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Report No: PAD1001

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 319.7 MILLION
(US$495.3 MILLION EQUIVALENT)

TO THE

FEDERAL REPUBLIC OF NIGERIA

FOR

TRANSFORMING IRRIGATION MANAGEMENT IN NIGERIA PROJECT

May 27, 2014

Agriculture, Rural Development and Irrigation (AFTA1)
Sustainable Development Department
Country Management Unit AFCW2
Africa Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective April 30, 2014)

Currency Unit	=	Naira
NGN 162.1	=	US$ 1
US$ 1.54969	=	SDR 1

GOVERNMENT FISCAL YEAR
January 1 – December 31

Weights and Measures
Metric System

ABBREVIATIONS AND ACRONYMS

ADP	Agricultural Development Program
AEHE	Agricultural Equipment Hiring Enterprise
AfDB	African Development Bank
AgDPO	Agriculture Sector Development Policy Operation
ARCN	Agricultural Research Council of Nigeria
ATA	Agriculture Transformation Agenda
ATIC	Agriculture Transformation Implementation Council
AWF	African Water Facility
BES	Budget Execution System
BP	Business Policy
BIS	Bakolori Irrigation Scheme
CADP	Commercial Agriculture Development Project
CBN	Central Bank of Nigeria
CDD	Community-Driven Development
CFAA	Country Financial Accountability Assessment
CMC	Change Management Committee
CME	Chief Minister of the Economy
CMO	Catchment Management Office
CMP	Catchment Management Plan
CNA	Community Needs Assessment
CPS	Country Partnership Strategy
CSO	Civil Society Organization
DA	Designated Accounts
DCGE	Dynamic Computable General Equilibrium
DFID	UK Department for International Development
DKIS	Dadin Kowa Irrigation Scheme
DPL	Development Policy Loan
DROD	Dams & Reservoir Operations Department
EA	Environmental Assessment

EAP	Emergency preparedness Action Plan
ECOWAS	Economic Community of West African States
EFCC	Economic and Financial Crimes Commission
EIT	Extractive Industries Transparency Initiative
EMT	Economic Management Team
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FGN	Federal Government of Nigeria
FM	Financial Management
FMARD	Federal Ministry of Agriculture and Rural Development
FMC	Farmers' Management and Service Delivery Center
FMEnv	Federal Ministry of Environment
FMF	Federal Ministry of Finance
FMWR	Federal Ministry of Water Resources
FRL	Fiscal Responsibility Law
GDP	Gross Domestic Product
GEMS	Growth and Employment in States
GES	Growth Enhancement Scheme
GIFMIS	Government Integrated Financial Management Information System
GIS	Global Information System
GNP	Gross national Product
GoN	Government of Nigeria
GR	Asian Green Revolution
HA	Hydrological Area
Ha	Hectare
H-JKYB	Hadejia-Jama'are-Komadougou–Yobe Basin
HNW	Hadeija-Nguru Wetlands
HVIS	Hadejia-Jama'are Valley Irrigation Scheme
IBRD	International Bank for Reconstruction and Development
ICB	International Competitive Bidding
ICT	Information and Communications Technology
IDA	International Development Association
IFC	International Finance Corporation
IFPRI	International Food Policy Research Institute
IFR	Interim Financial Report
IMA	Irrigation Management Association
IMF	International Monetary Fund
IPF	Investment Project Financing

IPPT	Inter-ministerial Project Preparation Team
IR	Intermediate Results
ISP	Implementation Support Plan
ISR	Implementation Status and Results Report
ITRC	Irrigation Training Research Center
IUCN	International Union for the Conservation of Nature
IWMI	International Water Management Institute
IWRM	Integrated Water Resources Management
JICA	Japan International Cooperation Agency
KRIS	Kano River Irrigation Scheme
LCBC	Lake Chad Basin Commission
LDP	Letter of Development Policy
LGs	Local Governments
LGCs	Local Government Councils
LSMS	Living Standard Measurement Study
LUA	Land Use Act
LUAC	Land Use Allocation Committee
MDG	Millennium Development Goal
M&E	Monitoring and Evaluation
MGM	Matching Grant Mechanism
MIS	Management Information System
MOF	Ministry of Finance
MOU	Memorandum of Understanding
MRVIS	Middle Rima Valley Irrigation Scheme
MTEF	Medium-Term Expenditure Framework
NBA	Niger Basin Authority
NBS	National Bureau of Statistics
NCA	National Council on Agriculture
NCB	National Competitive Bidding
NCWR	National Council on Water Resources
NEPAD	New Partnership for Africa's Development
NEWMAP	Nigeria Erosion and Watershed Management Project
NGO	Non-Governmental Organization
NIC	National Irrigation Commission
NIHSA	Nigeria Hydrological Services Agency
NIMET	Nigeria Meteorological Agency
NIP	National Implementation Plan
NIPN	National Irrigation Policy for Nigeria
NIRSAL	Nigerian Incentive-based Risk Sharing for Agricultural Lending
NIWRMC	Nigeria Water Resources Management Commission
O&M	Operations and Maintenance

OP	Operational Policy
ORAF	Operational Risk Assessment Framework
PAD	Project Appraisal Document
PDO	Project Development Objective
PER	Public Expenditure Review
PFM	Public Financial Management
PHRD	Policy and Human Resources Development
PIM	Participatory Irrigation Management
PIMM	Project Implementation Management Manual
PMU	Project Management Unit
PoE	Panel of Experts
PPP	Public-Private Partnerships
PREM	Poverty Reduction and Economic Management Network
PS	Permanent Secretary
PSC	Project Steering Committee
RAMP II	Nigeria's Rural Access and Mobility Project
R&D	Research and Development
RBDA	River Basin Development Authority
RBMC	River Basin Management Commission
ROSC	Report on the Observance of Standards and Codes
RPF	Resettlement Policy Framework
RTGS	Real Time Gross Processing System
SBD	Standard Bidding Document
SCPZ	Staple Crop Processing Zones
SDR	Special Drawing Rights
SFPZ	Staple Food Processing Zones
SIL	Specific Investment Loan
SoSP	Statement of Sector Policy
SPRI	Small-scale Private Irrigation Schemes
SRFP	Standard Request for Proposal
SRRBA	Sokoto-Rima River Basin Authority
S-RSB	Sokoto-Rima Sub-Basin
TA	Technical Assistance
TRIMING	Transforming Irrigation Management in Nigeria
UBRBA	Upper Benue River Basin Authority
UNDP	United Nations Development Program
WHO	World Health Organization
WRB	Water Resources Bill
WRC	Water Regulatory Commission
WUA	Water User Association
WUAF	Water User Association Federation

Regional Vice President:	Makhtar Diop
Country Director:	Marie Francoise Mary-Nelly
Sector Director:	Jamal Saghir
Sector Manager:	Martien van Nieuwkoop
Task Team Leader:	David Casanova
Co – Task Team Leader:	Soulemane Fofana

NIGERIA
Transforming Irrigation Management in Nigeria (TRIMING) Project

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PAD DATA SHEET

Nigeria

Transforming Irrigation Management in Nigeria (P123112)

PROJECT APPRAISAL DOCUMENT

AFRICA

AFTA1

Report No.: PAD1001

Basic Information		
Project ID P123112	EA Category A - Full Assessment	Team Leader Juan David Casanova Anoll
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]	
Project Implementation Start Date 19-Jun-2014	Project Implementation End Date 30-Sep-2021	
Expected Effectiveness Date 01-Oct-2014	Expected Closing Date 30-Apr-2022	
Joint IFC No		

Sector Manager	Sector Director	Country Director	Regional Vice President
Martien Van Nieuwkoop	Jamal Saghir	Marie Francoise Marie-Nelly	Makhtar Diop

Borrower: FEDERAL GOVERNMENT OF NIGERIA	
Responsible Agency: Federal Ministry of Water Resources	
Contact:	Title:
Telephone No.: (234-80) 5969-2427	Email: ympeter@gmail.com

Project Financing Data(in USD Million)					
[ ]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[X]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	560.30	Total Bank Financing:	495.30
Financing Gap:	0.00		

Financing Source	Amount
BORROWER/RECIPIENT	44.00
International Development Association (IDA)	486.35
IDA recommitted as a Credit	8.95
LOCAL BENEFICIARIES	21.00
Total	560.30

Expected Disbursements (in USD Million)

Fiscal Year	2015	2016	2017	2018	2019	2020	2021	2022	0000
Annual	40.00	52.00	84.00	89.00	92.00	72.00	36.30	30.00	0.00
Cumulative	40.00	92.00	176.00	265.00	357.00	429.00	465.30	495.30	0.00

Proposed Development Objective(s)

To improve access to irrigation and drainage services and to strengthen institutional arrangements for integrated water resources management and agriculture service delivery in selected large-scale public schemes in Northern Nigeria.

Components

Component Name	Cost (USD Millions)
Component 1: Water Resources Management and Dam Operation Improvement.	108.00
Component 2: Irrigation Development and Management.	355.00
Component 3: Enhancing Agricultural Productivity and Support to Value Chains.	44.00
Component 4: Institutional Development and Project Management.	53.00

Institutional Data

Sector Board

Agriculture and Rural Development

Sectors / Climate Change

Sector (Maximum 5 and total % must equal 100)

Major Sector	Sector	%	Adaptation Co-benefits %	Mitigation Co-benefits %
Agriculture, fishing, and forestry	Irrigation and drainage	60	10	
Agriculture, fishing, and forestry	General agriculture, fishing and forestry sector	10		
Water, sanitation and flood protection	General water, sanitation	30	10	

	and flood protection sector			
Total		100		

☐ I certify that there is no Adaptation and Mitigation Climate Change Co-benefits information applicable to this project.

Themes

Theme (Maximum 5 and total % must equal 100)

Major theme	Theme	%
Public sector governance	Other public sector governance	20
Rural development	Rural services and infrastructure	40
Environment and natural resources management	Water resource management	40
Total		100

Compliance

Policy

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

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

Legal Covenants

Name	Recurrent	Due Date	Frequency
Computerized multi-project financial and accounting system		31-Dec-2014	

Description of Covenant

The recipient adapts a computerized multi-project financial and accounting system in a manner satisfactory to the Association and successfully train relevant staff in the use of it 3 months after project effectiveness.

Name	Recurrent	Due Date	Frequency
Appoint independent auditors		31-Dec-2014	

Description of Covenant

Appoint not later 3 months after project effectiveness independent auditors with qualifications, experience and terms of reference satisfactory to the Association.

Name	Recurrent	Due Date	Frequency
Training PMU and FPFMD staff		31-Oct-2014	

Description of Covenant

The recipient shall no later than 1 month after effectiveness date train relevant staff within the PMU and FPFMD on the Association's financial management procedures and disbursement guidelines in a manner satisfactory to the Association.

Name	Recurrent	Due Date	Frequency
Train of PMU staff		31-Dec-2014	

Description of Covenant

The Recipient shall, no later than three (3) months after the Effective Date, (a) train the procurement staff of the PMU in the use of the Association’s procurement tracking system (b) establish a procurement records management system and successfully train relevant staff in the use thereof and (c) organize contract administration training for the procurement staff of the PMUin a manner satisfacto

Name	Recurrent	Due Date	Frequency
Remaining staff of the PMU		01-Nov-2014	

Description of Covenant

The PMU staff shall be complemented by a water resources management specialist, an agribusiness specialist, a M&E specialist, a communications specialist, a data & information specialist and an internal auditor at the latest one month after effectiveness.

Conditions

Source Of Fund	Name	Type
IDA	Adoption of Project Implementation Manual	Effectiveness

Description of Condition

Source Of Fund	Name	Type
IDA	Establishment of Change Management Committee	Effectiveness

Description of Condition

Team Composition

Bank Staff

Name	Title	Specialization	Unit
Adebayo Adeniyi	Senior Procurement Specialist	Procurement	AFTPW
Oyewole Oluyemi Afuye	Procurement Specialist	Procurement	AFTPW
Lucas Kolawole Akapa		Operations	AFTA1
Akinrinmola Oyenuga Akinyele	Sr Financial Management Specialist	Financial Management	AFTMW
Joseph Ese Akpokodje	Senior Environmental Institutions Specialist	Environment	AFTN1
Guy J. Alaerts	Lead Water Resources Specialist	Water Resources	ECSAR
Volana Andriamasinoro	Program Assistant	Program Assistant	AFTA1
Bayo Awosemusi	Lead Procurement Specialist	Procurement	AFTPW
Katherine A. Bain	Senior Governance Specialist	Governance	AFTP3
Alexandra C. Bezeredi	Regional Environmental and Safeguards Advisor	Environment & Social Safeguards	AFTSG
Jacob Burke	Lead Irrigation Specialist	Irrigation	TWIWA
Juan David Casanova Anoll	Sr Water Resources Mgmt. Spec.	Team Lead, Water Resources Management	AFTA1
Hocine Chalal	Lead Environmental Specialist	Environment	AFTN1
Sateh Chafic El-Arnaout	Sector Leader	Sector Coordination	AFTSN
John A. Elder	Operations Adviser	Operations Adviser	AFTDE
Abiodun Elufioye	Program Assistant	Program Assistant	AFCW2
Achim Fock	Manager	Agriculture Economist	SARDE
Soulemane Fofana	Senior Rural Development Specialist	Rural Development	AFTA1
Michael Gboyega Ilesanmi	E T Consultant	Social Development	AFTCS
Ogo-Oluwa Oluwatoyin Jagha	Senior Operations Officer	Monitoring and Evaluation	OPSRE
Aisha Donald Kaga	Senior Executive Assistant	Executive Assistant	AFCW2

Indira Konjhodzic	Country Program Coordinator	Program Coordination	AFCNG
Jonathan Mills Lindsay	Lead Counsel	Land law	LEGEN
Seenithamby Manoharan	Senior Rural Development Specialist	Irrigation	SASDL
Marie Francoise Marie-Nelly	Country Director	Country Director	AFCW2
Stephen D. Mink	Lead Economist	Agriculture Economist	AFTA1
Kabiru Ali Muhammed	Team Assistant	Team Assistant	AFCW2
Nneoma Veronica Nwogu	Counsel	Counsel	LEGAM
Juvenal Nzambimana	Senior Operations Officer	Operations Quality	AFTA1
Magdalene O. Odubor	Team Assistant	Fiduciary Assistant	AFCW2
Chita Azuanuka Oje	Program Assistant	Program Assistant	AFTG1
Bamidele Emmanuel Oladokun	Public Information Associate	Communications	AFREC
Francois Onimus	Sr Water Resources Spec.	Irrigation	AFTA3
Uchenna Prince Onyebuchi	Consultant	Monitoring and Evaluation	AFTDE
Knut Opsal	Lead Social Development Specialist	Social Development	AFTCS
Sheu Salau	Agric. Economist	Agriculture Economist	AFTA1
Luis M. Schwarz	Senior Finance Officer	Disbursement	CTRLA
Shobha Shetty	Sector Manager, Rural Development	Rural Development	SASDL
Joop Stoutjesdijk	Lead Irrigation Engineer	Irrigation	SASDA
Obadiah Tohomdet	Senior Communications Officer	Communications	AFREC
El Hadj Adama Toure	Lead Agriculture Economist	Agriculture Economist	AFTA1
Satoru Ueda	Lead Dam Specialist	Dam Specialist	TWIWA
Martien Van Nieuwkoop	Sector Manager	Sector Management	AFTA1
Michael D. Wong	Lead Private Sector Development Specialist	Private Sector Development	AFTFW
Kazuhiro Yoshida	Sr Irrigation Engineer	Irrigation	AFTA1

Non Bank Staff

Name	Title	City

Yesuf Abdella	Rural Engineer, FAO Investment Center	Rome
Jonathan Denison	WUA specialist	East London
Theodore Herman	Dam Safety Specialist	Ra'anana
Ernst Lutz	Economist, Consultant	
Christopher Molokwu	Agricultural Economist	
Juan Morelli	Economist	Montevideo

Locations

Country	First Administrative Division	Location	Planned	Actual	Comments

I. STRATEGIC CONTEXT

A. COUNTRY CONTEXT

1. **Nigeria has experienced a decade of growth and relative stability**, and it achieved significant progress in sound macroeconomic management. Nigeria is highly dependent on oil. Oil and gas account for over 90 percent of exports and nearly 75 percent of consolidated government revenues. Despite the high economic growth, Nigeria must find a formula to translate its resource wealth into significant welfare improvements for the population. The country has a per capita gross domestic product (GDP) of US$4,016 (2012), an inflation rate of close to 10 percent, a 46 percent poverty rate, and low social indicators. Over 40 percent of the population lives below the poverty line, and an estimated 45 percent of the working age population is either unemployed or officially out of the workforce.

2. **Increasing the competitiveness of the agricultural sector, achieving higher productivity, and raising incomes sustainably for the large share of the labor force working in the agricultural sector will have an immediate impact on reducing the number of people living below the poverty line**. A recent study by IFPRI analyzed growth options in agricultural sub-sectors for meeting a six percent annual growth target for the sector in order to accelerate overall economic growth and reduce poverty in Nigeria between 2009-2017, using an economy-wide, dynamic computable general equilibrium (DCGE) model[1]. The study identified significant potential for agricultural growth and poverty reduction through sector policies and investment, particularly those fostering improved productivity in food staples. One of the conclusions from the study is that Nigeria is unlikely to meet Millennium Development Goals (MDG) under its current growth path unless there is a significant improvement in agricultural productivity and efficiency of public spending.

