comprehensive knowledge base and analytical tools; (b) improved in situ monitoring systems (for example, for weather, surface and ground waters), modern earth observation tools, and surveys; (c) the strong focus on capacity development; (d) outreach to women and youth; (e) policy reforms that should contribute to setting up an improved knowledge, institutional, and policy framework foundation for the longer- term across the country; support to enable institutions to work together across sectors (especially environment/climate, water, and agriculture) and levels of governance (federal, state, and local levels and with community-level organizations); and (f) activities contributing to improving social cohesion and peacebuilding. The estimation of measurable benefits will therefore underestimate the full range of project benefits. The results of the analysis indicate a net present value (NPV) of US$1,550 million and an Internal Rate of Return (IRR) of 17 percent. Sensitivity analysis showed that a 10 percent increase in costs (including operational costs) and a 10 percent reduction in all project benefits yielded a satisfactory IRR of 14 percent.

80. **GHG mitigation benefits.** The World Bank uses the EX-ACT tool to quantify the GHG mitigation potential of projects it funds, as an important step in managing and ultimately reducing emissions. For the proposed project, the net carbon balance quantifies GHGs emitted or sequestered because of the project

compared to the without-project scenario. A detailed analysis is presented in Annex 4 but in brief, over the project duration of 31 years (including six years for project's activities implementation, and 25 years for capitalization of its effects), the project results in a carbon emission savings of a total of 113,162,760 tCO_2-eq, equivalent to savings of 3,123,410 tCO_2-eq per year.

B. Fiduciary

81. **Financial Management:** An FM assessment of the implementing entities at federal and state levels was undertaken, described in Annex 5. Subject to the mitigation measures and the action plan being implemented as per the agreed time frame, the project has met the minimum FM requirements in accordance with World Bank Policy and IPF Directives. This objective will be sustained by ensuring that strong and robust FM arrangements are maintained for the project throughout its duration. Detailed financial reviews will also be carried out regularly and the frequency will be adjusted based on actual performance and its impact on assessed risk, to provide reasonable assurance that project funds are being utilized for intended purposes.

82. **Procurement:** Procurement arrangements as described in Annex 5 were assessed. The main procurement risks identified, and mitigation measures agreed, are as follows:

- Weak capacity in the design and preparation of technical specifications for the major civil works contracts (gully erosion and flood control and rehabilitation and construction of small dams): Experienced engineering firms will be hired through open international procurement to support the states in the design of the works contracts.
- Unethical conduct of members of bid/proposal evaluation committee and use of ad-hoc bid/proposal evaluation committee: Members of evaluation committees shall be required to sign and attach a Statement on Ethical Conduct and Fraud and Corruption to the evaluation report in which they participate.
- Submission of fake documents by bidders with their bids: Due diligence will be carried out on such documents by the evaluation committee before the submission of their bid evaluation report. The due diligence report will form part of the evaluation reports.
- Contract implementation not in accordance with the signed contract: An experienced engineering firm will be hired by the federal/state PMUs to supervise contract execution. The firm will also certify all payment certificates submitted by the contractors before payments are made.
- In addition to the above measures, annual procurement audit, third party monitoring, and spot checks on project sites will be undertaken for the entire duration of the project implementation.

C. Legal Operational Policies

83. **The project may support construction or rehabilitation of infrastructure establishment on international waterways or their tributaries.** Project implementation could conceivably alter flow patterns or water quality, most likely in a beneficial fashion. This will only be determined during project implementation when the project intervention sites are selected and known. As such, this triggers the International Waterways Policy (OP 7.50). Under this policy, notification of such projects is made to all riparian states. On September 6, 2021, The FGN sent the Riparian Notification that OP 7.50 requires in separate letters to the Lake Chad Basin Commission (LCBC) and the Niger Basin Authority (NBA), the

governing bodies covering/regulating the riparian states. A No Objection Letter was received from the NBA on September 22, 2021. The LCBC sent a response on November 4, 2021 temporarily authorizing the GoN to proceed with processing of the project (pending possible feedback from the Member States).

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social

84. **Given that the exact states and locations of project interventions were unknown during project preparation, a framework approach was adopted with regard to E&S impacts and mitigation measures.** The disclosed ESMF described how to address potential E&S risks during project implementation, including conducting site-specific Environmental and Social Impact Assessments (ESIAs) and developing site specific Environmental and Social Management Plans (ESMPs) before commencement of any major works, as needed. The Resettlement Policy Framework (RPF) details the resettlement and compensation principles, organizational arrangements, and design criteria to be applied to meet the needs of project-affected persons and specifies the contents of any required site-specific Resettlement Action Plan (RAP). The RAP(s) would be developed during implementation. All terms of reference for site-specific Environmental and Social Framework (ESF) documents and the applicable instruments/documents will be subjected to World Bank review, clearance, and disclosure prior to commencement of civil work activities. The Labor Management Procedure (LMP) includes aspects related to working conditions, employment, occupational health and safety (OHS), and worker specific GRM. Similarly, an Integrated Pest Management Plan (IPMP) rounds out the list of E&S management documents in effect for the project. Considering the risk and complexity of the project, the Client will require the support of E&S consultants during implementation. Annex 6 presents further details of the E&S aspects of the project. All ESF documents (ESMF, RAP, LMP, and IPMP) were disclosed in-country on October 27, 2021 and internally on October 28, 2021.

85. **All relevant stakeholders were consulted during project preparation and during the development of the E&S documents.** The stakeholder consultation process built on previous stakeholder engagements which commenced at project concept stage. During project design, relevant stakeholders from all proposed participating states and relevant focal persons from federal and state MDAs were consulted. During the consultation, stakeholders were informed of the provisions of the ESF as it relates to the project, the World Bank due diligence process and the required documents. The stakeholders were also consulted prior to finalizing all the ESF documents and on the disclosure requirements, both at the federal and state level. The Stakeholder Engagement Plan (SEP) was prepared and disclosed in-country on October 27, 2021 and internally on October 28, 2021.

86. **Project activities will take place in northern Nigeria, including the northeastern part of Nigeria that has seen high levels of conflict and insecurity.** Nigeria is currently on the World Bank's list of fragile and conflict-affected situations. Security has become a major source of concern on World Bank-financed projects in Nigeria. There will be a security risk under this project for both project workers and contractors as well as beneficiaries arising from Boko Haram armed groups, banditry, kidnapping, and farmer/pastoralist conflicts. In view of this, a Security Risk Assessment was conducted, and a Security

Management Plan (SMP) was developed. The adoption of Federal-level Security Management Plan is a condition of Project effectiveness. This plan will be constantly updated during implementation to respond to changes in security issues in participating states.

87. **The project's social risk is rated as High.** Medium- to large-scale civil works might result in an influx of labor, with risks associated with labor management and working conditions. The high rating also reflects security concerns (see above). In addition, the social risks include COVID-19 related risks with respect to stakeholder engagement and community mobilization activities. The project interventions include risks of sexual exploitation and abuse and sexual harassment (SEA/SH). As such, the project was screened for risk of SEA/SH and a SEA/SH action plan was developed, including a code of conduct, and will be implemented to address such risks. No voluntary land donations are expected. Where community land is used for community-shared infrastructure, any person suffering from a restriction to economic resources would be compensated in line with the requirement of ESS5.

88. **Environmental risk rating is considered Substantial because of potential environmental impacts and widespread nature of infrastructure investments with potential cumulative impact.** Given potential E&S impacts and the Borrower's limited capacity with the ESF, the overall E&S risk is considered High. Risks and impacts of infrastructure works will be assessed as per ESMF prior to construction and will be managed in accordance with ESMPs. The project will also support investments for better management and conservation of special ecosystems, including wetlands, desert oases, and protected areas. Investments might include those related to wetland improvements, monitoring systems, inventories of the status of these ecosystems, stabilization and restoration of wetlands, forest reserves and oases. These interventions will result in overall positive impacts on these special ecosystems, however, due to sensitive nature of these ecosystems extra attention will be given to biodiversity protection during interventions. Location of these interventions will be identified during project implementation as per participating state selections and watershed management plans. Biodiversity surveys and Biodiversity Management Plans (BMP) will be prepared as needed once the locations and interventions are identified, to avoid, minimize, mitigate and/or offset potential adverse impacts, and as per ESMF.

89. **Concerning climate co-benefits, the project is well aligned with the World Bank's commitments.** The entire project is focused on building climatic resilience and fostering adaptation to reduce extreme poverty, over-dependence on fragile natural resources and to encourage inclusive growth, all necessary conditions for building peaceful co-existence. The project will also assist Nigeria in meeting its international obligations and national policy priorities such as the NDC.[33] Because of this inextricable link between climate change and desertification, the entirety of the project's investments is considered as helping the country to build climate resilience. Technical assistance to national, state, and local policy will improve the country's climate change mitigation (see also Annex 4).

V. GRIEVANCE REDRESS SERVICES

90. **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

[33] These include The Land Degradation Neutrality, National Adaptation Strategy, National Drought Plan, National Action Plan to Combat Desertification, and so on.

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. KEY RISKS

91. **The overall risk to achieving the development objective is High, as based on the following risks:**

(a) **Political and governance risk is rated *Substantial*:** Strong political and agency support has been built for ACReSAL at federal and state levels. COVID-19 impacts are expected to continue for the next year at least, raising the possibility of greater distress on poor and vulnerable peoples.

(b) **Macroeconomic risk is rated as *Substantial*:** Macroeconomic risks, such as balance of payments constraints, might affect the ability of the Government to pay any required envisaged counterpart funds. The risk is mainly due to the COVID-19 pandemic-induced slowdown of the economy and its impact on the country's fiscal position. The project limits such costs to land acquisition and involuntary resettlement compensations, as well as project staffing costs. Limited access to forex for potential capex imports (linked to balance of payment constraints faced by the country) might also delay payments and affect the attainment of the PDO.

(c) **Sector strategies and policies risk is rated *Moderate:*** The project will be implemented across several MDAs at national and state levels, creating the risk for overlapping mandates or gaps in mandates. This issue has largely been addressed in NEWMAP through technical assistance by the FPMU. It is envisaged this process would be followed also with states in the new project.

(d) **Technical design of the project is rated *Substantial*:** The integrated landscape management process with focus on climate mitigation/adaptation has been preliminarily tested under NEWMAP, Transforming Irrigation Management in Nigeria Project (TRIMING – P123112) and FADAMA. However, ACReSAL's multisectoral approach is innovative and may pose challenges for ensuring effective collaboration. Shovel-ready technical designs are available to jump-start project implementation but there are still risks of low disbursement in the first year or two of the project. The multiplicity of MDAs responsible for implementation and supporting the delivery of the project present a substantial management and coordination risk, especially at state levels.

(e) **Fiduciary risk is *Substantial*:** The risk of corruption and fraud will be mitigated by procurement, FM, and oversight systems, and will build on experiences under NEWMAP, FADAMA, and TRIMING.

(f) **Institutional capacity for implementation and sustainability risk is rated *Substantial*:** The project will likely face challenges in terms of state and federal implementing agencies engaging new technical specialists in a timely manner. A major investment in institutional strengthening (Subcomponent C1) will mitigate these risks.

(g) **E&S risks are rated *High*:** The environmental risk rating is considered ***Substantial,*** and the overall social risk rating is ***High.*** This is due to the wide range of risks and impacts on human populations and possible land acquisition due to the nature, magnitude, and complexity of the project activities (large civil works), the scale (about 20 States in Nigeria), the sensitivity of the location(s) of the project (arid and semi-arid regions of northern Nigeria), and the Borrower's limited capacity on ESF. In addition to the risk of labor influx and SEA/SH/GBV, the social risk classification also considered security risks for project staff, community workers, and beneficiaries given the presence of non-state armed groups active across the region. Project design and implementation must address security risk for communities to fully participate. The project will follow World Bank ESSs and there will be an emphasis on training and technical support during implementation to address any capacity gaps. See further details on E&S risks and mitigation measures in Annex 6.

(h) **Stakeholder risk is rated *Substantial*:** The project will implement a more holistic approach for watershed management that is centered on community participation in planning, implementation, and livelihood improvement. In some areas, there may be risks from potential elite capture of project benefits and exclusion of some stakeholders, particularly underserved members of targeted communities. To mitigate these risks, the project will implement strong culturally adapted communication plans and measures to mobilize and inform local communities, with support from qualified local NGOs.

(i) **Extreme weather events such as floods and droughts (in part caused by climate change) may impact the implementation of the project.** Frequent heat waves or droughts could affect the design of the agriculture-related activities. Climate change-induced variability in rainfall could lead to changes in vegetation survival that will make it difficult to attribute changes to project interventions.[34] The project will support state-of-the-art land and restoration monitoring systems to track in detail the outcomes of project investments.

(j) **The Security Risk is *High* in many northern states.** The security situation in some parts of the north, as detailed in the section above on social issues, will raise challenges for implementation and supervision. Addressing this risk will require strong commitment by the FGN and by the states to ensure security of beneficiaries and project actors will be needed, as well as ongoing monitoring of project context and adaptation of activities as needed. The project's Security Risk Assessment and SMP will be key to managing security risk challenges. Project staff will receive security training, including mechanisms for reporting changes in the security context to project management, which in turn would consider adaptations in project implementation as needed.

[34] https://ieg.worldbankgroup.org/blog/four-lessons-sahel-land-restoration-programs-and-their-impact-vulnerable-populations.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Nigeria

Agro-Climatic Resilience in Semi-Arid Landscapes (ACReSAL)

Project Development Objectives(s)

The PDO is to increase the implementation of sustainable landscape management practices in targeted watersheds in northern Nigeria and strengthen Nigeria's long-term enabling environment for integrated climate-resilient landscape management.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
PDO Level Indicators									
Land area under sustainable landscape management practices (CRI, Hectare(Ha))		0.00	0.00	58,000.00	329,000.00	476,000.00	623,000.00	830,000.00	830,000.00
Area under improved catchment management (Hectare(Ha))		0.00	0.00	6,000.00	20,000.00	40,000.00	60,000.00	70,000.00	70,000.00
Area under community-led landscape restoration (Hectare(Ha))		0.00	0.00	40,000.00	120,000.00	220,000.00	320,000.00	350,000.00	350,000.00
Protected areas under improved management (Hectare(Ha))		0.00	0.00	0.00	150,000.00	150,000.00	150,000.00	300,000.00	300,000.00
Area provided with		0.00	0.00	2,000.00	4,000.00	6,000.00	8,000.00	10,000.00	10,000.00

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
new/improved irrigation or drainage services (Hectare(Ha))									
Area under improved rainwater harvesting (Hectare(Ha))		0.00	0.00	10,000.00	35,000.00	60,000.00	85,000.00	100,000.00	100,000.00
Enabling environment for integrated landscape management strengthened (Text)		Enabling environment for integrated landscape management in need of strengthening		Knowledge and analytics platform for integrated dryland management in operation, publicly accessible, and supporting knowledge, learning, and decision making Strategic landscape-scale watershed plans created and providing guidance for SLM practices		50% of targeted states with effective dryland management coordination mechanismsPolicies submitted for approval: water sector policy; environmental sector policy; agriculture sector policy	National integrated dryland management strategy submitted for approvalMultisector policy on dryland management submitted for approval	100% of targeted states with effective dryland management coordination mechanisms	Enabling environment for integrated landscape management strengthened
Increase in Normalized Difference Vegetation Index (NDVI) in targeted areas, correcting for natural variability. (Percentage)		0.00	0.00	0.00	2.00	3.00	4.00	5.00	5.00
Direct project beneficiaries (Number)		0.00	0.00	340,000.00	1,020,000.00	2,040,000.00	2,720,000.00	3,400,000.00	3,400,000.00

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Number of direct project beneficiaries - Female (Number)		0.00	0.00	168,000.00	504,000.00	1,008,000.00	1,343,000.00	1,680,000.00	1,680,000.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Component A. Dryland Management									
Multisectoral strategic watershed plans completed with appropriate analytical and stakeholder inputs (Number)		0.00	10.00	15.00	20.00	20.00	20.00	20.00	20.00
Total water storage capacity added or restored through project interventions (Cubic Meter(m3))		0.00	0.00	0.00	0.00	1,700,000.00	41,700,000.00	51,700,000.00	51,700,000.00
Targeted gully complexes treated with appropriate measures (Number)		0.00	0.00	5.00	11.00	16.00	16.00	16.00	16.00
Area benefitting from improved information and extension services contributing to improved climate-smart sustainable agriculture systems (Hectare(Ha))		0.00	0.00	10,000.00	40,000.00	90,000.00	240,000.00	400,000.00	400,000.00

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
Restoration of riparian areas in sensitive habitats (Hectare(Ha))		0.00	0.00	13,000.00	40,000.00	48,000.00	50,000.00	50,000.00	50,000.00
Component B. Community Climate Resilience									
Community-based organizations with increased capacity (Number)		0.00	0.00	200.00	600.00	1,000.00	1,000.00	1,000.00	1,000.00
Integrated micro-watershed management plans completed with community participants (Number)		0.00	0.00	30.00	130.00	200.00	200.00	200.00	200.00
Farmers reached with agricultural assets or services (CRI, Number)		0.00	0.00	50,000.00	160,000.00	310,000.00	560,000.00	750,000.00	750,000.00
Farmers reached with agricultural assets or services - Female (CRI, Number)		0.00	0.00	10,000.00	32,000.00	62,000.00	112,000.00	150,000.00	150,000.00
Women-led/owned enterprises, cooperatives, and farmer groups receiving financial and technical support (Percentage)		0.00	0.00	20.00	20.00	20.00	20.00	20.00	20.00
Component C. Institutional Strengthening and Project Management									
Proposed integrated knowledge and analytics platform operational and supporting knowledge, learning, and decision		Proposed integrated knowledge & analytics platform - not yet initiated	Stocktaking of available data (from in situ, earth observation) and services	Initial knowledge base and analytical tools for Northern Nigeria watershed planning	Draft online catalog of relevant services and decision support dashboards	Draft Nigeria-wide data and analytics platform for integrated landscape planning	Rollout of Nigeria-wide data and analytics platform	Sustainability plan for knowledge base and analytics	Knowledge and analytics platform operational and supporting knowledge, learning,

Indicator Name	PBC	Baseline	Intermediate Targets						End Target
			1	2	3	4	5	6	
making (Text)									and decision making
Targeted states with effective multisector landscape management coordination mechanisms (Percentage)		10.00	10.00	20.00	30.00	50.00	70.00	100.00	100.00
Project management units meeting agreed standards (Percentage)		0.00	60.00	70.00	80.00	80.00	90.00	90.00	90.00
Grievances responded to within the stipulated service standards for response times as outlined in the Project Implementation Manual (Percentage)		0.00	80.00	80.00	90.00	90.00	95.00	95.00	95.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Land area under sustainable landscape management practices	The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the	Annually	Individual subcomponents	Data for this indicator will be collected through the aggregation of data in individual sub-components	FPMU

	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.				
Area under improved catchment management	This sub-indicator measures the area under catchment management, which encompasses a set of different dependent measures in a certain area,	Annually	Contract progress / completion reports, MIS and project reports	Data for this indicator will be collected using a multi-layered approach including contract progress or completion reports, field surveys	SPMUs in close collaboration with FPMU

	with overall planning and management. Catchment management activities include, but are not limited to, sand dune stabilization, shelterbelts, and grassification.			employing geo-tagged photos and unmanned aerial vehicle surveys, and remote sensing and satellite imagery	
Area under community-led landscape restoration	This sub-indicator measures the area of degraded or desert land under landscape restoration. As per the Global Guidelines on Restoration: "forest and landscape restoration addresses restoration on a landscape scale, often encompassing several ecosystems and land uses as a way of enabling users to achieve trade-offs among conflicting interests and balancing social, cultural, economic and environmental benefits". Restoration is widely acknowledged as a way of reversing degradation processes and increasing the contributions of ecosystems and landscapes to	Annually	Contract progress / completion reports, MIS and project reports	Data for this indicator will be collected using a multi-layered approach including contract progress or completion reports, field surveys employing geo-tagged photos and unmanned aerial vehicle surveys, and remote sensing and satellite imagery	SPMUs in close collaboration with FPMU

	livelihoods, land productivity, environmental services, and the resilience of human and natural systems. The term "restoration" covers a wide range of conservation, sustainable management and active restoration practices that increases the quality and diversity of land resources, thus enhancing ecological integrity and human well-being. Landscape restoration as practiced in ACReSAL will increase fodder production on restored land and thus contribute to improved rangeland and pasture management.				
Protected areas under improved management	This sub-indicator measures protected areas under improved management. Protected areas management refers to the assessment of how well protected areas are being managed considering context and planning,	Start of project (baseline), Mid-term Review, End of Project	Protected Area Management Effectiveness Tracking Tool (METT)	Data for this indicator will be collected from METT assessments to be completed in all participating protected areas	Independent M&E consultant

	appropriateness of management systems and processes, and delivery of protected area objectives. The area of a targeted protected area will be considered to be under improved management when its METT score has increased by 40% (as compared to baseline values).				
Area provided with new/improved irrigation or drainage services	This sub-indicator measures in hectares the total area of land provided with new or improved irrigation or drainage services in operations supported by the World Bank. Irrigation or drainage services refers to the better delivery of water to, and drainage of water from, arable land, including better timing, quantity, quality, and cost-effectiveness for the water users.	Annually	Monitoring reports and farm-level surveys	Data for this indicator will be collected using a multi-layered approach. Monitoring reports will be verified with farm-level surveys employing geo-tagged photos and unmanned aerial vehicle surveys	SPMUs in close collaboration with FPMU

	New irrigation or drainage services refers to the provision of irrigation and drainage services in an area that has not had these services before. The area is not necessarily newly cropped or newly productive land, but is newly provided with irrigation and drainage services, and may have been rain-fed land before. Improved irrigation or drainage services refers to the upgrading, rehabilitation, and/or modernization of irrigation or drainage services in an area with existing irrigation and drainage services.				
Area under improved rainwater harvesting	"Improved" areas refers to World Overview of Conservation Approaches and Technologies (WOCAT) promoted water harvesting approaches and technologies for improved	Annually	Monitoring reports and farm-level surveys	Data for this indicator will be collected using a multi-layered approach including monitoring reports and farm-level surveys employing geo-tagged photos and	SPMUs in close collaboration with FPMU

	water management for rainfed farming systems in drylands such as planting pits, cross slope barriers, eyebrow terraces, and water harvesting basins. Improved areas may additionally refer to the use of drought-resistant crop varieties.			unmanned aerial vehicle surveys	
Enabling environment for integrated landscape management strengthened	"Enabling environment" refers to integrated knowledge base and analytics, policies, and institutions integrated into multisector planning and investment efforts at federal and state levels. The indicator will be measured by the attainment of specific, time-bound milestones as follows: Year 2: Knowledge and analytics platform for integrated dryland management in operation, publicly accessible, and supporting knowledge, learning, and decision making; strategic landscape-scale watershed plans	Annually	Project reports, strategic landscape-scale watershed plans, policies submitted, national integrated dryland management strategy	Data collection for this indicator will be derived primarily from project reports detailing achievements in all milestone activities. Watershed plans, policies submitted, and the management strategy will be used to verify related milestones	FPMU

	created and providing guidance for SLM practices; Year 4: 50% of targeted states with effective dryland management coordination mechanisms; policies submitted for approval: water sector policy; environmental sector policy; agriculture sector policy: Year 5: National integrated dryland management strategy submitted for approval; multisector policy on dryland management submitted for approval; and Year 6: 100% of targeted states with effective dryland management coordination mechanisms				
Increase in Normalized Difference Vegetation Index (NDVI) in targeted areas, correcting for natural variability.	NDVI is a measure of the state of plant health based on how the plant reflects light at certain frequencies. It quantifies vegetation by measuring the difference between near-infrared (which vegetation strongly	Annually	Remotely sensed observations	Data for this indicator will be collected from appropriate remotely sensed observations	FPMU

	reflects) and red light (which vegetation absorbs). The NDVI will be calculated as an annual average. NDVI will be an annual average (controlling for climate), and targets vegetative interventions in the following areas: areas benefiting from afforestation in degraded ecosystems (including in targeted watersheds and around targeted national parks), areas under community-led landscape restoration, and areas under irrigation, rainwater harvesting, agricultural improvement, and sand dune control.				
Direct project beneficiaries	This indicator measures the number of people directly benefiting from project activities. Direct project beneficiaries are those people benefitting from micro-watershed planning and linked investments facilitating	Biannually	Beneficiary surveys	Data for this indicator will be compiled from beneficiary surveys conducted with a representative sample of participants in communities in the 200 targeted micro-watershed communities	SPMUs in close collaboration with FPMU

	adaptation to evolving dryland conditions in 200 targeted micro-watersheds. Benefits from linked investments may include: improved flood and erosion control protection, ecosystem services, improved advisory services providing information on climate hazards and agricultural information, livelihoods strengthening and enterprise opportunities, improved access to credit, improved access to water for agriculture, capacity strengthening for targeted activities, increased and improved agricultural inputs and services, improved access to fuelwood and sustainable energy, restored and better managed land for agricultural and livelihoods purposes.				
Number of direct project beneficiaries - Female					