3. **The Federal Government launched an Agriculture Transformation Agenda (ATA) in 2011** that combines institutional reforms with key public investments aimed at connecting markets and supporting the expansion of the private sector and productivity growth in a number of prioritized food staple value chains.

4. **Irrigation development has long been considered essential to the sustainable growth of agricultural production in Nigeria.** The country has an estimated 2.1 million ha potentially irrigable area, of which over 1 million ha are in the north, while currently irrigated area is only approximately 200,000 ha. Creating a more efficient water management approach has the potential to substantially increase rural production, incomes and employment opportunities.

5. **Vision 20:2020 contains the country's ambition to become one of the top twenty economies in the world by 2020**, focusing on two broad objectives: (i) optimize the country's human and natural resource potential to achieve rapid and sustained economic growth, and (ii) translate economic growth into equitable social development that guarantees a dignified and

[1] Diao, X., M. Nwafor, V. Alpuerto, K. Akramov, and S. Salau. 2010. Agricultural Investment for Growth and Poverty Reduction in Nigeria; IFPRI Discussion paper 00954.

meaningful existence for all its citizens. The program of the current government, the 2011 Transformation Agenda, building on the Vision 20:2020, assigns top priority to job creation and addressing infrastructure constraints to growth, notably in power and transportation, and also includes far-reaching reforms in agriculture and the oil and gas industries.

6. **The country vision is complemented by state-level development strategies**. Nigerian states operate with a high degree of legal and *de facto* autonomy in the areas of service delivery, internal organization, and revenue generation, which coexists with a stronger federal mandate in the areas of public order (police, military and security institutions), federal control over sub-national borrowing, and appointments in the judiciary.

7. **A number of the states in the North of the country, including some states in which investments under this credit are proposed, continue to be affected by conflict.** Since the Boko Haram attacks of 2009, the group has been responsible for the death of at least 5,000 people. Most attacks for which Boko Haram has taken responsibility have taken place in Northern Nigeria. The geographical area of coverage of these attacks is centered on the Grain Belt and other areas, which could most benefit from the Transforming Irrigation Management in Nigeria (TRIMING) project. Agriculture has a potential to increase employment and improve livelihoods and is thus vital to the restoration of stability to the region.

B. SECTOR AND INSTITUTIONAL CONTEXT

8. **Agriculture is an important part of the Nigerian economy,** being the third largest sector and accounting for 22 percent of the GDP in 2012. With the large share of the population involved in agriculture, it is also the largest employer in the country. However, agriculture still remains largely uncompetitive in major crops when compared with international markets. Overall economic growth for the 2011-13 period was 6.4 percent, while agriculture only grew by 2.6 percent. In a departure from past government interventions, the current sector strategy is focused on improving value chains of specific, targeted, agricultural commodities, with an important role for the private sector to take the lead in the management of many aspects of these value chains.

9. **The government sees its Agricultural Transformation Agenda (ATA) as a major tool to drive rural income growth, accelerate achievement of food and nutritional security, and generate employment.** The agriculture sector reform aims to increase productivity, but also trade and investment linkages and expanding value addition to locally produced agricultural products. The ATA aims to do so through engaging with large numbers of small farms, including reaching agricultural areas least favored by rainfall and market access, where poverty is also the greatest. Successful reform in this sector is expected to create over 3.5 million jobs by 2015.[2] Existing challenges include limited access to the necessary productivity-enhancing inputs, due to the inadequate investment in agricultural research and development, limited private investment in developing improved seeds and fertilizers, the insufficient availability of improved technologies to farmers, use of various information and communication technology (ICT) enhanced tools, as well as lack of knowledge about their use.

[2] Mid-Term Report of the Transformation Agenda (May 2011-May 2013): Taking Stock, Moving Forward, NPC, 2013.

Value chains remain underdeveloped due to poor infrastructure, a lack of finance for agriculture, and dearth of market information. Significant deficiencies in large-scale dam and irrigation infrastructure negatively impact agricultural productivity, notably in the North where the bulk of Nigeria's dam and irrigation infrastructure is located.

10. **Reaching the ATA goals requires an ambitious policy and institutional reform agenda, and transformation in public irrigation should play an important role.** The proposed TRIMING Project seeks to serve as a catalytic operation to support the reform process, focusing on improving large-scale public irrigation in Northern Nigeria where it can make a contribution to agricultural production and growth, as well as rural poverty reduction.

Irrigation Subsector

11. **Irrigation development has long been considered essential to the sustainable growth of agricultural production in Nigeria.** The country has an estimated 2.1 million ha of potentially irrigable area, of which over 1 million ha are in the North. Of a total of 624,408 ha planned for irrigation in 2004, only an estimated 293,117 ha has been equipped for irrigation and only 218,840 ha has actually been cropped[3] (see Table 1).

12. **Since the 1970s, when the Federal Government of Nigeria (FGN) embarked on a substantial investment program, the sector has witnessed a number of reform efforts resulting in a plethora of institutions and new policy papers and commitments but continues to face significant constraints to improved performance.** Dam construction and formal large-scale surface irrigation schemes started in the 1970s and the Sokoto-Rima (S-R) and Hadeija-Jama'are (H-J) River Basin Development Authorities (RBDAs) accounted for most of the cropped irrigated area and seven of the largest dams in Nigeria.

Table 1: Equipped and actual irrigation areas

Scheme Type	Equipped Area (ha)	Actually irrigated (ha)	Actually irrigated as percent of equipped area (%)
River Basin Development Authorities	92,317	29, 140	32
State schemes	12,200	6,700	55
Private sector – sugar schemes	5,600	0	0
Private small-scale schemes	128,000[4]	128,000	100
Improved fadama (equipped lowland)	55,000	55,000	100
TOTAL	**293,117**	**218,840**	**75**

The existing irrigated area is thinly spread, mainly in narrow strips flanking the rivers. Nevertheless, the one percent of land that is irrigated produces 4.4 percent of the value of Nigeria's agricultural produce.

13. **Between 1998 and 2007, a number of policy documents were produced** including the National Water Resources (NWR) Policy, drafts of National Irrigation Policy, Water

[3] As described in the FAO 2004 Review of the Public Irrigation Sector in Nigeria (ROPISIN) Report. The area irrigated by small pumped tube-wells was based on the Bank-supported Fadama 1 Project.
[4] Estimate is too high and there is likely double counting with the non-equipped flood recession cropping area.

Resources Infrastructure Operation and Maintenance policy, and the final Report of the Water Resources Strategy. An attempt to establish an independent regulatory commission with clear powers and an enabling Act called the Nigeria Integrated Water Resources Management Commission (NIWRMC), only partially succeeded when the President refused to sign the Bill approved by the National Assembly till it lapsed. The NIWRMC exists today borrowing from extant laws and regulations but without the framework it needs to fully take off. The NWR Policy and Strategy is the foundation of the NWR Bill that is presently being prepared for the National Assembly. It builds on much of the earlier work and is consistent with the global principles of Integrated Water Resources Management (IWRM). Key features of the Bill include (a) assigning regulatory responsibilities to the NIWRMC and the water resources development to RBDA, and (b) promoting stakeholder participation in water management such as WUAs.

14. **Notwithstanding the intentions behind these reform efforts, many have not borne fruit or have enjoyed limited success.** As a result, a number of governance challenges continue to impede the sector. These can be divided into three inter-related types of challenges:

(a) **A number of institutions with overlapping and duplication of mandates which are controlled by the Federal Government with poor coordination.** This has resulted in a preference for massive, multi-state, multi-year infrastructure procurements without paying sufficient attention to subsequent operations and maintenance. The multiplicity and frequent reconfiguration (in number and function) of agencies and institutions has, in turn, led to lack of a coherent irrigation subsector development policy and legal framework exacerbated by piecemeal planning, political interference in their management and institutions that are both service deliverers and regulators at the same time. Board and oversight mechanisms have been set up but, rather than provide regulation or accountability, these have proved to be cumbersome, expensive, and ineffective. The poor coordination between RBDAs and other agencies, particularly the Ministry of Agriculture has been weak.

(b) **Weak Stakeholder Ownership and limited local autonomy.** The voice of Water User Associations (WUAs) has traditionally been weak from design to operation and maintenance of irrigation projects, as these have tended to be top-down. Participatory Irrigation Management (PIM) principles, even though gaining in recognition, are yet to be institutionalized as the guiding philosophy for the sector, and participation of stakeholders continues to be weak. The WUAs, in particular, do not see sufficient incentive to keep paying and much less to pay higher rates if they do not first see better water delivery and higher yields due to improvements in farming support services along the value chain, and, in some cases there remains a perception that government should take charge of providing farmers with water for free.

(c) **Weak financial sustainability.** Contributions of funds from users (including those outside the irrigation sector), along with the politicization of the RBDAs, has been responsible, in part, for the inadequate operations and maintenance (O&M). RBDAs are sometimes distracted from their core mandate of water provision for irrigation, since some of their funds are used for other activities, making up 66 percent of the overall

budget of an RBDA (see Annex 10 for a review of public expenditures in the RBDAs where the project intends to work).

15. **To address these problems, transformative change is required and has started. Since 2006, some steps towards the building of some consensus around the reform agenda in the irrigation sector have been taken, and there is increasingly strong leadership and cooperation for this.** There has been recognition of the failure of previous reform efforts and a resolve that significant changes and transformations (such as related to O&M) are essential to achieve real reform and avoid further decay of the sector. In this respect, three periods can be distinguished:

- **The 2006-13 period involved building consensus**. This included the realization that irrigation development had not gone well in the past, that farmers were not well served, and that production from irrigated lands was even decreasing. Thus, the consensus-building included the acceptance of failure of previous schemes and a resolve that significant changes and transformations (such as related to O&M) are essential to achieve positive change on one hand and that without transformative changes, continued and fast deterioration may be unavoidable on the other hand. As an important step forward, a MoU between the Ministry of Agriculture and Rural Development (FMARD) and the Federal Ministry of Water Resources (FMWR) was signed in October 2013 (attached as Annex 8) to strengthen the collaboration in support of the ATA.

- **In 2014 specific reforms at the intervention sites are proposed/required under this Project**. A Statement of Sector Policy (SoSP) for Large-scale Public Irrigation Schemes was signed and a legal "delegation of authority for the selected schemes" from the FMWR, based on 1993 Water Act (101), to Transfer Tertiary Irrigation and Drainage Facilities to registered WUAs was issued and is presented as Annex 7. The latter enables WUA transformation and related processes with immediate effect while the National Water Resources Bill is due for consideration by the National Assembly. This legal statement provides for key transformative institutional approaches that are already contained in the draft Bill.

- **In 2015, or as soon as the new National Water Resources Bill has been passed, comprehensive reforms will be undertaken nationwide.** The proposed Project is a pilot fully aligned with the reforms contained in the draft bill. Legal Delegations have been issued that are in line with key provisions of the draft Bill and which apply to the three RBDAs where project activities will take place.

16. **Four key conditions are required for the proposed Project to be able to succeed in its expected transformational role**:

(a) **Government commitment** to financial sustainability and institutional reforms;
(b) **Accountability of irrigation agencies to farmers**; this includes a commitment from agencies to provide satisfactory services;
(c) **Participation of water users through empowered Water User Associations,** which set and collect fees and also make spending decisions; and
(d) **Farmers' willingness and ability to pay O&M fees**.

17. **The project will make these principles, which are aligned with the draft Bill, actionable by:** (i) improvement of the RBDAs' management performance including O&M; (ii) implementation of a change for a real decentralized and client-oriented management approach for each irrigation scheme; (iii) implementation of a pay-user approach based on payee "voice and choice" in scheme irrigation management and operating budget prioritization; (iv) a better allocation of responsibilities between irrigators and the scheme operating agency; and (v) improving the income of farmers and thereby the capacity to pay for better water services.

C. HIGHER LEVEL OBJECTIVES TO WHICH THE PROJECT CONTRIBUTES

18. **Worldwide evidence** suggests that creating jobs and livelihood opportunities is one of the most effective ways to address the underlying grievances and perceptions of exclusion that drive conflict and insecurity. The majority of the population of Nigeria's Northern States relies directly or indirectly on agriculture for its livelihood (80 percent of the population is involved in farming, fishing, or livestock rearing). The proposed TRIMING Project has the potential to substantially increase rural production, incomes and employment opportunities, by changing the approach by which public irrigation schemes operate. The Project will improve irrigation on 50,000 ha, develop an additional 23,000 ha of irrigated land (an 85 percent increase), for more than 140,000 farmers, and to generate an additional 37 MW of power by the year 2017 with more than 1.0 million direct beneficiaries and crowding in private sector participation. Further, the agricultural output of this project is estimated at 400,000 tons of rice and 700,000 tons of tomato per year when the project is completed. In addition, the Project will also reduce public safety risks posed by five large dams in the Northern States by providing flood risk reduction measures benefiting more than 10 million people.

19. **The Bank's Country Partnership Strategy (CPS) for FY14-17[5] aims to support poverty reduction and shared prosperity in Nigeria, with a clearly articulated approach to Northern Nigeria**. The CPS program is structured around three strategic clusters: (a) *promoting diversified growth and job creation* by reforming the power sector, enhancing agricultural productivity, and increasing access to finance; (b) *improving the quality and efficiency of social service delivery* at the state level to promote social inclusion; and (c) *strengthening governance and public sector management*, with gender equity and conflict sensitivity as essential elements of governance. The TRIMING project supports the objectives of the First strategic cluster, specifically, outcomes related to building sustainable agricultural development and market access. The CPS recognized that in order to sustain recent growth in the agriculture sector and its significant contribution to a robust growth in non-oil economy (largely driven by expansion in cultivated areas), there is a significant need to increase agricultural productivity. Increases in agricultural productivity are only possible when farmers have adequate access to and adopt agricultural technologies, improve the use of irrigation, and have good marketing opportunities. The World Bank's current portfolio including the CADP, FADAMA, AgDPO, WAAPP, NEWMAP, the PPP and SCPZ Projects directly respond to this by supporting increased production along with policy and institutional reforms.

[5] Approved April 24, 2014.

20. **In addition to the AgDPO, the World Bank is supporting the ATA with a portfolio of four other operations**: the Commercial Agricultural Development Project (CADP), the FADAMA series of operations, the West-African Agriculture Productivity Project (WAPP) and the Staple Crop Processing (SCPZ) Project under preparation expected to be approved by the Board in FY15. The Nigeria Erosion and Watershed Management Project (NEWMAP) improving natural resources management and the Public Private Partnership (PPP) project promoting PPP and leveraging private sector investment are also related to this project.

21. The **CADP** aims to strengthen agricultural production systems and facilitate access to market for targeted value chains among small and medium-scale commercial farmers in the five participating states Cross River, Enugu, Kaduna, Kano, and Lagos. The value chains being supported are rice, oil palm, cocoa, fruit trees, poultry production, aquaculture, and dairy, with maize and rice as staples.

22. The **Third National FADAMA Development Project** for Nigeria is to increase the incomes for users of rural lands and water resources within the Fadama areas in a sustainable manner throughout the country's territory. The recently approved additional financing will focus on improving farm productivity performance of clusters of farmers engaged in the priority food staples rice, cassava, sorghum, and horticulture in six selected states with high potential (Lagos, Niger, Kano, Koji, Enugu, and Anambra).

23. The planned **SCPZ Project** is also an important component of ATA. It includes the construction, development and operation of agro-processing clusters located in areas of high-food production across the country. It will facilitate agro-processing infrastructure that will be used to attract private sector investments into the local production and processing of Nigerian agricultural produce and adding value to local agriculture produce to serve the vast and growing local market.

24. **The TRIMING Project is part of a balanced portfolio which will directly support key cross-cutting priorities in the water and agricultural sectors that are identified in the CPS**. These include promoting reforms and increasing agricultural productivity, where the CPS places a strong emphasis on innovative approaches and on strengthening of systems. The CPS also notes that emphasis will be placed on strengthening water-related institutions, building state and national capacity for management of irrigation systems, as well as decentralized irrigation management.

II. PROJECT DEVELOPMENT OBJECTIVE

25. The Project Development Objective (PDO) should be seen within the transformative approach described above.

A. PDO

26. The Project Development Objective is to improve access to irrigation and drainage services and to strengthen institutional arrangements for integrated water resources management and agriculture service delivery in selected large-scale public schemes in Northern Nigeria.

B. PROJECT BENEFICIARIES

27. The main actors of the project include basin stakeholders, irrigation and drainage entities, water users associations, farmers, and villagers in the project areas. Through the direct infrastructure investments (covering about 50,000 ha) and concomitant activities in agriculture and on-farm water management focused in these areas, approximately 140,000 farm families with over 1 million people will directly benefit. Moreover, the project is expected to strengthen five Water User Associations Federations (WUAF), comprising 550 multiple secondary and tertiary level WUAs servicing and representing the beneficiary farmers. The Flood Emergency Information System and flood forecasting tools to be developed for the three basins are expected to benefit a population of about 10 million people. Finally, some activities are targeted towards strengthening integrated water resources management across States and improve upstream and downstream dialogue.

C. PDO LEVEL RESULTS INDICATORS

28. The PDO level result indicators of the TRIMING Project are the following (more details are given in Annex 1):

- Area provided with improved irrigation and drainage services (hectares);
- Irrigation fee recovery rate by WUAs (percentage, total amount collected from users in one fiscal year divided by the total amount billed that same year)[6];
- Cropping intensity (percentage, irrigated area divided by the irrigation area equipped); and
- Direct project beneficiaries (number), of which female (percentage).