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Multisectoral strategic watershed plans completed with appropriate analytical and stakeholder inputs	"Analytical inputs" refers to relevant environmental and socioeconomic data assembled in dynamic models of watershed and their ecosystem services. "Appropriate stakeholders" refers to relevant agencies, technical and subject matter experts, and other pertinent stakeholders.	Annually	Watershed plans	Data for this indicator will be compiled using watershed plans produced by the project	SPMUs
Total water storage capacity added or restored through project interventions	"Restored" refers to i) rehabilitation of existing small dams/reservoirs, ii) rehabilitation, replacement and/or decommissioning of deep boreholes, iii) rehabilitation and construction of associated hydraulic infrastructure (including, borehole heads, pumps and meters), and iv) development and/or improvements of irrigation and drainage networks.	Annually	Contract completion reports, monitoring reports	Data for this indicator will be collected using a multi-layered approach including contract completion reports and in situ monitoring reports using geo-tagged photos	SPMUs
Targeted gully complexes treated with appropriate measures	This indicator measures the number of gully complexes that have been treated with	Annually	Contract completion reports,	Data for this indicator will be collected using a multi-layered approach	SPMUs

	appropriate measures to mitigate erosion as planned.		monitoring reports	including contract completion reports and field surveys using geo-tagged photos	
Area benefitting from improved information and extension services contributing to improved climate-smart sustainable agriculture systems	Activities to be monitored by this indicator include: improved access to weather forecasts, capacity building and monitoring of improved integrated pest management, improved eco-friendly plant nutrient management, improved soil carbon enhancement techniques, access to improved climate-resilient inputs, and enhanced knowledge of approaches to improved on-farm land and water management and sustainable cropping practices.	Annually	Contract completion reports, project reports, capacity building and training log books, farm surveys	Data for this indicator will be collected using a multi-layered approach to ensure comprehensive accounting for all the various activities monitored by the indicator	SPMUs
Restoration of riparian areas in sensitive habitats	Restoration" refers to restoring land, putting in place buffer zone protection areas (preferably with native species), works to repair and stabilize riverbanks, removal of invasive species, removal of debris in waterways, among	Start of project (baseline), Mid-Term Review, End of Project	Biodiversity inventories/diagnostics using methodologies such as traditional sampling, eDNA	Data for this indicator will be collected using a multi-layered approach including, biodiversity inventories/diagnostics, restoration plans, contract completion reports .	SPMUs

	other actions.		assessment, IT and other SLM tools, restoration plans, contract completion reports		
Community-based organizations with increased capacity	Capacity strengthening activities include: erosion management, disaster prevention, operation and management, agro-climatic resilience trainings, group management, conflict management, gender-based violence, landscape restoration, nature based solutions, natural resource degradation, climate change risks, drivers of farmer-herder conflicts, health risks for cooking with firewood and charcoal, and peacebuilding.	Annually	Training logs, capacity building reports	Data for this indicator will be collected through training logs and capacity building reports	SPMUs
Integrated micro-watershed management plans completed with community participants	This is a citizen engagement indicator that measures the number of integrated micro-watershed plans designed and implemented with the community using	Annually	Micro-watershed plans	Data for this indicator will be collected through micro-watershed plans	SPMUs

	participatory approaches. Incorporating community participation is integral to the production of plans and appropriate participation will be further defined in the project M&E manual.				
Farmers reached with agricultural assets or services	This indicator measures the number of farmers who were provided with agricultural assets or services as a result of World Bank project support. "Agriculture" or "Agricultural" includes: crops, livestock, capture fisheries, aquaculture, agroforestry, timber, and non-timber forest products. Assets include property, biological assets, and farm and processing equipment. Biological assets may include animal agriculture breeds (e.g., livestock, fisheries) and genetic material of livestock, crops, trees, and shrubs (including fiber and fuel crops). Services include research, extension, training,	Annually	MIS and project reports, ICT products/tools	Data for this indicator will be collected through MIS and project reports reporting on the distribution of agricultural assets and services, as well as agricultural ICT services, which will have a built-in mechanism for tracking the number of farmers receiving the information	SPMUs

	education, ICTs, inputs (e.g., fertilizers, pesticides, labor), production-related services (e.g., soil testing, animal health/veterinary services), phyto-sanitary and food safety services, agricultural marketing support services (e.g., price monitoring, export promotion), access to farm and post-harvest machinery and storage facilities, employment, irrigation and drainage, and finance. Farmers are people engaged in agricultural activities or members of an agriculture-related business (disaggregated by men and women) targeted by the project.				
Farmers reached with agricultural assets or services - Female					
Women-led/owned enterprises, cooperatives, and farmer groups receiving financial and technical support	This gender-focused indicator measures the percentage of women-led/owned enterprises, cooperatives, and farmer groups receiving financial and technical support. "Technical support" may include vocational and	Annually	MS and project reports	Data for this indicator will be collected through MIS and project reports recording both male and female funding recipients	SPMUs

	financial literacy training, and training in leadership, group decision-making, book-keeping, and business management.				
Proposed integrated knowledge and analytics platform operational and supporting knowledge, learning, and decision making	This indicator measures the operation of the knowledge base and analytics platform to support knowledge, learning, and decision making (for climate, land cover, land degradation, and watershed management). The indicator will be measured by the attainment of specific, time-bound milestones as follows: Year 1: Stocktaking of available data (from in situ, earth observation) and services; Year 2: Initial knowledge base and analytical tools for Northern Nigeria watershed planning; Year 3: Draft online catalog of relevant services and decision support dashboards; Year 4: Draft Nigeria-wide	Annually	Project reports	Data on this indicator will be collected through project reports	FPMU

	data and analytics platform for integrated landscape planning; Year 5: Rollout of Nigeria-wide data and analytics platform; Year 6: Sustainability plan for knowledge base and analytics.				
Targeted states with effective multisector landscape management coordination mechanisms	"Effective" refers to coordination mechanisms operating with access to an adequate knowledge base and across relevant administrative and sectoral levels, engaging in joint planning exercises, and promoting a shared vision for all stakeholders. The baseline figure of ten percent accounts for at least two multisector dryland management coordination agencies initiated under the NEWMAP project in Katsina and Kogi States.	Annually	Coordination mechanism reports	Data on this indicator will be collected through project reports produced by coordination mechanism administration units	FPMU
Project management units meeting agreed standards	This indicator measures the percentage of active project management units that are delivering the project according to standards as	Annually	Annual performance assessment reports	Data on this indicator will be collected through annual performance reports	FPMU will collect data on SPMUs and a third-party assessor will collect data on the FPMU

	defined in the PIM. Standards should include: delivery indicators, responsiveness to clients and partners, quality of support, transparency, adoption pf process monitoring recommendations.				
Grievances responded to within the stipulated service standards for response times as outlined in the Project Implementation Manual	This indicator measures the efficacy of the GRM as a percentage of grievances responded to within the stipulated service standards for response times as outlined in Project Implementation Manual.	Annually	Grievance Redress Mechanism	Data on this indicator will be collected through the Grievance Redress Mechanism	SPMUs

ANNEX 1: Implementation Arrangements and Support Plan

Project institutional and implementation arrangements

1. **The FMEnv is the lead implementing ministry for the project, to be carried out in collaboration with the FMWR and the FMARD.** Figure 4 presents the project's institutional arrangements. A FSC and FTC will provide overall policy and technical guidance respectively. The FSC will be chaired by the Minister of Environment, co-chaired by the Ministers of Agriculture and Rural Development and Water Resources, and will include the FMFBNP, Commissioners of the Environment of the Participating States, and other relevant MDAs as appropriate. Similarly, a State Steering Committee (SSC) and State Technical Committee (STC) will provide overall policy and technical guidance respectively. The SSC will be chaired by State Commissioners for Environment and includes Permanent Secretaries of Finance, Agriculture, Water and other sector representatives. Also, the STC will be chaired by the Permanent Secretary of the Environment and including relevant Directors of Agriculture, Water, and other sector representatives. The constitution of the various project organs and their function and organization are laid out in the PIM.

2. **Seconded ministry staff and consultants (engaged only as needed) will constitute both the Federal and State Project Management Unit.** The FPMU and SPMUs will have appropriate capacity to lead, facilitate, and support project implementation at federal and state levels, including for overall project management, procurement, contract management, FM, E&S issues, data analytics, and M&E.

3. **ACReSAL implementation will require effective inter-ministerial and inter-state coordination, collaboration, and information sharing.** Memoranda of understanding (MOUs) will clarify the collaboration between the FMEnv and relevant MDAs; it may be possible to produce a single MOU covering all the MDAs. In the event of poor compliance with MOUs, the Federal Steering Committee would be expected to intervene to seek a solution, in accordance with national procedures. Each component, subcomponent, and activity will be overseen by a designated federal agency but generally implemented through relevant state MDAs, including those responsible for environment, agriculture, water resources, works, forests, parks, wetlands, and emergency response, as well as those focused on climate and hydrological information or watershed/basin regulation (Table 1.1). Some investments, for example, those related to inter-state water resources or national parks, would need to be implemented at the federal level. Implementation details would rely on annual joint work programs at both federal and state levels, as further detailed in the PIM.

4. **At the community level, a Local Project Implementation Committee, headed by the relevant local government officer, will support inclusive participation and promote local ownership of project activities.** Whenever possible, the project will use existing community-led structures and planning processes, for example, those developed under NEWMAP and FADAMA, to ensure strong community engagement based on principles of transparency, participation, accountability, and enhanced local capacity. Finally, as needed at individual sites, site committees will coordinate implementation. Further details on implementation arrangements for specific project components or subcomponents are included in Annex 3.

5. **Quality assurance will be enhanced through independent ACReSAL expert advisors,** who will be a pool of leading international and national experts in disciplines such as geotechnical and civil engineering, dams, watershed planning, hydrology, and ecosystem monitoring. The expert advisors will

be pre-qualified and contracted by the FPMU to be deployed anywhere in the project at federal, state, and local levels to enhance supervision and raise project quality and investment sustainability.

6. **Nongovernment stakeholders will also have important roles in the implementation of the project.** During preparation, meetings were held with NGOs and with academia. Consultations will continue to be held during implementation of the project following an approach outlined in the PIM and SEP.

7. **Project Implementation Manual (PIM).** All project operational modalities will be detailed in a PIM to be adopted by the FMEnv as a condition of effectiveness. The PIM will include at the very least:

- Details on the functioning of the FPMU and SPMUs with information on critical staff (coordinator, FM specialist, procurement specialist, E&S safeguards specialists, and M&E specialist);
- Structure and functioning of the steering committees and other organs involved in project implementation;
- Already disclosed SEP to meaningfully engage beneficiary communities, including protocols for community consultations on program design and implementation;
- Details on the implementation of project investments;
- Procedures in place for land acquisition and resettlement;
- Policies to manage contractors, including OHS, labor recruitment, safety of workers, payment of wages, and GBV/SEA/SH Action Plan;
- Grievance Management System developed and operational (including specific protocols for SEA/SH cases); and
- Procedures in place to manage security-related risks.

Table 1.1. Implementation Arrangements for ACReSAL Components and Subcomponents

Component	Subcomponent	Key Activities	Federal-level Coordination	Implementation
A. Dryland Watershed Management	A1. Strategic Watershed Planning	• Preparation of watershed plans	• NIWRMC; FMEnv, FMW, FMARD, NASRDA, NCRS	• NIWRMC, FMEnv, RBAs, states
	A2. Landscape Investments	• Sand dunes • Water resources management • Rangeland management	• Desertification and Drought Control (FMEnv) • Dept. of Forestry (FMEnv) • FMWR • FMARD	• States • States • FPMU, states • FMARD, FMWR, states
	A3. Special Ecosystems	• Oases • Wetlands • Forest management • Protected areas	• Desertification and Drought Control (FMEnv) • Dept. of Forestry (FMEnv) • National Parks Service	• FMEnv, states • FMEnv, states • FMEnv, states • National Parks Service
B. Community Climate Resilience	B1. Community Strengthening	• Capacity building, enhanced cohesion	• States	• Local governments
	B2. Community Investments	• Community infrastructure • Community-led landscape restoration • Community-managed support at the farm level	• FMARD • FMEnv • FMWR	• States • Local governments • Local Project Implementation Committees • Technology providers • Commercial banks or microfinance providers • NGOs • Possibly selected international organizations
C. Institutional Strengthening & Project Management	C1. Institutional and Policy Strengthening	• Institutional infrastructure, training, policy development • Development of framework for long-term integrated watershed management program	• FMEnv • FMWR, NIWRMC • NCRS • NASRDA	• Federal and state MDAs • NIWRMC • FMEnv • FMW
	C2. Project Management	• Coordination and implementation at federal level • Coordination and implementation at state level	• FMEnv	• FPMU • SPMUs

Note: NIWRMC = Nigeria Integrated Water Resources Management Commission; NSRDA = National Space Research and Development Agency.

Private sector participation

8. **There are opportunities for private sector participation in various activities of the project but particularly in Subcomponent B2.** For instance, the project could partner with private companies to work on FLID. A scanning of the solar irrigation market in Nigeria revealed that over 20 companies operate in Lagos and Abuja with a few in Kaduna and Kano. Services rendered range from pre-and after sales services on solar irrigation equipment to partnering with financial partners or providing PAYGO services. Furthermore, the equipment suppliers either partner with private finance institutions or provide themselves PAYGO services. PAYGO allows distributors to provide different type of contracts to farmers, therefore meeting different market segments. This can include time-based subscriptions, usage-based service or rent-to-own (with the pump being the asset/collateral). Farmers can pay digitally the solar pump distributer. Customized payment modalities can be developed based on farmers' availability to pay throughout or after a harvest season. Hence this component would strengthen private sector service provision of PAYGO services for solar pumps and other irrigation technologies to smallholder farmers whilst attracting private sector co-investment in the irrigation sector. Other private sector involvement is expected in supporting farmers in connecting to input and output markets through a value chain approach and private extension services.

Strategic Communications

9. **In addition to a comprehensive community engagement approach, the project will have a communications strategy that will rely on existing NEWMAP structures to lead on external stakeholders' engagement.** It will utilize public communications approaches to raise awareness of the project and ensure buy-in from key stakeholders. Targeted public outreach will be implemented towards communicating the rationale and development objectives of the project including results and impact achieved. Communication specialists at both the FPMU and SPMUs will lead the public outreach and will utilize communication tools which will include multi-media products, digital & social media engagement, outreach and knowledge sharing sessions and partnerships with CSO's, the media, and think tanks to facilitate awareness creation and knowledge. Climate-focused campaigns to establish platforms for engagement will be established. Outputs from these activities will include multi-media content such as message briefs, videos, technical briefs, beneficiary testimonials, blogs, and public events. These efforts will complement established community level engagement and the GRM which will contribute to mitigating negative perceptions and reputational risk by providing a two-way feedback mechanism which will further enhance transparency and accountability.

Financial management

10. **Financial Management (FM) arrangements will be anchored under the oversight of the Federal Project Financial Management Department (FPFMD) and federal and state Project FM Units, reasonably familiar with IDA FM arrangement.** The FPFMD and State Project Financial Management Units (SPFMUs) would have the responsibilities of establishing and maintaining FM arrangements acceptable to the World Bank. The FM control features will include the following: (a) a comprehensive Financial Procedures Manual covering all the key elements of FM (that is budgeting, funds flow, accounting, internal control, reporting and audit); (b) computerized accounting system; (c) qualified staff who have been trained in relevant World Bank procedures and requirements; (d) robust segregation of functions/duties; (e) a strong control environment for fiduciary risk mitigation; (f) highly independent and well-trained internal auditors; and (g) a full alignment with the government own FM system with some important

enhancements and controls. The FPMU will also be responsible for disbursement as further outlined in Annex 5.

Procurement

11. **Procurement implementation at the Federal level will be handled by the FPMU that will be housed in the FMEnv.** The FPMU will handle all the procurement for the participating agencies at the Federal level. The agencies will however lead in the preparation of the technical requirements and technical specifications, terms of reference for those activities that fall under their respective mandates and participate in bid/proposal evaluation of such activities to provide the needed technical inputs. They will also lead in contract management. The same arrangement will be replicated at the state level where the SPMUs that will be housed in the states' environment state ministries will handle all the procurement for the participating agencies at the state level.

Strategy and approach for implementation support

12. **The overall implementation support strategy for the project will draw heavily from the lessons learned from the implementation of projects in Nigeria, especially the NEWMAP project, and in other countries.** The project will use a combination of monitoring tools and systems to ensure quality and depth in supervision, reduced corruption, and strengthened governance. Implementation support will focus significant oversight on the design, construction, and overall quality of major civil works. Effort will also be placed on ensuring effective implementation of watershed management, livelihood improvement, and capacity building activities. Implementation support will emphasize flexibility and ongoing feedback to the client. This will be based on a robust M&E system addressing input-output, process, and impact monitoring, including a rigorous impact evaluation, and delivered through a comprehensive project MIS. The client's implementation will be supported by physical supervision by World Bank teams with expert staff, a complaint handling mechanism, and physical, financial, and technical audits. Along with key line MDAs, the FMFBNP will also be closely involved in supervision, paying special attention to M&E.

13. **Given the large allocation of resources towards land restoration and management, these activities will be subject to intensive oversight.** Key lessons incorporated in the supervision strategy are:

(a) The need for comprehensive site visits/physical verification by World Bank-managed teams with leading, relevant professional expertise.
(b) In-depth review of engineering designs.
(c) Independent verification of project activities.
(d) Follow-up on detailed fiduciary issues highlighted in aide memoires.
(e) Strengthening of prior and post-reviews of contract procurement to highlight fiduciary red flags such as possible collusion and price-fixing.
(f) Verifying authenticity of bidders.
(g) Reconciling payments with contracts.
(h) Supervising large numbers of decentralized low-value procurement, and
(i) Include a larger number of implementation support missions early in project implementation to help get the project off to a good start.

14. **Supervision teams will consist of geotechnical/civil engineers/dam specialist, agronomists or watershed management experts, fiduciary (procurement/FM) specialists, and E&S experts.** The teams will review M&E data and verify results in the field.

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

16. **The implementation support plan will involve engagements by the Bank team through on-ground engagements and field visits to project sites.** The project team will provide strong implementation support and guidance regarding technical, fiduciary, E&S issues. ACReSAL implementation support will be organized in: (a) general supervision; (b) fiduciary and safeguards management support; and (c) technical support in key areas.

17. **General supervision:** Project supervision will be carried out by the task team leaders (TTLs) and project team members. The TTL or co-TTLs will ensure that project implementation is consistent with the World Bank requirements as specified in the World Bank's legal documents. It is expected that a fluid information exchange will be maintained with the FMFBNP as well as the FMEnv, FMWR, and FMARD, leading to trust, good communication, and transparency.

18. **Fiduciary management support:** The project will undertake fiduciary supervision missions which entail consistent supervision of FM and procurement arrangements. The mission will be conducted as the need arises. Support will be given to the FPMU and SPMUs.

19. **FM supervision will be consistent with a risk-based approach and will involve collaboration with the World Bank's project team, World Bank Group Finance and Accounting (WFA) and procurement.** Given the assessed Substantial risk rating and the significance of timely and sustained implementation of mitigation measures to achieve residual risk rating of Moderate, on-site supervision will be carried out at least twice a year. On-site review will cover all aspects of FM, including internal control systems, the overall fiduciary control environment, and tracing transactions from the bidding process to disbursements as well as Statement of Expenditure (SoE) review. Additional supervision activities will include desk review of interim financial reports (IFR), quarterly internal audit reports, audited Annual Financial Statements and Management Letters as well as timely follow up of issues that arise, and updating the Implementation Status and Results Report (ISR) and the FM System. The World Bank's project team will support in monitoring the timely implementation of the action plan. The risk will be assessed during implementation as performance is reviewed and the supervision plan will be adjusted for any changes in the level of assessed risk.

20. **Safeguards support:** The project safeguards team will monitor and ensure appropriate implementation and application of the ESF as necessary including training on E&S management, if required. Inputs from the World Bank's social and environment specialists will be essential.

21. **Technical support:** The project team will provide technical support as needed. This will include: (a) reviewing and advising as necessary on project's engineering designs; (b) monitoring implementation progress in accordance with the agreed M&E and verification protocols; and (c) supporting the FGN in developing and achieving the Project's objective and implementing its components.

ANNEX 2: State Selection, Investment Staging, and Dynamic Fund Allocation

1. **This annex describes the process for the progressive staging of activities and large investments in each state, based on transparent prioritization and performance criteria.**

State Selection

2. **Eligibility criterion.** In consultation with the FMFBNP, the FMEnv developed a simple technical eligibility criterion for the states, using the CGIAR Aridity Index (further explained in Annex 4). Based on this criterion, the 19 northern states of Nigeria as well as the FCT were deemed eligible to participate in ACReSAL, as listed in Table 2.1.

Table 2.1. Eligible States

Northeast	Northwest	North Central
Adamawa	Jigawa	Benue
Bauchi	Kaduna	FCT
Borno	Kano	Kogi
Gombe	Katsina	Kwara
Taraba	Kebbi	Nasarawa
Yobe	Sokoto	Niger
	Zamfara	Plateau

3. **Prioritization criteria.** In consultation with state commissioners responsible for environment, agriculture, and water portfolios, the FMEnv developed prioritization criteria for state participation in the project. Eleven prioritization criteria were proposed to assess the demonstrated commitment and implementation readiness of eligible states, with the view to determining staged access to investment funding. The demonstrated commitment criteria included: (a) Engagement in dryland management; (b) Counterpart funding; (c) Use of State Ecological Fund; (d) Intersectoral coordination; and (e) Commitment to project security. Implementation readiness criteria included: (a) Readiness of investment projects; (b) Availability of catchment investment plans; (c) Institutional capacity; (d) Policy readiness; (e) Fiduciary capacity; and (f) Safeguards capacity.

4. **Eligible states were asked to document their compliance with the prioritization criteria**. The state selection process and prioritization criteria were also presented at the Northern Nigeria Governors' Forum (NNGF). The responses submitted by the states to document the criteria were assessed by the FPMU.

5. **State staging and dynamic allocation of funds for performance management.** ACReSAL is open to all interested states in northern Nigeria. The managed allocation of project funds to participating states is intended to promote implementation performance. States will access growing levels of funding based on their compliance with readiness and performance conditions. At entry, states will benefit from funding for technical assistance and planning studies, towards satisfying minimum capacity and readiness conditions (Stage 1). The states having satisfied capacity and readiness conditions will have access to an initial capped amount of investment funding to start implementing an agreed workplan (Stage 2). Each state will have the opportunity to subsequently access larger capped tranches of funding to continue implementing their workplan (Stage 3), based on their performance in Stage 2. In all stages, state performance will take into account the timeliness and compliance of consultancies, design, procurement.

and implementation tasks. Excessive delays or compliance deviations in procurement or in implementation will be factors in potential decisions for reduced or deferred allocation of new funding or even for a reallocation of non-committed funding. The proposed starting and fund allocation mechanisms are further described below.

State staging

6. **For initial consideration for ACReSAL investments starting at project effectiveness, the states have to demonstrate eligibility for Stage 1** (Table 2.2).

Table 2.2. State Readiness to Enter Each Stage

	State Level		
Criteria	**Stage 1**	**Stage 2**	**Stage 3**
Overall Commitment	**Overall Commitment Index Score > 0.7** (see details of Index in the PIM) • Counterpart Financing (also Land Availability and Ecological Fund Use) Commitment • Institutional Capacity (including SPMU Setup, Technical, Fiduciary and ESF) • Policy Readiness • Security		
Component A	• Scoping of potential investments in A2 and A3	• Initial investment packages approved (up to $S2A_{max}$)*	• Initial investment packages approved (up to $S3A_{max}$ with special provision for larger investments)
Component B	• Identification of at least 2 priority micro-watersheds for planning • Scoping of potential investments in Component B	• Initial investment packages approved (up to $S2B_{max}$)	• Approved micro-watershed plans • Initial investment packages approved (up to $S3B_{max}$ with special provision for larger investments)
Component C		• SPMU fully operational	

Note: *Initial limits (to be adjusted from time to time with the concurrence of the Federal Project Steering Committee and World Bank): $S2A_{max}$=US$10 million; $S2B_{max}$=US$2 million; $S3A_{max}$=US$25 million; $S3B_{max}$=US$5 million.

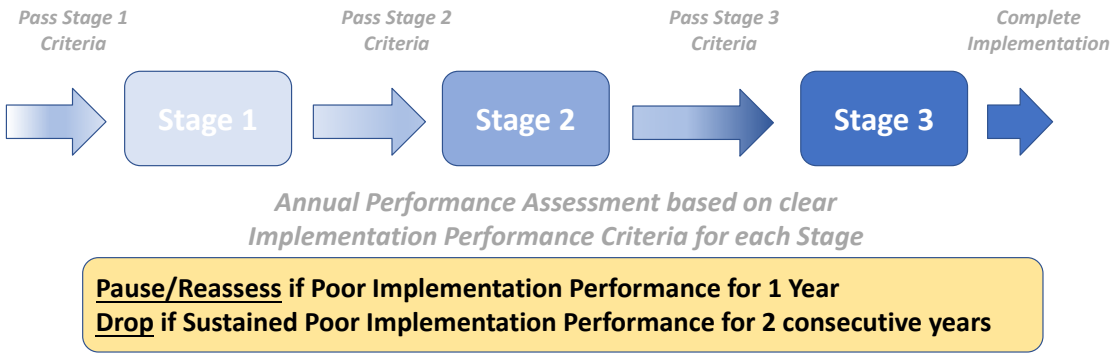
7. **Entering subsequent stages will unlock additional activities that can be undertaken by the states as in Table 2.3.**

Table 2.3. Potential Activities at Each Stage (state level)

	Activity	Stage 1	Stage 2	Stage 3
A1	*Strategic Watershed Planning*	Strategic watershed knowledge base, analytical tools, stakeholder discussions, strategic watershed plan development		
A2	*Landscape Investments*	Strengthen state extension systems (for example, IPM programs), agro-climatic data and information systems, support for investment preparation	+ Support for small investments	+ Relevant scaled-up on-the-ground landscape restoration as in A2
A3	*Special Ecosystems*	Knowledge base, training	+ Wetland and oases management	+ Forest and woodland management and supporting infrastructure as in A3
B1	*Community Strengthening*	Community engagement, micro-watershed planning	+ Establishment/ strengthening of community groups	+ All relevant micro-watershed investments as in B1
B2	*Community Investments*	Farmer training	+ Special equipment (for example, Delfino Plough), small investments	+ All eligible investments in B2
C1	*Institutional and Policy Strengthening*	Knowledge base, data/analytic Services, virtual training, Cloud services, limited IT equipment	+ In-person training, internships, national study tours, office and IT equipment	+ International study tours and other C1 activities, minor civil works, enhanced in situ monitoring, and other activities as in C1
C2	*Project Management*	Basic support to start SPMU	+ Full SPMU support	
D	*CERC*	Qualified emergency support		

8. **States are expected to progress through the various stages towards full implementation of the planned project activities.** This will be based on regular reviews of state performance every 6 months, as based on the recommendation of the National Project Steering Committee and concurrence of the World Bank. In addition, the annual performance of states will be assessed to determine if the state should continue at that stage or be dropped as indicated below.

Figure 2.1. Progression of State Levels by Component



9. **Data on state performance will be updated by the FPMU on a public website along with other key M&E indicators.** The Implementation performance criteria will include:

- SPMU performance (related to overall project activity facilitation, technical, fiduciary, ESF)
- State investment implementation performance

Responsibilities

10. The **Federal and State Project Steering Committees (with concurrence of the World Bank) will respectively:**

- Finalize and adjust state readiness criteria and potentially allowable activities for the states at various stages
- Semi-Annually review assessment of each state's readiness to determine/adjust overall the state's stage
- Review AWPB and ACReSAL Procurement Plan and ensure this is in line with current stage of each state
- Annually review state implementation performance to determine consequences of (pause/reassess, drop)

Dynamic Allocation of Investment Financing

11. **Individual Investments will also be considered with well-defined milestones.** The overall process will include:

- Investment summary of relevance to PDO, technical (with location, maps, and photos), environmental, social, economic, institutional Aspects (submitted/revised by State, reviewed by FPMU) – includes request for supporting technical assistance for preparation (to be included in workplan/procurement plan
- Final investment package including feasibility studies/detailed costs and designs/ESF instruments and supervisory technical assistance (TA) (draft submitted/revised by state after State Steering Committee clearance, reviewed by FPMU and submitted to World Bank for clearance as required)
- Included in AWPB/Procurement Plan (reviewed and cleared by Federal and State Steering Committees respectively and World Bank) and Strategic Watershed Plan after PY2
- Investment implementation with supporting technical assistance

- Regular monitoring by SPMU/FPMU and State and FSCs for action based on milestone achievements and reflected in project M&E system for reporting and corrective actions

12. **The investments in Component A can be a combination of "lumpy" investments (for example, a check-dam or major erosion control work which cannot have benefits if only partially completed) and "scalable" investments (for example, most watershed management measures, rangeland management), that can be customized and still bring positive impacts.** Both will require careful determination of specific milestones (3-5 milestones as indicated below), which, when achieved, release the next tranche of funds. This dynamic fund allocation is intended to avoid "earmarking" of large amounts of financing to non-performing investments and incentivize timely investment completion. Remaining funds will be allocated on a rolling basis to better performing states.

Table 2.4. "Lumpy" Versus "Scalable" Investments

"Lumpy" Shovel-ready Investments	"Scalable" Investments
• Initial Tranche 1 (initiating work) ~10% budget • Intermediate Tranches (1-3 levels based on Investments) ~70% based on milestone completion • Final Tranche (completion, final reporting, lessons for replication/scale-up) ~20%	• Initial Tranche 1 (initiating work) ~10% • Intermediate Tranches (1-3 levels based on Investments) ~80% based on milestone completion • Final Tranche (completion, final reporting, lessons for replication/scale-up) ~10%

13. The fiscal responsibility for the IDA credit will be assumed jointly between the FMFBNP and the participating states. The relative allocation of those responsibilities is decided by the Borrower. Table 2.5 presents some preliminary ideas about how the Borrower may choose to make these allocations.

Table 2.5. Approximate Allocations of Fiscal Responsibilities

Component	Federal Responsibility	State Responsibility
A: Dryland Management	• Strategic catchment planning consultancy (across states) • Cross-state investments • National parks	• Most activities on the ground
B: Community-Based Climate Resilience	• Technical assistance • Cross-state landscape restoration and agriculture	• Detailed investment preparation, implementation, and supervision • Equipment (but procured centrally where possible)
C: Institutional Strengthening and Project Management	• Capacity-building support (involving federal MDAs) • FPMU & consultancies	• Capacity-building support (involving state MDAs) • SPMU & consultancies
D: CERC	• Full component	

ANNEX 3: Detailed Project Component Descriptions

Component A. Dryland Management (Total Cost: US$327.8 million equivalent)

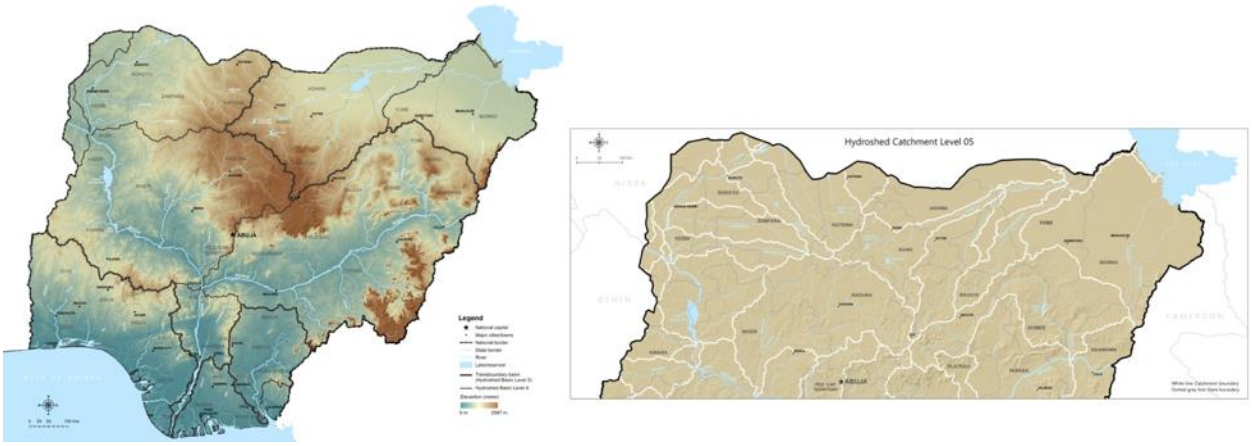
1. **Component A and its three subcomponents will support a planning process to prioritize needed investments to address major drivers of desertification and land degradation in northern Nigeria and bring to bear major investments best managed at a large-scale watershed level.** The investments will be managed primarily by government agencies (at the federal and state level) and will target the highest priority large-scale public investments as identified in watershed-level SLWM plans. Implementation will be through a combination of government agencies and contractors. Component A investments complement those of Component B which will be planned and managed at the community level.

2. **In some cases, it may be desirable for some of these activities to be implemented on private lands (those of individual households or of local communities).** Doing so sustainably, however, would require providing landholders with long-term compensation for their efforts and for the opportunity costs they would face, that is, PES. At present, financing sources that would allow such long-term compensation are not in place, and so the project will limit itself to working in public lands for the Component A investments. Under Subcomponent C1, the project will support efforts to pilot PES programs in northern Nigeria.

A1. Strategic Watershed Planning (US$33.0 million)

3. **Two scales of planning are proposed for the ACReSAL project – strategic watershed plans covering all northern Nigeria and micro-watershed plans for selected areas where there are planned project-financed interventions** (see further details under Subcomponent B1). The present subcomponent will support large-scale integrated watershed management planning. Plans will be prepared for up to 20 watersheds, covering all of northern Nigeria. One possible watershed typology to be adopted by the project is the Level 05 hydroshed watersheds (see Figure 3.1 which also shows the major river basin watersheds in Nigeria).

Figure 3.1. Major River Basins in Nigeria and Level 05 Hydroshed Watersheds



4. **The objective of SLWM planning is to identify activities necessary to support the integrated use of land and water resources in a geographically discrete drainage area for the benefit of its residents,**

while also protecting or conserving the ecosystem services which the watershed provides. SLWM plans have multiple objectives, such as sustainable land and natural resources management, water resources management, poverty alleviation, and agricultural and rural development. Therefore, SLWM plans will be prepared through a collaborative effort, led by a committee involving the relevant agencies, supported by a technical advisory board (comprising of technical staff from the relevant agencies and subject matter experts) and consulted with diverse stakeholders. Rapid initial plans will be prepared in the first year, with updates to be prepared throughout the project lifetime, as part of a continuous and participatory process, constituting an adaptive management model. The plans will inform the identification and preparation of ACReSAL investments; in the first year many "shovel-ready" investments will however commence quickly.

5. **The methodology and approach for the SLWM planning are outlined in the PIM and are available in the project files.** An important model the project will follow is TerrAfrica's *Sustainable Land Management in Practice: Guidelines and Best Practices for Sub-Saharan Africa.*[35] Preparation of SLWM plans will include: (a) the development of models of watersheds and their ecosystem services (including, for example, food production, soil retention, water regulation, fodder and fuel production, carbon sequestration); (b) spatial prioritization of watershed management actions based on an assessment of the cost, the benefits to ecosystem services and livelihoods and potential tradeoffs (inclusion of a concept of landscape corridors and clustering of interventions inside these corridors would contributed to achieving more impact); (c) definition of a M&E framework including RF, metrics, roles and responsibilities for collecting and reporting on progress towards plan implementation; (d) clearly laying out roles and responsibilities of implementing agencies and defining mechanisms for allocating project funds to priority investment actions, including identifying additional funding where applicable; and (e) incorporation of information (collected in the MIS under Subcomponent C1) on monitoring of conflict impacts in the project area, to inform the planning process and to help prioritize project investments. The Global Partnership for Sustainable and Resilient Landscapes (PROGREEN), a World Bank multi-donor program, will finance "Analysis of global good practices on watershed planning and landscape-level interventions applicable in Northern Nigeria context". The results will help adapt the methodology and approach to be followed by ACReSAL.

6. **Examples of investments the project will finance under this part of the project will include:**
- Preparation of participatory scale-appropriate integrated watershed management plans
- Development of detailed guidelines for Watershed Committees (WCs) and local agencies (LAs) for each phase of watershed development (preparatory phase, works phase, consolidation, and O&M phase)
- Consultations, promotion, and socialization of plans
- Inter-ministerial coordination mechanisms for enhanced planning
- Prioritization of investments in the watershed to achieve the management targets
- Data capture on the Performance Assessment Tool through the state MIS

A2. Landscape Investments (US$244.8 million)

7. **This subcomponent will support large landscape-level investments, as prioritized in the strategic watershed plans.** These may include those related to water resources (for example, surface and groundwater storage, managed aquifer recharge, riverbank restoration, gully rehabilitation, irrigation, improved water systems), to environmental management (stabilization of sand dunes, forest

[35] WOCAT, coordinated by FAO. 2011. http://www.fao.org/3/i1861e/i1861e.pdf.

management, afforestation), and to agriculture investments at large scale. The subcomponent is expected to include state-implemented and federal-implemented investments, depending on the scope of the subprojects. A considerable pipeline of investments has already been identified and prepared under NEWMAP and some of these will be financed under ACReSAL, provided they are consistent with ACReSAL objectives and requirements.

Sand dune control (US$30.8 million)

8. **Urgent investments to restore vegetative land cover are needed in selected areas to control the movement of sand dunes threatening the survival of communities.** Caused by climate change, sand dune encroachment increases vulnerability by wiping away livelihood opportunities and physically erasing living spaces. The sand dune control investments will have to be prioritized in the SLWM watershed plans (see subcomponent A1). This set of activities will support efforts aimed at halting the movement of shifting sand dunes and prevent their encroachment onto communities, infrastructure, agricultural land, and wetlands. Investments will support the planning, design, and establishment of straw checker boards and the seeding and planting of vetiver, indigenous shrubs, and grass on moving and semi-stabilized sand dunes. The establishment of straw grids combined with supportive grass and shrub planting will allow an initial fixation of the sand. The grids remain intact for about three to five years, allowing time for the development of the vegetation cover and subsequently for their permanent stabilization. The control of sand dunes by the project will restore vegetation cover (which will improve carbon sequestration), reverse land degradation and restore soil productivity. These will build resilience of the affected communities to climate change and reduce out-migration.

9. **Planting activities will be complemented in selected sites by supporting investments** in fire control equipment, construction of firebreaks and access routes, watchtowers, small scale temporary irrigation infrastructure, small buildings for technical staff and workers, and project information and warning signs.

Water resources management (US$168.0 million)

10. **The objective of this part of the subcomponent is to implement investments to improve the long-term conservation and management of water resources.** Some investments will help improve the water security of local communities, in targeted basins, and improve resilience to the impacts of climate-related disasters through improved access to resilient green infrastructure.

11. **Some specific interventions have already been designed and assessed or are in the process of preparation (for example, feasibility, technical design) under the NEWMAP program and some others by the FMWR.** For the proposed interventions that could be taken up from NEWMAP, they will be given priority in the first year of the project, provided they align with the objectives of ACReSAL. In principle, priority would be given to those activities that have already been identified and discussed in watershed management plans. In screening any of these solutions, preliminary studies of available options would be made to determine the relative benefit vs cost of different alternatives.

12. **For water management interventions, both surface water (river, lakes, streams, runoffs, oases) and groundwater sources will be considered.** Legality of supply deals with doctrines and principles of water rights. Complications could arise from the fact that political boundaries do not coincide with hydrological boundaries; under ACReSAL the goal would be to ensure appropriate consultations and

collaboration among riparian states in dealing with inter-state water resources. The project will rely in this area on the leadership of the FMWR and its parastatals (such as the NIWRMC). The menu of water resources investments includes the following subproject typologies:

13. **Integrated dams/small-scale multipurpose reservoirs and irrigation development.** Dams store and protect surface water sources and ensure the availability of water for drinking and irrigation during low precipitation months and periods of seasonal droughts. Depending on the locations, reservoir capacities, and flood peaks, some of the reservoirs will have multiple functions, such as stream flow control to prevent and minimize flooding incidents in the rainy seasons and in addition, provide resources for productive uses like irrigation, water supply, and livestock watering. To ensure resilience of local communities, the project would go beyond just building dams/storages but also provide basic infrastructure that would facilitate access to water resources, for example, hydraulic infrastructures for irrigation, water supply. The extent of the requirements at each location would be determined in a watershed management planning process, that will also consider ecological flow requirements and preferences of communities, as determined in participatory community planning. Possible activities under this subcomponent include: (a) construction of new and/ or rehabilitation of existing small dams/ reservoirs; (b) rehabilitation, replacement and/or decommissioning of deep boreholes; (c) rehabilitation and construction of associated hydraulic infrastructure (including, borehole heads, pumps and meters); and (d) development and/or improvements of irrigation and drainage networks.

14. **Flood and sedimentation control structures downstream** will prevent and mitigate the impacts of floods, which may cause loss of life and significant damages to local infrastructure, properties, and agricultural assets, and are even more damaging during periods of heavy precipitation. Flood and sediment control structures will include check dams, levees, retaining walls, embankments, culverts, bridges, concrete channels, grouted riprap, and stream bed rehabilitation, among others. The project could support sensitization, mobilization, and organization of communities to manage erosion and prevent disasters. Specific locations will be determined through hydraulic modeling, historical flood records, flood risk mapping, and other relevant analysis.

Agricultural strengthening and investments (US$46.0 million)

15. **Agricultural investments to increase resilience at scale will be implemented at the federal or state levels.** They will complement community- and household-level activities undertaken in component B and irrigation development opportunities associated with water resources management subprojects noted above. Agricultural strengthening investments in this subcomponent, in addition to rangeland management noted below, will finance a range of agricultural extension services such as promotion of integrated pest management (IPM) and knowledge and data platforms and services.

16. **Rangeland management investments**: Rangelands provide important economic and environmental functions, including fodder for livestock. The project will support investments critical for pastoral systems productivity, resilience against climate change, and increased carbon sequestration. The project will finance: (a) the assessment of the current state of natural resources (including forage and water) using satellite and digital technologies and tools (for example, FAO feed balance methodology) to guide decisions on improved management, utilization, and access , as a key enabling infrastructure towards climate smart livestock systems; (b) the establishment and implementation of inclusive community-driven climate-smart sustainable rangeland/landscape management, including all key users of resources, and establishing clear conditions for access to natural resources (grazing reserves and

water), and the development of sound governance mechanisms and "social fencing" approaches; (c) the construction and rehabilitation of stock routes and water points to improve their network, including in areas that can open up new rangeland/pastures and their sustainable management through support to established committees; and (d) cultivated pasture development. Besides increasing the amount and quality of grazing resources which is a climate change adaptation measure, support for improved rangeland/pasture management would contribute to climate change mitigation through increased carbon sequestration – above and below ground, as well as reduced methane emissions from enteric fermentation (mainly because of improvements in pasture quality). These activities will be coordinated with the animal husbandry departments at the state and federal level. Rangeland improvement will be considered as part of broader watershed management and the provision of fodder from landscape restoration.

A3. Special Ecosystems (US$50.0 million)

17. **Natural ecosystems form an important and integral part of the drylands of northern Nigeria.** They harbor globally important biodiversity and are genetic reservoirs for many species of flora and fauna that people depend on for their livelihoods. These natural ecosystems include national parks, forest reserves, wetlands, oases, and remnants of natural woodlands. They play particularly important functions in several important ecosystem services such as food (fisheries, nuts, and so on), biomass for firewood and housing, erosion control, regulation of water flows, recharge of surface and groundwater, among others. Only a few of these special ecosystems in northern Nigeria are formally protected within national parks and gazetted forest reserves. All these special ecosystem areas suffer from degradation caused by climate change and by human activities pursued to cope with the impacts of climate change.

18. **Investments under this subcomponent will improve the conservation and management of special ecosystems**, including wetlands (such as the Hajejia-Nguru Wetlands, a RAMSAR site and national park), desert oases, forest reserves, protected areas and woodlants remnants, as well as increasing adaptation and resilience to climate change. They are all urgently in need of additional support and financing. Planned project investments, further detailed below, will include support of government forest conservation, restoration and afforestation plans, national and state biodiversity plans and strategies, and community engagement initiatives. Policies, regulations, capacity building and technical assistance in different topics are covered under Component C. A forthcoming PROGREEN-financed study entitled "Scoping of ecosystems and their services in drylands of northern Nigeria" will provide useful inputs to this subcomponent.

19. **Background information on oases of northern Nigeria is included in Annex 4.** Oases support community livelihoods in many ways but are being degraded due to climate change and other causes. Their degradation continues to expose these communities to economic shocks and stresses making them more vulnerable to climate change. The remediation and restoration of oases will in some cases be supported under the investments of Subcomponent B2, when participating communities are in such areas. The ACReSAL project will further focus resources on some of the most vulnerable oases for the purposes of their remediation and restoration. Investments could include those related to inventories, actions plans for climate change adaptation, protection and restoration of oasis buffer areas, improved water provision and water quaility, recovery of cultural water management traditions, jobs and microprojects for oases cleaning, restoration of palms, tourism, control of pollution and invasive species, and fire management.

20. **Targeted investments will be carried out in selected wetlands to restore their ecological functions.** Investments will include wetland inventories, definition of buffer protection areas, zoning, banks restoration, monitoring systems, water management, biodiversity conservation, invasive species control, jobs and community microprojects, overfishing management, climate change adaption action plans, education campaigns, and so on. Climate change is currently adversely impacting wetlands in the region through more severe droughts. Planned water management investments will help improve resilience of wetlands to climate change and also better protect biodiversity.

21. **Public sector investments in better management of the remaining forested areas of northern Nigeria are a critical element of dryland management.** Forest areas have critical functions in dryland management strategies for maintaining ecosystem integrity, supporting livelihoods, and slowing desertification. Charcoal production is an economically important sector but in Nigeria is considered as one of the major drivers of deforestation (particularly in Bauchi, Kaduna, Nasarawa, Taraba, Ogun, Oyo, Kogi States). In Nigeria, charcoal is primarily used as a source of domestic energy for cooking and heating. Charcoal is a major source of domestic fuel for urban areas such as Jos, Kano, and Abuja. There is also a large market for charcoal export to Europe and Asia.[36]

22. **Clusters of forest sector investments to be supported include:**

- **Improved seed quality.** Support will be provided to the various Seed Centers in the country. It will cover both productivity aspects and the viability of climate-resilient tree seeds. The support will improve and diversify the tree seed pool. Local cooperatives will be trained in the use of new varieties and in seed collection, handling, and distribution.
- **Improved woodlot management.** Investments will include training of local cooperatives in establishment and management of woodlots and tree nurseries (of assorted native species). This activity, apart from increasing the vegetative cover in the communities, will also help intensify production of sustainable fuelwood within community woodlots, thereby reducing the pressure on forests, and contributing to climate adaptation.
- **Sustainable rural energy production and use.** The majority of the population in the areas targeted by the project rely on charcoal and fuelwood as the main source of domestic energy. This is one of the major drivers of deforestation, contributing to land degradation and desertification. The project will support improved processing of fuelwood (produced from community woodlots) and agricultural wastes into charcoal and briquettes to produce sustainable forms of domestic energy. This activity will contribute to climate mitigation by reducing the pressure on forests and thus contribute to reduced carbon emission and better soil and water retention. The project will also assess women's role in charcoal production and consumption by targeting investments to reduce gender disparities in this sector of the economy. The World Bank's PROGREEN project will finance "Sustainable woodlot management in northern Nigeria: assessment of woodlot biodiversity and quantity, and opportunities for alternative rural energy applications". This study will assess current charcoal production practices and their implications, identify alternative options and develop measures to address deforestation and forest degradation. Where possible, ACReSAL will finance identified investments.

[36] http://gaviglobal.com/2020/10/29/charcoal-exporters-in-nigeria.

23. **Gazetted forest reserves are under the responsibility of state and local governments.** The project will support the Government's efforts to improve the management and conservation of forests, increase presence of personnel, offices, transportation, communication, management plans, and so on. Improved access to fuelwood will be provided by supporting plantations with fast-growing species and to strengthen non-timber forest product value chains for forest-dependent communities. To address challenges identified in the forestry sector, the project will set up a combination of incentive-based agroforestry schemes, agricultural intensification, bush fire control, establishment of fuelwood plantations on degraded gazetted forest lands or in other communal land. The aim will be to increase fuelwood production and meet the energy needs of local communities, create jobs and microbusiness that supply high-consumption urban hubs. It also includes efficient production of charcoal, transhumance grazing management, Non-Timber Forest Products (NTFPs), fire control, invasive species, and. biodiversity conservation.

24. **Four of Nigeria's seven national parks, Chad Basin, Gashaka-Gumti, Kamuku, and Kainji Lake, are located in the semi-arid region of northern Nigeria.**[37] They are under the management of the National Parks Service. They together cover about 15,492 km^2 (about 70 percent of the total area covered by Nigerian national parks) and are globally recognised for their species richness, endemism, and protection of ecosystem resources that sustain the socio-economic livelihoods of communities in their respective region. President Muhamadu Buhari recently approved the upgrading of ten game or forest reserves to the status of national parks. Many of the new national parks are in northern Nigeria: Falgore, Hadejia wetlands, Allawa Kogo, Pandan, Marhai, and Kampe. National park investments will support protected areas which are considered to be particularly at risk, which form major parts of the prioritized watersheds under the project, and are national priorities. About 300,000 ha of these protected areas are expected to benefit from improved conservation and management because of ACReSAL investments.

25. **Expected investments in the national parks address both the needs of communities in park buffer zones and the parks themselves.** This part of the subcomponent will be under the authority of the National Parks Service. Communities in buffer zones will be supported in areas where the Parks Authority has jurisdiction to be operating. Support will include boreholes, afforestation/reforestation, training and support to local livelihoods, and involvement of local communities in park management. The project will support biodiversity and ecological surveys in seven national parks and management plans for 11 of them. Ranger posts and critical park infrastructure will be financed as well as demarcation, training, and diverse support to park management as needed.

Component B. Community Climate Resilience (US$293.4 million equivalent)

26. **The objective of the component is to increase agro-climatic resilience at community and household levels by promoting locally adapted SLWM strategies and through climate-smart approaches to agriculture and natural resources management.** Most of the challenges of dryland management are to be found at the local level, where they constitute the day-to-day reality of communities and farmers. Communities need support to be more resilient and communities and households need targeted investments to put new approaches into effect. The process for selecting communities will be tailored to state-specific contexts and will be determined by the states, but will need to be laid out in the PIM. Selection criteria could include those related to agricultural potential, risk of natural resources conflicts,

[37] The Yankari Game Reserve (with an area of 2,244 km^2) used to be a national park until 2007 when it was returned to the Bauchi State Government.

security considerations, and interest and commitments of local government authorities (LGAs). In targeted micro-watersheds, this component will support the following subcomponents:

B1. Community Strengthening (US$22.0 million)

27. **This subcomponent aims to strengthen the capacity of communities for sustainable natural resource use and management.** Support will be provided to "local project implementation committees" (as named on Figure 4, or their local equivalent. These committees would coordinate and lead project investments, in coordination with the relevant SPMU. When appropriate, the project would strengthen existing community structures, as have been promoted for example under the World Bank-financed NEWMAP, Community and Social Development Project (CSDP) and FADAMA projects. Collaboration with LGAs would be assured through their leadership of the local project implementation committees.

28. **A participatory process of micro-watershed planning will be supported.** The strategic watershed management plans prepared in Component A1 are expected to cover most of northern Nigeria and will have produced basic guidelines and priorities for the micro-watersheds that are included in their respective watersheds. In some communities, functional equivalents of the micro-watershed plans already exist and they would be strengthened and not replaced; this would be the case for example for community development plans (CDPs) developed under NEWMAP, CSDP or FADAMA projects. The micro-watershed plans, intended to be living documents, will include the community's identification of needs and priorities and will help prioritize project investments. They will include mapping of conflicts and conflict resolution mechanisms as an input to peace building and will incorporate information (collected in the MIS under Subcomponent C1) on monitoring of conflict impacts in the project area. The project will support information campaigns on the plans and project funding procedures, and monitor and evaluate the implementation of the plans and achievement of their objectives. More details on the micro-watershed planning process and the expected format of the plans are included in the PIM.

29. **This subcomponent will also include investments to improve community capacity for critical local development needs, peace building, and to improve conflict resolution capacities at the local level.**[38] These will build on both formal and informal institutions and practices and finance interventions such as dialogues, joint planning and implementation across stakeholder groups, training, and capacity building. Attention will need to be paid to the inclusion of marginalized groups such as youth, the physically handicapped, and internally displaced persons (IDPs). Community structures will be strengthened for implementation of subprojects, monitoring, and reporting, and operation and maintenance of community assets/investments. Capacity building training will cover vocational and financial literacy, leadership, group decision-making, book-keeping, business management, and so on. The formation or strengthening of community-based groups could include savings and cooperative associations.

30. **The project includes significant gender-targeted support.** Gender-focused investments at the community level will be made through this subcomponent; see also more specific measures which will be financed through Subcomponent B2. All of the investments described in the previous paragraph will include a focus on women-led groups and enterprises to target gender gaps. The project will also adopt several broader measures and mechanisms to support women's active participation, including selection

[38] The World Bank's PROGREEN project will finance a study "Global good practices on community-level agroforestry interventions to foster peacebuilding and social cohesion in Northern Nigeria".

of service providers with proven capacity in working with women and separate sessions with women to ascertain their opinions and needs. The project will monitor the progress of closing the gender gap in women's access and control of assets through an indicator "Women-led/owned enterprises, cooperatives and farmer groups receiving financial and technical support (%)".