29. The Intermediate Results (IR) Indicators for Component 1 are:

- IR Indicator One: Dams rehabilitated meeting international safety standards (number);
- IR Indicator Two: Staff trained in dam safety assurance (number);
- IR Indicator Three: Rivers with discharge gauging stations (number); and
- IR Indicator Four: Channel carrying capacity improved, and riparian population protected against flooding (number).

30. The Intermediate Results (IR) Indicators for Component 2 are:

- IR Indicator Five: WUAs operational (number, an operational WUA is a WUA that is registered with acceptable bylaws);
- IR Indicator Six: Farmers actively participating in WUA affairs (i.e. paying part or all of their dues –percentage-); and
- IR Indicator Seven: Apex WUAs/WUA Federations (WUAFs) and RBDAs jointly managing fund for financing maintenance of the transmission infrastructure (number).

[6] This indicator was selected to measure the effectiveness of 'strengthened institutional arrangements' incl. the associated capacity building.

31. The Intermediate Results (IR) Indicators for Component 3 are:

- IR Indicator Eight: Farmers and other beneficiaries reached with new technology and input-output support (number, of which percent are women);
- IR Indicator Nine: Yield of primary agricultural products (rice, maize, tomatoes) (percent increase); and
- IR Indicator Ten: Commercial partnerships established with off-takers (number).

32. The Intermediate Results (IR) Indicator for Component 4 is:

- IR Indicator Eleven: Project monitoring and publically disseminated scorecards for each scheme are debated annually, drawing on an information system which facilitates information on reform progress, results and resources.

III. PROJECT DESCRIPTION

A. PROJECT COMPONENTS

33. The total project cost is US$560.3 million (including physical and financial contingencies), US$495.3 million from IDA out of which US$8.95 million is IDA recommitted as credit, US$21 million from beneficiaries, and US$44 million from FGN.

34. The following **criteria were used to select the schemes to be rehabilitated:**

- Availability of land/soil suitable for gravity command;
- Size 2,000 ha/scheme or above to avoid fragmentation;
- Reliable water resources without creating major conflict to other users and uses;
- Farmer occupier land tenure system preferred;
- Existing schemes requiring rehabilitation for maximum leveraging of sunk cost; and
- Not involving significant resettlement, with only minor land acquisition in connection with irrigation infrastructure required.

Table 2: Selected Project Areas.

Basin (hydrological area)	**Sub-basin**	**Intervention Sites**
Niger North	Sokoto	Bakolori Irrigation Scheme
	Rima	Middle Rima Valley Irrigation Scheme
Lake Chad	Hadejia Jama'are	Kano River Irrigation Scheme
		Hadejia Valley Irrigation Scheme
Upper Benue	Gongola	Dadin Kowa Irrigation Scheme

35. More details on the selection process and criteria are provided in Annex 2. Table 2 above shows in a schematic way where the TRIMING Project intends to work: three basins (hydrological areas), four sub-basins, and five irrigation schemes.

36. There **are three fundamental principles agreed to be followed at each scheme** where TRIMING will work: **(i) Autonomy at the Scheme Level to ensure full O&M cost**

recovery; (ii) Participatory Irrigation Management (PIM) to empower WUAs organizations and ensure accountability; and (iii) Enhanced support to farmers' productivity.

37. The project strategies for the establishment of **autonomous irrigation management structures at scheme level are to define contractual arrangements** involving the RBDA, the WUAs, and where appropriate, a professional third party to formalize performance of the irrigation and drainage services, and ensure financial accountability on funds contributed for O&M.

38. There are three organizational levels (see more details in Annex 9) that follow from the hydraulic nature and strategic importance of the irrigation system:

(a) **Distribution** means that part of the irrigation scheme which is managed and operated by the WUAs themselves and always includes the tertiary canals and drains, and which may include higher-level canals depending on the capacity on the WUA. The WUAs will receive technical assistance to organize the O&M of the Distribution infrastructure and collect contributions from their members to cover the related costs. Thus, instead of fees that are sent to Abuja like a tax, these fees will, in the future, stay at the scheme level to cover O&M.

(b) **Transmission** includes the bulk water conveyance system from the dam to the upstream end of the distribution system, and the corresponding drainage works. For O&M of the transmission and distribution systems, various options have been formulated requiring different legal instruments to give effect to these (see Annexes 2 and 9). This can be under a co-management, special purpose vehicle, and/or public private partnership (PPP) approach.

(c) **Storage** includes large dams and reservoirs which have broad public benefits and substantial safety issues and whose O&M will therefore remain with the RBDA.

Table 3: Organizational levels from the hydraulic nature of the irrigation systems.

Level	Organization in charge	Main service objectives
Distribution	WUAs (several levels of organization)	Equitable distribution Fee collection
Transmission	Operator (different options)	Reliable bulk water supply Efficiency
Storage	RBDA (Dam Department)	Water resources allocation Public safety

39. In each scheme selected for rehabilitation, in addition to the works needed to ensure dam safety and the rehabilitation of the irrigated area to become fully operational: (i) a technical assistance (TA) for developing participatory irrigation management (PIM) is envisaged, as well as (ii) a TA for developing a Farmers' Management and Service Delivery Center (FMC) to support irrigated agronomy in order to improve productivity of the scheme. Furthermore, support in institutional development and capacity building is envisaged at local as well as RBDA and national levels. Subsequent paragraphs provide a detailed description.

40. The Project consists of four components. These are linked with each other. The main thrust of the project is Component 2 with the aim of rehabilitating public irrigation schemes. This needs to be complemented with improvements in dams/reservoirs via Component 1 to assure integrated water management and to improve safety for people downstream. Component 3 is helping to increase agricultural productivity of the irrigated lands as well as with the processing and marketing side of the increased output. Finally, Component 4 is essential for capacity building and managing the three components.

Component 1: Water Resources Management and Dam Operation Improvement (US$97 million, out of which US$81 million IDA)

41. This Component is part of the support for the transformative water resources sector institutional reforms covering policies, enabling legislation, regulatory instruments, organizational restructuring and dam safety assessment procedures currently being formulated for enactment by the FGN. It includes two subcomponents:

Subcomponent 1.1: Support to Integrated Water Resources Management (US$37 million)

42. This Subcomponent will be implemented by the PMU in collaboration with the NIHSA, NIMET and RBDAs. It will support the piloting of anticipated provisions for separation of government regulatory and operational powers and responsibilities for integrated water resources management (IWRM) of river basin-wide water allocation, river flow control, and channel maintenance needed for sustainable bulk water supply and drainage for large public irrigation scheme planning, development, and operational management.

43. Activity 1.1.1 'Integrated Basin Resources Planning and Monitoring Systems Improvement', would support the following improvements: hydrological and meteorological data collection infrastructure in Hydrological Areas 1 and 8; meteorological network and hydrological monitoring coverage and instrumentation upgrading; groundwater monitoring improvements; institutional capability for sustainable water resources monitoring systems; and data archiving and access.

44. Under Activity 1.1.2, 'IWRM Bill/Act Implementation Support in Selected River Basins', the Project would support more detailed analysis and a schedule of implementation actions for existing Catchment Management Plans (CMPs) prepared for the NIWRMC in the following two basins: Sokoto-Rima Basin and the Hadejia-Jama'are Sub-Basin.

45. Activity 1.1.3 would support investments in essential river channel works and maintenance in the above-mentioned basins to: (i) protect communities against damages from flooding caused by high dam spillway discharges; and (ii) mitigate impacts on downstream riparian communities of reduction of dry season river flows due to water abstraction for existing irrigation schemes served by the dams. In the Gongola river basin of the Upper Benue Hydrological Area HA 3, such works would be supported for proposed irrigation development downstream of Dadin Kowa dam.

Subcomponent 1.2: Dam Operations Improvement and Safety (US$60 million, out of which US$44 million IDA)

46. This subcomponent will be implemented by the PMU in collaboration with the Department of Dams & Reservoirs Operation Department (DROD) of FMWR and the RBDAs. It covers selected dams and reservoirs including: Bakolori, Zobe, Goronyo, Tiga, Challawa Gorge, Ruwan Kanya operational reservoir, Hadeija Barrage and Dadin Kowa. It comprises four principal activities.

47. *First*, major investments for ensuring the sustainable operational safety of each large dam and its ancillary headwork structures in selected RBDAs via: (a) remedial civil works (embankments and spillways); (b) repair/refurbishment or replacement of hydro-mechanical and electrical equipment and controls; and (c) improvement of dam safety monitoring by repair or replacement of dam monitoring instrumentation and facilities for observation and measurement of dam embankment.

48. *Second*, dam operational improvements consisting of: (i) an adequate O&M Plan and updating of the dams' overall O&M Manual; (ii) undertaking a reservoir bathymetric survey to determine reservoir sedimentation loss and, its current reservoir elevation-volume-area curve needed for modifying reservoir operation rules, frequency of spillway discharges and reservoir foreshore limits for given reservoir inflows, as well reservoir sediment accumulation near dam water intakes to determine their potential blockage and need for mitigation measures and flushing operations; (iii) development of Reservoir Rule Curves to ensure reliable irrigation supply and provision of flood control storage to mitigate spillway discharge flood hazards; (iv) provision of dam hydromet & inflow hydrometry facilities to improve reservoir operational management and flood forecasting; (v) a dam Emergency Preparedness Plan (EPP) and publicly approved and practiced Emergency Action Plan (EAP) for high spillway discharge & dam break contingencies to warn population and implement partial or full evacuation as necessary; and (vi) desilting of the heavily sedimented reservoirs.

49. *Third*, national dam safety assurance by strengthening the DROD capacity to ensure and guide the dam safety assurance of FMWR-owned dams operated by RBDAs and/or those of other entities (e.g. Federal Ministry of Power hydroelectric dams and State-owned dams). Envisaged support includes Technical Assistance (TA) for: (a) professional and field training of engineers in the Instrumentation and Dam Monitoring & Supervision Divisions; (b) operational support for periodic large dam safety inspections; (c) preparation of essential technical Guidelines for the operation and safety of large dams (inclusive of EPPs and detailed EAPs); and (d) preparation of essential training programs in dam safety assurance, reservoir operation and routine maintenance of works and mechanical-electrical equipment for RBDA dam engineers and technicians that would be implemented in the Project's RBDAs under DROD oversight.

50. *Fourth*, support for a Dam Safety Panel of Experts to review Consultants' detailed designs, advise on complexities arising during construction and review of as-built drawings and completion reports to approve remedial works and appurtenance repairs, and provide an independent certification that original dam safety risks have been adequately reduced.

Component 2: Irrigation Development and Management (US$315 million, out of which US$294 million IDA)

51. The poor condition and inefficient performance of irrigation canal and drainage infrastructure are the major contributors to the poor water service delivery observed in most of the large, public irrigation schemes in Nigeria. These schemes were developed 20 to 30 years ago and are proposed for rehabilitation and limited expansion (as described in more detail under Subcomponent 2.1 in Annex 2). Combined with poor agricultural services and marketing infrastructure as well as the prevailing challenges in the policy environment, these problems have impeded the proper functioning and development of irrigated agriculture in the country.

52. To effectively make use of the sunk costs invested in the existing schemes and the capacities built over the years, the Project will focus on rehabilitating these schemes. To contribute to the efforts of addressing the root causes of the challenges faced by the irrigation sub-sector, the Project will pilot new approaches based on accountability, financial sustainability, and empowerment of water user associations. To ensure sustainability, in addition to other selection criteria, the Project will favor schemes that can easily be irrigated by gravity.

53. As the Project is aimed at transforming the irrigation sub-sector through demonstration of best practices of addressing the fundamental causes of poor irrigation performance and scheme deterioration, it is deliberately designed to complement the other activities of the Project focusing on policy reforms and support to improve the O&M capacity. Lessons learned from the pilot rehabilitation and expansion investments will be used by the FMWR to replicate similar efforts in other parts of the country. Component 2 directly contributes towards the project development objective of improving access for farmers to water for irrigation.

Subcomponent 2.1: Irrigation Infrastructure Investments (US$270 million, out of which US$266 million IDA)

54. This Subcomponent will be implemented by the PMU in collaboration with the Department of Irrigation and Drainage of the FMWR and the RBDAs. It will support rehabilitation of 27,000 ha to improve the performance of a total of 50,000 ha irrigation area in five schemes downstream of the existing storage reservoirs (see Table 4). In addition it includes a major investment in the form of studies and design of irrigation and drainage infrastructure and conducting the associated engineering supervision of civil works, as well as ESIAs, ESMPs and RAPs. The environmental and social impacts of the four schemes were assessed in the context of basin-wide Integrated Water Resources Management (IWRM) before a final decision was made on the extent of improvements/rehabilitation and expansion investments.

55. Regarding the irrigation schemes selected:

(a) **Bakolori Irrigation Scheme (BIS)** in Zamfara state. This is the 'first-mover' as the feasibility studies have already been prepared. It is envisaged to rehabilitate and re-convert the former sprinkler-equipped area to achieve a maximum improved irrigated area of 21,000 ha.

(b) **Middle Rima Irrigation Scheme (MRVIS)** in Sokoto state**.** There is an area of approximately 2,000 ha equipped for irrigation with very low agricultural

intensification. Furthermore, there is an existing contract for finalizing the works for a total of 5,000 ha. In this scheme, the TRIMING Project would focus on the hardware for the dam safety requirements and on the software for the irrigation scheme in itself. During the first years of project, this would result in improved irrigated area of 2,500 ha and could be further expanded to a total of about 5,000 ha once the remaining infrastructure is completed.

(c) **Kano River Irrigation Scheme (KRIS).** The equipped irrigation area is 15,000 ha though only 12,000 ha are being irrigated. The Project would focus in the first instance to rehabilitate the equipped irrigation area so that it becomes fully operational.

(d) **Hadejia Valley Irrigation Scheme (HVIS)** in Jigawa state**.** The equipped irrigation area is 6,000 ha though only 5,000 ha are being irrigated. The project would focus in the first instance to rehabilitate the equipped irrigation area so that it becomes fully operational.

(e) **Dadin Kowa Irrigation Scheme (DKIS)** in Gombe, Borno and Adamawa states**.** This scheme does not exist as such and is the only one that would in fact be a completely new irrigation scheme (the existing 100 ha is basically a pilot). Considering the pre-feasibility studies prepared by the FGN, Dadin Kowa represents an excellent opportunity for a PPP approach, taking into account the marketing opportunities offered by the tomato cannery as well as the sugarcane development and the development of the 40 MW hydropower. The TRIMING Project would provide support to undertake the required PPP full feasibility studies and transaction advice. A provision of funds will be made available in the project budget to be used in accordance with the outcome of the on-going PPP feasibility studies and will support the implementation of a PPP transaction in Dadin Kowa if the deal proves to be attractive to the private sector.

Table 4: Planned irrigation rehabilitation and expansion areas and estimated beneficiaries

Status and projection	**Scheme**					**Total**
	BIS	**MRVIS***	**KRIS**	**HVIS**	**DKIS**	
Present irrigated area (ha)	8,000	2,000	12,000***	5,000	(100)	27,000 (27,100)
Improved irrigated area by end of project (ha)	21,000	(5,000)**	15,000	6,000	0 (3,000)	42,000 (50,000)
Farmers (#)	50,000	15,000	40,000	25,000	10,000	140,000
Direct beneficiaries (#)	370,000	105,000	320,000	200,000	70,000	1,065,000

BIS: Bakolori Irrigation Scheme; MRVIS: Middle-Rima Valley Irrigation Scheme; KRIS: Kano River Irrigation Scheme; HVIS: Hadeija Valley Irrigation Scheme; DKIS: Dadin Kowa Irrigation Scheme. Data source: Atkins/ENPLAN Group, Nigeria.
* Support to Middle Rima Valley Irrigation Scheme (MRVIS) is limited to dam safety, water management, and agricultural service interventions (i.e. there is no TRIMING support for irrigation development).
** 2,500 ha already developed and 2,500 ha new development (all funded by the government and not TRIMING).
*** 12,000 ha normal rehabilitation and 3,000 ha major rehabilitation.
Please note: The totals in bracket are all inclusive.

56. More details of this Subcomponent description and proposed interventions in terms of rehabilitation, conversion from sprinkler to gravity irrigation system, finalization of incomplete works, expansion and new development, and related studies as well as social/environmental actions are provided in Annex 2.

Subcomponent 2.2: Improving Irrigation Management (US$45 million, out of which US$28 million IDA)

57. This Subcomponent will address the daunting challenge of ensuring the long-term viability of the irrigation and drainage services delivered on public irrigation schemes developed by the Federal Government over the past 30 years. The approach will be to implement a progressive management transfer to users' regulated bodies in the form of WUAs and to autonomous professional operators, either public or private. The approach will be first piloted in the Bakolori Irrigation Scheme (BIS), which is the 'first mover', starting with the areas to be rehabilitated. The principles, operational arrangements and regulatory framework underpinning this process are described in Annex 9.