31. **Important investments will be supported aimed at reducing GBV in beneficiary communities** such as: (a) GBV service provider mapping and referral pathways to ensure that survivors within the community know where to go to report incidents and receive medical, legal, shelter, security, and psychosocial support. The project will collect data from GBV service providers, input it into a shared database and analyze the data to see which providers meet basic quality standards. To ensure the community has access to quality services, the hired GBV firm will provide training and technical support to service providers (these often include grassroots women's groups) when there is the need; (b) consultations with women and girls to understand where they feel safe reporting to, which will allow for multiple reporting channels within the community where survivors can go to report incidents of GBV including SEA/SH. These reporting channels (youth and women's groups, local leaders, and so on.) will be trained on how to receive incidents through a survivor-centered framework. Specific protocols for how SEA/SH cases will be handled will be developed by the GBV firm in collaboration with the project GBV Specialist; (c) multi-stakeholder dialogues to engage local leaders, community-based organizations and GBV advocates on local-level GBV risks, underlying drivers and effective prevention and response mechanisms will take place throughout the duration of the project;[39] (d) GBV training for male and female project beneficiaries on topics such as risks, consent, reporting and accessing care as a survivor of GBV will be carried out by the hired GBV firm; and (e) social marketing campaigns and community sensitizations to promote behaviors that mitigate GBV will be done in coordination with the communications team and through radio, pamphlets, posters and community focal points.

B2. Community Investments (US$271.4 million)

32. **This subcomponent aims to finance physical investments as prioritized through the micro-watershed planning process.[40]** As noted in more detail below, gender inequalities with regard to agricultural production will be addressed through preferential gender-focused investments. The intermediate project indicator "Farmers reached with agricultural assets or services" is disaggregated by gender to measure the project impacts not just on farmers generally but specifically for women. Although the menu of potential investments will vary from community to community, three clusters can be described:

Community-led landscape restoration (US$128.0 million)

33. **This activity will enhance local landscape restoration with community involvement.** The approach will allow communities to evaluate a menu of options and choose locally appropriate investments, thus facilitating sustained community management of the restored landscapes. An example is the mechanization of traditional half-moon water harvesting techniques using the Delfino Plough. The communal land is then planted with a mix of shrubs and tree (native plant species) chosen by the communities. These can provide non-timber forest products (NTFPs) such as fodder, acacia (gum Arabic),

[39] The project's intermediate indicator "Number of community-based groups with increased capacity" specifically indicates GBV as one the capacity areas to be considered.
[40] The Bank's PROGREEN Project will finance two relevant studies: "Scoping analysis on relevant community-level infrastructure and services" and "Scoping of global good practices and Nigerian experience on climate resilient agriculture".

balanites,[41] plants for beekeeping, nuts, and human and animal medical plants. The selection of the right mix of species and availability of seeds are both key and the choices need to balance short- and long-term benefits. The goal is to combine longer term benefits in terms of enhanced community resilience, biodiversity, carbon sequestration, and increased water infiltration and retention with shorter term financial benefits that maintain community engagement. These investments are expected to restore 350,000 ha.

Climate-smart rainfed crops (US$89.0 million)

34. **Crops cover much of the landscape in the project area (57 percent) and provide the main source of food and livelihoods.** Yet, crop productivity has been declining due to a series of factors, including underinvestment, overexploitation, a changing climate, and security threats. Agricultural area expansion and imports are the primary means to meeting increasing food demand; yet agricultural expansion is a driver of desertification, which in turns reduces agricultural productivity, generating a vicious circle of overexploitation. To break this cycle, the project will invest in water and soil conservation, optimizing farm management (improved crop varieties, Integrated Pest Management; soil and water testing technologies), value chain development, and small equipment to increase labor efficiency.

35. **Efficient water management is essential for increasing the potential of rainfed agriculture and adapting to climate change in semi-arid landscapes.** The project will support investments in water harvesting technologies and improved crop varieties to optimize farm efficiency and build resilience against climate-induced droughts in beneficiary communities. The World Overview of Conservation Approaches and Technologies (WOCAT) has promoted successful water harvesting approaches and technologies for improved water management for rainfed farming systems in drylands. The project will adapt WOCAT guidelines[42] to implement micro-watershed water harvesting technologies such as planting pits, cross slope barriers, eyebrow terraces, and water harvesting basins.

36. **Several new drought resistant crop varieties have been developed that are suitable for the socio-environmental conditions of the project area, yet adoption is still limited.** Adoption of such improved varieties (such as Iron Cowpea, Iron Pearl Millet, Vit A Maize and Sorghum), including through partnerships with local private sector suppliers, would increase crop productivity and resilience, thus reducing the pressure for agricultural expansion. The adoption of such new varieties would allow increasing climate resilience while at the same time improving nutrition by addressing key micronutrient deficiencies. The project is expected to support investments in 100,000 ha.

37. **Community Revolving Funds (CRFs) present good potential for sustainability and scaling-up.** CRFs have been supported in World Bank- projects at scale, especially in East Africa, to support investments by community-based groups, including farmer groups in micro-watersheds. The CRF, led by a management committee, would be a community level fund to support ACReSAL-supported and registered community interest groups/farmer groups and enterprises to undertake investments for climate-smart rainfed crops interventions. Each of about 2800 target communities in targeted watershed would receive a CRF grant of an indicative amount of US$25,000. Registered community interest groups /farmer groups will prepare investment/business plans and apply for loans from the CRF. The investment/business plans will be appraised and approved by the CRF Management Committee. The PIM

[41] Common names include desert date, soap berry tree, Egyptian balsam, and so on.
[42] WOCAT (2013). Water Harvesting – Guidelines for Good Practice.

outlines the details of CRF implementation, strategies for their sustainability, and where the funds would be reassigned in the event of CRF dissolution.

38. **The project will award a minimum of 20 percent of the revolving funds to women-led/owned enterprises and cooperatives to finance quality agricultural assets and inputs.** The CRF management committees will be required to have at least one female executive (out of three). The project will also prioritize subproject proposals that have women as beneficiaries (members and/or leaders) by giving additional scores in the appraisal and approval process based on the percentage of women beneficiaries. The project will engage the services of more female extension service agents to increase women farmers' use of productivity-enhancing technologies. The success of these measures in reducing gender inequalities will be specifically measured by the indicator "Women-led/owned enterprises, cooperatives, and farmer groups receiving financial and technical support (%)".

Farmer-led irrigation development (FLID) (US$54.2 million)

39. **Climate variability and dry spells are the main constraints to agricultural potential in the project area.** The Government, supported by the international community, has traditionally addressed such constraints by building dams to store surface water. Yet the region is also well-endowed with accessible groundwater, with around 7 million ha of cropland with groundwater at depths of less than 25 m. A strong potential for solar energy,[43] the declining costs for photovoltaic power, and the presence of an emerging solar sector (including solar-powered pumps)[44] as well as innovative financing services such as PAYGO, generate ideal conditions for supporting small-scale solar-powered irrigation for individual households or small groups. FLID investments aim to lower financial, knowledge, and market barriers for farmers for boosting small-scale irrigation and building agricultural resilience. Financial constraints need to be addressed on both the demand and supply sides. This will include stimulating markets to serve different farmer segments, improving access to financial services (for example, PAYGO),[45] with a particular focus on equitable access for vulnerable communities and women, access to new technologies such as solar pumps and building awareness on various technologies and practices for efficient irrigation. PAYGO schemes provide an excellent opportunity to address financing obstacles to investing in irrigation, while at the same time allowing for payments directly related to actual use (a chronic issue in larger irrigation scheme). This will create incentives for users to limit water use. Technical assistance will include support to communities, beneficiaries, and companies to ensure adoption of irrigation translates into sustainable and productive use of water in the micro-watersheds in alignment with the CDPs and infrastructural investments (for example, managed aquifer recharge, small dams) made under Subcomponent A1. More

[43] On average, photovoltaic output in Northern Nigeria ranges between 4.0-5.0 kWh/kWp (*https://globalsolaratlas.info/global-pv-potential-study*). A study carried out by IFPRI in September 2021 assessed that – at current prices of diesel fuel and solar energy array—solar is more cost effective than diesel in northern Nigeria, while diesel is more cost effective than solar in Central Nigeria (irrigation demand is not significant in the southern part of the country).

[44] A 2021 IFPRI review of the solar irrigation sector revealed that several companies operate in Lagos with a few in Kaduna and Kano. Services rendered range from pre-and after sales services on solar irrigation equipment to partnering with financial retailers or providing PAYGO services. There is a wide range of pumps available in Nigeria, with a variety of competitive prices (https://www.clasp.ngo/research/all/off-and-weak-grid-solar-appliance-market-nigeria/).

[45] PAYGO allows distributors to provide flexible types of contracts meeting different market segments. This can include time-based subscription, which would allow a payment based on actual water use. Farmers can pay digitally the solar pump distributor. Technology that allows measuring use and blocking the service remotely exists, even if it is not yet widely adopted in Nigeria.

information on the details of the project's FLID investments are available in Project Files and are detailed in the PIM.

40. **The project will prioritize subproject proposals that use a gender responsive approach to increase women in their client base by giving additional scores in the appraisal and approval process based on the corresponding percentage of women beneficiaries.** The provision of technical assistance and capacity-building activities will address the technical and operational needs of beneficiaries, especially women, including facilitation and linkages for credit access and market opportunities and irrigation equipment and service providers. Enhancing women's access to finance, specifically asset-based financing, will include a review of the credit screening and score cards the service providers use.[46]

Component C. Institutional Strengthening and Project Management (US$78.8 million equivalent)

C1. Institutional and Policy Strengthening (US$45.6 million)

41. **This subcomponent aims to improve the enabling institutional and policy foundation for integrated landscape management in Nigeria – with an initial focus on ACReSAL activities but setting the foundation for longer-term national frameworks.** It is important to develop a shared appreciation of the challenges and opportunities in dryland watersheds across sectors and administrative levels and facilitate institutional convergence in a situation with many institutions working on these issues with overlapping mandates. Although not all states may be initially eligible for physical investments, all states in northern Nigeria are eligible for technical assistance and planning studies under Subcomponent C1. Investment clusters to be supported will include:

- ***Monitoring Infrastructure:*** This will include investments in hydrometeorology, climate and weather information systems and will enhance in situ monitoring (for example, weather, surface and groundwater levels and quality,[47] flows, soil moisture, sediment, and so on.) for building climate resilience as well as sampling field equipment, surveys, laboratories, integration of global and regional data, and rescue of legacy data as well as modern earth observation (from satellites, airborne surveys, drones, 360° cameras, , and so on.). These technologies will also support remote project supervision, important not only due to the current pandemic but to modernize operations spread over large areas and involving several institutions at different levels. Agencies that will be supported include but not limited to Nigeria Hydrological Services Agency (NIHSA), Nigeria Meteorological Agency (NIMET), NCRS, and NASRDA. An emphasis will be placed on leveraging modern technologies, such as remote sensing and satellite imagery through NCRS and NASRDA, to help institutions tackling desertification in Nigeria to benefit from rapidly evolving national, regional, and global good practices. A Centre of Excellence for Space-based Environmental

[46] While credit risk assessment tools predict the likelihood of repayment, they are not necessarily designed to be gender sensitive. Typically, resource ownership and income are used as criteria to assess the potential risk of agricultural clients, which marginalizes most women, as they tend to be resource poor. Scorecard criteria exclude the factors known to influence women's ability to achieve investment returns and repay credit, such as off-farm income, livelihood diversification, group membership and social networks, and financial management skills. Women farmers generally also have diverse on- and off-farm livelihood activities. Including income-generating activities which better estimate the credit worthiness of women farmers.: https://ilssi.tamu.edu/2021/06/14/innovating-for-financial-inclusion-strengthening-asset-based-financing-for-women-farmers/.

[47] PROGREEN will finance "Scoping the existing state of hydromet services in Northern Nigeria" and "Creating initial knowledge base for innovative technologies to be used at the local level of northern Nigeria landscapes".

Monitoring and Assessment for Sustainable Development (CoE-SEMASD) has been proposed, which could be supported.

- ***Institutional infrastructure***: The project will support key agencies at federal and state levels with institutional infrastructure such as IT, connectivity, cloud services, videoconferencing, and office improvements. Such investments will help in setting up the analytics and decision-support frameworks (including in situ and earth observation, online services, cloud analytics, and interactive customizable dashboards) to allow key institutions to collaborate on shared visions for multi-sectoral strategic watershed planning as well as improve the provision of public-domain data services, knowledge products (with appropriate e-packaging), and learning/virtual learning platforms leveraging modern technology.
- ***Knowledge products:*** The project will finance a modern integrated multisectoral knowledge base (with key information related to climate, surface, and groundwater resources, rainfed and irrigated agriculture, topography, soils, land cover, land degradation, desertification, population, watershed infrastructure, and other social, economic, and environmental aspects of watersheds) that will draw upon existing in situ data, surveys, earth observation products, and other inputs. This will be organized using modern GIS systems and cloud services. These knowledge products will be key inputs to the project-supported watershed planning processes. Analytical tools (including modern cloud based systems) will be developed leveraging existing tools to use these data services to generate insights on a range of aspects (water balance including rainfall, evapotranspiration, soil moisture, streamflow, groundwater, vegetation health with indices such as NDVI, agricultural productivity, erosion, and other biophysical indicators) to provide insights into the historical trends, current status, forecasts, and future scenarios (related to climate, population, investments, strategic development paradigms) for these watersheds. These will then be e-packaged in different ways (interactive dashboards to access data and knowledge resources, interactive documentation, portals, Apps, decision support systems to support planning and operations, VR/AR systems, and so on.) to allow different types of stakeholder customized access (including public-domain versions) on computers, touchscreens, mobile tablets and smartphones, operational control rooms, and so on.). This activity will not only involve the MDAs working on watershed-related activities at federal and state levels but also academia.
- ***Policy environment:*** The project will facilitate technical assistance and collaboration to improve the policy environment for longer-term integrated landscape management. Policies could cover public-domain data access, regulations to protect and manage forests, wetlands and oases, biodiversity conservation, collaboration across agencies in strategic watershed planning with adequate analytical and meaningful stakeholder participation aspects, addressing specific drivers of desertification, conflict, biodiversity conservation, actions plans for species at risk, and so on.
- ***Capacity-building and outreach:*** The project will have a strong focus for both in-person and virtual training, learning events, internships, and competitions (including “hackathons”, “appathons”, and interactive “blogathons”) to improve youth participation and links with academia, and facilitating interactions with private sector (including tech start-ups). Platforms for data, analytics, knowledge, and learning will leverage national-level platforms for use at national, northern Nigeria, state, and local levels. This will include events such as annual “Watershed Moments” to facilitate sharing of lessons from Nigeria experience and global good practices.
- ***Payments for ecosystem services (PES):*** The project will pilot the use of PES, building on the experience of similar efforts implemented under similar conditions in Northern Ghana by

the Ghana Sustainable Water and Land Management Project (P098538). ACReSAL will pilot PES to encourage farm households to plant trees in a sustainable manner. Participating farmers will receive planting materials and then receive payments based on the number of surviving trees. An initial draft plan will be prepared based on the experience of similar programs in other countries, especially for PES mechanisms to encourage tree planting in semi-arid areas. The project could also finance a knowledge exchange to allow Nigerian stakeholders to access relevant experience, in Costa Rica or other countries.

C2. Project Management (US$33.2 million)

42. **This subcomponent intends to support overall project monitoring and management.** It will provide support for incremental operating costs (e.g., for specialized expertise, project-related travel, meetings, and documentation). It will also support the development of monitoring systems and dashboards and improvement of workflow processes to facilitate coordination across agencies at the central and state levels and public versions to improve transparency and outreach. The monitoring systems and documentation of lessons learned on an ongoing basis will be used to support adaptive project management, especially to identify activities that can be scaled up depending on implementation performance and community feedback.

43. **Good project management will include requisite attention to fiduciary issues (procurement, FM, contract management), implementing the ESF, citizen engagement, and other aspects.** The Borrower is preparing a PIM to support detailed planning of project rollout.

44. **The project's E&S risk rating is High.** Therefore, managing E&S risks during project implementation, both at federal and state level, will require extensive efforts. These will include equipping federal and state level PMUs with adequate staff, preparation of site-specific E&S assessments and plans as identified in the Project Environmental and Social Commitment Plan (ESCP), regular monitoring and reporting, and so on. Once the state selection process has been finalized, state-level SMPs need to be prepared as a requirement of disbursement. Subprojects will also be screened as per the ESMF, and as needed, site specific E&S instruments will be prepared and executed before commencement of any work. Details of these arrangements are provided in the PIM.

45. **The project will support a strong technology-based M&E system,** leveraging virtual interconnections and virtual field visits, regular and customized e-reports, and possibly even the development of a project mobile app to facilitate monitoring, adaptive management, and communications. The project will carry out monitoring of conflict impacts in the project area, including through aggregation and analysis of community and localized data to inform project activities. Given the dynamic situation on the ground, including the evolving security situation, the project's MIS systems will include a focus on regular project updates that allow for adaptive management, including to identify activities that need to be adapted or can be scaled up depending on implementation performance and community feedback.

46. **Component D: Contingent Emergency Response (US$0 million).** A CERC is a financing mechanism available to Borrowers in IPF operations to enable quick deployment of uncommitted funds to respond to an eligible crisis or emergency. An operations manual will describe in detail the implementation arrangements for the emergency response mechanism.

ANNEX 4: Drylands and Climate Change in Northern Nigeria

1. **The nature and evolution of drylands are characterized by complex interactions of the natural and human environment.** The sections below first review how drylands and desertification are characterized in Nigeria. The most important factor influencing drylands is likely climate and climate change which are explored in greater detail, followed by a review of other sectors which both contribute to desertification and are impacted by it. Finally, a summary is provided of the climate change co-benefits expected from the ACReSAL project.

Drylands of northern Nigeria

2. **Figure 4.1 shows the very diverse levels of humidity in Nigeria, contributing to the country's diverse ecosystems and agricultural zones.** The map is based on the widely used CGIAR Aridity Index (Trabucco and Zomer, 2018) that combines data on rainfall and evapotranspiration (and which also reflects water availability, vegetation, and temperature). Dryland areas can be classified north to south as arid, semi-arid, and dry sub-humid (see the map at back of the PAD). For all the states with dryland zones, Figure 4.2 shows the size of these areas. The 17 states and FCT shown on Figure 4.2, as well as Nasarawa and Benue (which are part of the Northern Nigeria Governors Forum), are the 19 states and FCT considered technically eligible for the ACReSAL project.[48]

3. **Nigeria's drylands can also be classified into savanna agro-ecological zones, covering the central and northern states.**[49] The northernmost savanna region (Sahel), mainly in the far north-east of the country, is characterized by open grasslands and desert with tree cover less than ten percent. The Sudan Savanna region is further south and has similar features but with tree cover up to 20 percent. The next two savanna agro-ecological zones (Northern and Southern Guinea) cover the balance of the northern states and feature open woodlands and grasses on 15-25 percent of the landscape. The fifth and southernmost Derived[50] Savanna agro-ecological zone covers most of the north-central states, where tree cover can reach 30 percent.

4. **Dryland zones are not uniformly dry; they all have natural areas of wetlands of which some of the most important are oases, localized areas with good availability of water resources.** There are over 200 traditional oases in northern Nigeria distributed as follows: Yunusari, Yobe (60 oases), Yusufari Karasuwa, Yobe (61 oases), Sokoto/Kebbi (26 oases), Jigawa (60 oases).[51] Oases are the cradle of cultivars adapted to local conditions and constitute a natural heritage of plants for multiple uses including fodder, condiments, and medicinal and aromatic plants. Over-exploitation, climate change, and the absence of community-based water and land management systems have resulted in the rapid degradation of critical oases. This has had multiple adverse impacts: (a) degradation of ecosystem services, including nutrient cycling, decomposition and soil respiration, water and soil conservation, together with the reduction of biomass for carbon sequestration and gas regulation; (b) loss of unique breeds (or varieties) and their

[48] The states of Nasarawa and Benue are included because of their membership in the Northern Nigeria Governors' Forum and because in both cases they also face significant dryland management challenges. Nasarawa State's average Aridity Index is about 0.7 which is marginally above the range for dry semi-humid. Benue State average Aridity Index of 0.9 is on the lower end of the Humid zone.

[49] Fasona, M., Oloukoi, G., Olorunfemi,F., Elias, P., and Adedayo, V. 2014. Natural Resource Management and Livelihoods in the Nigerian Savanna. Penthouse Publications. Ibadan, Nigeria.

[50] Resulting from people clearing forest for cultivation.

[51] Department of Desertification, Land Degradation and Drought Management, Federal Ministry of Environment.

associated diversity, particularly pollinators and soil organisms adapted to local conditions; (c) collapse of a resilient food production base for local and global communities; and (d) out-migration and the resulting conflicts between competing users of over-exploited natural resource bases. The ACReSAL project will focus resources on some of the most vulnerable oases.

Figure 4.1. Aridity Index Applied to Nigeria

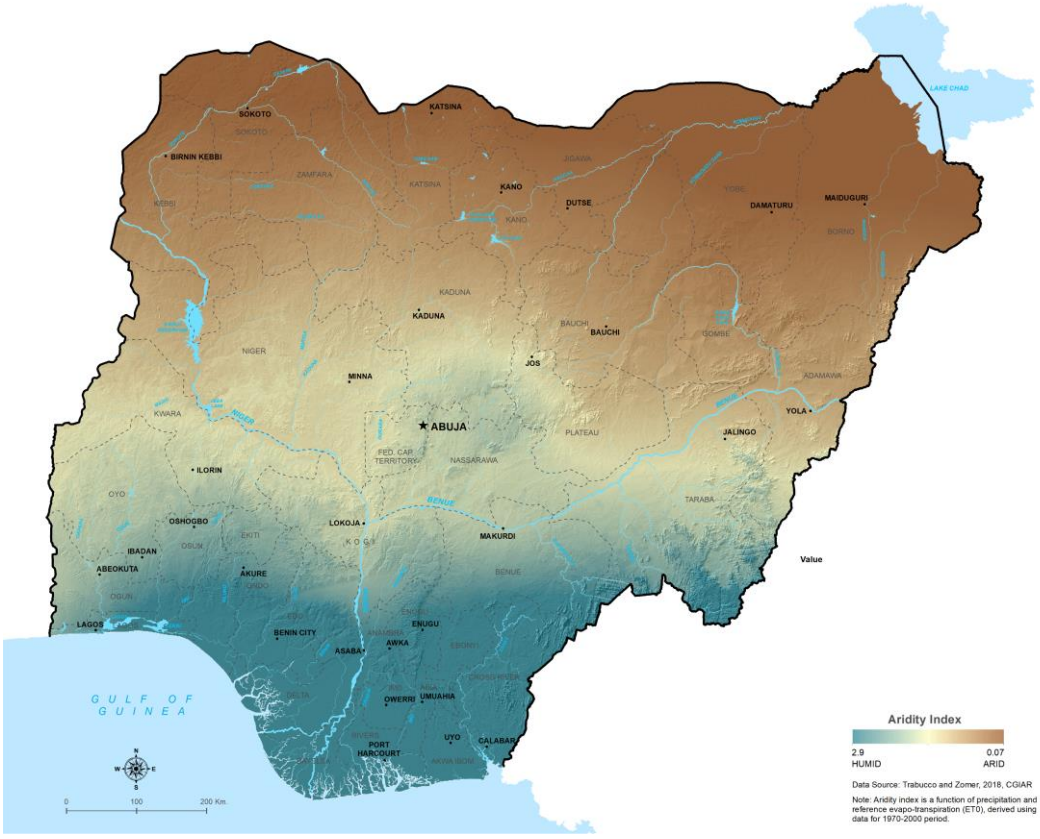
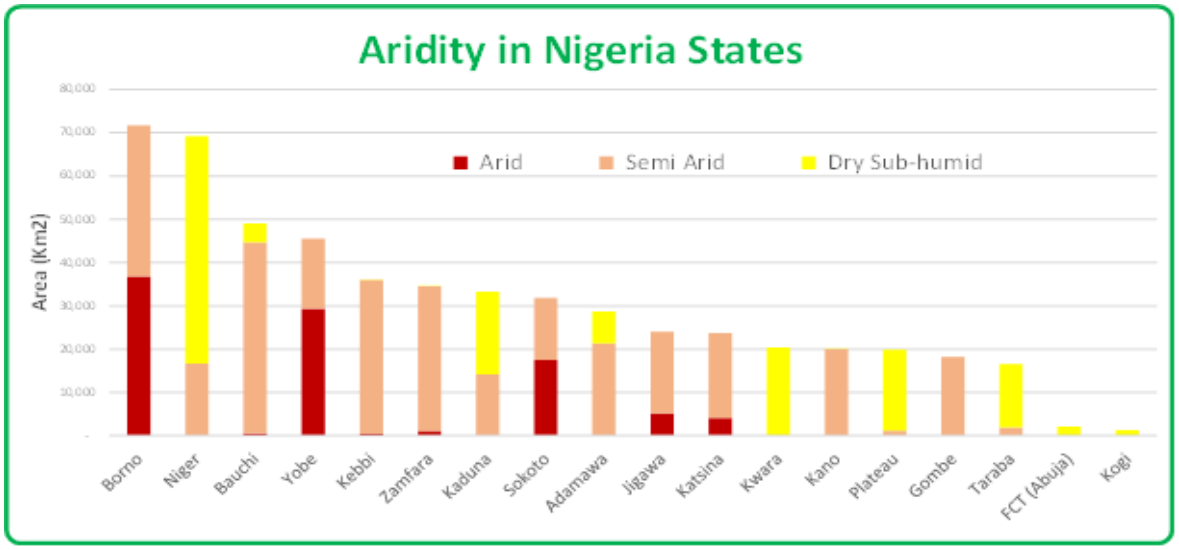


Figure 4.2. Aridity in Nigerian States



Desertification

5. **Although Nigeria does not technically have an area of permanent "desert", the northern region is under threat of desertification.** Desertification is the process of degradation of drylands such that they become progressively less suitable to support human populations. Specifically, it is defined by the UNCDD as "the degradation of land in arid, semi-arid, and dry sub-humid areas. It is a gradual process of soil productivity loss and the thinning out of the vegetative cover because of human activities and climatic variations such as prolonged droughts and floods." Other characteristics include a rise in the reflective capacity (albedo) of the surface for solar radiation, a considerable and permanent loss of perennial plants, especially woody shrubs and trees, increased soil erosion and impoverishment by wind, gully, and sheet erosion of soils by occasional heavy rainfalls.