58. The investments under this Subcomponent would support the development of a detailed training strategy with associated learning materials to re-align existing WUAs and establish new ones to achieve a transformed institutional structure for effective water management. To achieve this, two main activities would be supported, the first being the design of the training process (Activity 2.2.1) and associated learning materials and media, and the second being the implementation of the WUA training process (Activity 2.2.2) at field level over an extended timeline. Where PPP arrangement are established for part or full operational and maintenance responsibilities on a scheme, the WUA functions will be tailored according to specifics of the private sector enabling contracts and other local factors.

59. The Subcomponent will finance: (i) Technical Assistance for the purpose of establishing and strengthening the WUAs at the various levels and supporting scheme operation and maintenance activities, including the preparation of an O&M manual; (ii) training for WUAs' representatives and staff as well as RBDA and scheme operator staff on governance, management, and O&M of irrigation schemes; (iii) transitional contributions to O&M costs of irrigation schemes on a declining scale to support WUAs towards a better and sustainable management of irrigation schemes until such time they are financially autonomous. These contributions would be in the form of block grants for O&M based on a maximum percentage to be adjusted following the business planning process (eg. at 80 percent in year 1, 60 percent in year 2, 40 percent in year 3 and 20 percent in year 4); and (iv) buildings and equipment for the WUAs and the RBDAs that are not covered by the transitional contributions to O&M costs paid to the WUAs. These activities will be implemented in parallel and in correspondence with the construction works (rehabilitation or expansion) financed under the Subcomponent 2.1, so that the rehabilitated or newly constructed infrastructure is handed over to the WUAs and scheme operators from the contractor in a progressive manner. The WUAs and scheme operators will immediately start assuming their O&M responsibilities on the transferred infrastructures, using the proceeds of the irrigation service fees complemented with the project's transitional contributions to the O&M costs of the WUAs.

60. Outputs from this Subcomponent would be strengthened WUAs to manage, operate, and maintain the irrigation and drainage systems at turnout and tertiary levels, and improved level of bulk water service delivered by the scheme operator to the WUAs. Expected benefits include: (a) improved maintenance of canals; (b) improved water distribution; (c) increase in irrigated area; (d) increased level of water fee collection and revenue generation; and (e) enhanced transparency and accountability.

Component 3: Enhancing Agricultural Productivity and Support to Value Chains Development (US$41 million, out of which US$38 million IDA)

61. This Component will be implemented by the PMU in collaboration with the RBDAs, FMARD, State – ADP Ministries of Agriculture, Local Government and farmers associations. It will provide resources to enhance farmers' productivity in the rehabilitated schemes, and improve their participation in the value chains development. Activities under the component will be aligned and coordinated with the Local and State authorities as well as with FMARD's programs under the Agricultural Transformation Agenda (ATA) and will include: (i) structuring of and capacity building for farmer organizations for improved access to markets, inputs, and services; (ii) facilitation of value chains development opportunities to increase and improve supply of services along the value chains through a matching grants mechanism; and (iii) introduction and promotion of innovation through a collaborative R&D program. The component will put a specific focus on value chain management and capacity building for improved job opportunities through promotion of small and medium-size local entrepreneurs, and inclusion of youth and women in project activities, clustered around two subcomponents.

Subcomponent 3.1: Support to agricultural productivity and market linkages (US$37 million, out of which US$34 million IDA)

62. This Subcomponent aims at building WUAs' technical and managerial capacity to improve farmers' ability to access markets opportunities and adequate production support services, mechanization services, agro-processing support, and financial management access to markets. To that aim the project will finance the following activities:

63. Activity 3.1.1: Establishment of a Farmers Management and Service Delivery Center (FMC)[7] in each of the irrigation schemes based on a value chain approach. The FMCs will be a one stop shop that will provide technical assistance to farmers and eligible beneficiaries in the areas of accounting and financial management (e.g. establishing accounting software, book keeping), business planning and establishing out-grower schemes to facilitate commercialization of farmers products, facilitation of access to technologies such as mechanization and agro-processing support, inputs and finance, as well as technical support through extension services (provided directly or through third parties such as the ADPs), training, and R&D in partnership with relevant R&D institutions). It is expected that by project closing farmers will pay 100 percent of the costs of the FMCs.

64. Activity 3.1.2: Provision of Technical assistance through a savvy agribusiness firm for the two watershed covered by the Project (namely Hadeija Jama'are and Sokoto-Rima Valley) to support the establishment of the FMC at scheme level and initiate strong forward and backward linkages along the value chains, using the productive alliance models. In particular, the firm will support the FMCs in developing, documenting, training and communicating on methodologies, procedures and instruments for market linkages, access to inputs, extension and financial services, management of the matching grants mechanisms, and accounting and financial

[7] To be harmonized with Component 2.

management of the WUAs[8]. The firm will be supporting the establishment of the FMCs for 4-5 years in each scheme.

65. Activity 3.1.3: Establishment of a Matching Grant Mechanism (MGM) to ensure funding of critical activities along the value chains aimed at improving farmers' productivity through access to improved technologies and access to markets and services, such as mechanization equipment or services, storage, farm-gate commodity aggregation, primary processing and packaging centers, transport services, etc. These grants are meant to complement or unlock financial services where existing in project intervention areas, or to mitigate market failure where such services are not provided. The matching grants could also be used to strengthen or scale up on-going initiatives under the ATA such as the Growth Enhancement Support (GES), FADAMA, scheme or commodity bulking, and processing schemes in projects interventions areas.[9]

Subcomponent 3.2: Support to innovation and R&D (US$4 million IDA)

66. Technical assistance would be provided for farmer water schools, applied research such as improving irrigated agronomy, introduction of innovations such new crops or production techniques as part of emerging commercial partnerships, etc. Innovations from the Project will also be identified and supported for technology transfer within and outside the country. The Project will also finance key studies on irrigated agriculture with competitive grants to be carried out by research centers such as the International Water Management Institute (IWMI), universities, and the private sector. The Project will further fund the establishment of Community Radio Stations in all irrigation schemes, and they will be owned and operated by the community.

Component 4: Institutional Development and Project Management (US$49 million, out of which US$30 million IDA)

67. This Component will provide support to the building of capacity[10] in the irrigation and water resources sector management in general and to the key project actors in particular including WUAFs, RBDAs, FMWR, NWRMC, NIHSA, etc. In doing so, the project will build further momentum around the change process, support consensus building and facilitate change management among the different actors at the national, RBDA and local level. Through the empowerment of the WUAs the project will also work towards the creation of inclusive and

[8] The IFC can provide inputs in the selection of the consulting firm and in developing its terms of reference for the required value chain analysis, potential off-takers assessment, and other functions identified under Detailed Project Description (Annex 2). IFC can also assist in gathering inputs from both local and global agribusiness players (who are existing or potential IFC clients) on the selection of, and work with, the consulting firm so that it is private sector-driven.

[9] The project will build on FADAMA's experience. Similarly to FADAMA where the requests for matching grants are reviewed at the local level, the matching grants under the TRIMING Project will be reviewed at the Scheme Level with the Scheme Oversight Committee (SCO). Also, as FADAMA, the payment of the matching grant under TRIMING Project will be done by the PMU.

[10] The capacity building under TRIMING will be based on needs assessment as well as strategic planning and re-orientation of the RBDAs and WUAS to deliver under their new mandates. For instance, some stakeholders will need capacity building in financial management, some in procurement, some in contract management, some in monitoring and evaluation and some in strategic and developmental communication.

accountable management of the sector and finally, the evidence-based monitoring of the roll out of these pilots so that appropriate adaptions can be made and lessons for scale up generated. It will also support project management and M&E. In recognition of the different needs and challenges of the selected schemes, support will be tailored to the realities of each scheme. In addition, it will enhance the efficiency of personnel through the provision of advanced IT-based tools, performance-based systems for staff evaluation, modern survey and design techniques as well the overall management of the PMU and the Irrigation Department through administrative and managerial skills enhancements and tools (e.g. management information systems).

Subcomponent 4.1: Institutional Development and Governance (US$18 million, out of which US$11 million IDA)

68. This Subcomponent will be implemented by the PMU in collaboration with the WUAF, FMWR, RBDAs, NWRMC and includes five activities: (i) Capacity building and training of FMWR staff based on a needs assessment; (ii) Support to RBDAs in their strategic planning and modernization process; (iii) Consensus building and supporting the change process for public large-scale irrigation; (iv) Generation, feedback, and dissemination of information in order to improve the institutional strengthening and governance of the sector; and (v) Strengthening oversight and accountability in the sector.

69. This will include advocacy to the overall reform agenda with the aim to improve the water resources sector in Nigeria. It will provide support for the development of a communications strategy and its implementation based on communication needs assessment. It will provide support to enhance participation in decision-making by collaborating with the NIWRMC for standards setting, sector information gathering and development of rules for intervention and stakeholders behavior modification. Furthermore, it will provide public dissemination of results and information upon lessons-learnt by scheme and basin level.

Subcomponent 4.2: Project Management and M&E (US$31 million, out of which US$19 million IDA)

70. This Subcomponent will have two main activities: Activity 4.2.1: Project Management and Coordination with the setting up of: (i) a Project Management Unit (PMU) to properly manage the Project; (ii) a Steering Committee (SC) to oversee and review the budget as well as guide and evaluate the performance of the PMU; and (iii) a Change Management Committee (CMC) to analyze, advise and make proposal regarding the change management process for large-scale public irrigation schemes in Nigeria. Activity 4.2.2, Monitoring and Evaluation (M&E), will focus on three main tasks: (i) development of an Information System to monitor and evaluate the project, (ii) all types of studies and analytical work necessary to undertake the project; and (iii) development of an Electronic Records and Document Management System (ERDMS) for all the reports, maps, drawing and information in the department of irrigation, dams and reservoirs, statistics and policy, as well as other units of the FMWR.

B. PROJECT FINANCING

Lending Instrument

71. The lending instrument is an Investment Project Financing (IPF), which is an appropriate instrument, given that the project is well defined and can be implemented over a finite time period. The estimated total project cost is US$560.3 million, including a base cost of US$503 million and physical and price contingencies of US$57.3 million (see Table 5). The physical contingencies reflect some uncertainty with the scope of the proposed infrastructure interventions. The price contingencies reflect current inflation rates. The WB will finance US$495.3 million (about 88 percent) of the total project cost using all IDA, out of which US$8.95 million is IDA recommitted as credit. The Government of Nigeria will finance the remaining US$44 million (about 8 percent); it is estimated that beneficiaries will contribute US$21 million to this by the end of the project (about 4 percent). All components will be financed at 100 percent.

Table 5: Project Cost and Financing

Project Components	**Total Cost (US$ million)**	IDA (US$ million)	Gov.(US $ million)	Ben.(US$ million)
Component 1: Water Resources Management and Dam Operation Improvement	97	81	16	0
Subcomponent 1.1: Support to Integrated Water Resources Management	37	37	0	0
Subcomponent 1.2: Dam Operations and Safety Improvements	60	44	16	0
Component 2: Irrigation Development and Management	315	294	4	17
Subcomponent 2.1: Irrigation and Drainage Investments	270	266	4	0
Subcomponent 2.2: Improving Irrigation Management	45	28	0	17
Component 3: **Enhancing Agricultural Productivity and Value Chains**	41	38	0	3
Subcomponent 3.1: Support to agricultural productivity and market linkages.	37	34	0	3
Subcomponent 3.2: Support to innovation and R&D.	4	4	0	0
Component 4: Institutional Development & Project Management	49	30	19	0
Subcomponent 4.1: Institutional Development and Governance	18	11	7	0
Subcomponent 4.2: Project Management and M&E	31	19	12	0
Total Baseline Costs	503	443	40	20
Physical contingencies (7%) + Price contingencies (5%)	57.3	52.3	4	1
Total	560.3	495.3	44	21
Beneficiaries (%)	4%			
Government share (%)	8%			
World Bank (IDA/IBRD) share (%)	88%			

C. LESSONS LEARNED AND REFLECTED IN THE PROJECT DESIGN

72. Key lessons relevant to the project that have been taken into account during the preparation are:

- **The sequencing and timing of investments for rehabilitation and modernization are important to deliver results**. The infrastructure investments on the dams and control structures as well as water saving works (e.g. essential canal lining) are important for improving the delivery of water to the minor heads. Properly designed field channels are necessary for the water to reach the crops and can only be introduced when the system above the outlet is performing as designed. In addition, timely and complementary on-farm works (e.g. field channels) and other interventions (e.g. agriculture demonstrations, water user association training activities) would have maximized the impacts of these main investments in the past.

- **Integration of water and agriculture investments is needed to improve agriculture productivity**. Good linkages between agriculture investments and irrigation and drainage investments are critical to improving agricultural productivity. This includes also emphasis on agriculture interventions focused on improved field-level on-farm water management. The proposed operation will therefore provide funding for an implementing entity to provide services for technology transfer as well as storage, agro-processing (e.g. milling) and marketing.

- **It is critical to include WUAs in the design and implementation of system rehabilitation to strengthen ownership and sustainability.** Input of farmers (i.e. the users) during system re-design is needed to better understand the constraints (both technical and social) faced by the users. These technical consultations with water users associations will also improve the formal handover process and increase the likelihood of successful and sustainable WUA-led O&M.

- **Clear assignments of responsibilities and accountabilities between federal, river basin, state, and local actors 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.

- **Reform processes are process-intensive and require resources to support consensus building, coalesce actors around reform leadership and reward progress.** Changing behaviors is not easy and takes time. When sector wide reform is not achieved, the WB is not able to leverage its role, or its resources, efficiently.

- **Strengthening water users associations requires substantial long-term effort.** This is a long-term process that requires substantial nurturing. Focus in this operation is on providing these users with training on a range of relevant topics.

- **Appropriate Public-Private Partnership (PPP) approaches can be used for enhanced service delivery performance** using the concept of "professional third party" between the Government and the users.

- **Accurate data and regular feedback to the project is essential**, both to measure progress and to adapt to different contexts and situations as they evolve.

IV. IMPLEMENTATION

A. INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

73. **The Federal Ministry of Water Resources (FMWR)** has the overall responsibility for execution of the project. The FMWR will set up a Project management unit (PMU) staffed with highly competent multi-disciplinary experts fully dedicated to implement the project.

74. **The Project Steering Committee** (PSC), established on March 5th 2013, as documented in the Aide Memoire agreed with the government on April 2013, is headed by the Permanent Secretary (PS) for the FMWR and ensures the oversight of the project. The PSC: (i) reviews and approves the Annual Work Program and Budget prepared by the PMU, (ii) evaluates the PMU's results and gives orientation for sound project implementation, (iii) provides policy advice and carries out monitoring of operations, and (iv) approves updates of the project's various manuals. The PSC meets twice a year; one of those meetings will be held immediately after the annual visit to the field, which will include the Ministers of Water and Agriculture as well as the RBDA staff and state and local representatives of the scheme(s) to be visited. The PSC comprises all the PS from various Ministries and key institutions at State level (Commissioners for Water and Agriculture of each corresponding State) as well as representatives for key stakeholders. These are inter alia: Federal Ministry of Finance (FMF), Nigeria Meteorological Agency (NIMET), Federal Ministry of Environment (FMEnv), Federal Ministry of Agriculture and Rural Development (FMARD), NGO representatives, etc.

75. **The Change Management Committee** (CMC) is the emanation of the Inter-ministerial Project Preparation Team (IPPT); it was established in June 2013 as documented in the Aide Memoire of July 2013. It will provide technical advice both to the Steering Committee as well as to the Project Management Unit (PMU). Aside from staff of FMWR it will include representatives of the following institutions: Federal Ministry of Finance, Federal Ministry of Environment, Federal Ministry of Agriculture and Rural Development, Sokoto Rima River Basin Development Authority, Hadejia-Jama'are River Basin Development Authority, and the Upper Benue River Basin Development Authority. The Committee may also invite respected leaders in the field of irrigation management, dam safety, and agriculture on an *ad hoc* or permanent basis. The CMC will be confirmed by a document to be issued by the FMWR.

76. **The Project Management Unit (PMU)** led by a Project Coordinator already includes an irrigation component manager, an environmental safeguards specialist, a social safeguards

specialist, a procurement specialist and an accountant. This team will be complemented by a water resources management specialist, an agribusiness specialist, a M&E specialist, a communications specialist, a data and information specialist, and an internal auditor at the latest one month after effectiveness. The PMU will be in charge of the daily coordination, supervision and implementation of the project's components. They will hire civil works firms, consulting firms and individuals, NGOs and various suppliers to carry out the different activities of the project. The PMU will work closely with the various Directorates of the FMWR including the Department of Irrigation and Drainage, the Department of Dams & Reservoir Operations, the Department of Planning, Research and Statistics (DPRS). As per the gap analysis results, the PMU will finance where needed the capacity building, the key equipment and training of the Ministry's Directorates. The PMU will provide Progress Reports on a monthly basis to the Steering Committee who will seek the technical views of the Change Management Committee before making any major decision as necessary.

77. **At scheme level, the contractual approach is based on the Statement of Sector Policy for Large-Scale Public Irrigation Schemes** which stipulates that:

- The schemes will be managed with progressively increasing administrative and financial autonomy with the objective to achieve full cost recovery for the operational and maintenance costs of the water conveyance and distribution. The large dams having broad public benefits and critical safety requirements will be excluded from this transfer.
- The responsibility for operation and maintenance of tertiary irrigation and drainage canals will initially be transferred to the WUAs, followed by higher level infrastructure (secondary and primary canals and drains) in due course based on an assessment of the capacity of WUAs to manage them.
- The operation and maintenance of the non-transferred infrastructure will remain the responsibility of the RBDAs. The RBDAs will have the option to delegate part or all of these services to a service provider which could be either a special purpose vehicle or a competitively selected private contractor. Related costs will be fully covered by the portion of the fees charged to the WUAs.
- The specific arrangements will be described in a Tripartite Memorandum of Agreement between the FGN, the RBDA and the users represented by their APEX organization. This Agreement will be established for a period of three to five years, will include fee setting, and will be signed before launching any rehabilitation and expansion works.

78. **Scheme Oversight Committees** (SOCs) with representation from all relevant stakeholders (FMWR, RBDA, FMARD, State – ADP and Ministries of Agriculture, Local Government, WUA) will be established to review at regular intervals the implementation of the agreements at scheme level. This SOC will meet at least once before the beginning of each agriculture season to plan the agricultural campaign (calendar, crop, irrigation service delivery, etc.). The interface between the states, local governments and other key stakeholders is ensured at the SOC level and where the implementation of agreements at scheme level will be reviewed.

79. **The Water Users Associations Federations** (WUAFs) and their members will be in charge of maintenance and operations at tertiary and field-canal level and would collect,

administer, and maintain adequate organizational systems to fulfill this responsibility. A Delegation of Authority was established by the FMWR to this effect (see Annex 7).

B. RESULTS MONITORING AND EVALUATION

80. The project will use a result-based monitoring approach to assess progress and support project implementation in accordance with international best practice. The M&E system will consist of the following elements: (i) baseline studies; (ii) community-based monitoring and evaluation techniques; (iii) operational research for informing policy and improving operations; (iv) internal learning reviews and dissemination; and (v) impact evaluation for learning and assessing the effects of interventions on project beneficiaries. The project will employ a multi-level approach to monitoring which will identify the role of federal and state-level stakeholders and implementing agencies, including the beneficiaries. This will ensure that partners take timely corrective measures when required and will enable joint accountability for achieving the project objectives. The project will use a web-enabled, management information system to manage information and report progress. The database will be available on an open-access basis, to support greater transparency, collaboration and improved project governance.

81. The Project Management Unit (PMU) will have the main responsibility for monitoring, evaluating and reporting data on the key performance indicators. The PMU will be assisted by an external M&E firm, to be engaged as consultants for the project period. The firm will support the PMU to develop the M&E framework and a plan for data collection. It will also assist in setting up the project management information system, facilitate regular joint monitoring exercises, oversee the data collection for impact evaluation, reporting and feedback on lessons learned to ensure learning and continuous improvements in project implementation.

C. SUSTAINABILITY

82. Sustainability has been a key problem. It has therefore been an important factor in project design and in particular on the strengthening and engagement of WUA and farmers which are central to these efforts. As already mentioned, the main principles for sustainability are (a) autonomy at the Scheme Level to ensure full O&M cost recovery; and (b) Participatory Irrigation Management to empower WUA organizations and ensure accountability of the funds collected from the users. All activities, including the irrigation infrastructure works and agriculture recommendations are designed with stakeholder participation. For instance: (i) a joint management framework will be put in place to demarcate the responsibilities and duties of the three main stakeholders, e.g. Federal Government, RBDAs, and WUAs; (ii) surveys and designs for the rehabilitation and modernization of the irrigation works will involve community consultations; and (iii) a major component involves the training of WUAs and scheme operators on a range of governance, technical, and financial issues to encourage greater ownership and internal management. A contractual approach will be followed to clarify the roles and responsibilities of each party in scheme O&M. These are considered critical to ensuring that the investment impacts are long-lasting.

83. Demonstrations of borrower commitment include: (i) sufficient budget and staff have been provided to the PMU to undertake preparatory work and to ensure a smooth transition into project implementation; (ii) there is movement toward a National Water Resources Bill which would provide for comprehensive, transformative irrigation management nation-wide; (iii) a Memorandum of Understanding (MoU) has been signed between the FMWR and the FMARD; (iv) a statement of sector policy for public irrigation schemes and a delegation of authority to the WUAs has been issued by the Honorable Minister of FMWR; and (v) the project is being viewed as a pilot operation, leading the way toward comprehensive transformation of public irrigation nationwide.

V. KEY RISKS AND MITIGATION MEASURES

84. Implementation risks at the project level are rated as Substantial (see Annex 4). Key risks are:

Stakeholder Risk	**Moderate**
Implementing Agency Risk	
- Capacity	**Substantial**
- Governance	**Substantial**
- Fiduciary	**Substantial**
Project Risk	
- Design	**Substantial**
- Social and Environmental	**Substantial**
- Delivery, Monitoring, and Sustainability	**Moderate**
Overall Implementation Risk	**Substantial**

Overall Risk Rating Explanation

85. **The overall risk rating for this project is substantial.** This rating is due to a challenging policy and institutional environment and limited capacities at all levels. The risks identified and mitigation measures proposed are detailed in the ORAF (Operational Risk Assessment Framework, see Annex 4) and summarized below. All risks are rated before mitigation.

(i) *Stakeholder risks* are considered **substantial.** There is risk that water users associations may not receive sufficient support (technically and institutionally). Accordingly, the project has placed special emphasis on improving the policy and regulatory environment through upfront measures before appraisal. This includes a legal statement by the Minister of the FMWR in support of the reforms based on the 1993 Act. In addition, the project will make a significant effort to strengthen Water User Associations.

(ii) *Implementation agency risks* are considered **substantial** (governance and capacity risks). Implementation delays, particularly with infrastructure improvements, are possible,

considering the capacity of the FMWR and lower levels to implement a rehabilitation and modernization program in a timely and efficient manner following World Bank norms.

(iii) *Governance risks* are considered **substantial**, with limited transparency in personnel management and insufficient accountability in procurement and contract management. The general opaqueness of current canal system operations (vis-à-vis the water users in the canal command areas) also represents a governance risk. To mitigate these risks, a project management information system (M&E) will be established (including a project website) to ensure a more transparent procurement process. Governance will also be enhanced through a management information system (MIS) which is to be established. This includes strengthening business functions (e.g. payments, hiring) and introducing performance metrics of field engineers. Fiduciary arrangements will be strengthened including with government and independent audits.

(iv) *Project risks* are considered substantial (project design risks as well as social and environmental risks). Delivery, monitoring, and sustainability risks are assessed as moderate.

(v) *Other implementation risks* (not mentioned above) include inadequate operating and maintenance funds. This risk relates to the challenge of ensuring that irrigation and drainage rehabilitation and modernization investments are sustainable and that a streamlined system is implemented for allocating and spending operation and maintenance (O&M) funds as per actual needs. This also is tied to the importance of the engagement of water users association (mentioned in the *stakeholder risks* section above) which is meant to take on this responsibility for tertiary canals. Government contribution where applicable and users' fees will have to be available on a timely basis.

(vi) *There are significant security risks in the project areas*. As mitigation measures, security risk assessments will be part of the quarterly project performance reviews. Should the situation deteriorate, the Government will agree with IDA on necessary project adjustments.

VI. APPRAISAL SUMMARY

A. ECONOMIC AND FINANCIAL ANALYSES

86. A financial and economic analysis was undertaken for the Bakolori Irrigation Scheme (BIS). Proposed interventions include: (i) dam rehabilitation and safety improvements, (ii) rehabilitation of existing irrigation and drainage infrastructure; (iii) development of surface irrigation and drainage systems on former sprinkler land, (iv) repair and upgrading of flood protection dykes, (v) management, operation and maintenance of irrigation/drainage systems; (vi) WUA development and support services; (vii) fisheries programme; and (viii) agribusiness and PPP support. The main benefits of these interventions are expected to be obtained from: (i) expansion of irrigated crop area, (ii) increased cropping intensity and higher crop yields; (iii) improved farm incomes from irrigated crop and enhanced livestock production; (iv) reduction of

expected economic losses due to recurrent flood events, and (v) enhanced livelihoods for fishing households.

87. **Link of economic analysis with project development objectives.** Rehabilitating and/or expanding irrigation services -- and making these sustainable by appropriate institutional reforms, in particular with the development of WUAs -- is laying the basis for increased agricultural productivity as contained in the development objectives. The economic analysis that was undertaken provides estimates of the expected incremental agricultural benefits. It is those benefits which then further result in increased farmers' incomes and the related multiplier effects that reduce poverty.

88. **Rationale for public funding**. Dams and reservoirs are large, multi-purpose public assets for which public funds are needed to maintain them and to thereby also assure their safety for the downstream populations. Public funding for construction, operation, and maintenance is also necessary for the larger/primary irrigation canals. Private operators will be reluctant to engage in large-scale investment across multiple states without the full power of the state behind. For the smaller/tertiary canals, the initial investment for construction still requires public resources, but the project will actively encourage users to become fully responsible at the tertiary level for the maintenance and operation of the canals.

89. **Value added of WB involvement.** Given the complexity of irrigation schemes, the required know-how, and the number of stakeholders involved, the World Bank is well placed to support this project due to its experience and successes in large-scale public irrigation and the associated agricultural development knowledge, in addition to its convening power to bring together various stakeholders to work toward the achievement of this large-scale investment. The project will combine and apply these experiences, providing a unique window of opportunity to integrate a strategic approach to productivity enhancement, diversification, and value chain development. This includes experience gained in the development of WUAs, in sectoral policy and institutional transformation, in community and matching grant programs, and from achievements and lessons learned in Nigeria and elsewhere.

90. The **development impact** of the project would be an improved access to irrigation and drainage services and strengthened institutions for integrated water resources management and agriculture service delivery in selected large-scale public schemes in Northern Nigeria. Thereby the project would contribute to reducing extreme poverty in northern Nigeria and promoting shared prosperity. This will be achieved through a total improved irrigated area of 50,000 hectares and the value chain development for the outputs produced. This will benefit 140,000 farmers, including youth and women, and will result in 1,065,000 direct beneficiaries.

91. For estimating agricultural benefits, financial and economic crop gross margins per ha were calculated by valuing the physical input and output quantities in terms of their respective market and economic prices respectively (see Annex 11 for details). On the existing surface irrigation area, cropping intensity is expected to increase from 130 percent to 186 percent while, on the former sprinkler irrigation area, cropping intensity will rise from 106 percent to 176 percent. Overall, the project's cropping intensity will increase from 115 percent to 180 percent.

92. Farm budgets were prepared to determine the impact of the project interventions on farm incomes using an average farm size of 2.0 ha. Based on the estimated existing and future cropping patterns, the likely net returns to farmers in the present, "with" and "without" future project situations were estimated, including the typical livestock activities to determine the financial results with and without project. Net farm incomes were obtained both before and after the irrigation fees required to meet annual operation and maintenance (O&M) costs of the irrigation and drainage systems. It is expected to achieve a significant increase in net incomes of the average household from Naira 259,000 to Naira 833,000 per annum (before irrigation costs). When irrigation costs are deducted, overall net farm income would be Naira 781,000 per annum, which is more than three times the average level of a typical farm in the area without the project. As irrigation O&M costs after rehabilitation would only represent 10 percent of incremental net income, farmers are expected to have the capacity and willingness to pay fees to cover the O&M costs, thereby making it sustainable.

93. The incremental net benefit stream was then used to estimate the economic internal rate of return (EIRR) and net present value (NPV) calculated at a discount rate of 12 percent. **The EIRR of the BIS was estimated at 13.5 percent** with a NPV of Naira 1.94 billion (US$12 million). These results show that the proposed BIS investment is justified even without considering indirect benefits as mentioned in Annex 11. A sensitivity analysis was also undertaken to test the effects from changes in the cost and benefit assumptions. A decrease in capital costs of 20 percent would increase the EIRR to 16.4 percent, while a cost increase of 20 percent would reduce the EIRR to 10.8 percent. An increase in benefits of 20 percent provides an EIRR of 16.5 percent and a benefit decrease of 20 percent reduced the EIRR to 9.1 percent. With a combination of a 20 percent benefit increase and a reduction in project costs of 20 percent, the EIRR would increase to 20.3 percent. In contrast, a benefit reduction of 20 percent together with a 20 percent increase in costs, the EIRR would fall to 6.6 percent.

94. Based on these results the proposed investment for the BIS appears to have a robust justification. As the other proposed investment costs for the MRVIS, KRIS, HVIS and DKIS and the respective development plans are defined, similar financial and economic analysis will be prepared to verify the viability of those investments.

B. TECHNICAL

95. With the scale of investment in the rural space in northern Nigeria, the Government indicated a need for a Bank-supported project that would add value by transforming irrigation management in the selected project areas and also serve as a pilot for a nationwide transformation. This would include: (i) using the project framework to help facilitate coordination across various programs (to ensure that agricultural and water productivity are maximized); (ii) ensuring the use of modern surveys, design approaches, and information technologies (to enhance the service delivery of irrigation water); (iii) supporting the global best practice on the Participatory Irrigation Management agenda; (iv) strengthening the innovative Water User Association (WUA) concept as a key platform for engagement with rural water users (to contribute to increased local ownership); and (v) supporting the River Basin Development Authorities (RBDAs) and state-level agencies (to enhance the regulatory and institutional frameworks for water management in the selected states).

C. FINANCIAL MANAGEMENT

96. Responsibility for establishing and maintaining acceptable FM arrangements will be handled by the existing Federal Project Financial Management Division (FPFMD). The FPFMD is a multi-donor and multi-project FM platform, established at the federal level through the joint efforts of the Bank and the government. This common FM platform features robust systems and controls. The FPFMD is presently involved in the implementation of a number of Bank-assisted projects. The Bank's recent review showed that this Division has been performing satisfactorily. The FPFMD consist of Accounts and Internal Audit Sections. A qualified accountant with appropriate expertise has been designated for the project to manage the PPF and also manage the main credit. The process of competitive selection of an appropriately qualified internal auditor is being concluded by the FPFMD. The internal auditor shall be reporting to the Project Coordinator. The Project Accountant and Internal Auditor will be supported by accounting technicians to ensure that internal controls through segregation of duties are not undermined. As work load necessitates, additional professionally qualified accountants and internal auditors will be recruited for the duration of the project. To further strengthen the financial management systems in the FPFMD, implementation of some agreed action plans are required. Further to the recommended action plans being implemented as per the agreed timeframe, the financial management arrangements will meet the minimum FM requirement in accordance with OP/BP 10.00. Taking into account the risk mitigation measures, the financial management risk for this financing is assessed as Substantial. Annex 3 provides additional information on financial management.

D. PROCUREMENT

97. Procurement for the proposed project would be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits" dated January 2011; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers" dated January 2011, and the provisions stipulated in the Legal Agreement.

98. Procurement activities under the project will be implemented by the PMU that has been established in the Federal Ministry of Water Resources (FMWR). The unit will implement all the procurement on behalf of the FMWR, the various RBDAs, and all other project activity implementing agencies. However, the activity implementing agencies will be fully involved in identifying the activities to be included in the annual work plan. They will provide inputs into the technical specifications and terms of reference. In addition they will participate in the bid and proposals evaluations and in the supervision of the contracts that will be executed on behalf of the respective agencies. These agencies will also be responsible for the acceptance and the takeover of the goods, services and works for such contracts.

99. The procurement plan for activities to be taken up during the first 18 months of project implementation has been prepared and is available in the project files as well as in Annex 3. The procurement plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. The major procurements of civil works, goods and consultancies are identified.

E. SOCIAL (INCLUDING SAFEGUARDS)

100. The project stakeholders include farmers in the project areas organized through water user associations (WUAs). Infrastructure investments covering 50,000 hectares and associated activities are expected to benefit an estimated 140,000 farmers and 1.0 million beneficiaries[11]. A critical element of the project is the strengthening of WUA institutions to enable participatory irrigation management (PIM). Feedback from stakeholders during preparation indicates that their primary objective with respect to rehabilitation of irrigation systems relates to improved water access, agricultural productivity and incomes. Among primary stakeholders, the project will also focus on existing women's groups and explore culturally appropriate ways of enhancing their participation in irrigation management. Positive project impacts include increased water supply and reliability, improved on-farm productivity and financial returns from farming as well as longer-term food security and better nutrition. Establishing improved operation and maintenance (O&M) is critical in creating viable interventions, and long-term financial sustainability will be ensured if increased participation and ownership can be generated through the establishment of functional and inclusive WUAs. Finally, any negative impacts resulting from failure to achieve changes in the current approach to irrigation management will be mitigated through a comprehensive stakeholder communication and participation strategy combined with a strong capacity building program at local, RBDA, and Federal levels.

101. OP 4.12 on Involuntary Resettlement is triggered because project interventions will result in some degree of land acquisition and temporary loss of livelihood. Rehabilitation of existing irrigated land, roads and other infrastructure as well as development of new irrigated areas may require minor land acquisition. Following the completion of physical works, most of the land will be re-allocated to the farmers, but during the construction period affected farmers will temporarily lose their livelihood and will be eligible for crop compensation. Specific interventions will not be known in detail prior to appraisal and a Resettlement Policy Framework is therefore the most appropriate instrument. An RPF was prepared by the client, cleared by the Bank and disclosed in-country and in Infoshop on February 19th, 2014. This document spells out the key objectives and principles of the policy and will give guidance to the preparation of subsequent resettlement action plans (RAPs). Specific attention will be given to the development of grievance redress mechanism at the community level that will be accessible to all stakeholders as well as arrangements for monitoring the implementation of RAPs. In addition, robust assessments of other potential social impacts related to land tenure and use will be conducted as part of the ESIA process at each of the project sites. Social issues and challenges related to land tenure are further discussed in Annex 3 and the role of WUAs in improving irrigation management has been highlighted in Annex 9.