6. **An extreme manifestation of desertification is the expansion and movement of sand dunes.** According to Government geological data, there has been a 400 percent increase in sand dunes over the last twenty years. In some cases, these sand dunes cover entire villages, impacting agricultural lands leading to a decline in agricultural outputs and livestock production as well as severe socio-economic impacts (such as loss of livelihood and migration). It has been reported that sand dunes have encroached on 30,000 hectares of land in parts of Yobe State.[52] Under Subcomponent A2, ACReSAL will target resources to the stabilization of sand dunes. The control of sand dune migration will also stabilize the soil, restore the vegetative cover, improve micro-climates and build resilience of affected communities. Improved vegetative cover will improve carbon sequestration and mitigate climate change.

Climate change

7. **Nigeria's climate is strongly influenced by two major and seasonal air masses, namely the Tropical Maritime and the Tropical Continental.** The Tropical Maritime is a warm and moisture-laden wind that brings an inflow of moisture from the Atlantic Ocean to the southern parts of the country,

[52] Ebele, N. E. and Emodi, N. V. (2016). Climate change and its impact in Nigerian economy. Journal of Scientific Research & Reports, 10(6), 1-13. http://www.journaljsrr.com/index.php/JSRR/article/view/21917/40737.

moving northwards from February to June. It is generally responsible for most of the rainfall experienced in the country, which occurs in the months of May to October. The Tropical Continental air mass (also called the Harmattan) on the other hand, is a dry and dust-laden wind that blows from the Sahara Desert through the northern states down to the southern part of the country, mostly from November to March.

8. **Nigeria is generally hot, with the temperature varying with seasons and rainfall pattern.** The rainy seasons create cooler conditions while the dry seasons result in higher temperatures. Because of the large area occupied by the country (910,770 km²), the mean temperature and rainfall varies significantly between the southern and northern parts of the country. The mean annual rainfall in the south is about 3,000 mm per year falling mostly from March to September. In the north, the mean annual rainfall ranges from 500 mm to 1,000 mm with a long dry season that lasts up to 7 months (October to April).

9. **Because of human-caused changes in the global climate, the country is already experiencing climate variability in the form of increased temperatures, rainfall variability and intensity, droughts, floods, and heatwaves.** Most of the northern states face increasing aridity while others are exposed to seasonal riverine flooding. From 1941 to 2000, the temperature in the country has increased from 1.4 to 1.9 °C.[53] The annual rainfall has also decreased from 1941 to 2000 by 2-8 mm across most of the country but increased by 2-4 mm in a few places. Extreme precipitation events causing flooding have probably increased. In 2012 alone, about 363 people were killed, 5,851 injured and 3,871,53 displaced due to flooding incidents across the country. In monetary terms, the cost of the 2012 flood damage alone, is estimated at N1.48 trillion (equivalent to US$9.5 billion) or 1.4 percent of the country's GDP.[54]

10. **Looking to the future, the mean annual temperature is projected to increase** between 1.1° C and 2.5° C by the 2060s and between 1.4° C and 4.6° C by the 2090s. Mean annual precipitation is expected to increase in all parts of Nigeria up to the year 2070. These projections are based on a 1960-1990 baseline and for time horizons of 2050 (mean 2041-2060) and 2070 (mean 2061-2080) for the emission scenarios RCP4.5 and RCP8. The Sahel savannah is predicted to have the highest increase in precipitation of 30 percent (under both RCPs) followed by the Sudan savannah with 10 percent, and with the remaining zones at 5 percent for both 2050 and 2070 time periods.[55] Regional Climate Models indicate an increase in the number of days with extreme rainfall in May and July over West Africa.

11. **Droughts are prolonged periods of less than normal precipitation.** To a certain extent, droughts are a natural phenomenon in all drylands and historically, drought-affected areas would recover when normal precipitation returned, and the land would not have been permanently degraded. However, under intense use of dryland natural resources, as we see today because of high human density, droughts can trigger over-exploitation of natural resources and constitute a "tipping point" of irreversible damage to drylands – thus a contributing factor to desertification. The evidence points to climate change causing more intense and longer periods of drought.

[53] BNRCC (Building Nigeria's Response to Climate Change). (2011). National adaptation strategy and plan of action on climate change for Nigeria (NASPA-CCN). Prepared for the Federal Ministry of Environment Special Climate Change Unit.
[54] Federal Government of Nigeria (2013) Nigeria Post Disaster Needs Assessment (PDNA) for 2012 Floods. A report by the Federal Government of Nigeria.
[55] Third Nigeria's National Communication to the UNFCCC, page 165. A RCP is a Representative Concentration Pathway.

Impacts of climate change

12. **The northern part of Nigeria, targeted under ACReSAL, is particularly vulnerable to desertification and climate change** as a relatively greater percentage of the population relies on subsistence and rain-fed agriculture, highly vulnerable to temperature and rainfall patterns. Compared to southern Nigeria, a greater proportion of the population is extremely poor, and thus generally more vulnerable to a changing climate. The most significantly affected sectors in northern Nigeria are those of agriculture, water, and peace and security. These sectors also contribute to desertification. The Sectoral Context in the main body of the PAD has more detailed information on the consequences of desertification for the agricultural and water sectors, natural ecosystems, and conflict.

13. **The yields of most agricultural crops are projected to further decline in the longer term (by the year 2050) due to climate change.**[56] The yield of rice is projected to decline by 7 percent (by 2030) and 25 percent (by 2050). The crop yield decline is projected to be more pronounced in the northern part of the country. Due to temperature changes, there is expected to be a decline in productivity of root crops such as cassava and sweet potato. Climate change will also affect agricultural production by increasing incidence of pests and diseases and loss of farmlands due to flooding and other extreme weather events.[57] Livestock production will also be profoundly affected as changes in rainfall and dry spells are predicted to lead to reduction in surface water resources and pasture and foraging range.[58] Increasing temperatures may create conditions favorable for livestock diseases. Households cope with cash and food shortages by cutting and selling more firewood, thereby exacerbating land degradation, and accelerating the onset of desertification.[59]

14. **Desertification and climate change are also leading to profound impacts on water resources and these impacts can be expected to grow in intensity.** Rising temperatures and more variable annual rainfall both contribute to reduced water availability. Increasing variability in rainfall patterns and intensity can also be expected to result in more prolonged or intense droughts and at the same time, to more intense flooding events. Floods can destroy water management infrastructure such as small dams and sanitation facilities. Droughts of course can have profound impacts on northern Nigeria leading to widespread food insecurity and malnutrition. Women and children are particularly vulnerable to water stress; women may be forced to travel longer distances in search of water (and fuelwood), additionally exposing them to problems of insecurity and harassment.

15. **Most of the northern states are currently subjected to various conflicts which significantly affects development.** Several studies have shown a direct relationship between climate risks and fragility, conflicts, and violence (FCV) in areas dependent on natural resources.[60] Climate change can exacerbate conflicts in natural resources dependent areas. For example, tensions between farmers and herders over grazing rights and water access have led to major outbreaks of violence in Nigeria.

[56] Dominic, Agba & Adewara, Sunday & Adama, Joseph & Adzer, Kelvins & Atoyebi, Gabriel. (2017). Analysis of the Effects of Climate Change on Crop Output in Nigeria. American Journal of Climate Change. 06. 554-571. 10.4236/ajcc.2017.63028.
[57] Federal Ministry of Environment (2020) Third National Communication to the UNFCCC. FMEnv, Abuja.
[58] Ayanlade, A. et al. (2017). Comparing smallholder farmers' perception of climate change with meteorological data: A case study from southwestern Nigeria. Weather and Climate Extremes 15, 24–33. http://dx.doi.org/10.1016/j.wace.2016.12.001
[59] Anselm A. Enete and Taofeeq A. Amusa. 2010. Challenges of Agricultural Adaptation to Climate Change in Nigeria: A Synthesis from the Literature. Journal of Field Actions. Volume 4. 2010.
[60] USAID (2018): "Lessons Learned from Peace III: A Mid-Cycle Portfolio Review", USAID: Washington, D.C. Retrieved from https://www.climatelinks.org/resources/lessons-learned-peace-iii-mid-cycle-portfolioreview (Accessed 15th April 2021).

16. **The combined effects of climate change will lead to economic contraction in the long-term.** It is estimated that climate change can cause a loss of 6 percent to 30 percent of GDP in Nigeria by the year 2050. This loss is *equivalent to between N15 trillion (US$100 billion) and N69 trillion (US$460 billion).* [61]

Link between Climate Change and Project Activities and Climate Co-Benefits

17. **The project is well aligned with the World Bank's commitment of increasing its climate portfolio from 28 percent to 35 percent over the period FY21-25.** The entire project is focused on building climatic resilience and fostering adaptation will reduce extreme poverty, over-dependence on the fragile natural resources and encourage inclusive growth, all necessary conditions for building peaceful co-existence. The project will also assist Nigeria in meeting its international obligations and national policy priorities. [62]

18. **Because of this inextricable link between climate change and desertification, the entirety of the project's investments is considered as helping the country to build climate resilience.** Table 4.1 has a detailed description of project activities and their adaptation and mitigation benefits.

Additional Mitigation Co-Benefits

19. **ACReSAL will invest in several activities that, although not an explicit goal of the project, will lead to a reduction in emission of GHGs and generation of mitigation co-benefits.** These activities (which are eligible under the MDB agreed list of activities compatible with low mitigation pathways[63]) include:

(a) **Agriculture:** Carbon sequestration in soil, conservation agriculture, reduced tillage, climate-smart agricultural practices, agroforestry, sustainable land management initiatives (enhancement of soil carbon stock/soil organic matter, increased biomass production and reduced biomass burning). Intensive agricultural production to be supported by the project will create a disincentive for bringing marginal land under agriculture. This will reduce deforestation and carbon emissions.

(b) **Water:** Water conservation initiatives, water harvesting technologies, smart water supply, pumping and distribution systems powered by renewable energy (such as solar and wind). Current irrigation practice is based on diesel-powered pumps. Replacing these pumps with renewable energy powered systems will significantly reduce carbon emissions.

(c) **Forestry:** Increased carbon sequestration through afforestation and reforestation, forest protection to allow for natural regeneration and enrichment planting.

(d) **New plantations or conservation of existing vegetation** will sequester carbon dioxide (a key GHG) and reduce emissions.

(e) **Renewable energy:** Solar pumps for irrigation, fuel-efficient stoves, solar stoves.

(f) **Community empowerment:** Training on fabrication of fuel-efficient stoves, seedlings nursery, hay production, bee keeping, solar technology, and so on.

(g) **Women empowerment**: Investments targeted at empowering women with skills and tools will reduce deforestation.

[61] Abraham, T. W., & Fonta, W. M. (2018). Climate change and financing adaptation by farmers in northern Nigeria. *Financial Innovation*, *4*(1). https://doi.org/10.1186/s40854-018-0094-0.
[62] These include: The INDC, Land Degradation Neutrality, National Adaptation Strategy, National Drought Plan, National Action Plan to Combat Desertification, and so on.
[63] *https://pubdocs.worldbank.org/en/999311596711498678/1257-joint-report-on-mdbs-climate-finance-2019-final.pdf.*

Table 4.1. Climate Co-Benefits Matrix with Cost Allocations

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
ACReSAL Project	700.0	Because of the inextricable link between climate change and desertification, the entirety of the project's investments is considered as helping the country to build climate resilience.
A. Dryland Management	327.8	
A1. Strategic Watershed Planning	33.0	**Adaptation:** The project will contribute to strengthening the participation and governance systems of Watershed Committees (WCs) and local agencies (LAs) through: (a) development of detailed guidelines for WCs and LAs for each phase of watershed development (preparatory phase, works phase, consolidation, and O&M phase); (b) development and delivery of training modules on inclusive participation (such as participatory planning) and governance systems (such as standard record maintenance) for WCs, LAs, and other relevant users/common interest groups, with a special focus on the women representatives in these bodies; (c) incentivizing development and roll-out of a performance assessment tool and incentive system for WCs and LAs for effective planning, implementation, and sustainable watershed management; and (d) capturing of data on performance of WCs and LAs on the Performance Assessment Tool, through the state MIS.
A2. Landscape Investments	244.8	**a. Sand dune control (US$30.8 million)** **Adaptation:** Climate change have amplified the frequency and severity of drifting sand dunes and its effect on many communities in the extreme northern fringes of the country. The control of sand dunes by the project will restore vegetation cover, reverse land degradation and restore soil productivity. These will build resilience of the affected communities to climate change and reduce out-migration. **Mitigation:** The vegetation cover and stabilized soil will facilitate carbon sequestration. Similarly, the fire control investments and activities under this subcomponent will also reduce GHG emission. **b. Water resources management (US$168.0 million)** The project will invest water resources management activities such as construction of new and/ or rehabilitation of existing small dams/ reservoirs; rehabilitation, replacement and/or decommissioning of deep boreholes; rehabilitation and construction of associated hydraulic infrastructure (including, borehole heads, pumps and meters); and development and/or improvements of irrigation and drainage networks to make water safe and clean water available for irrigation and domestic purposes. Water is a limiting factor to agricultural productivity and food security because the rainy season lasts 3 to 4 months only in most parts of the north. Irrigation will enable farmers to cultivate their lands all year round which will make them nutritionally and economically resilient to climate change.

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
		While making water available, this project will also ensure this is done in a safe manner. Therefore, flood and sedimentation control structures such as check dams, levees, retaining walls, embankments, culverts, bridges, concrete channels, grouted riprap, and stream bed rehabilitation, among others would be provided to prevent and mitigate the impacts of floods. The project will also support sensitization, mobilization and organization of communities to manage erosion, control flooding and prevent disasters. These activities will ultimately build resilience of systems and people to climate change. **c. Large-scale agricultural investments (US$46.0 million)** **Adaptation:** As a result of climate change threat to agriculture in the project areas, this project will support large-scale agricultural investments such as irrigation, rangeland management, climate-smart agricultural approaches; training on agro-climatic data information systems to improve the climate resilience and adaptation of local communities. Other activities under this subcomponent with climate change adaptation co-benefits include land leveling, reduced and energy efficient tillage, improved soil management and rainwater harvesting (small ponds). These investments will reduce surface run off, soil erosion, increase soil water retention capacity, improve ground water recharge. In addition, accelerated adoption of integrated soil fertility management and conservation technologies and practices, such as legume-based crop rotation, reduced or zero tillage, green manuring, cover and catch cropping, mulching, crop-biomass incorporation in soil, bioinoculants, and so on. will improve soil productivity, thereby improving crop/tree productivity. The increased agricultural productivity from these investments will reduce climate vulnerability among the affected communities. Although, the project is not directly investing in livestock production, however, activities under the rangeland management such as provision of boreholes along transhuman routes, improved fodder and nurseries systems will address pastoralists needs-leading to reduction of herder-farmer conflict and reduced pressure of herders on vegetation and soil. **Mitigation:** The rangelands and nurseries will stabilize the soil, enhance water retention, and sequester carbon in soil and biomass. Increased usage of energy-efficient solar water-lifting devices will replace diesel pumps, reduce energy use in irrigation, and lead to substantial GHG emissions reductions. Judicious fertilizer application based on soil health card prescription has multifold benefits – reduced fertilizer use and increased use of organic manure will also improve soil-moisture holding capacity, reducing irrigation requirements and therefore energy and labor, and protecting water bodies from run-off pollution. The accelerated adoption of integrated soil fertility management and conservation technologies and practices will improve the existing carbon pool through increased soil carbon sequestration. Large-

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
		scale demonstration of improved composting techniques (NADEP, vermicomposting, bio-digestor) will reduce GHG emissions. Provision of more effective knowledge and advisory support for adoption of CSA will improve crop and resource management to reduce, in some cases, GHG emissions. Soil testing will improve the precision and amount of fertilizer used. In some cases, it may reduce fertilizer use, reducing GHG emissions.
A3. Special Ecosystems	50.0	**Adaptation:** The project will work with relevant authorities to improve and rehabilitate special ecosystems such as oases, wetlands, and protected areas to safeguard the critical ecosystem services they provide. Oases constitute the lifeline for many people living in dryland areas. Restoring these oases will therefore improve the livelihood of these communities helping them adapt to climate change. Sustainable oases investments are intended to update oases management plans to better adapt to a changing climate and ever-growing challenges. Wetlands render critical ecosystem services such as flood control and habitat protection. These services reduce the vulnerability of communities to climate hazards. The project will also support buffer zone communities surrounding protected areas with alternative livelihood options to reduce their over-dependence on fragile ecosystems in the protected areas. Restored ecosystems services in previously sand dune denuded areas will help people adapt to climate change in these areas. **Mitigation:** Afforestation, reforestation, and biodiversity conservation are classified as mitigation activities. More vegetation cover and enhanced micro-climates from restored oases will lead to regeneration of biodiversity and the associated ecosystem services which all lead to better mitigation outcomes. Protected Areas constitute the largest carbon sinks in the country. Strengthening their protection will lead to better mitigation outcomes. Improved vegetation cover will sequester carbon in soil and biomass thereby contributing to climate change mitigation.
B. Community Climate Resilience	293.4	The communities will be strengthened towards both climate change adaptation and mitigation through climate change and weather information services, low-carbon demonstration projects, use of solar technology for green and clean energy efficiency outcomes, application of climate-smart technology and strategic and integrated planning for climate mitigation.
B1. Community Strengthening	22.0	**Adaptation:** The project's support will go towards funding the demonstration and adoption of technology options for sustainable crop intensification and resilience to climate change, all based on the same principles of good choice of improved germplasm, adequate plant nutrition, effective pest management and response to market demand. Together with adequate extension service, the project will: (a) train farmers on relevant CSA technologies; (b) identify and train a cohort of lead farmers (with special emphasis on women) for the purposes of farmer-to-farmer extension; (c) train and retool extension agents, especially with respect to CSA technologies and practices; (d) defray the costs of demonstration and training materials, and farmer-to-farmer exchange visits, where necessary; and (e) finance adoption of CSA technology, for example, labor-saving fertilizer applicators necessary to reduce drudgery associated with improved fertilizer management for reduced methane emissions under rice production. CSA technologies will help people adapt to climate change by ensuring agriculture remains a profitable venture despite changing climate. Practices that lead to reduction of methane and carbon emission have mitigation benefits.

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
		Natural resource user groups will provide platform for creating awareness on: (a) the impact of certain practices that leads to landscape degradation and depletion of natural resources; (b) climate change, conflict resolution and mediation mechanisms; and (c) investments targeted at community strengthening will also enable peacebuilding and social cohesion. These will create a conducive community atmosphere for adoption of climate resilient practices which will strengthen adaptation. The trainings to be provided under this subcomponent will build the capacity of community members on agro-climatic resilience, group dynamics, conflict management, GBV, and natural resource management. The enhanced capacity will engender community cohesion, better management of and reduce pressure on natural resources as well as greater prosperity at the community level. Climate change-induced landscape degradation is one of the drivers of conflict. Investments that target peace restoration and peace building will help communities adapt better to consequences of climate change. Whereas the greatest burden of climatic impacts falls on vulnerable groups (women, children, and people living with disabilities), they are the least able to cope and are often disenfranchised from getting support. By targeting this group with climate awareness trainings, or climate-smart NRM support (to women that are involved in NTFPs or agriculture, other livelihood support and coping mechanisms to climate-change induced shocks and stresses) this project is enhancing adaptation. Planning at the micro-watershed level will enable targeted investments based on land capability/vulnerability which will make the investments have greater impact and more sustainable. **Mitigation:** Increased awareness on the importance of natural resources and practices leading to their degradation will reduce deforestation (leading to reduced carbon emission) a situation that will lead to more vegetation cover enhancing carbon sink in the process. Community cohesion, community engagement and conflict resolution mechanisms will create the needed awareness, incentives and motivation for adoption of climate change control practices such as tree-planting, reduced deforestation and reduced bush burning, reduced charcoal and fuelwood utilization, which all enhance mitigation.
B2. Community Investments	271.4	**a. Community-led landscape restoration (US$128.0 million)** **Adaptation**: The landscape restoration with native plant species (chosen by the communities) and value-adding activities such as promotion of non-timber forest products (NTFPs) like fodder, acacia (gum Arabic), plants for beekeeping, nuts, and human and animal medical plants will strengthen adaptation outcomes.

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
		Mitigation: Significant amount of carbon will be sequestered in soil and biomass from the 350,000 hectares of the restored landscape. **b. Climate-smart rainfed crops (US$89.0 million)** **Adaptation:** The project will also support diversification of cropping systems. This is in line with analytical work which shows that crop diversification is critical to resilience of agricultural production to climate change and to attaining faster productivity, income growth, nutritional security, and reducing the environmental footprint. In this respect, the project will provide funding for several activities, including but not limited to: (a) awareness creation on diversification among farmers; (b) farmer experimentation with new crops and training/demonstration of relevant production technology; (c) assuring availability and access to seeds and germplasm and other critical inputs for the new crops, for example, through partnerships with agro dealers; (d) postharvest management/quality control; and (e) marketing skills. The project's support to crop diversification will be based on agronomic/agro-ecological suitability, scheme comparative advantage, and local, national, or international market opportunities. Inheritance laws and traditions have left most of the country's women land-poor; the project will place special emphasis on supporting women to engage in productive activities that require very little land, such as homestead gardens, and the production of seedlings and other planting materials for sale. This is expected to improve their resilience to climate change. Additional adaptation and mitigation measures are: (a) use of submergence-resistant, and short duration high-yielding crop varieties (adaptation); (b) use of solar/biogas in lieu of diesel powered irrigation pumps (mitigation), increased smallholder access to irrigation equipment (adaptation), salinity-resistant varieties (adaptation) and proper use of fertilizers, in terms of right timing, placement, source and amount (mitigation), alternate wetting and drying irrigation (adaptation and mitigation); (c) direct seeding and use of lodging-resistant varieties for (adaptation); (d) use of salinity- and drought-resistant varieties for crops (adaptation); (e) use of floating beds on water bodies for vegetable production (adaptation); (f) use of dwarf and early maturing varieties for (adaptation); (g) conservation agriculture (adaptation and mitigation); (h) reliance on short-duration varieties (adaptation); (i) aerobic treatment of manure to reduce methane production (mitigation); and (j) water management to reduce methane emissions (mitigation). Project support will mainly deal with removing barriers to adoption of the above technologies including those related to limited awareness, knowledge and technical information, labor constraints (for example, through introduction of labor-saving technologies) and lack of appropriate inputs (for example, seeds and germplasm of resilient crop varieties). In this respect, the project will rely on market opportunities for produce as the ultimate guarantor of CSA adoption. Priority will be accorded to technologies that do not increase the workload and hazards for women beneficiaries. Where relevant, the project will support the sourcing of new promising adaptation and mitigation technology including for adoptive trials. All these activities have tremendous adaptation co-benefits as they build resilience, reduce exposure

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
		and improve adaptive capacity. Reduction of methane production and use of solar pumps for irrigation all contribute to climate mitigation. Rainwater harvesting: Scarcity of water in arid and semi-arid is one of the biggest problems constraining development. Rainwater harvesting will diversify sources of water for domestic and irrigation purposes which foster adaptation to climate change. Enhancing farmers' access to solar irrigation pumps will boost their productivity, reduce drudgery, and improve their means of livelihood making them economically resilient to climate change. Climate-smart and climate-resilient approaches, including promotion of agroforestry, sylvo-pastoral systems, community woodlots, improved climate-resilient seeds, and improvement of soil carbon that also helps improve soil water holding capacity all have adaptation co-benefits. Shared community assets and services (for example, related to solar irrigation, produce storage, agro-processing, mobility, and market linkages) to improve sustainable productivity and livelihoods constitute an adaptation co-benefit. Community technologies will enable sustainable use of land resources and will reverse land degradation (thereby making land more productive in the long run). Technologies such as climate and weather information services will reduce losses due to climatic change. The project will create awareness and build capacities on these technologies at the community levels. The improved capacities for agro-climatic resilient technologies are an adaptation co-benefit. PES and other innovative incentive schemes will enhance adoption of agro-climatic resilient technologies which will lead to positive adaptation outcomes. **Mitigation:** Rehabilitation/modernization will focus on improving the capacity of the infrastructure to modulate the impacts of excess water deficits. Among others, this will include resectioning of embankments to incorporate the latest higher flood safety design criteria re-excavation/deepening of canals; improving storage and creation of additional water storage capacity by excavating larger water retention structures to be used as water sources for supplemental (rainfed) and dry season irrigation and ground water recharge; managed aquifer recharge to augment ground water quantities and improve water quality in degraded aquifers; rehabilitation and construction of water control structures; river erosion control; promoting connectivity (for example, using culverts and low-head weirs) to allow fish migration and natural recruitment where needed; and other protective works. Since appropriate drainage is crucial to diversification and effective on-farm water management (and also contributes to reduction of methane emissions from waterlogged plots – a mitigation co-benefit), the project will also support rehabilitation of drainage canals and remodeling sluices for quick and early drainage. In addition to irrigation needs, construction of pump houses and installation of new pumps for drainage purposes will also be explored. For the purposes of improved and effective on-

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
		farm water management, the project will support installation of small infrastructure such as small culverts, turn-outs, field channels, and distributary boxes. Improved management of grazing areas is also considered a mitigation co-benefit. Improved rural energy systems aimed at providing alternatives to fuelwood and charcoal, producing sustainable fuelwood in community woodlots and reducing production, consumption and marketing of fuelwood and charcoal. Community woodlots will sequester carbon in soil and biomass which will enhance mitigation while the cheaper and more sustainable domestic energy option will foster adaptation. Women are the greatest beneficiaries as increased household income (as a result of reduced household expenditure on fuelwood), reduced indoor pollution and less exposure to harassment from walking long distances in search of fuelwood have both environmental, social, economic and health co-benefits. **c. FLID (US$54.2 million)** **Adaptation:** The opportunity to grow crops all year round through irrigation will reduce the vulnerability of communities to food shortage and will enhance their copping capacity to climate change. **Mitigation:** The use of solar technology (instead of diesel pumps before the project) in the irrigation system have huge GHG mitigation potentials.
C. Institutional Strengthening and Project Management	78.8	Support to national, state, and local policy, through technical assistance will improve the country's climate change mitigation and adaptation strategies.
C1. Institutional and Policy Strengthening	45.6	**Adaptation:** Benefits include: • Develop and implement ex-ante and ex-post interventions, including early-warning systems based on production and market demand forecasts. • Within the FMEnv, strengthen PIU for implementing the project. Develop and manage the M&E system and MIS, ensure compliance with E&S safeguards, and arrange for impact evaluations. • Information services for integrated watershed management planning, coordination, and monitoring (knowledge base, online data/analytic services, decision support systems, and e-packaging). • Policy Improvement (for innovations and institutionalization of integrated landscape/watershed management) at federal and state levels will improve the adoption climate-resilient landscape management practices which in turn foster adaptation.