F. ENVIRONMENT (INCLUDING SAFEGUARDS)

102. Given the spatial and temporal boundaries of this project, the potential local as well as cumulative impacts are significant. While the project is designed to benefit farming communities

[11] To ensure access to drinking water and ease of mobility for the livestock in the area and those owned by the mobile Fulani herders, appropriate watering points and cattle crossing corridors will be provided at socially agreeable strategic locations.

through investments on rehabilitation of irrigation systems and allied agriculture activities, the implementation of proposed components of the Project may result in adverse impacts on people and land. For these reasons, the project is rated as Category A. It triggers seven safeguards policies: Environmental Assessment (OP 4.01), Involuntary Resettlement (OP 4.12), Natural Habitats (OP/BP 4.04), Physical and Cultural Resources (OP/BP 4.11), Pest Management (OP/BP 4.09), Safety of Dams (OP/BP 4.37) and Projects in International Waterways (OP/BP 7.50), Environmental Assessment (OP 4.01), Safety of Dams (OP 4.37), Involuntary Resettlement (OP 4.12) – mentioned above, Pest Management (OP 4.09), and Projects on International Waterways (OP 7.50).

103. Adverse environmental impacts may arise due to certain planned activities, like disposal of silt during rehabilitation of irrigation infrastructure, construction and installation of irrigation control structures, small bridges over canals, increased used of agro-chemicals for increasing crop productivity etc. Adverse impacts could also arise due to poor construction quality and unsafe construction practices, but these would be addressed by Quality Supervision Protocols that would be followed, in a combination with Quality Assurance Consultants and their own engineers. Finally the cumulative impacts of the proposed intervention along the rivers and basins of interest need to be assessed thoroughly. For instance the hydrodynamic regimes of the rivers of interest and their implications on the proliferation of invasive vegetation should be assessed and mitigated.

104. The project design would invest in building the technical capacity in the local institutions for enhanced water resources planning and management, undertake rehabilitation and modernization of critical irrigation and drainage infrastructure in identified priority areas, and extend the agricultural intensification and on-farm water management activities.

105. In view of the above, an Environmental and Social Management Framework (ESMF) was prepared by the client describing the potential environmental and social impacts of the sub-projects to be financed by this project. The ESMF also provides guidance for preparation of ESIAs, ESMPs, and environmental audits. It includes a screening process that is consistent with both World Bank operational policies and Nigeria Environmental regulations, and a chapter on project processing that describes the responsibilities. The ESMF and Pest Management Plan (PMP) were both prepared by the Borrower according to National and World Bank policies and were disclosed in-country in Nigeria and in the World Bank's InfoShop on February 19, 2014.

106. An ESIA for the Bakolori Irrigation Scheme was prepared by the Client, cleared by the WB and disclosed at Infoshop on February 19, 2014. The other site-specific ESIAs will be prepared during project implementation along with the technical studies for the corresponding investments. The environmental and social impacts of these schemes will be assessed in the context of basin-wide Integrated Water Resources Management (IWRM) before a final decision will be made on the extent of improvements/rehabilitation and expansion investments.

G. OTHER SAFEGUARDS POLICIES TRIGGERED

107. **Projects on International Waterways (OP/BP 7.50).** The dams depend on rivers and their tributaries with sources and courses (e.g. River Niger, Sokoto and Rima, Hadejia, etc.)

outside Nigeria. Thus OP/BP 7.50 is triggered. Since Nigeria is a member of the Niger Basin Authority and Lake Chad Basin Commission, riparian notifications were sent to the Niger Basin Authority and the Lake Chad Basin Commission for onward transmission to riparian states**.** In conformity with OP 7.50, all riparian states were notified of the project through their representative authorities, the Lake Chad Basin and the Niger Basin Authority, and both authorities provided a no-objection to the project.

Annex 1. Results Framework and Monitoring

Project Name: Transforming Irrigation Management in Nigeria (P123112)

Project Development Objectives

PDO Statement

To improve access to irrigation and drainage services and to strengthen institutional arrangements for integrated water resources management and agriculture service delivery in selected large-scale public schemes in Northern Nigeria.

These results are at	**Project Level**

Project Development Objective Indicators

				Cumulative Target Values									Data Source/	Responsibility for
Indicator Name	Core	Unit of Measure	Baseline	YR15	YR16	YR17	YR18	YR19	YR20	YR21	End Target	Frequency	Methodology	Data Collection
Direct project beneficiaries	☒	Number	0	5,000	20,000	100,000	250,000	450,000	700,000	950,000	1,000,0000	Annual	Survey of perceived project benefits	PMU
Female beneficiaries	☒	Percentage	0.00	3.00	8.00	15.00	25.00	32.00	38.00	46.00	50.00	Annual	Survey of perceived project benefits	PMU
Area provided with irrigation and drainage services (ha)	☒	Hectare(Ha)	0	0	3,000	9,000	20,000	29,000	40,000	47,000	50,000	Annual	RBDA report	RBDA and PMU
Area provided with irrigation and drainage services – Improved (ha)	☒	Hectare(Ha) Sub-Type Breakdown	0	0	3,000	6,000	14,000	20,000	25,000	27,000	27,000	Annual	RBDA report	RBDA and PMU
Area provided with irrigation and drainage services - New (ha)	☒	Hectare(Ha) Sub-Type Breakdown	0	0	0	3,000	6,000	9,000	15,000	20,000	23,0000	Annual	RBDA reports	RBDA and Project Management Unit
Cropping intensity (by scheme)	☐	Percentage	115.00	115.00	120.00	125.00	140.00	155.00	165.00	175.00	180.00	Annually	Reports	PMU

Irrigation fee recovery rate by WUAs	☐	Percentage	25.00	25.00	30.00	40.00	50.00	60.00	70.00	75.00	80.00	Annual	WUAs' financial account statement	PMU
Intermediate Results Indicators														
				Cumulative Target Values									Data Source/	Responsibility for
Indicator Name	Core	Unit of Measure	Baseline	YR15	YR16	YR17	YR18	YR19	YR20	YR21	End Target	Frequency	Methodology	Data Collection
Dams meeting international safety standards	☐	Number	0.00	0.00	1.00	2.00	3.00	5.00	6.00	7.00	8.00	Annual	Independent dam safety assessment by dam specialist	PMU and FMWR
Staff Trained in Dam Safety Assurance and Dam Management	☐	Number	0.00	12.00	24.00	32.00	40.00	48.00	56.00	60.00	60.00	Annual	Training report	PMU
Rivers with discharge gauging stations	☐	Number	0.00	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	Annual	Report	PMU
Rivers with channel carrying capacity improved, and riparian population protected against flooding	☐	Number	0.00	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	Annual	Report	PMU
Apex WUAs/WUA Federations (WUAFs) and RBDAs jointly managing fund for financing maintenance of the bulk infrastructure	☐	Number	0.00	0.00	1.00	2.00	3.00	4.00	5.00	5.00	5.00	Annual	WUA, RBDA reports	PMU
Operational water user associations created and/or strengthened (number)	☒	Number	150.00	150.00	200.00	200.00	250.00	300.00	400.00	500.00	550.00	Annual	WUA, RBDA reports	PMU

Farmers actively participating in WUA affairs (ie. paying part or all of their dues percentage)	☐	Percentage	15.00	20.00	30.00	40.00	50.00	70.00	80.00	90.00	90.00	Annual	WUA, RBDA reports	PMU
Clients who have adopted an improved agr. technology promoted by the project	☒	Number	0	0	2,000	5,000	10,000	16,000	24,000	32,000	32,000	Annual	Report	PMU
Clients who adopted an improved agr. technology promoted by project – female	☒	Number Sub-Type Breakdown	0	0	300	500	1,500	2,600	3,800	4,800	4,8000	Annual	Report	PMU
Yield of Main Product (eg. rice)	☐	Tons	3.50	3.50	3.80	4.00	4.20	4.80	5.00	5.50	5.50	Annual	Report	PMU
Commercial partnerships established with off-takers	☐	Number	0.00	0.00	1.00	2.00	3.00	4.00	5.00	6.00	7.00	Annual	Report	PMU
Project monitoring and publically disseminated scorecards for each scheme are debated annually, drawing on an information system which facilitate information on reform progress, results, and resource	☐	Number	0.00	0.00	0.00	1.00	1.00	2.00	3.00	4.00	4.00	Annual	Report	PMU

Project Development Objective Indicators	
Indicator Name	Description (indicator definition etc.)
Direct project beneficiaries	Direct beneficiaries are people or groups who directly derive benefits from an intervention (i.e., families that have a new piped water connection). Please note that this indicator requires supplemental information. Supplemental Value: Female beneficiaries (percentage). Based on the assessment and definition of direct project beneficiaries, specify what proportion of the direct project beneficiaries are female. This indicator is calculated as a percentage.
Female beneficiaries	Based on the assessment and definition of direct project beneficiaries, specify what percentage of the beneficiaries are female.
Area provided with irrigation and drainage services (ha)	This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).
Area provided with irrigation and drainage services - Improved (ha)	No description provided.
Cropping intensity	The ratio of the harvested irrigated areas over the area equipped for full control irrigation actually irrigated (times 100 to give it in percentage)
Irrigation fee recovery rate by WUAs	Total amount collected from users in one fiscal year (as identified by date of payment) divided by the amount billed that same year (as identified by the date of the bill). This will include ALL amounts billed and collected as long as they are related to the irrigation service (including for example penalties for late payment etc.). One payment made in one year may refer to a bill from the past year but will be counted the year it has been made.

Intermediate Results Indicators	
Indicator Name	Description (indicator definition etc.)
Dams meeting international safety standards	Dams meeting international safety standards
Staff Trained in Dam Safety Assurance and Dam Management	Staff Trained in Dam Safety Assurance and Dam Management
Rivers with discharge gauging stations	Rivers with discharge gauging stations

Rivers with channel carrying capacity improved, and riparian population protected against flooding	Rivers with channel carrying capacity improved, and riparian population protected against flooding
Apex WUAs/WUA Federations (WUAFs) and RBDAs jointly managing fund for financing maintenance of the bulk infrastructure	Number of maintenance funds established conform to the provisions in the PIMM under the joint responsibility of the WUAF and the RBDA and actively used to finance maintenance of the bulk water supply. "Jointly managed" means that the WUAf representatives are associated at all steps of the spending decisions from annual planning to procurement, contract management and commissioning of the works.
Operational water user associations created and/or strengthened (number)	This indicator measures the number of water user associations created and/or strengthened under the project that are operational.
Farmers actively participating in WUA affairs (i.e. paying part or all of their dues percentage)	Registered members of WUAs making payment(s) to the WUA in one given year. This is an indicator of the active participation of farmers in the WUAs but not a measure of fee recovery since the amount of payment made is not taken into account.
Clients who have adopted an improved agr. technology promoted by the project	This indicator measures the number of clients of the project who have adopted an improved agricultural technology promoted by the project.
Clients who adopted an improved agr. technology promoted by project – female	No description provided.
Yield of Main Product (e.g. rice)	Yield of Main Product (Rice is chosen for the time being, average yield is 3.5 ton/ha)
Commercial partnerships established with off-takers	Number of commercial partnerships established with off-takers (at least 2 per Scheme = 8 in total)
Project monitoring and publically disseminated scorecards for each scheme are debated annually, drawing on an information system which facilitate information on reform progress, results, and resource	Project monitoring and publically disseminated scorecards for each scheme are debated annually, drawing on an information system which facilitate information on reform progress, results, and resources.

Annex 2: Detailed Project Description
Transforming Irrigation Management in Nigeria (TRIMING) Project

1. The **Project Development Objective** is to improve access to irrigation and drainage services and to strengthen institutional arrangements for integrated water resources management, with the overall aim to support agricultural productivity improvement in selected large-scale public schemes in Northern Nigeria.

2. The following **selection/prioritization criteria were used:**

Eligibility (accept/reject):

- Availability of land/soil suitable for gravity command;
- Size 2,000 ha/scheme or above to avoid fragmentation;
- Reliable water resources without creating major conflict to other users and uses;
- Farmer occupier land tenure system preferred;
- Existing schemes requiring rehabilitation for maximum leveraging of sunk cost; and
- Not involving significant resettlement, with only minor land acquisition in connection with irrigation infrastructure required.

Selection (ranking) criteria (comparing eligible schemes):

- Accessibility to market;
- Potential for quick return to investment;
- Attractiveness for PPP management of the headwork and main system;
- Existence of ongoing initiatives promoting agricultural services;
- No major environmental concerns; and
- Existence of ongoing irrigation (though small) managed by WUAs

Project Location and Beneficiaries

3. The project will focus on three river basins[12] in northern Nigeria, which have been identified by the Government of Nigeria (GoN) as priority areas. The main stakeholders in the project include irrigation Water Users Associations (WUAs), Federal Ministry of Water Resources (FMWR) and its three River Basin Development Authorities (RBDAs). Within the project areas, it is estimated that the project would positively impact over 160,000 farm organization families. Moreover, the project is expected to strengthen over 550 WUAs including their apex (5 WUAF). Component 1 of the project is expected to reduce the hazard of a dam break up to 10 million people and reductions of overbank flooding to about 0.8 million people.

[12] Sokoto-Rima (in Sokoto state), Hadejia-Jama'are (in Kano state), and Upper Benue (in Gombe) River Basins.

Component 1: Water Resources Management and Dam Operations and Safety Improvements

4. This Component is part of the support for the transformative water resources sector reform covering policies, enabling legislation, regulatory instruments, and organizational restructuring currently being formulated for enactment by the FGN. It includes provision of rehabilitated and upgraded water resources monitoring infrastructure and systems essential for effective IWRM, as well as provision of river training works and channel maintenance to mitigate the impact of high dam spillway discharges. It includes two subcomponents.

Subcomponent 1.1: Integrated Water Resources Management Support

5. This component will support the piloting of anticipated provisions for separation of government regulatory and operational powers and responsibilities for integrated water resources management (IWRM) of river basin-wide water allocation, river flow control, and channel maintenance needed for sustainable bulk water supply & drainage for large public irrigation scheme planning, development, and operational management. To implement IWRM, the FMWR's Nigeria Hydrological Services Agency (NIHSA) has divided Nigeria into eight designated "Hydrologic Areas " (HAs) whose composite boundary is defined by the hydrological catchment boundaries of its constituent river basins, including discharge monitoring stations for river inflows of all trans-national rivers crossing the Nigerian border and entering one or more of an HA's river basins. This Project has selected dams and irrigation schemes within: (i) the Sokoto-Rima river basin included in HA 1 covering part of northwest Nigeria; (ii) the Hadejia-Jama'are sub-river basin contained within the Hadejia-Jama'are-Komadugu-Yobe Basin of northeastern Nigeria's HA 8; and (iii) the Gongola River Basin in the Upper Benue sub-basin HA 3. Under the IWRM envisaged by the forthcoming water resources legislation and its implementing institutions, meeting the large consumptive water use and drainage water disposal of public irrigation schemes in a river basin requires the planned consideration of the water quantity and quality needs of all other non-irrigation water-using sub-sectors, including the environmental water needed to sustain the biodiversity and productivity of diverse habitats.

6. Subcomponent 1.1, strengthening IWRM in the selected river basins requires, first, investment support for ensuring the Nigerian Meteorological Agency's (NIMET) and Nigerian Hydrological Services Agency's (NIHSA) revival, expansion, and rationalization of all real-time monitoring network infrastructure of the selected HA and improvement of the data archiving and access to rainfall, river flows, and groundwater data as an essential basis for the selected river basins and for future IWRM. Second, the anticipated reform of water allocation, water quality, and drought and flood control management is based on improvement of water resources planning. This is facilitated by supporting the Nigeria Integrated Water Resources Management Commission (NIWRMC) (in its extant and future established regulatory form) in preparation of strategic Catchment Management Plans (CMPs) formulated with the participation of Catchment Stakeholders represented on each HA's Catchment Management Office's Basin Stakeholder Advisory Committee and supporting the IWRM awareness and capacity building of its members. Third, support will be provided--where possible—for anticipated appropriate regulatory and out-sourcing financing arrangements for provision of the works, services, and equipment needed for

river flow regulation, river flood management, and channel maintenance within a selected river basin.

Activity 1.1.1: Integrated Basin Resources Planning and Water Resources Monitoring Systems Improvement[13]

7. This Subcomponent would support the following improvements: Hydrological, Meteorological, and Groundwater Data Monitoring Infrastructure Improvements in Hydrological Areas 1, 3, and 8; and Institutional Capability for Sustainable Water Resources Monitoring Systems Data Archiving and Access by post-installation operational support for new gauging stations in the Meteorological and Hydrological Networks Groundwater Monitoring for four years.

8. The S-R Basin investment plan calls for: (i) NIMET is to receive and operate weather stations, tipping bucket rain gauges (data stored on logger and telemetered) and standard rain gauges; and (ii) NIHSA to operate automatically monitored river water level and water quality stations (telemetry plus logger), automatically monitored river water level stations (telemetry plus logger), manually monitored water level stage boards, bridge-based current meter setups and boat mounted for updating river stage-discharge curves and groundwater observation boreholes. Annual operating and repair costs for all new equipment are provided in the budget. A hydrometric programme training budget for staff has been provided. Project budget estimates were made for the Hydrometric programmes of HA 3 and HA 8, to be further discussed when a MoU is to be signed with these institutions in order to define roles and responsibilities.