Component/ Subcomponent	Allocation (US$)	Climate Co-Benefits
		• Capacity building will boost knowledge and skills of project stakeholders on climate change mitigation and adaptation. **Mitigation:** benefits on the mitigation side include: • Support to strategic climate change policy development. • Adoption of climate-resilient activities and sharing related knowledge will strengthen the resilience of smallholder farmers to the negative impact of climate change. Research, exchange of knowledge, and study tours will lead to reduced GHG emissions, build capacity at the institutional level, pass information on CSA practices to farmers, and lead to replication of those practices in other parts of the country. • Climate risks will be better monitored, managed, and mitigated through project efforts to leverage MIS data for monitoring and planning. • Science-based and IT-driven infrastructure will enable farmers boost productivity while putting less pressure on the environment. A resilient landscape is less vulnerable to climatic impacts. GHG accounting analysis will be undertaken as part of preparation will likely invest in projects that will generate net emission reductions. • The piloting of PES by the project to encourage farm households to plant trees and receive payments will increase vegetation cover and enhance mitigation.
C2. Project Management	33.2	Project management activities such as M&E, E&S safeguards, research and development, adaptive communication among others, will reduce project risks, increase project success and guarantee the realization of the aforementioned adaptation and mitigation outcomes.

GHG analysis

20. **The GHG analysis was done using the EX-ACT tool; version 9.1, which provides an assessment of the project's net carbon balance.** Defined in terms of net balance in CO_2 equivalent both emitted and sequestered from project implementation. The tool compares the with-project scenario to the without-project scenario to estimate carbon stock changes. This is expressed in equivalent tons of CO_2 per hectare and year.

21. **Basic assumptions**: The GHG analysis has selected Low Activity Clay soil type, the dominant soil type in northern Nigeria. The project implementation period is 6 years, and another 25 years was given for capitalization on project activities. Therefore, a total of 31 years has been taken. The without-project scenario has been assumed to be the same as a 'no-project' or business-as-usual scenario, except for protected areas.

22. **In protected areas, it is assumed, in a business-as-usual scenario, the degradation will increase from moderate to severe, resulting in up-to 60 percent loss of biomass in the areas identified for project activities.** The forest types identified are Tropical dry and tropical deciduous. The latter comprises about 15 percent of protected areas in Northern Nigeria. With the project, it is expected degradation of forests will be reduced, but it may not be possible to completely stop degradation.

23. **For agriculture, it is assumed that the project will mainly be addressing major food crops that include, maize, grains, tubers and legumes; and that tillage for tubers will continue, although it will be reduced.** While there will be 10,000 ha under irrigated agriculture, it will not include flooded rice cultivation. Furthermore, presently clearing of farmlands is usually carried out though burning of stubble, and only about 20 kg/ha of synthetic fertilizer is applied to crops. Organic manures and compost application, although presently widespread, is only 0.4 kg/ha. It is likely, that thought improved agronomic practices, this shall increase to 50 kg/ha and 20 kg/ha respectively, and annual burning of farmland shall be stopped.

24. **Grasslands presently facing intensive grazing will, without the project, become severely degraded. However, with project interventions, these grasslands will be improved.** Grasslands, which presently face five-year fire cycles, shall no longer be burnt after project interventions. Of this, about 70.3 ha of degraded lands will be converted to silvo-arable lands.[64]

25. **Results:** Over a 31-year period, the project the project will lead to a net climate benefit of 113,162,760 tCO_2-e, when compared to the business-as-usual scenario. This is equivalent of an annual savings of 3,123,410 tCO_2-e. As can be seen from Table 4.2, the largest benefits are from improved forest management, and account for 66 percent of the total savings, followed by grassland management at 28

[64] Sources: Discussion with team members; *https://nigeria.wcs.org/wild-places/yankari-game-reserve.aspx*; *https://whc.unesco.org/en/tentativelists/6360/*; Mbaya, Lazarus Abore. 2017. Status of Forest Reserves (Savana Woodland a Woodland and Rural Livelihoods in Gombe State Nigeria and Manawa Forest Reserve. *https://www.researchgate.net/publication/*; Mohammed, A.H, S Jahun, A. S. Dangana, 2015. Herbaceous Species Diversity in Kawana Forest Reserve, in Gombe State. American Gornal of Agriculture and Forestry, 2015. Vol 3, pp 140; *https://ramsar.org/*; *http://www.keybiodiversityareas.org/site/factsheet/6746*; NBS, 2019. Annual Statistical Abstract. Government of Nigeria; NAERLS, 2020. Wet Season Agricultural Performance in Nigeria. National Report. National Agriculture, Extension and Research Liaison Services, Ahamdu Bello University. Federal Ministry of Agriculture and Rural Development, Abuja, Nigeria; *https://earthmap.org/*.

percent. It is also determined that project activities will result in an annual reduction in GHG gasses by -148 tCO_2-e equivalent on every hectare of land, or an annual saving of -4.8 tCO_2-e/ha.

Table 4.2. Results of Ex ACT GHG Analysis

Component		Overall			Annual		
		Without Project	With Project	Balance	Without Project	With Project	Balance
Land use change	Others		-5,099	-5,099		-164	-164
Cropland	Annual	1,446,640	-1,925,008	-3,371,647	46,666	-62,097	-108,763
Grasslands		5,416,610	-9,719,690	-15,136,300	174,729	-313,538	-488,268
Forest Management		71,897,962	-22,889,346	-94,787,309	2,319,289	-738,366	-3,057,655
Inputs and investments		86,228	223,821	137,594	2,782	7,220	4,439
Total emissions, tCO_2-e		78,847,439	-34,315,321	-113,162,760	2,543,466	-1,106,946	-3,650,412

Table 4.3. GHG Emission Savings by Hectare

Total Emissions Saved	Without Project	With Project	Balance
Total emissions, tCO_2-e/ha	103.7	-45.2	-148.9
Total emissions, tCO_2-e/ha/yr	3.3	-1.5	-4.8

26. **Table 4.4 provides details of uncertainty under the present scenarios.** This uncertainty is mainly due to emission factors.

Table 4.4. Percent Uncertainty in Estimations

Uncertainty Level	tCO2-e/yr	Percent
Without	2,543,466	28
With	-1,106,946	42
Balance	-3,650,412	33

ANNEX 5: Financial and Procurement Management

Procurement management

1. **Procurement for the proposed project will be carried out in accordance with the following World Bank procedures:** (a) the World Bank Procurement Regulations for IPF Borrowers (Procurement Regulations) (July 2016, revised in November 2017, August 2018 and November 2020); (b) "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants", dated October 15, 2006 and revised in January 2011 and July 2016; and (c) other provisions stipulated in the Financing Agreements. In accordance with paragraph 5.9 of the Procurement Regulations, the World Bank's Systematic Tracking and Exchanges in Procurement (STEP) system will be used to prepare, clear, and update procurement plans and conduct all procurement transactions for the project. In this regard, the allocation of roles in STEP has been forwarded to the implementing agencies to register the agencies in STEP.

2. **Procurement procedures at the federal and state levels under the project will be similar to those of NEWMAP.** Each state will be responsible for the procurement of its own activities and submit the prior review activities directly to the World Bank for review. The categories of procurement activities consist of works, consulting services, and goods. The procurement of works will include gully erosion control, flood and sedimentation control, construction of firebreaks, rehabilitation and construction of small dams, small scale irrigation infrastructure, small buildings, and so on. The procurement of goods will include procurement of fire control equipment, vehicles, farm inputs (seeds, fertilizers), post-production equipment, computers, furniture, and so on. Procurement of consulting services will include studies, engineering design and supervision, data collection and analyses, and so on. The appropriate selection method for each works, consulting services, and goods contracts is established in the Procurement Plan.

3. **Kaduna, Niger, Kogi, Jigawa, Borno, Kano and Gombe States that may participate in the project have an e-Procurement system which is being used in some of the MDAs. Sokoto State is in the final stages of their e-Procurement implementation.** The other states and the FPMU that are yet to have an e-Procurement system will be encouraged to implement them. The systems so deployed will be used for procurement under the project. This will further improve value for money, transparency, economy, efficiency, effectiveness, integrity, and openness of procurement process under the project. All the above-mentioned states are implementing the same e-Procurement solution under a Framework Agreement and the World Bank's has been supporting the states in the design and deployment of the solution. In addition, Framework Agreements will be used for similar standard goods and services like procurement of computers, vehicles, safeguard studies, and so on. that will be procured by almost all participating states. This will offer more efficiency, transparency and competition, better value for money through economies of scale, security of supply. In addition, such procurement will be more easily monitored and evaluated.

4. **The appropriate World Bank Standard Procurement Documents will be used for all international open competitive procurement.** For national open competitive procurement at the federal and state levels, the Federal Government standard national bidding documents may be used provided, the following are incorporated into the documents: (a) open advertising of the procurement opportunity at the national level; (b) the procurement is open to eligible firms from any country; (c) the request for bids/request for proposals document shall require that bidders/proposers submitting bids/proposals present a signed acceptance at the time of bidding, to be incorporated in any resulting contracts, confirming application

of, and compliance with, the World Bank's Anti-Corruption Guidelines, including without limitation the World Bank's right to sanction and the World Bank's inspection and audit rights; (d) Procurement Documents include provisions, as agreed with the World Bank, intended to adequately mitigate against environmental, social (including SEA and GBV), health and safety risks and impacts; (e) publication of contract award information; (f) contracts with an appropriate allocation of responsibilities, risks, and liabilities; (g) rights for the World Bank to review procurement documentation and activities; (h) an effective complaints mechanism; and (i) maintenance of records of the Procurement Process. Other national procurement arrangements (other than national open competitive procurement), that may be applied for the project (such as limited/restrictive competitive bidding, request for quotations/shopping, direct contracting), shall be consistent with the requirements set out in paragraph 5.3 of the Procurement Regulations. Since the complaint mechanism as provided for under state laws are similar to that of the Federal law, the federal-level sanction procedures will apply under the project.

5. **For procurement arrangements at local/community level, for example, for Component B, the SPMU will select the service providers and release funds to a registered community association in tranches.** The community association in turn will release the inputs and the funding for the execution of the activities to community interest groups using the CDD procurement procedures and methods acceptable to the World Bank and specified in the PIM, under the guidance and supervision of the community association.

6. **The Project Procurement Strategy for Development (PPSD) has been prepared by the FPMU and reviewed by the World Bank. A summary is as follows:** The project is designed as framework project and therefore investments and the participating states (the major investments will be implemented by the participating states) are not fully known yet. The security challenges in the country especially in the northern states that will participate in the project may reduce the participation of foreign firms and firms from other parts of the in the procurement process for the project. The current high inflation and exchange rate volatility in the country will affect the costing of the various procurement packages in the project. The use of eProcurement by the participating states and the FPMU will improve value for money, transparency, economy, efficiency, effectiveness, integrity, and openness of procurement process under the project. The FPMU and the states that are implementing NEWMAP have experience in World Bank Procurement Regulations. The procurement officers have received sufficient training in procurement under World Bank funded project. The gaps that were observed in the implementation of NEWMAP especially in contract management will be addressed under ACReSAL. A sufficiently large numbers of firms are available locally and international for most of the procurement packages under the project, therefore competitive procurement can readily be used to achieved value for value during procurement implementation. The design of the gully erosion sites already cleared under NEWMAP that will be transferred to project will be updated prior to the launching of the procurement processes for the construction of such sites. The PPSD will be regularly updated once there are clear pictures on the participating states and the procurement activities that will be implemented by the states and the FPMU.

Table 5.1. Summary of PPSD

Contract Title, Description and Category	Estimated Cost US$ and Risk Rating	World Bank Oversight	Procurement Approach/Competition	Selection Method	Evaluation Method
Implementation support consultancy	9,500,000 Substantial	Prior	International	SPD (RFP)	Rated Criteria (VfM)
Long-term framework and policy support	2.500,000, Substantial	Prior	International	SPD (RFP)	Rated Criteria (VfM)
Development of strategic catchment plan	1,600,000, Substantial	Prior	International	SPD (RFP)	Rated Criteria (VfM)
Monitoring Information System (MIS) and maintenances	600,000, Moderate	Post	International	SPD (RFP)	Rated Criteria (VfM)
Others ICT Equipment and connectivity, cloud services, others general services	400,000, Moderate	Post	National	RFB	Lowest Evaluated Cost
Desktops & Laptops	300,000, Low	Post	National	RFB	Lowest Evaluated Cost
Data collection and analysis at State/federal Level	168,000, Moderate	Post	National	CQS	Negotiation
Production of Manuals (PIM)	90,000, Low	Post	National	RFQ	Lowest Evaluated
Design and hosting of interactive website	56,000, Moderate	Post	National	CQS	Negotiation

7. **Disclosure of Procurement Information.** Disclosure of the Procurement Plan and all procurements shall be made in accordance with the provision of the above World Bank Procurement Regulations.

Financial management

8. **The Federal Treasury Circular of March 2010 established the FPFMD in the Office of the Accountant General for the Federation (OAGF) to handle the FM responsibilities for funds provided to MDAs by donor partners.** At the state level, the SPFMUs in the Offices of Accountants General, as with the FPFMD, handle the FM responsibilities for funds provided by IDA. Responsibility for establishing and maintaining acceptable FM arrangements for the project will be handled by FM units in the FPMU and the SPMUS.

9. **The FPFMD and SPFMUs are multi-donor and multi-project FM platforms, established at the federal level and in all states through the joint efforts of the World Bank and the government.** These common FM platforms feature robust systems and controls. The SPFMUs and FPFMD in the participating states and FPFMD are presently involved in the implementation of many World Bank-assisted projects. The World Bank's recent review showed that these units have been performing satisfactorily. To strengthen the FM system in the SPFMUs and FPFMD, implementation of some action plans is required. The FM risk for this financing is assessed as Substantial.

10. **The SPFMUs and the FPFMD will designate from the pool of professional accountants in the state and federal level offices of Accountant General a project accountant, project internal auditor, and other support accounting technicians to ensure appropriate segregation of duties.** The SPFMUs and FPFMD will support the project to prepare and submit annual audited financial statements and calendar semester unaudited IFRs in a format to be agreed with the World Bank within agreed timelines. A computerized accounting system will be used and shall be configured in line with the formats of the IFR and the annual financial statements. The project bank account at the federal level will be opened with the Central Bank of Nigeria and at the state level the accounts will be opened with reputable commercial banks acceptable to IDA.

11. **An FM assessment of the implementing entities in line with the FM Manual (September 7, 2021) and the AFTFM Financial Management Assessment and Risk Rating Principles (October 2010) was conducted in August 2021.** The objective of the assessment was to determine whether the implementing entities have in place acceptable FM arrangements that satisfy the World Bank's FM requirements under World Bank Policy and Directives for IPF, which will ensure: (a) that all transactions and balances relating to the project are correctly and completely recorded; (b) the preparation of regular, timely, and reliable financial statements; (c) safeguarding of the entity's assets; and (d) existence of auditing arrangements acceptable to the World Bank.

12. **The overall FM risk for the project was assessed as Substantial.** The FM risks will be reviewed during project implementation and updated as appropriate. The rating was due to the inherent risks and the implementation arrangements which involve multiple levels and agencies, not because of the control risks associated with the project's FM arrangements. The inherent risks arise at country, entity, and project levels. These risks include integrity risk within the sector, implementing entities in widely dispersed locations with security concerns. However, these inherent risks are well mitigated using the SPFMUs and FPFMD, which feature robust controls (internal and external). The SPFMUs at the state level where payments to multiple beneficiaries will take place have adequate experience in managing financial flows to multiple levels from other projects in the portfolio and they will be given additional training. With the mitigation measures, the residual FM risk is Moderate. When the regime of mitigation measures is

fully implemented during implementation, the residual risk will be Moderate. The mitigation measures include use of expert advisors, a strengthened bid evaluation process, a GRM established in the FPMU and SPMUs, computerized accounting systems, professionally qualified and experienced FM staff, and an independent and effective internal audit that will adopt risk based internal audit methodology involving risk mapping. FM arrangements for Community Investments under Component B2, will include tranching of disbursement and FM supervision integrated with M&E to validate expenditures and physical verification of site interventions by Project Internal Auditors and social accountability mechanisms, including community meetings and display of subproject information on notice boards in the community hall. These arrangements will be documented in the FPM. State-level NGOs will provide oversight on implementation of community subprojects. A random selection of subprojects will be visited during World Bank supervision missions. The Financial Procedures Manual (FPM) will detail adequate internal controls which will include an enhanced accountability framework over soft expenditures (travels, study tours, workshops, and so on) which shall be implemented in the project. Regular reporting arrangements and supervision plan will also ensure that the implementation of the project is closely monitored and that appropriate remedial actions are taken expeditiously.

Table 5.2. Financial Risk Mitigation Measures

FM Arrangement	Risk Mitigation Measures
Inherent Risks	
Country Level Funds may not be used in an efficient, accountable, and transparent way.	The ERGP 2017-2020 launched in 2017 by the federal government to restore macroeconomic stability in the short-term. Governance is among the main pillars of the ERGP which commits to transparency and anti-corruption, public service reform, inter government coordination and delivery. Reforms in public financial management (PFM) have been supported by the World Bank under SEEFOR (P121455), SLOGOR (P133045), and PSRGDP. Continuing support for PFM reforms is being provided under the on-going SFTAS program (P162009) involving participation of all the 36 states. Robust FM arrangements (FPFMD & SPFMUs) have been established at federal and state levels designed to mitigate the Country level risk.
Entity Level Integrity issues in the sector. Weak institutional capacity to implement the project components and to effectively monitor progress and embrace full accountability for results.	The implementing agencies' FPMU and SPMUs have experience implementing World Bank-financed projects. Implementation team involving expert advisors (foreign and local) in disciplines related to ACReSAL activities will be hired. Strengthened bid evaluation process will be implemented. GRM established within the FPMU and SPMUs and implementation of protocol for fraud and corruption.
Project Level Risk exposure in the administration of project funds to multiple implementing entities in widely dispersed locations with security concerns of insurgency, banditry, and kidnapping.	Adequate training of designated project FM staff in World Bank FM policies and procedures. States to provide a statement of commitment and potential measures to ensure the security of Project personnel, beneficiary communities and assets, in coordination with Federal Government, and in compliance with World Bank operational security requirements.
Control Risks	

FM Arrangement	Risk Mitigation Measures
Misuse of funds and inadequate documentation of incurred expenditures	Internal Control is strengthened by using the FPFMD and SPFMU arrangement which features strong controls. Robust Financial Procedures Manual (FPM) including checklist of support documents for incurred expenditures to be in place, and staff familiar with the FPM. Independent and effective internal audit and risk management function will be in place. Enhanced project accountability framework over soft expenditures will be implemented. GRM established within the FPMU and SPMUs. Social accountability mechanism established at community levels which will emphasize transparency and local level accountability.

13. **The SPFMUs and FPFMD are established in all states and federal level respectively through the joint efforts of the Government and the World Bank.** These units are presently supporting the implementation of many World Bank-assisted projects. The financial accountability framework in the SPFMUs and FPFMD feature among other things the following: (a) all the key elements of FM, including: budgeting, funds flow, accounting, internal control, reporting and audit; (b) computerized accounting system and robust FM procedures manual; (c) qualified staff that are well-trained in relevant World Bank procedures and requirements, including procurement; (d) robust segregation of functions/duties; (e) a strong control environment, which is required to mitigate fiduciary risks; (f) highly independent and well-trained internal auditors; and (g) full alignment with the Government's own FM system but with some important enhancements and controls.

14. **The World Bank's recent reviews showed that the SPFMUs and FPFMD are performing satisfactorily.** The key issues noted within the SPFMUs and FPFMD are those of unretired advances and inadequate documentation for incurred eligible expenditures. To mitigate the risks of unretired travel advances and provision of inappropriate documentation to acquit the travel advances and unjustifiable claims for travel not undertaken, the project will implement an enhanced accountability framework which aims at forestalling such occurrence through additional oversight measures. The details of the enhanced accountability framework will be elaborated in the Financial Procedures Manual (FPM).

15. ***Planning and Budgeting:*** **On an annual basis, the Project Accountant working under the supervision of the Head FPFMD and Head SPFMU at the FPMU and at SPMUs in consultation with key members of the implementing unit will prepare the AWPB for the fiscal year based on the approved work program.** The AWPB will be submitted to the World Bank for the first year of project implementation, which shall be furnished no later than one month after the project effective date and then not later than November 30 of each year Detailed roles, timeline and procedures for planning and budgeting will be documented in the FPM.

16. ***Funds Flow.*** **Project funding consists mainly of an IDA credit and counterpart funding is envisioned.** At the federal level, the project accounts will be opened with the Central Bank of Nigeria (in line with the FGN TSA directives) and the states will open the project accounts at reputable commercial banks acceptable to IDA. Retroactive financing will be included in the project as per details included in the Financing Agreement. The specific banking arrangements are as follows:

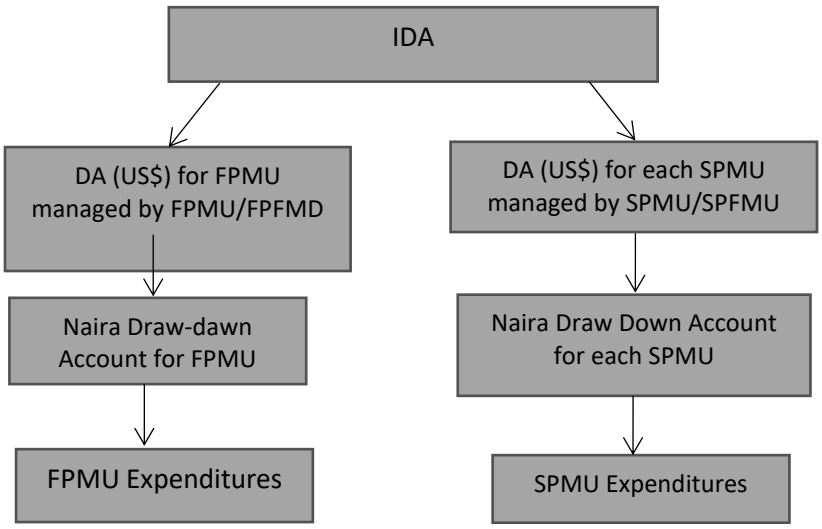
Federal PMU

- One US$ Designated Account (DA) for the FPMU to which the initial deposit and advances from IDA will be disbursed for activities to be executed at federal level.
- One Current (Draw-down) Account in Naira to which draw-downs from the DA will be credited in respect of eligible expenditures.

Participating State PMUs

- One US$ DA to which the initial deposit and advances from IDA will be disbursed.
- One Current (Draw-down) Account in Naira to which draw-downs from the DA will be credited in respect of incurred eligible expenditures, maintaining balances on this account as close to zero as possible after payments.
- One Current Account in Naira to which state government contributions will be deposited.

Figure 5.1. Funds Flow Arrangement



17. **All bank account ledgers will be reconciled with bank statements monthly and expeditious investigation of identified differences conducted.** Details of the bank reconciliation procedure will be documented in the FPM.

18. **The FPMU and SPMUs will be responsible for preparing and submitting Withdrawal Applications (WAs) to the World Bank.** The WAs will be supported by bank statement and a reconciliation of the DA and such other support documents as may be required.

19. ***Accounting:*** **IDA funds will be accounted for by the project on accrual basis using International Public Sector Accounting Standards (IPSAS) in line with the FGN's adoption of IPSAS in its entirety in 2016.** Annual financial statements will be prepared in accordance with accrual basis IPSAS. Computerized accounting system will be used incorporating a Chart of Accounts for the project which enables recording and reporting of expenditures by Categories, Components, Subcomponents and Activities. All accounting

and control procedures will be documented in the FPM, a living document which will be updated as appropriate regularly by the Project and shared with the World Bank for review and clearance.

20. ***Financial Reporting:*** **Within the SPMUs and FPMU, the project coordinators will ensure that project accountants prepare relevant financial reports on a timely basis.** In compliance with government requirements, monthly returns will be made to the Accountant General of the State and Federation respectively for incorporation in the government accounts. Unaudited IFRs will be prepared by the FPMU and SPMUs on a calendar semester basis and submitted to the World Bank within 45 days of end of the relevant semester. The formats of IFRs have been developed and agreed.

21. ***Internal Control:*** **Adequate internal controls are in place at both SPFMUs and FPFMD but will be strengthened further.** The control features at both SPFMUs and FPFMD include a framework FM procedures manual adapted for each project, relevantly qualified staff that are well trained in relevant World Bank procedures and requirements, including procurement; segregation of functions/duties and highly independent and well-trained internal auditors. At the peak of the COVID-19 pandemic, these internal auditors were relied upon to support FM supervision for the World Bank-funded projects. The FM staff are nominated by each State Accountant-General and the Accountant General for the Federation and subject to clearance by the World Bank.

22. ***Internal Audit.*** **The FPFMD and SPFMUs have independent and effective Internal Audit Units. The work programs of the assigned internal auditors will include periodic reviews of the ACReSAL project activities.** The internal auditors will utilize a risk-based internal audit (RBIA) methodology for which training will be provided by the project. This is to enable them to carry out the traditional compliance audit and the non-financial or operational internal audit but without adopting the pre-payment audit system.

23. **Risk mitigation measures related to governance and anti-corruption.** Measures to mitigate risks of fraud and corruption include having in place GRM within the FPMU or relevant SPMU; social accountability mechanism at community levels which will emphasize transparency and local level accountability; and the planned hiring of independent ACReSAL Expert Advisors – quality assurance pool of leading international and national experts in disciplines related to ACReSAL which will provide assurance on the technical quality of deliverables.

24. **Each SPMU and the FPMU will prepare project financial statements.** The FPMU and each SPMU will prepare financial statements and appoints its own auditor. The annual financial statements will be audited by an independent external auditor appointed by the FPMU and the SPMUs based on Terms of Reference acceptable to IDA. The auditor will express an opinion on the annual financial statements in compliance with International Standards on Auditing (ISA). In addition to the audit report, the external auditors will prepare a Management Letter. Copy of the audited financial statements along with the Management Letter will be submitted to IDA not later than six months after the end of each financial year.

25. **In addition to the annual financial audits, technical audits will also be conducted.** Technical audits will be conducted on the Works contracts and performed by subject matter experts. The technical audits will focus on the Works contracts with a view to ascertaining technical quality, economy, and efficiency in use of project resources.