Activity 1.1.2: IWRM Bill/Act Implementation Support in Selected River Basins

9. The IWRM Plans are tools for the management of water resources in a manner that promotes optimal, equitable, and sustainable use of the resource. Because of their cross-cutting nature, IWRM Plans should be developed with the full participation of all relevant sectors and stakeholders. The development of the Sokoto-Rima Sub-Basin (S-RSB) IWRM Plan has therefore followed a process that has included consultations with a broad spectrum of stakeholders in the S-R Sub-Basin. The S-RSB is a trans-boundary basin of which 41 percent of its 226,720 km^2 is located in Northern Nigeria (93,129 km^2) within Hydrological Area 1 (HA 1). The outlet of HA 1 is the Kainji dam, whereas the S-RRB outlet is the confluence of the Sokoto–Rima River with the River Niger. JICA has prepared its Catchment Management Plan for HA 1 to 2030, whereas the S-RRB IWRM Plan study projects supply and demand to 2035 and 2065. IWRM starts with the assessment of the development strategies and plans and projections from various sectors for their potential water requirements against the total available water. The process then proposes appropriate management responses to the water balance that results from such assessment and analysis. The process followed in the development of the S-RRB IWRM Plan included the assessment of both surface and groundwater resources in the S-RRB and the assessment of the socio-economic and institutional profile and water needs in the basin. The impact of Climate Change has been included in the IWRM Plan as it affects the runoff

[13] The subcomponent costs for Bakolori and Zobe dams are based on a feasibility report. The feasibility reports and costs for Goronyo dam and dams in other sub-basins are expected after Board Approval but provisional costs have been made in the Project Cost based on Inception Report estimates.

generation during 2030s and 2060s. In the long run the runoff is expected to decrease under the "dry scenario", whereas it will increase under the "wet scenario". The average between these two scenarios indicates that the runoff is going to decrease by 7 percent in the next 20 years and later it will increase by 14 percent in 50 years.

10. This Subcomponent will support implementation actions in the following two basins where there are existing IWRM plans, i.e. the Sokoto-Rima Basin, and the Hadejia-Jama'are-Komadugu-Yobe Basin (HYKYB). The water resources management problems in the HJKYB are mainly related to the adverse impacts of Tiga and Challawa Gorge dams and the KRIP and HVIP schemes by changing the Hadejia river's flow regime from an ephemeral stream in the dry season to a perennial one which generated a major Typha Grass infestation that caused adverse impacts on the Hadejia-Nguru Wetlands (HNW) -- a designated RAMSAR site -- by reducing its economic productivity and biological diversity. The dry season flows from the Hadejia River onward to Borno and Yobe States and Lake Chad have been effectively curtailed and created major hardships to their riparian populations. In addition, the Typha infestation has caused siltation and contraction of the Hadejia river channel carrying capacity, resulting in significantly increased overbank flooding exacerbated by high spillway discharges from the two upstream dams. The IWRM Plans for the Hadejia-Jama'are Sub-Basin will be formulated after Project Effectiveness.

Activity 1.1.3: Investments in River Channel Works and Maintenance in Selected River Basins[14]

11. The geomorphological and prefeasibility engineering assessment of managing flood risk caused by high spillway discharges by the reinstatement/construction of embankments and other measures downstream of the dams to protect downstream communities. This is addressed for: Bakolori, Zobe, and Goronyo dams in the Sokoto-Rima sub-basins; the Tiga and Challawa Gorge dams in the Hadejia Sub-basin; and Dadin-Kowa on the Gongola river in the Upper Benue sub-basin. The Project supports investments in river channel works to mitigate the impacts of overbank flooding for these rivers. A basic understanding of the geomorphological functioning of the river channels downstream of the dams with high spillway discharges is an essential context for the development of viable and sustainable river training structures and/or non-structural solutions to mitigate river bank erosion and migration, overbank flooding caused by channel conveyance atrophy (siltation and heavy aquatic weed infestation), and the impact of changes in seasonal river flow regime following dam construction. It can also inform decisions on riparian land uses and the hazards to key regional infrastructure (road and rail crossings). A major investment will be made in the Hadejia-Sub-Basin to address channel siltation and annual Typha Grass removal to reduce overbank flooding and construction of flow proportioning structures to improve seasonal flow in the Hadejia-Nguru Wetlands to: (i) reduce the adverse impacts of the current post-dam flow regime; and (ii) increase dry-season flow to water users beyond the wetlands.

[14] Sokoto Rima Sub-Basin detailed designs and final costs will be completed prior to Board Approval. The feasibility reports and detailed designs for the Hadejia-Jama'are Sub-Basin and Gongola Sub-basin will be completed after Board Approval.

Subcomponent 1.2: Dam operations improvement and safety

12. This Subcomponent addresses the operational and dam safety assurance needs of the large dams serving irrigation schemes and ensuring public safety in the selected river basins by interventions fulfilling all the requirements of the Bank's Operational Policy 4.37. The safety assurance and management of embankment dams in Nigeria is below tolerable international safety standards. A particular focus is given to the safety contingencies of high spillway discharges on downstream areas in addition to provisions for dam break emergencies. The reduction of safety risks for these dams and correction of their operational deficiencies to meet international standards, as well as initiation of a programme of national dam safety assurance for all Nigeria's large dams, are addressed under this Subcomponent.

13. Interventions include dam rehabilitation, dam operational improvements and safety management for six large dams and two operational reservoirs including: Bakolori, Zobe and Goronyo dams in the S-R Basin; Tiga, and Challawa Gorge dams and Ruwan Kanya Hadeija Barrage operational reservoirs, in the Hadejia-Jama'are Sub-Basin; and Dadin Kowa dam in the Gongola Sub-basin. The hazards and safety risks to downstream populations to be addressed for the selected dams are considerable; a description of the dams, their safety issues and rehabilitation and operational improvement needs is given in a detailed table included in the PIMM.

14. To meet the above challenges, the Subcomponent would support the completion of four Activities, namely: (a) ensure the sustainable operational safety of the selected large dams and their ancillary headworks structures in selected RBDAs by dam works rehabilitation, hydro-mechanical and electrical equipment repair or refurbishment, and reinstallation of dam monitoring instrumentation; (b) operational improvement of the selected dams (based on floodplain mapping and reservoir bathymetric surveys); (c) TA for national dam safety assurance strengthening and training FMWR Dams & Reservoir Operations Department and RBDA dam unit staff of the selected dams; and (d) Bank OP 4.37 mandated establishment of an international Panel of Experts to advise on remedial design issues, complex construction problems, and post-construction safety certification of the dams.

Activity 1.2.1: Rehabilitation of Selected Dams[15]

15. The dam rehabilitation tasks under this Activity include: (i) review of flood inflow extreme values generated to assess spillway capacity and related reservoir flood buffer capacity against overtopping; (ii) simulation of downstream channel overtopping at very high spillway discharges to determine the locations and areal extent of flooding in the vicinity of the command areas served by the dam and at locations downstream; (iii) determination of area flooded under a dam break, especially when there are other large dams downstream on the same river system (e.g. as for Zobe dam on the Karaduwa river -- a tributary of the Rima river on which Goronyo Dam is located not too far from their confluence) and for Dadin Kowa Dam located upstream of Kiri Dam on the Gongola river; (iv) embankment crest level settlement survey to restore crest

[15] Detailed designs for Bakolori and Zobe dams will be ready by Project Effectiveness.

design elevation levels; (v) dam remedial civil works for repair of embankments and spillway structures, provision of auxiliary overflow spillways whose need has been determined by extreme flood review; (vi) improvement of foundation seepage prevention such as extension or provision cut-off walls and repair/improvement of embankment seepage control, collection, monitoring and drainage works; (vii) repair, and/or replacement of dysfunctional hydro-mechanical and electrical control equipment such as inlet & outlet valves and gates to improve reservoir operational performance and reduce dam failure risks; and (viii) repair and replacement of dam safety monitoring instrumentation used to monitor the external and internal condition of the dam structure[16].

Activity 1.2.2: Operational Improvements of Selected Dams

16. The tasks under this Activity include: (i) a reservoir bathymetric survey to determine the cumulative loss of reservoir storage capacity affecting the reservoir's flow regulating capacity and, to determine the need for removal of sediment accumulation at dam inlet works and/or structures to divert sediment from such locations; (ii) preparation of updated O&M Manuals that reflect changes introduced by dam rehabilitation for structures, operational mechanical-electrical equipment, O&M equipment and dam monitoring instrumentation for normal and emergency conditions; (iii) preparation of a dam O&M Plan covering staffing and training needs and O&M budget funding requirements; (iv) detailed topographic mapping of the flood plain downstream of the dam based on the area covered by the dam break analysis; (v) preparation of an Emergency Preparedness Plan (EPP) specifying the criteria and tasks of dam staff in identifying emergency conditions, actions to prepare the dam equipment for coping with a safety contingency, flood warning procedures, etc.; (vi) preparation of a stakeholder approved Emergency Action Plan (EAP) based on detailed delineation of floodplain overbank flooding depth zones to enable selective warning, preparedness and evacuation of population at risk preparedness, warning and evacuation arrangements for a potential dam break emergency; (vii) instrumentation monitoring data recording & processing, and dam safety assurance and management; and (viii) desilting of the heavily sedimented reservoirs .

Activity1.2.3: TA for RBDA Dam Unit Training and Strengthening the Dam & Reservoir Operations Departments National Dam Safety Assurance Function

17. In addition to training and capacity building of RBDA technical staff in utilizing O&M Manuals, there is a great need for operational and dam safety training and capacity building of dam site staff. Dam Unit engineers and technicians need to be trained in all aspects of dam and reservoir safety assurance including maintenance issues, instrumentation reading, data processing and maintenance, operation of valves and gates, dam inspection and formal

[16] The preparation consultants are required to consider all modes of dam failure due to structural deficiencies, non-operational mechanical-electrical appurtenances and equipment, and incorrect reservoir management using a modern Probable Failure Mode Assessment (PFMA) approach. Based on international experience it is desirable that construction supervision be undertaken by a specialized TA firm having staff experienced in design and supervision of dam safety remedial works, hydro-mechanical appurtenance refurbishment, installation and electrical equipment, and dam instrumentation replacement for *existing* dams. The TAs would facilitate on-the-job training of engineers and technicians in remedial works supervision, O&M and dam safety monitoring, sensitization of RBDA management to dam safety needs, and report and advice on any developing dam safety contingencies.

surveillance procedures and familiarity with a dam's O&M manual. This, together with an adequate O&M budget will improve operational performance and increase dam longevity. The pending Water Resource Bill includes establishing a Dam Safety Inspectorate in FMWR to cover all dams in Nigeria. In the interim, the Project will support the Dam & Reservoir Operations Department (DROD) as follows: (i) professional and field training of engineers in its Instrumentation and Dam Monitoring & Supervision Divisions; (ii) operational support for increased periodic dam safety inspections of FMWR dams; (iii) technical assistance for preparation of essential Dam Safety Technical Guidelines for the operation and safety of large dams (inclusive of EPPs and detailed EAPs acceptable to downstream authorities and the population at risk); and (iv) adaptation of international dam safety training materials to DROD and RBDA needs and preparation of training modules for formal and on-job training and refresher courses as part of an in-house training long-term program to periodically train DROD engineer and RBDA and Dam Unit staff, particularly to cope with staff replacements and attrition A persistent problem in RBDAs is hiring and keeping good engineers for a long period to work near distant and remote dams.

Activity1.2.4: Dam Safety Panel of Experts (PoE)

18. This Activity supports a Dam Safety Panel of Experts of international standard to: (i) review Consultants' detailed designs; (ii) advise on complexities arising during construction as necessary; and (iii) review "as-built" drawings and completion reports to approve remedial works and appurtenance repairs and provide an independent certification that original dam safety risks have been adequately reduced. The expertise required would include, inter alia, the following specialists with existing dam rehabilitation experience: (i) geotechnical investigations and design; (ii) hydro-mechanical and electrical equipment & control; (iii) dam monitoring instrumentation; (iv) operational hydrologist; and (v) dam remedial works construction specialist. The Panel would be recruited by the PMU from a long list of individuals willing to periodically visit northern Nigeria upon invitation to attend PoE meetings on site. Thus, an expert pool of 1-2 persons per specialization would be formed. The DROD, its TA, and the Works supervision TA would collaborate to prepare briefing materials for each PoE site meeting attended by DROD and TA specialists, and the PoE team would have to furnish a draft report to the PMU and DROD summarizing the findings and conclusions of its deliberations along with recommendations.

Component 2: Irrigation Development and Management

19. Poor operation and maintenance (O&M) of irrigation and drainage canals and related infrastructures is the major contributor to the deterioration, inadequate water service delivery, and inefficient performance observed in most of the irrigation schemes developed more than 20 to 30 years ago in Nigeria. Combined with poor on-farm water management practices, weak institutions, poor agricultural services and market infrastructure as well as the prevailing gaps in the policy environment, these problems have impeded the development of irrigated agriculture in the country. Moreover, some of the storage dams (Dadin Kowa, for example) constructed during the same period and still in good condition, with a potential for multi-purpose use, are abandoned in various parts of the country.

20. To effectively make use of the sunk costs invested in the existing schemes and the capacities built over the years, the Project will focus on rehabilitating these schemes. To contribute to the efforts of addressing the root causes of the challenges faced by the irrigation sub-sector, the Project will pilot new approaches based on accountability, financial sustainability, and empowerment of water user associations. To ensure sustainability, in addition to other selection criteria, the Project will favor schemes that can easily be irrigated by gravity.

21. The Component will rehabilitate and expand[17] irrigation areas and provide support to the irrigation water management in five schemes[18] for which studies are on-going. The schemes considered (see main section, pages 13-14) are: (i) Bakolori Irrigation Scheme (BIS); (ii) Middle Rima Valley Irrigation Scheme (MRVIS); (iii) Kano River Irrigation Scheme (KRIS); (iv) Hadejia-Jama'are Valley Irrigation Scheme (HVIS); and (v) Dadin Kowa Irrigation Scheme (DKIS) (see Map in Annex 12). In the first four schemes (BIS, MRVIS, KRIS and HVIS), the Project will support works (except in MRVIS where they are already on-going) in order to rehabilitate the irrigation equipped-area so that it becomes fully operational. In addition, (i) a technical assistance (TA) for developing participatory irrigation management (PIM) is envisaged, as well as (ii) a TA for developing a Farmers' Management and Service Delivery Centers (FMC) to support irrigated agronomy in order to improve productivity of the scheme. In the case of DKIS, it's quite a different case as this scheme does not exist as such and is the only one that would in fact be a completely new irrigation scheme (the existing 100 ha is basically a pilot). Considering the pre-feasibility studies prepared by the FGN, Dadin Kowa represents an excellent opportunity for a PPP approach, taking into account the marketing opportunities offered by the tomato cannery as well as the sugarcane development and the development of the 40 MW hydropower. The TRIMING Project would provide support to undertake the required PPP full feasibility studies and transaction advice. A provision of funds would be made available in the project budget to be used in accordance with the outcome of the on-going PPP feasibility studies and could notably support the implementation of a PPP transaction in Dadin Kowa if the deal proves to be attractive to the private sector

22. As the Project is aimed at transforming the irrigation subsector through demonstration of best practices of addressing the fundamental causes of poor performance and scheme deterioration, it is deliberately designed to complement the other activities of the Project focusing at policy reforms and support to improve the O&M capacity. Implementation of rehabilitation and expansion works in the four schemes will be progressive and depend on the speed and quality of the step-by-step irrigation management change process as described below under Subcomponent 2.2. Lessons learned from the pilot rehabilitation and expansion investments areas will be used by the FMWR to replicate similar efforts in the other schemes and, later on, in other parts of the country. This Component directly contributes towards the project development objective of improving access for farmers to water for irrigation and to strengthen institutional arrangements for integrated water resources management in targeted areas in northern Nigeria.

[17] Expansion refers to conversion from sprinkler to gravity irrigation system, finalization of incomplete works and development of new area under the exiting scheme.

[18] Feasibility study report of BIS, ATKINS, March 2014; Pre-feasibility study report of DKIS, by individual consultants, March 2014; Inception report of KRIP and HVIP, Haskoning/DHV, March 2014.

Subcomponent 2.1: Irrigation and Drainage Investments

23. The Subcomponent provides a major investment in the form of: (i) studies and design of additional irrigation schemes; (ii) construct irrigation and drainage civil works; (iii) conducting associated engineering supervision, and (iv) ESMP and the Resettlement Action Plans (RAP) for the entire project, including its implementation.

24. Unless dictated by exceptional situations where gravity drainage is difficult, like in BIS, the Project will focus on gravity irrigation system to ensure sustainability. All schemes to be rehabilitated are located downstream of completed storage reservoirs. The infrastructure[19] development related activities of this Subcomponent will directly contribute to the Irrigation Development and Management Component of the Project thereby improving about 50,000 ha. The major activities include: (i) rehabilitating poorly operating and underutilized irrigation schemes; and (ii) expanding the irrigable area within the existing schemes to include: (a) new areas, (b) finalize part of incomplete infrastructures, and (c) convert abandoned sprinkler areas to gravity irrigation system to improve the irrigation performance. The environmental and social impacts of these schemes will be assessed in the context of basin-wide Integrated Water Resources Management (IWRM) before a final decision will be made on the extent of improvements/rehabilitation and expansion investments. Such assessments have already been completed for BIS during project preparation phase.