Disbursements

26. **From lesson learned in the on-going NEWMAP project using the report-based disbursement method, the issue of implementing entities with funds in their DAs well in excess of their requirements in comparison to implementation progress has been flagged.** Accordingly, the project will use the transaction-based disbursement method and not report-based disbursement at effectiveness. Use of the transaction-based disbursement method will be augmented with enhanced controls which will include acceptable justification for additional advances and regular submission of documentation for incurred eligible expenditures. When project implementation begins, the World Bank will review and monitor the performance of the fiduciary arrangements in place. The World Bank team may recommend conversion to report-based disbursement based on assessment of performance and demonstrated capacity for adhering to the principles of report-based disbursement. Details of the disbursement arrangement will be in the Disbursement Letter.

Disbursement Categories

27. **Table 5.3 sets out the expenditure categories and percentages to be financed out of the credit proceeds.**

Table 5.3. Expenditure Categories and Percentages to Be Financed

Category	Amount of the Credit Allocated (expressed in SDR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, and consulting services under the project	497 million	100
(2) Emergency Expenditures	0	100
TOTAL AMOUNT	497 million	

Financial Management Action Plan

28. **Actions to be taken for the project to further strengthen its FM system are listed in Table 5.4.**

29. **Table 5.4. FM Action Plan**

Action	Date Due By	Responsible Entity
Train designated SPFMU and FPFMD staff in World Bank FM procedures and Disbursement Guidelines.	Before effectiveness	FPFMD/FPMU and SPMU/PFMU
Appoint external auditor	Within 90 days after effectiveness	FPFMD/FPMU and SPMU/PFMU
Designate PA, PIA and support accounting technicians	Signing of Financing Agreement	FPFMD/FPMU SPMU/PFMU
Prepare Financial Procedures Manual (FPM)	Disbursement Condition	FPFMD/FPMU and SPMU/PFMU

30.

ANNEX 6: Environmental and Social Framework

Application of the ESF to the project

1. **The ACReSAL project will involve significant investments across many different natural resource management sectors including water resources, forestry, agriculture, rangelands, and critical ecological areas.** The scale of the project is extensive, intended to be implemented across much of northern Nigeria. All project investments will take place in drylands, characterized by a high degree of sensitivity both environmentally and socially. While precisely intending to address their E&S challenges, the project itself has major E&S risks.

2. **Borrowers are expected to comply with and apply the requirements of the ESF when implementing World Bank supported projects.** For the ACReSAL project, eight Environmental and Social Standards (ESSs) apply, with the exception of ESS9 (Financial Intermediaries) and ESS7 (Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities): ESS1 (Assessment and Management of E&S Risks and Impacts), ESS2 (Labor and Working Conditions), ESS3 (Resource Efficiency and Pollution Prevention and Management), ESS4 (Community Health and Safety), ESS5 (Land Acquisition, Restrictions on Land Use and Involuntary Resettlement), ESS6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources), ESS8 (Cultural Heritage), and ESS10 (Stakeholder Engagement and Information Disclosure).

3. **To comply with the requirements of the ESSs and to be able to mitigate the project risks,** the Borrower developed an ESMF, IPMP, RPF, SEP, LMP, and a Security Risk Assessment/SMP. Similarly, an ESCP has been prepared by the Borrower to be implemented throughout the project life. All these instruments were prepared, cleared, and disclosed on October 27, 2021. Furthermore, the ESCP was redisclosed on the World Bank website on November 15, 2021. The World Bank has also prepared and disclosed the appraisal stage ESRS.

4. **The World Bank classifies all projects into an Environmental and Social Risk Classification (ESRC) and discloses the classification on the World Bank's website and in project documents.** The ACReSAL Project is classified as "High Risk" after considering, in an integrated manner, the risks and impacts of the project. The following sections present a summary of the major E&S risks, information on the project's approach to several emerging E&S issues and discusses plans to improve the Borrower's capacity.

Summary of major environmental risks

5. **Considering potential risks of project activities, widespread nature and potential cumulative impact, and the Borrower's capacity on ESF implementation, environmental risk rating is considered Substantial.** The risks and impacts of small to medium scale infrastructure works will be assessed prior to construction and will managed according to specified ESMPs.

6. **Environmental risks and impacts typical of construction work (for example, vehicle raised dust, nuisance noise, water use and contamination, soil compaction and erosion, waste management, and worker health and safety), as well as potential impacts on biodiversity need to be assessed and managed properly.** This component also focusses on climate change resilience at the farm level and includes climate-smart activities such as: restoration and management of riverbanks; reforestation and

promotion of agroforestry; improved livestock management; improved water harvesting and water storage in ponds; irrigation technologies; and energy-efficient storage, transportation, handling, and processing facilities. E&S risks associated with pest management, vector management associated with livestock and water storage ponds, biodiversity conservation, civil works might have adverse E&S risks and impacts. E&S assessments will be conducted, and management plans will be prepared prior to any civil works to manage the E&S risks according to mitigation hierarchy, in accordance with ESMF.

7. **Project will also support investments for better management and conservation of special ecosystems, including wetlands, desert oases, and protected areas.** Investments might include those related to wetland improvements, monitoring systems, inventories of the status of these ecosystems, stabilization and restoration of wetlands, forest reserves and oases. These interventions will result in overall positive impacts on these special ecosystems, however, due to sensitive nature of these ecosystems extra attention will be given to biodiversity protection during interventions. Location of these interventions will be identified during project implementation as per participating state selections and watershed management plans. Biodiversity surveys and Biodiversity Management Plans (BMP) will be prepared as needed once the locations and interventions are identified, to avoid, minimize, mitigate and/or offset potential adverse impacts.

Summary of major social risks

8. **The project is expected to result in positive socio-economic benefits for beneficiaries.** While the interventions proposed under this project are intended to be the building blocks which will help address the challenges of adapting to changing dryland environments, there are inherent and significant social risks associated with the project. The social risk rating is High. Under component A, the project will finance infrastructure investments such as: (a) construction and/or rehabilitation of existing small dams and reservoirs; (b) rehabilitation, replacement and/or decommissioning of deep boreholes; (c) rehabilitation and construction of associated hydraulic infrastructure (including borehole heads, pumps, and meters); and (d) development and/or improvements of irrigation and drainage networks, large water storage systems and oasis buffer areas. Though these interventions will be implemented using a participatory approach, there is potential risk of exclusion of minority ethnic groups, persons with disabilities, and women given social, cultural, and religious norms in the proposed areas of project intervention. Land access rights of individuals, community groups, and vulnerable or minority groups may be affected, and complex involuntary resettlement or land acquisition may also occur. Some of the water resource management investments could also negatively impact water availability for downstream communities. There are additional risks related to possible labor influx and community health and safety (including SEA/SH risks).

9. **Under Component B, while the project proposes to improve agricultural and rangeland productivity, disseminate information to farmers on crop suitability, water management, carrying capacity for livestock, managing water points and pastoral migration**, these could further exacerbate the competition for these resources unless a robust stakeholders / community / state actors' engagement is included in the project design. Given the exact states and location of these intervention are unknown at this stage an RPF that spells out the resettlement and compensation principles, organizational arrangements and design criteria to be applied to meet the needs of project-affected persons and specifies the contents of an RAP was developed. No voluntary land donations are expected to be needed under the project. If there are any restrictions to resources, those impacted would be compensated in line

with the requirement of ESS5. An LMP that includes needed elements of OHS was also developed to address risk associated with labor management and community health and safety.

10. **The different land tenure situations prevailing in northern Nigeria will have complex influences on project impacts stemming from possible resettlement or reduced access to natural resources.** The Box below provides background information on land tenure in northern Nigeria. These different tenure systems pose different risks and challenges to women, pastoralists, IDPs, and minority ethnic groups. The Land Use Act limits women's access to land ownership by requiring only the head of household to apply for registration, while some customs require women to have male counterparts stand for them before they are granted access to land. However, married women have better access to land compared to unmarried women. In most instances, poor, vulnerable populations and ethnic minorities often feel threatened by the possibility of the rich and powerful to take away their land created by the lack of access to secure land, often cause by political dominance. Other potential risk includes IDPs limited access to land due to financial constraints and instability. There is also potential for community-based decision-making to restrict the access of individuals or groups to resources– either via local natural resource management systems, or introduction of sustainable land management options which limit the access of tenant farmers to current agricultural land.

11. **The project aims to avoid, reduce, or mitigate (where avoidance is not possible) the adverse impact of involuntary land acquisition and restrictions on communities and people.** In cases where involuntary resettlement is unavoidable, the project will ensure that the affected community and people are adequately compensated. While some investments will be implemented within the existing tenure system and land jurisdiction under the land restoration and agriculture subcomponent activities for which no title or any legal status is required. There is the likelihood that some of these activities might be implemented on private lands (those of individual households or of local communities) which would require providing landholders with some form of compensation. Where this happens, participating SPMUs will implement appropriate resettlement compensation/livelihood support plans consistent with the provision of ESS5 and the RPF.

12. **Restrictions of access will be community-based decisions in the common interest of all, so compensation for these restrictions is not envisaged.** However, the project will ensure that a participatory and an inclusive approach to decision-making is followed, such that affected persons have livelihood alternatives, and recourse to a grievance mechanism under the project.

Capacity and commitment of Borrower

13. **Given the ESF's relative novelty, the capacity of the Borrower to manage risks and impacts in a manner consistent with the ESSs will need strengthening.** Some needs will be addressed through ongoing capacity-building support to the client on ESF rollout, including through the proposed Sustainable Procurement, Environmental and Social Standards Enhancement Project (SPESSEP) (P169405) and through implementation support. In addition, the FGN's preparatory team includes E&S safeguards officers that are familiar with the World Bank E&S requirements and operational policies and have also participated in ESF roll-out training.

14. **Many of the states likely to participate in the project also have at their disposal trained experts.** During implementation, the project management units will benefit from additional capacity support from

the World Bank E&S Team. There are concerns over capacity and experience in managing emerging issues such as GBV/SEA/SH issues which will be addressed through implementation support and capacity building activities. To support management of E&S risks, each project management unit at the federal and state level would be expected to include one Environmental Specialist, one Social Specialist, one GRM officer, one Gender/GBV specialist, and one Security Management Officer.

Box 6.1. Land Tenure

The Land Use Act (LUA) vests all land in state governors and grants the governors almost unfettered discretion to make decisions about land, including its allocation and revocation of use rights. As per the act, compensation for state acquisition of land is limited to the value of any rent paid to the state that year as well as improvements to the land, rather than its market value. By this Act, the land tenure in Nigeria is classified into:

State Owned Land. Under this tenure right, the state governor holds the right to manage and control all land in the territory of each state. This right includes granting of statutory right of occupancy to all persons with respect to land. The state governor also holds the power to revoke any right of occupancy for overriding public interest with or without payment of compensation. At the local level, the local government holds the right to manage and control all rural land in the territory of each local government and holds the right to grant customary right of occupancy in rural areas within its jurisdiction.

Customary Lands/Community Owned Lands. The land use act recognized the right of community / heads of communities to hold the right to manage and control land in their territory. Under customary law, allocation of part of communal land to member of the community neither divests the community of title nor vest title to the land in the individual, rather, the community maintains possession of the land through such individual. A single customary right of occupancy can cover no more than 500 hectares for agriculture, and no more than 5000 hectares if for grazing unless consent is obtained from the Governor. Any transfer of interest in the right under customary occupancy requires the approval of the government of the state which means customary right of occupancy cannot be sold.

Individual and Private Land. In line with the constitution, the land use act allows individual to hold statutory right of occupancy to land. This right is the highest to land an individual can hold in Nigeria. This right of occupancy allows the holders to use or occupy land to the exclusion of all other person except the governor and is granted for a maximum holding of 99 years, subject to the payment of grant rent fixed by the government throughout the holding period. Evidence of title are recognised as valid for statutory right of land for individual.

Lands with unresolved tenure. The Land Use Act regards land to which no title has been granted (statutory or customary) on which agricultural activities are carried out as customary lands as long as it continues to be used for agricultural purposes. The purpose of these land cannot be converted, and such land is not transferrable.

Sexual exploitation and abuse and sexual harassment (SEA/SH)

15. **The project's activities also have the potential to increase GBV risks, specifically SEA/SH risks, in part due to the significant GBV levels existing in the Nigeran context.** As noted above, GBV is endemic in Nigeria, impacting a third or more of women and girls. The most common acts of violence against women in Nigeria include SH, physical violence, harmful traditional practices, emotional and psychological violence, socio-economic violence and violence against non-combatant women in conflict situations. The insurgency has resulted in mass abductions, survival sex, forced prostitution, forced and early marriage, physical, mental and sexual assault including rape. About 3 million people are estimated to be in need of protection from sexual and gender-based violence (SGBV) in North-East Nigeria alone. In addition, the prevalence of child marriage is extremely high in Nigeria, almost half of the girls (48 percent) are married off before their 18th birthday, and 22 percent are married before they turn 15.

16. **Considering these contextual risks and the potential that they will be exacerbated by the project's activities; the project is of Substantial risk for SEA/SH.** The project will be implemented in the northeastern part of the country, in a conflict area with large populations of IDPs, increasing risk levels for SEA/SH even further. Moderate amounts of labor influx and project activities in rural and hard-to-supervise areas also contribute to increased risk. In order to mitigate SEA/SH risk factors, GBV risk management has been addressed in the Borrower's ESCP, and in the SEA/SH Action Plan included in the PIM, which describes the following activities in detail: (a) A SEA/SH comprehensive risk assessment within the ESIA(s); (b) SEA/SH requirements in bidding documents; (c) GBV risks and mitigation measures in contractors' ESMP(s); (d) Mapping of GBV/SEA Service Providers; (e) Sensitization of communities and workers on SEA/SH; (f) Signing and training on Codes of Conduct for all project staff and workers; (g) A referral pathway to GBV service providers; and (h) Hiring of GBV expertise, support and monitoring. The SEA/SH/GBV action plan has also been disclosed in-country on October 27, 2021 and in the World Bank system on October 28, 2021.

17. **Specific SEA/SH protocols are developed within the project GRM.** They will consist of reporting channels that women and girls in the community have identified as appropriate and safe, as well as ensuring all reporting channels and GRM operators are trained on how to receive SEA/SH cases, and that there is a clear referral pathway in place. The GRM will facilitate survivor-centered timely quality care and support in response to any SEA/SH incidents that may occur. Protocols for how such cases will be handled will be developed and included in the PIM.

18. **Consultations with women and girls will be done in a safe and enabling environment.** Facilitators will be trained in a survivor-centered approach, they will be the same sex of participants, and conversations will be held in a private space where no one can hear or come in uninvited. Furthermore, power dynamics between women will be considered, for example, different ethnic groups, ages. that might prevent people from speaking openly and honestly. Creating a space where women and girls can speak about sensitive topics such as SEA/SH is paramount for designing appropriate mitigation and response measures.

Social Inclusion and gender

19. **Key marginalized and vulnerable groups to this project include women and girls, youth, the elderly, persons with disabilities, internally displaced people, pastoralists, and ethnic and religious minorities.** Women are a primary focus of the proposed project, with livelihood development targeted mainly at women and other vulnerable groups as identified in social assessments undertaken in participating communities. Local institutions developed under the project will ensure the full participation of women and other marginalized and vulnerable groups in any community-level structures, such as NRM committees, established or supported under the project. This may include, for example, specifying that an agreed number of leadership positions would be occupied by women or other members of marginalized groups. The project design is socially inclusive with all members of participating communities being invited and encouraged to become involved in watershed management activities.

20. **The project will promote social inclusion of persons with disabilities by ensuring:** (a) active participation of persons with disabilities in the design of disability-sensitive skills and livelihood programs for beneficiaries; and (b) the design, construction, or rehabilitation of community water supply and sanitation infrastructure facilities incorporates universal access and consideration for other disability

clusters. This process will build the required social capital and network that will provide the needed support for persons living with disability in the project areas.

21. **The project will also target other marginalized and vulnerable groups as follows:** (a) Pastoralists communities with livelihoods impacted by desertification – policy interventions for and improved grazing methods; (b) Internally Displaced Persons with loss of livelihoods resulting from climate change impacts like flooding and/or related conflict – reintegration and livelihoods support; and (c) Women will be addressed by increasing their access to inputs and financing.

Citizen engagement

22. **Citizen engagement is at the core of the project design.** The project will finance participatory management planning to restore degraded landscapes and protect environmental services and critical water supplies. Support will be provided to strengthen existing community groups and, where necessary, establish new community groups to facilitate the participatory planning process. Key areas of focus for participatory planning include the design, implementation and monitoring of watershed management plans; community infrastructure; and income generation activities. Special measures will be in place to ensure the participation of vulnerable groups, including women and persons with disabilities, in planning processes. The project's citizen engagement interventions will involve consultations and focus groups, and the establishment of a GRM to ensure clarifications about the project are responded to, problems with implementation resolved, and complaints and grievances addressed efficiently and effectively. A citizen satisfaction survey will be conducted to obtain a quantitative assessment of the project's citizen engagement approach. Beneficiary feedback will be monitored through two indicators in the RF: (a) number of integrated micro-watershed management plans completed with community participants; and (b) grievances responded to and resolved within the stipulated service standards for response times.

Stakeholder engagement

23. **As part of the ESF instruments preparation, the project has prepared an inclusive SEP** to cover all proposed selected sites to adequately represent views of all stakeholders including representation of ethnic minorities, women and girls, vulnerable groups, and underserved peoples. This will provide stakeholders the opportunity to be aware of project activities and their potential impacts and become conversant with ESF requirements, principles, and the rationale for participatory approaches. The SEP and this process will be updated where necessary and sustained throughout the project implementation. State level SEP will be prepared upon selection of states and prior to commencement of project activities.

Security risk

24. **Based on the project design and proposed area of intervention, the project interventions will take place in northern Nigeria, including the northeastern part of the country that is affected by fragility, conflict and violence.** These will impact on project activities resulting from security risk to project workers, World Bank staff and contractors. Though the exact states and locations are not yet known, a comprehensive security assessment of all participating states and sites was conducted in close collaboration with the participating state governments to prepare a robust SMP before project effectiveness, a summary of which has been disclosed. The SMP will be constantly updated to respond to changes in security issues in the respective states. Similarly, the project will engage a third-party

monitoring at the project management unit to monitor project implementation including ESF compliance of the project. The Federal level SMP will be adopted as a condition of effectiveness and state-level SMPs will be adopted as conditions of disbursements for each state.

Grievance redress mechanism (GRM)

25. **To ensure the concerns of project beneficiaries and stakeholders are taken care of and complaints and suggestions duly addressed, the project will develop and implement a robust project-based GRM.** The GRM will be developed and implemented by the FPMU but with provisions for access at the state and local level and accountability for management and follow-up at appropriate levels. The GRM will include reporting channels that are ethical, confidential, and safe for women and girls to report SEA/SH issues, operators will be trained on a survivor-centered approach and survivors will be referred to health, legal, safety, and psychosocial quality support services. The SEA/SH/GBV protocol will be in line with the provision of the SEA/SH/GBV action plan. A Procedural Manual for grievance redress officers would be developed detailing the procedures, roles, and responsibilities to resolve beneficiaries' complaints. Also, grievance redress procedures at various levels of the project would be constituted (with women representatives) to ensure that project-related complaints are promptly reviewed, addressed, and properly documented.

ANNEX 7: Economic and Financial Analysis

1. **A BCA was conducted to assess the economic feasibility of the project.** The analysis shows that the project generates benefits in excess of component costs, with an IRR of 17 percent, and an NPV of US$1,550 million.

Approach

2. **Objective and Approach:** The project aims to increase the adoption of sustainable landscape management practices in targeted watersheds in northern Nigeria and strengthen Nigeria's long-term framework for integrated climate-resilient landscape management. The main interventions consist of infrastructure ("hardware") and community-based planning and institutional and individual capacity strengthening ("software") to reduce climate-induced vulnerabilities in 19 states (and the FCT of Abuja) in northern Nigeria. The analysis considers a 25-year time horizon after 6 years of project implementation, and a 6 percent social discount rate, and uses a traditional "with and without project'' approach to assess the economic viability of IDA resources.

3. **Justification for public sector provision:** Land degradation and soil erosion are externalities caused by market failure, as there are no costs or penalties for activities leading to these outcomes (for example, unsustainable agriculture and other land use practices, excessive deforestation, and improper road and drainage construction). Without intervention, these market failures will continue to generate negative externalities to the environment and the population living in these areas (worsening desertification, droughts, famines, farmer-herder conflicts, resultant displacement and loss of life, and loss of livelihoods). Given the high investment costs associated with appropriate landscape management and soil erosion control, the private sector alone has no incentive to undertake these investments, and while the affected populations (the majority of whom are low-income communities) would find the costs to be prohibitive. Thus, using public sector funds to finance the project is considered appropriate.

4. **World Bank value addition**: Having carried out several erosion and watershed management projects in Nigeria (including NEWMAP, TRIMING, FADAMA), the World Bank is uniquely placed to lead the community-based strategic watershed and landscape investment in northern Nigeria.

Project costs

5. **Costs:** The BCA considers all project costs (that is, US$700 million over six years) as well as O&M costs, estimated at 10 percent of total project costs, effective from after the project ends. Project costs are expected to be disbursed as follow: 10 percent in 2022, 15 percent in 2023, 20 percent in 2024, 20 percent in 2025, 20 percent in 2026, and 15 percent in 2027; with O&M costs starting to accrue from 2028, that is, after the project ends.

Project benefits

6. **Summary of benefits:** The BCA attempts to quantify six key benefits due to the project across 19 states and the FCT in northern Nigeria: (a) incremental benefits from landscape restoration; (b) incremental profits from climate-smart irrigated agriculture; (c) reduced damages from soil erosion; (d) reduced deaths due to herder-farmer conflicts over grazing land and water; (e) reduced drought-related

human mortality; and (f) reduced GHG emissions. All benefits are assumed to accrue after project end, that is, from year 7 after the project starts, even though benefits will begin to accrue earlier.

7. **Non-monetized benefits:** The project would also have benefits that are not easily monetizable. The estimation of measurable benefits should therefore be considered conservative (under-estimated) in comparison to all potential project benefits. These non-monetized benefits include:

- *an improved comprehensive knowledge base and analytical tools* that could help improve a shared understanding of the issues, challenges, and opportunities in landscapes not only in the drylands of northern Nigeria but across the country
- *improved in situ monitoring systems*, for example, for weather, surface and ground waters, modern earth observation tools, and surveys, which should also improve the ability to make more information-based decisions for integrated multi-sectoral watershed management and for individual sector performance assessment and benchmarking
- *capacity development*, which should improve capacity of institutions at all levels and which, together with institutional infrastructure strengthening and technical assistance (including for holistic investment preparation, data/analytics, monitoring & learning, and project management), should help strengthen institutional capacity beyond the project (as the PDO also intends) and bring improved access to global good practices
- *outreach to women and youth* which, through learning programs, leveraging new technology, and internship programs, should help build the capacity of the next generation in contributing to these climate-smart landscape solutions for the country
- *policy reforms* that are sought to be developed and demonstrated, which should contribute to setting up an improved knowledge, institutional, and policy framework foundation for the longer-term across the country
- *support to enable institutions to work together across sectors* especially environment/climate, water, and agriculture) and levels of governance (federal, state, and local levels and with community-level organizations), which should have positive ramifications not only in this project but also in other sectors
- *improved social cohesion and peacebuilding* should also have benefits to provide more hope in a fragile and conflict affected part of the country.

8. **The first of six measured project benefits are the incremental benefits from improved landscape management.** The project plans community-led landscape restoration on 350,000 hectares[65] and to improve access to better weather forecasts and climate-resilient inputs, improved integrated pest management, and integrated eco-friendly plant nutrient management. Additionally, the project will enhance soil carbon, build capacity, and enhance knowledge of approaches for better agro-forestry, on-farm land and water management and sustainable cropping practices. Analysis based on data and findings

[65] See RF.

from the World Bank supported Fadama Project in Nigeria shows three profitable agro-forestry combinations, illustrated for one hectare (ha) of land each:[66]

(a) *acacia/*gum arabic (0.3 ha) - balanite (0.3 ha) - grass (0.4 ha)

(b) sorghum (0.4 ha) – *acacia*/gum Arabic (0.2 ha) – balanite (0.2 ha) – grass (0.2 ha)

(c) orchard plantations: mango (0.4 ha), guava (0.3 ha) and cashew (0.3 ha)

9. **Year-wise incremental profit for each combination was calculated using data from FADAMA project areas,** and the average incremental benefit across the three combinations was taken as the potential incremental benefit per hectare in proposed project areas (Table 7.1).[67]

Table 7.1. 25-Year Incremental Profits for Three Agro-Forestry Combinations (US$/ha)

Year	Combination 1	Combination 2	Combination 3	Average
1	−273	−287	−554	−371
2	−46	64	−225	−69
3	−41	67	−206	−60
4	−35	71	50	28
5	−35	71	141	59
6	−17	83	310	126
7	55	105	310	157
8	106	119	310	178
9	137	119	310	189
10	137	119	310	189
11	137	119	310	189
12	137	119	310	189
13	137	119	310	189
14	114	179	310	201
15	174	219	310	234
16	174	219	310	234
17	174	219	310	234
18	174	219	310	234
19	174	219	310	234
20	174	219	310	234
21	174	219	310	234
22	174	219	310	234
23	174	219	310	234
24	174	219	310	234
25	174	219	310	234

10. **Second measured benefit: Increased_profits from climate-smart irrigated agriculture.** The project aims to add or restore 51.7 million cubic meters of a total water storage capacity within the project

[66] The third and last in the Fadama series of projects (2008 – 2019) ended after two rounds of additional financing (Independent Evaluation Group (IEG), 2019, Fadama III ICR Review, CRR0022399, Washington DC: Independent Evaluation Group). The three profitable agro-forestry combinations were identified in a detailed analysis by Prof. C. Molokwu, FAO Consultant, based on information collected from M&E units of Fadama III. Personal communication. 25 October 2021.
[67] C. Molokwu, *op. cit.*

area. This is sufficient to irrigate around 10,000 hectares of cropland, assuming all the water storage is to be used for irrigation, and assuming a crop water requirement of around 5000 cubic meters per hectare (wheat needs 4,000 and tomatoes 6,000). Assuming further that these 10,000 hectares are used for rice cultivation, and that current farmer profits increase by 40 percent from US$310 to 434 per hectare due to all the project interventions.[68] This benefit of US$1.24 million per year is an underestimate as interventions should result in country-wide improvements in irrigated agriculture.

11. **Third measured benefit: Gully erosion control.** The project aims to treat 16 targeted gully complexes in largely urban areas, using a similar approach to that of the successful NEWMAP. Data from 30 erosion sites treated successfully by NEWMAP were analyzed in detail during the additional financing and yielded incremental benefits of US$4.2 million per site through: (a) avoided infrastructure losses; (b) avoided human deaths; and (c) avoided displacement.[69] This updated average figure of US$4,565,279 (In 2020 prices) per site is used to calculate the benefits from the 16 sites to be treated by the project. This totals to US$73.04 million per year.

12. **Fourth measured benefit: Reduced herder-farmer conflicts.** Benue, Kaduna, Nasarawa and Plateau States are estimated to lose US$13.7 billion annually to farmer-herder conflicts.[70] Between January 2015 and February 2015, 2,500 people are estimated to have died and 62,000 displaced, while many lives were reported lost and farmlands destroyed in the 2017 clash in the Acatu area of Benue State, and 168 people died in clashes in January 2018.[71] A detailed investigation by Amnesty International in 2018 in 5 states (Adamawa, Benue, Kaduna, Taraba and Zamfara) estimated that 3,641 people were killed between January 2016 and October 2018, that is, around 350 persons per state per year, although such conflicts are estimated to affect 33 out of the 36 states in Nigeria.[72] Since these clashes are over grazing lands and water, direct project interventions to improve biomass and water availability and indirect interventions to improve watershed management planning on nearly 55 million hectares of land, as well as community-level capacity building, negotiating skills, awareness raising, should help reduce these farmer-herder conflicts. Project interventions are assumed to save just these 3,641 recorded deaths from

[68] The per hectare profit from rice cultivation in Nigeria is estimated to average 124,172 Naira (US$10 @400 naira to US$1) by Kolawole, O., (2006), *Determinants of profit efficiency among small-scale rice farmers in Nigeria: A Profit Function Approach,* paper presented at the International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12-18, 2006. The PRODEPAM Project in Mali increased net farm income due to rice by 41 percent (World Bank, *Options for Preparing a Sustainable Land Management (SLM) Program in Mali Consistent with TerrAfrica for World Bank Engagement at the Country Level*).

[69] World Bank (2018) Project Paper on a Proposed Additional Credit to the Federal Republic of Nigeria for the Nigeria Erosion and Watershed Management Project (NEWMAP). May 31, 2018. Repot No. PAD2621.

[70] Dr. Abdulsalaam quoted in *The Vanguard*, 30 October 2017.

[71] Olalekan, A., '*Nigeria's Conflict …' The Conversation,* Feb 23, 2018.

[72] World Bank and the United Nations (2010), *Natural Hazards: UnNatural Disasters: The Economics of Effective Prevention,* World Bank: Washington DC notes that '…of 800 households interviewed in the Sahel region of northern Nigeria, 200 experienced conflicts, more than half related to resource access; 60 percent occurred in the dry season, and the most violent ones were in the fertile flood plains' Nyong and Fiki (2005). Pastoralists claim that farmers cultivate along cattle paths during droughts, while farmers said pastoralists watered their cattle at their wells and allowed them to graze on their crops. (p. 49). See Nyong, A., and C. Fiki. 2005. "Drought-Related Conflicts, Management and Resolution in the West African Sahel." Paper presented at the Global Environmental Change and Human Security Workshop, Oslo, June 21–23.

herder-farmer clashes in five states per year, an obvious underestimate. This totals US$58.86 million per year.[73]

13. **Fifth measured benefit: Reduced costs of droughts.** Desertification, land degradation and inadequate access to water have caused people to migrate with their families and livestock for decades in northern Nigeria. While 300,000 animals and a large number of humans died in the 1972-3 drought, devastating droughts have been a decadal phenomenon in the 1980s and 1990s. Without interventions and with increasing climate change impacts, such droughts are expected to become more severe and more frequent. However, project interventions to improve watershed management, revive water bodies and facilitate climate-smart agriculture and livelihoods can ameliorate the effects of future droughts. The analysis assumes that project interventions can avoid the deaths of 1,000 human beings across all of the 20 states of northern Nigeria, due to future droughts– which are assumed to recur every 5 years in some part of a state in northern Nigeria, although deaths are vastly under-reported.[74] This does not, of course, include the other costs associated with drought, such as the social and economic cost of livestock deaths, loss of livelihoods, and displacement and resettlement. Still, this benefit is estimated to be US$58.86 million per year.

14. **Sixth measured benefit. Reductions in GHG emissions.** The potential reduction in GHG emissions due to project interventions is estimated to be 3,123,410 tons of carbon per year (see the GHG analysis in Annex 4 for details) with a social cost of carbon of US$51 per ton.[75] The total value of this benefit comes to US$159.29 million per year, but is assumed to be phased in at 25 percent, 50 percent, 75 percent and 100 percent per year from year 7 of the project period.

Results of the BCA

15. **Net Benefits:** The BCA estimates that the NPV of the net benefits of the project is US$1,550 million and that the IRR is 17 percent (Table 7.2).

16. **Sensitivity analysis:** Sensitivity analysis showed that a 10 percent increase in costs (including operational costs) and a 10 percent reduction in all project benefits yielded an IRR of 14 percent.

[73] The value of a statistical life is taken to be US$16,167 (see World Bank, 2018, op. cit.), but an alternative calculation puts this value at US$489,000 (Patenaude, et al (2019) The value of a statistical life year in sub-Saharan Africa: Evidence from a large population-based survey in Tanzania. Preference based assessments, 19, pp. 151-156, (https://doi.org/10.1016/j.vhri.2019.07.009), using which would increase the total annual value of deaths avoided.

[74] See*, inter alia,* Chibueze, N. (2016) Historical analysis of economic effects of drought in northern Nigeria, J Pol Sci Pub Aff 2016, 4:3, DOI: 10.4172/2332-0761.1000214; Olagunju, TE (2015), Drought, Desertification, and the Nigerian Environment: A Review, *J Ecol & Nat Env.* Vol. 7(7), pp. 196-209, July 2015, DOI: 10.5897/JENE2015. 0523. The calculation assumes a population increase of 2 percent per annum. Deaths due to droughts are assumed from the literature given that official death registration is poor in Nigeria. A recent analysis noted that only 13.5 percent of registered deaths were registered in 2007, regressing to 10 percent in 2017 (Makinde, O.A., Odimegvu, C.O., Udoh, M.O., Adedini, S.A., Akinyemi, J.O., Atobatele, A., Fadeyibi, O., Abdulaziz-Sule, F., Babalola, S., Orabaton, N. 2020. Death registration in Nigeria: a systematic literature review of its performance and challenges. Global Health Action13(1) 2020-09-07, CC BY-NC-ND 3.0 IGO http://creativecommons.org/licenses/by-nc-nd/3.0/igo http://dx.doi.org/10.1080/16549716.2020.1811476

[75] 'The Biden administration has given the interim SCC a value of US$51 using a discount rate of 3 percent; this is the figure the Obama administration used, adjusted for inflation.' Cho, R. 2021. Social Cost of Carbon: What is it and why do we need to calculate it? [online] State of the Planet, Columbia Climate School available at https://news.climate.columbia.edu/2021/04/01/social-cost-of-carbon/.

Table 7.2. Benefit-Cost Analysis (US$, millions)

Year	Costs			Benefits							Net Benefits
	Project	O&M	Total	Incremental Profits		Avoided Erosion	Avoided deaths		GHG Reduction	Total	
				Landscape Restoration	Irrigated Agriculture		Conflicts	Droughts			
2022	70	0	70							0.00	−70.00
2023	105	0	105							0.00	−105.00
2024	140	0	140							0.00	−140.00
2025	140	0	140							0.00	−140.00
2026	140	0	140							0.00	−140.00
2027	105	0	105							0.00	−105.00
2028		70	70	−130	1.24	73.04	58.86	16.17	0.00	19.31	−50.69
2029		70	70	−24	1.24	73.04	58.86	0.00	39.82	148.79	78.79
2030		70	70	−21	1.24	73.04	58.86	0.00	79.65	191.82	121.82
2031		70	70	10	1.24	73.04	58.86	0.00	119.47	262.52	192.52
2032		70	70	21	1.24	73.04	58.86	0.00	159.29	313.04	243.04
2033		70	70	44	1.24	73.04	58.86	17.78	159.29	354.16	284.16
2034		70	70	55	1.24	73.04	58.86	0.00	159.29	347.23	277.23
2035		70	70	62	1.24	73.04	58.86	0.00	159.29	354.86	284.86
2036		70	70	66	1.24	73.04	58.86	0.00	159.29	358.43	288.43
2037		70	70	66	1.24	73.04	58.86	0.00	159.29	358.43	288.43
2038		70	70	66	1.24	73.04	58.86	19.56	159.29	377.99	307.99
2039		70	70	66	1.24	73.04	58.86	0.00	159.29	358.43	288.43
2040		70	70	66	1.24	73.04	58.86	0.00	159.29	358.43	288.43
2041		70	70	70	1.24	73.04	58.86	0.00	159.29	362.80	292.80
2042		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2043		70	70	82	1.24	73.04	58.86	21.52	159.29	395.99	325.99
2044		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2045		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2046		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2047		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2048		70	70	82	1.24	73.04	58.86	23.67	159.29	398.14	328.14
2049		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2050		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2051		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
2052		70	70	82	1.24	73.04	58.86	0.00	159.29	374.47	304.47
NPV in US$											**1,549.55**
IRR (%)											**17**

ANNEX 8: Related Projects and Initiatives

1. **Dryland management in northern Nigeria is complex and the needed solutions involve many sectors well beyond the scope of ACReSAL.** Even within its planned scope, ACReSAL is not a stand-alone project – it builds on the achievements of many previous and ongoing projects, of the World Bank and of other partners. Most importantly, no donor-financed project or initiative can be viewed in isolation but takes place in support of comprehensive federal and state-level government-led programs.

2. **This annex briefly mentions the lessons learned of related World Bank-financed projects in Nigeria.** A very few critical partner organization initiatives are noted but not in any comprehensive way. Finally, an overview is provided of the World Bank's overall programmatic approach to development challenges of northern Nigeria.

Predecessor and ongoing World Bank-financed dryland management projects

3. **The US$900 million NEWMAP** has been under implementation for close to a decade. NEWMAP introduced a holistic watershed management approach linking poverty alleviation with maintaining sustainable ecosystems and better disaster risk management. Within a catchment management framework, NEWMAP focuses investments on rehabilitating existing gully systems that pose major risks to infrastructure and people. The project has pioneered a highly participatory approach for gully rehabilitation, the blending of physical and vegetative soil and water conservation technologies to reduce investment costs and introduced an integrated livelihood component that has helped communities improve their economic welfare. Policy makers appreciate the value of an integrated approach, which can significantly reduce soil erosion and improve surface water management. NEWMAP is currently working in the northern and southern part of the country.

4. **The US$500 million Third National FADAMA Development Project for Nigeria focused on increasing the incomes for users of rural lands and water resources within selected areas in a sustainable manner throughout the Recipient's territory.** The original project (US$250 million) took place in 35 states and in the FCT. Since the original closing date of 2013, two rounds of additional financing of US$250 million allowed the project to put more focus on several conflict and non-conflict states. The project improved farm productivity performance of clusters of farmers engaged in priority food staples namely rice, cassava, sorghum, and horticulture. The project used a Community-Driven Development (CDD) approach. Local community members, through FADAMA Community Associations (FCAs) and FADAMA User Groups (FUGs), oversaw the design and implementation of the project and were empowered through skills and capacity-building to improve their livelihoods by increasing income generating activities. The FADAMA projects contributed to the reform of agriculture in the country, but the final Additional Financing support ended in 2019.

5. **The US$495 million TRIMING was approved in June 2014 and is ongoing.** It is establishing holistic basin-level water resources management strategies in northern states, rehabilitating major irrigation systems, integrating them with existing surface reservoir-based canal irrigation, and helping farmers improve productivity on irrigated lands. The project is operating in selected dams and irrigation schemes within: (a) the Sokoto-Rima river basin, in northwest Nigeria; (b) the Hadejia-Jama'are sub-river basin within the Hadejia-Jama'are-Komadugu-Yobe Basin in northeastern Nigeria; and (c) the Gongola River Basin in the Upper Benue sub-basin.

6. **The Livestock Productivity and Resilience Support Project (LPRES) (P160865) is under preparation.** This US$500 million project has the objective to improve the productivity of the livestock value chains and mitigate key drivers of the farmer-herder conflict. Both projects will contribute to peace building. When both projects will be operational in the same states or the same areas, careful coordination will ensure there are no overlaps in investments and that all activities are coordinated and complementary. Watershed planning and community resilience activities are expected to incorporate actions to promote and improve the sustainability and possibly the productivity of pastoral activities. Some ACReSAL investments will directly support the livestock sector – such as rangeland management under Subcomponent A2. L-PRES will help defining transhumance routes, grazing reserves, and the areas where pasture would be improved. These can then be integrated into the larger watershed planning as well as the smaller micro-watershed plans.

Other projects and initiatives

7. **The Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI or GGW)** is Africa's flagship initiative to combat the effects of above-described climate change and desertification in the Sahel and develop sustainable development pathways in this food-insecure region and its highly vulnerable populations and landscapes. Led by the African Union (AU), which represents the governments of all African nations, the initiative approved in 2007 aims to achieve a transformational change for millions of people by increasing resilience in the Sahara and the Sahel region through an integrated landscape approach.[76] The initiative initially promoted establishment of a 15 km wide and 8,000 km long belt of trees, extending from Senegal to Djibouti. It has subsequently evolved into the promotion of integrated approaches to management of dryland areas. The initiative in Nigeria, covering 11 frontline states in the north, is managed by a specific agency of FMEnv to give it greater visibility and impetus. With FAO's support, the AU has developed a regional harmonized strategy,[77] which includes the integrated landscape/Agriculture, Forestry and Other Land Use (AFOLU) approach, which is also aligned to all Sahelian countries' climate strategies: National Action Plans, Nationally Appropriate Mitigation Actions, and NDCs (FAO, 2018). ACReSAL is a part of the implementation of Nigeria's GGW.

8. **The FAO has been particularly active in dryland management projects in Nigeria, under the aegis of the GGW and under other initiatives.** For example, FAO has implemented a successful landscape restoration project which could be replicated under ACReSAL (under Subcomponent B2).

Programmatic approach to northern Nigeria

9. **The suite of investments noted above that collectively target the challenges of climate resilience in northern Nigeria must be complemented by parallel investments in other sectors.** Climate-resilience depend also on investments in human capital, in infrastructure, disaster risk management, and reducing

[76] In June 2010 the following 11 Sahelian countries signed a convention to implement the GGW: Burkina Faso, Chad, Djibouti, Eritrea, Ethiopia, Mali, Mauritania, Niger, Nigeria, Senegal and Sudan.

[77] *Harmonised regional strategy for implementation of the "Great Green Wall Initiative of the Sahara and the Sahel*" was achieved based on strong political will in the African continent to form an African partnership supported by international solidarity, to halt and reverse degradation of Africa's arid lands through a coherent and cooperative set of actions. FAO was one of the principal authors.

fragility, among others. The World Bank's CPF FY21-25 lays out the World Bank's programmatic approach, of which ACReSAL is one part.

10. **The CPF will enhance the preparedness of Nigeria to respond to natural hazards, climate risks, slow down desertification, and natural disasters, which undermine communities and livelihoods in the north of the country, fueling the fragility, conflict and migration crisis.** The project is at the intersection of the *"Climate Resilience", "Reducing Fragility"* and *"Transforming Agriculture*" engagement areas encompassed by the pillar and will benefit from the strategic policy dialogue and sector work sustained under these engagements. The project will also contribute to the other three pillars of the CPF as follows:

- *Promoting Jobs and Economic Transformation,* through an integrated approach that incorporates farm and non-farm livelihood support to poor and vulnerable groups;
- *Investing in Human Capital and Social Inclusion*, through capacity building at local levels for communities and community groups; and
- *Strengthening the Foundations of the Public Sector,* through the strengthening of government institutions to effectively plan and manage agro-climatic resilience programs.

11. **Selected World Bank-funded projects[78], complementary to ACReSAL, include the following** (see also the Country Context section above for additional World Bank projects in implementation or preparation in Nigeria):

- Community and Social Development Project (CSDP), P090644 and P148215 (AF), 2009 to present, US$340 million.
- Multi-Sectoral Crisis Response Project Additional Financing (MCRP), P157891, 2017 to present, US$200 million.
- Sustainable Urban and Rural Water Supply, Sanitation and Hygiene Project (SURWASH), P170734, under preparation, US$875 million.
- Accelerating Impacts of CGIAR Climate Research for Africa Project (AICCRA), P173398, 2021 to present, US$60 million.

[78] Complete information and documents on each of these projects is available by searching by P code or project name on the World Bank's public web site, https://projects.worldbank.org/en/projects-operations/projects-home.

ANNEX 9: Team Members

1. **The ACReSAL project was prepared jointly by a team from the GoN and from the World Bank.** The Government team was led by three Focal Points, each representing one of the three participating ministries: Salisu Dahiru (FMEnv), Cyril A. Bikom (FMARD), and Babarinde S. Mukaila (FMWR).

2. **Additional representatives of the GoN included the following:**

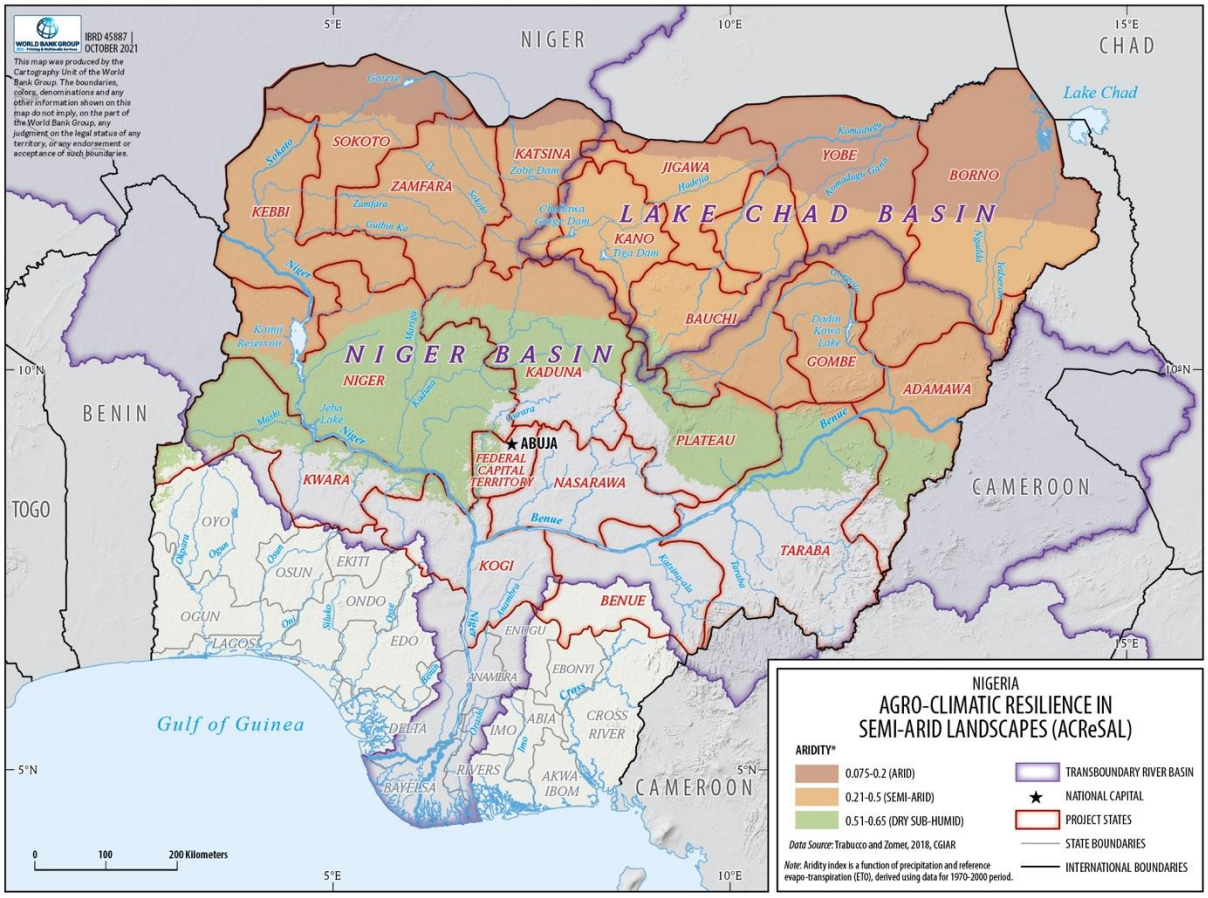
1.	Victor Ojiako	NIWRMC
2.	Sunday Idowu	NIWRMC
3.	Oghale Ruth Erezih	FMEnv
4.	Ifelola Olalekan	FCT, ARDS
5.	Oyewole Olanrewaju Simeon	NIMET
6.	Godstime James	NARSDA
7.	Daniel Okafor	NIMET
8.	John Gbadegsin	NIHSA
9.	Omobhude Kingsley	NIHSA
10.	Idris Shehu	NASRDA
11.	Emmanuel Bebiem	National Parks Service
12.	Kola Adekola Razak	Department of Forestry
13.	Dr Bukar Hassan	NAGGW
14.	Kalu Anna N.	FMARD
15.	Alabi Samuel	FADAMA
16.	Buba Godebe	PCU-FMARD
17.	Kunle	Dept. of Erosion Control
18.	Angela Kaigama	Nat. Planning Commission
19.	Mooreino Difftufe	Nat. Planning Commission
20.	Ukeni Aluuji	FMWR
21.	Oyakhirome Florence	FMWR
22.	Hassan Eniola	FMWR
23.	Moshood Aliu	FMEnv
24.	Efrom Gajere	NCRS
25.	Halima Bawa	FMEnv

3. **The World Bank's preparation team was led by: Joy Iganya Agene (Senior Environmental Specialist and TTL), Maurizio Guadagni (Senior Agricultural Specialist, and co-TTL), and Chinedu Umolu (Senior Water Resources Management Specialist, co-TTL).** Other core members of the World Bank's preparation team were Amos Abu (Senior Environmental Specialist and initial TTL), Winston Yu (Senior Water Resources Management Specialist, initially a co-TTL), Pier Mantovani (Sector Leader, Sustainable Development), Nagaraja Rao Harshadeep (Harsh) (Global Lead, Disruptive Technology), and Douglas J. Graham (Consultant, PAD preparation).

4. **Additional team members from the World Bank were the following:**

- Abiodun Elufioye (Program Assistant)
- Adebayo Adeniyi (Senior Procurement Specialist)
- Ahmed Abdullahi (Consultant, Environmental Safeguards)
- A.J. James (Consultant, Economic and Financial Analysis)
- Akinrinmola Akinyele (Senior FM Specialist)
- Anas Abba Kyari (Procurement Specialist)
- Arigu Kudu (FM Specialist)
- Ashutosh Raina (Social Specialist)
- Barbara Jordon Vicente (Food and Agriculture Organization, EFA Team)
- Bayo Awosemusi (Lead Procurement Specialist)
- Christopher Molokwu (Consultant, EFA)
- Elijah Abiodun Siakpere (Senior Social Development Specialist)
- Emmanuel Oladipo (Consultant, Institutional Assessment)
- Frank Fariello (Lead Counsel)
- George Ferreira Da Silva (Finance Officer)
- Halima Femi Pat Natson (Team Assistant)
- Halima Sarah McKenna Gellman (SEA/SH Specialist)
- Harriet Chinemerem Igwe (Operations Analyst)
- Jayne Kwengwere (Program Assistant)
- Kamakshi Nadisha Perera Mubarak (Social Specialist)
- Kenichiro Tachi (Senior Environmental Engineer)
- Lucky Erhaze (Consultant, Environmental Safeguards Specialist)
- Mansir Nasir (Senior External Affairs Officer)
- Martin Raine (Consultant, EFA)
- Mary Morrison (Senior Social Development Specialist)
- Moho Chaturvedi (Consultant, GHG Analysis)
- Morris Oyakhire Igene (Operations Officer)
- Nabil Antoun Joubran (Consultant, Engineer)
- Nikolas Myint (Senior Social Development Specialist)
- Nneka Okereke (Social Development Specialist)
- Olamide Bisi-Amosun (Young Professional, Natural Resources Management Specialist)
- Özgül Calicioglu (Young Professional, Clean Energy Specialist)
- Oznur Oguz Kuntasal (Senior Environmental Specialist)
- Petra Schmitter (Consultant, Senior Irrigation Specialist)
- Rachida OuroGbele (FAO, Cost Tables)
- Reid Cooper (FAO, Results Framework)
- Rohan Selvaratnam (Agriculture Analyst)
- Ruth Tiffer-Sotomayo (Senior Environmental Specialist)
- Stefano Pagiola (Senior Environmental Economist)
- Thomas Walton (Consultant, ESF)
- Victoria Esquivel-Korsiak (Senior Social Development Specialist)

ANNEX 10: Map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NIGER
CHAD
Lake Chad
SOKOTO
KATSINA
JIGAWA
YOBE
BORNO
ZAMFARA
KEBBI
LAKE CHAD BASIN
KANO
BAUCHI
NIGER BASIN
GOMBE
ADAMAWA
KADUNA
NIGER
BENIN
ABUJA
FEDERAL CAPITAL TERRITORY
PLATEAU
KWARA
NASARAWA
CAMEROON
TOGO
OYO
OSUN
EKITI
KOGI
TARABA
ONDO
BENUE
OGUN
LAGOS
EDO
ENUGU
EBONYI
ANAMBRA
Gulf of Guinea
DELTA
ABIA
IMO
CROSS RIVER
RIVERS
AKWA IBOM
BAYELSA
CAMEROON
0 100 200 Kilometers
NIGERIA
AGRO-CLIMATIC RESILIENCE IN SEMI-ARID LANDSCAPES (ACReSAL)
ARIDITY*
0.075-0.2 (ARID)
0.21-0.5 (SEMI-ARID)
0.51-0.65 (DRY SUB-HUMID)
Data Source: Trabucco and Zomer, 2018, CGIAR
Note: Aridity index is a function of precipitation and reference evapo-transpiration (ETO), derived using data for 1970-2000 period.
TRANSBOUNDARY RIVER BASIN
NATIONAL CAPITAL
PROJECT STATES
STATE BOUNDARIES
INTERNATIONAL BOUNDARIES