Activity 2.1.1: Rehabilitate 8,000 ha and convert 13,000 ha from sprinkler to gravity irrigation system in BIS

25. BIS is located in Sokoto state about 110 km from Sokoto town, near Talata-Mafara. It lies between latitude 12°30’ and 12°50’N and longitude 5°50’ and 6°20’E (see Map in Annex 12). With the exception of Jankarawa, which is discussed below, the soils in BIS are derived from terrace deposit which is suitable for irrigation. As a problem of water logging, that may pose salinity risk, was observed in pockets of low-lying areas, further investigations will be conducted during the detailed design to recommend the requiring water management practices. Rehabilitation of the drainage system will be a key component of the construction works program and will allow the scheme operator to manage the salinity risk.

26. The Bakolori dam has a storage capacity of 450 million m^3 (subject to change after checking the silt level). Currently, its hydro-turbines (with a capacity of 500 to 3,000 KW and six diesel generators [each 1,120 KW]) meant to pump drainage water are dysfunctional due to inadequate O&M.

27. Assuming a 180 percent cropping intensity in a normal year, only 382 million m^3 water (i.e. 54 percent of the 706 million m^3 average annual inflow to Bakolori dam and 91 percent of its 419 million m^3 live storage capacity) is required to irrigate the proposed 21,000 ha of land. At the same time one will need to ensure that the storage at the end of the year is kept same as the starting level and environmental flow requirements (EFRs), downstream water supply, and

[19] Irrigation infrastructure refers to: (i) irrigation and drainage canals and their regulating structures, (ii) pumping stations, (iii) roads, (iv) flow regulating storage reservoirs, and (v) land leveling etc.

fadama irrigation needs are met. The Jankarawa area was also assessed for possible inclusion and 700 ha of marginally suitable soils was identified. However, this site was excluded from funding under TRIMING as it cannot be irrigated by gravity. It poses significant irrigation management challenges.

Sub-activity a: Rehabilitate 8,000 ha of inefficiently irrigated area (including about 1,557 ha lost due to poor drainage) in BIS

28. This sub-activity will rehabilitate: (i) a 30 km long supply canal[20] of 30 m3/s capacity; and (ii) 30 km of main canals (15 km on the left side and 15 km of the right side), each with a design capacity of 15 m3/s. These canals and their related ancillary structures[21] generally require sealing of the cracks on the concrete panels and reinstatement of the embankment, which has been eroded for about 30 percent of the entire length, to its original height, and de-silting. Moreover, 200 km of secondary canals (both concrete-lined and unlined) need major repair work. All unlined secondary canals will be lined. Rehabilitation of concrete canals are mainly related to treatment of cracks, sliding, bulging, slabs uplifting, and grasses growing through the cracks and joints as well as silting at some locations. Similarly, all earthen canals need protection/stabilization of embankments to avoid erosion and/or seepage, weeds/shrubs removal as well as de-silting to bring them to the desired conveyance capacity. Tertiary canals extending to more than 400 km are also in a very poor condition as their embankments have been eroded and breached at several locations, requiring cleaning, reshaping, and provision of siphons or pipes equipped with simple covers buried within the canal embankments at predetermined intervals.

29. In addition, main, secondary, and tertiary drains (estimated total length of 1,000 km) and related structures are suffering from siltation and are choked with vegetation, weeds and shrubs. They have lost their original shape and need rehabilitation to conform to their original cross sections. Moreover, the rehabilitation of the drainage system is expected to bring back the 1,557 ha irrigable area into production, which was lost due to water logging. This will require rehabilitation of the drainage pumping stations at Dankaiwa and Yarkofoji. Although construction has to (as much as possible) be planned to take place during slack periods, the rehabilitation requirements are calculated taking the needs for alternate canals (detours) or other appropriate bypass systems, should irrigation continue during construction. The need for rights of ways is also factored in. Rehabilitation works are expected to be spread over 4 to 5 years, to be confirmed following detailed design.

30. Out of the 30 km long asphalt-surfaced main road running parallel to the supply canal, only the recently rehabilitated (by the government) three km long road is in a fair condition, while the remaining requires major rehabilitation. In addition, lateritic roads along the main and secondary canals which include 10 km main and 65 km access roads suffer from potholes, gulley erosion, water logging, and in some cases total washout. The 45 km field tracks along field

[20] The supply canal is in relatively good condition but requires rehabilitation.
[21] These include: replacement or repair of vandalized or damaged irrigation and drainage equipment and structures such as canal flow regulators and gates, energy dissipaters, I&D culverts, siphons, canal intakes/off-takes, flumes, escapes, bridges, drinking troughs, pump station, etc.

channels are mostly not maintained. Often, they are suffering from weed infestation and water logging. All these roads require extensive rehabilitation work.

Sub-activity b: Convert 13,000 ha of abandoned sprinkler area to gravity irrigation system

31. With a focus on growing rice, sugarcane, and other field crops, and in compliance/harmony with the existing gravity system, a detailed design of a gravity system will be prepared for furrow and basin irrigation (as appropriate, depending on topography and soils) to command the 13,000 ha abandoned sprinkler area. The type of support includes detail design and construction of lined secondary canals fitted with flow regulating and other control and conveyance structures, tertiary canals, drains (main, collector and field), land leveling, and roads. To ensure access to drinking water and ease of mobility for the livestock in the area and those owned by the mobile Fulani herders, appropriate watering points and cattle crossing corridors will be provided at socially agreeable strategic locations.

Activity 2.1.2: Rehabilitate 15,000 ha in KRIS (12,000 ha normal rehabilitation and 3,000 ha major rehabilitation)

32. KRIS and HVIS (discussed separately below) are located within the Kano-Zaria Plains, a vast, almost flat area, which extends continuously from Sokoto to Lake Chad (see Map in Annex 12). The altitude of KRIP varies from 520 m above sea level (a.s.l) to 425 m a.s.l with the general terrain slope directed to the northeast. It is located in Kano state, about 30 km southwest of Kano city between latitudes 110 45’ and 120 05’ North and longitude 80 45’ and 90 05’ East. In general, the soils in the area are categorized into deep and well permeable with physical characteristics fairly suitable for irrigation and uniformly distributed in the area. However, it has some limitations related to drainage, soil depth, texture, alkalinity, and the presence of hardpan, and therefore requiring proper water management practices.

33. The KRIS has the potential to irrigate 22,000 ha, out of which 12,000 ha has been fully developed and irrigated by gravity. An additional 3,000 ha is being irrigated through water abstraction from the main canal, making the total irrigated area 15,000 ha. The source of water is the Tiga dam with 1,968 million m^3 storage capacity (subject to change after checking the silt level) along with Ruwan Kanya dam.

34. The Subcomponent will support the feasibility studies, detail design and construction of normal rehabilitation of 12,000 ha and major rehabilitation of 3,000 ha currently dysfunctional.

Activity 2.1.3: Develop 6000 ha in HVIP (rehabilitation of 5,000 ha and finalizing 1,000 ha)

35. HVIS is located in Auyo area of Jigawa state. Hadejia is located 230 to 280 km from Kano depending on which route one takes. The scheme was developed on a fadama fertile land between the Hadejia River and its tributary, the Kaffin Hausa River. HVIP utilizes the water released from the upstream Challawa and Tiga dams into the river system. Its headwork consists of a barrage/storage pond of 11.4 million m^3 capacity from where water is diverted into the

30m^3/s capacity 2.8 km long supply[22] canal. Although planned to irrigate about 12,500 ha, only the north main canal irrigating about 5,000 ha (out of the planned 6,000 ha) was developed, while the remaining 6,500 ha in the south is undeveloped. The storage barrage, the earthen supply, and main canals are all infested by typha weed.

Sub-activity a: Rehabilitation of 5,000 ha

36. The Subcomponent will rehabilitate 5,000 ha in HVIP. The major activities include: (i) feasibility studies and detail design; (ii) rehabilitation of the earthen supply and main canals with lining to be considered as an option of ease of maintenance and provided it is economically viable; (iii) rehabilitation of irrigation and drainage as well as road infrastructures; and (iv) management/control of typha grass in the storage pond and all canals.

Sub-activity b: Finalizing 1,000 ha

37. Moreover, the Project will support extension of the north canal to utilize its full capacity by irrigating an additional 1,000 ha. The major activities include: (i) feasibility studies and detailed design; and (ii) construction of civil works, which include: (a) main canal (lined); (b) secondary and tertiary canals and their associated drains, flow regulating/control structures; (c) roads; and (d) land leveling.

Activity 2.1.4: Public Private Partnership (PPP) feasibility studies and detailed design and Transaction Advise of 21,000 ha irrigation and completion of the hydropower plant in DKIS

38. Located 40 km east of Gombe town, the Dadin Kowa Irrigation Scheme (DKIS) lies between 9°0' to 11°45' N and 8°55' and 13°50'E. The proposed gravity command area below Dadin Kowa dam is divided into two plots. These are: Dadin Kowa plot located in Borno and Gombe sates and Guyuk plot in Adamawa state. The source of water for DKIS is from the Dadin Kowa dam with a storage capacity of 2.8 billion m^3 (live storage of 1.77 billion m^3; subject to change after checking the silt level). The dam is structurally in a very good condition. Most of the 34 MW hydropower plant civil works are completed but without electro-mechanical equipment. With the exception of the recently completed Dadin Kowa town water supply scheme, the water stored in the dam was not used since its construction. However, in addition to the 100 ha currently irrigated by pilot farmers, the privately-owned Savannah Agro-processing Company located about 10 km downstream of Dadin Kowa dam is currently irrigating about 400 ha (out of its 2,000 ha potential), all using pumps. Another company called Savannah Sugar is currently irrigating 12,500 ha by gravity using the water supplied from another dam called Kiri dam downstream of Guyuk plot.

39. The Subcomponent will prepare the feasibility studies and detailed design to irrigate a total of about 22,000 ha (i.e. 3,000 ha in Dadin Kowa plot and 19,000 ha in Guyuk plot). The latter includes construction of a diversion weir across the Gongola River somewhere between 70 and 125 km downstream of Dadin Kowa dam. The project will support the funding of the public component for a PPP arrangement on irrigation development in Dadin Kowa and/or Guyuk.

[22] Called feeder canal by the RBDA.

Moreover, the detailed studies required to complete the hydropower plant and its transmission as well as the modalities for PPP arrangements to operate the hydropower and the irrigation schemes will be supported.

Activity 2.1.5: Conduct the engineering supervision, ESIAs, ESMPs and Resettlement Action Plan (RAPs)

40. The Project will support the engineering supervision of all civil works, preparation of ESIA for KRIP, HVIP, DKIP and other new studies under Activity 1 as well as ESMP and RAPs (including its implementation to be financed by government counterpart funds) for activities to be implemented under the Subcomponent.

Subcomponent 2.2: Improving Irrigation Management at Scheme Level

41. This Subcomponent will address the daunting challenge of ensuring the long-term viability quality of the irrigation and drainage services delivered on public irrigation schemes developed by the Federal Government over the past 30 years. The approach will be to implement a progressive management transfer to users' regulated bodies in the form of Water Users Associations (WUAs) and to autonomous professional operators, either public or private. The approach will be first piloted on BIS which is the 'first mover', starting with the areas to be rehabilitated. The principles, operational arrangements and regulatory framework underpinning this process are described in Annex 9.

42. The Subcomponent will finance: (i) Technical Assistance (TA) for the purpose of establishing and strengthening the WUAs at the various levels and supporting scheme operation and maintenance activities, including the preparation of an O&M manual; (ii) training for WUA representatives and staff as well as RBDA and scheme operator staff on governance, management and operation and maintenance of irrigation schemes; (iii) transitional financing of a part of the WUAs' O&M costs of irrigation schemes on a declining scale[23] until such time they are financially autonomous; and (iv) buildings and equipment for the WUAs and the RBDAs that are not covered by the project's transitional contributions to O&M costs paid to the WUAs. These activities will be implemented in parallel and in correspondence with the construction works (rehabilitation or expansion) financed under the Subcomponent 2.1 so that the rehabilitated or newly constructed infrastructure is handed over to the WUAs and scheme operator from the contractor in a progressive manner. The WUAs and scheme operators will immediately start assuming their O&M responsibilities on the transferred infrastructures, using the proceeds of the irrigation service fees complemented with the transitional financing of O&M costs to the WUAs.

43. **Technical Assistance:** the activities will include the development of a detailed training strategy with associated learning materials to re-align existing WUAs and establish new WUAs to achieve a transformed institutional structure for effective water management. The engagement process with existing WUAs and new farmers groups would take place in an intensive series of training and information exchange sessions at UNIT WUA (tertiary level) as

[23] Contributions to O&M costs will only be given to WUAs that are legally formed registered, and trained. Funding of O&M costs is transitional and will therefore be on a declining scale (see paragraph 48).

well as at the APEX WUA level (scheme level). To achieve this two main activities would be supported, the first being the design of the training process and associated learning materials and media, and the second being the implementation of the WUA training process at field level over an extended timeline. In parallel the TA will support the setting up of contractual arrangements between the Government, the RBDA and the WUAs to formalize the transfer of irrigation management and improve accountability over service delivery. Specifically the TA will comprise of the following activities.

Activity 2.2.1: Design and Production of a WUA Training Process and Multi-Media Toolkit

44. This activity comprises specialist TA to design in detail a WUA training programme and related manuals and media, down to the level of a curricula and a series of daily learning sessions for WUA members. It also involves the design and production of a communication strategy and resultant multi-media outputs that are needed by the facilitators who will be working with the WUAs. The activity would commence with a sample survey of WUA members to identify perceptions, skills and their capabilities in relation to expected WUA administrative and financial tasks. The intention would be to obtain sex-disaggregated data on literacy, numeracy and organizational capability, with particular attention to women's participation in decision-making in the local cultural context. The survey information would provide valuable contextual information for the design of the WUA training programmes, communication strategy, and media toolkit.

- **Technical support for the detailed design of an intensive WUA training programme:** The WUA training programme has two levels, the first being the training of the facilitators who will go into the field and work with WUAs at field level, and the second being the design of the learning materials that they will use in the field. The first level would require a detailed design of a curricula and related lesson plans to be used in an intensive 'training-of-trainers' course, prior to the outreach work in the field. The WUA facilitators would need to be taken through a learning process in relation to how irrigation schemes operate, the legal basis for WUA establishment, operational, financial and administrative processes and required skills for key WUA positions. They would need hands-on exposure to irrigation water-management practices in the field and engage with engineers, scheme management, and farmers to fully appreciate the scope of work and functioning of the scheme to be able to properly support the WUA establishment process. In the course on the WUA-facilitator training process, the facilitators would need to become WUA training experts in their own right, equipped with materials, lesson-plans, and supported by high-quality media. The second level of the intensive WUA training programme design is the development of the set of learning materials to be used by the WUA-facilitators in the series of engagement sessions at UNIT-WUA level. The WUA-facilitators would each need to be equipped with their own training manual that guides their field-interactions and specifies what and how content will be addressed in each of the progressive WUA sessions, with guidance on media to be used. They will also need to be equipped with handouts and manuals for the WUA members themselves. In summary three training manuals will need to be produced: (a) Training Programme for the Training of WUA Facilitators; (b) Lesson Plans and Training Guidelines for WUA-Facilitators to conduct the Training of WUAs; and (c) A WUA Manual for WUA members.

- **Development of a communication strategy and related targeted media:** Investment in this sub-activity would support the development of a sophisticated communications strategy to facilitate attitudinal change and increased uptake and effectiveness of the WUA-centered, PIM approach among farmers, local leaders, scheme administrators, and higher levels of Government. The strategy will identify key target audiences from farmers to high-level Government officials, assess their perceptions and bias, analyze the key messages to be communicated and set-out and justify the selection of various multi-media options to be pursued. The strategy will provide scripted outlines of videos, should these be warranted, define the messaging to be included in posters, hand-outs and pamphlets and consider radio messaging, targeting key audiences, and messages of PIM.

- **Compilation of a WUA Media toolkit:** Investments would transform the various learning materials and WUA manuals defined above, and the defined media specified in the communication strategy, through graphic design of print media, and with specialist video-production input if specified in the communication strategy, to produce an inspirational and visually attractive toolkit. The WUA Media Toolkit would then comprise the WUA training manuals (three separate manuals), visual media (possibly including video, posters, and pamphlets) and possibly completed radio adverts.

Activity 2.2.2: Water User Association Human Capital and Institutional Development for improved scheme operations

45. The investments in Activity (2.2.2) would be the field-level implementation of the WUA training process developed under Activity (2.2.1), at scale over an extended period. The implementing agent would conduct a review of the status of WUA development on each scheme and develop a training programme in consultation with existing WUA and scheme management structures. The training programme would have three phases: the first being the selection and training of the WUA-Facilitators in an intensive course using the training approach and media from Activity (2.2.1); the second phase would be the rollout at scale of the WUA training programme extending over 2 to 3 years depending on scheme size and the total number of UNIT WUAs using manuals and media developed in Activity (2.2.1); the final phase would be a reduced phase of WUA support and a phase-out from the scheme.

46. A key element of the WUA training rollout would be close collaboration with the existing scheme management and the contractor in coordinating the construction programme with the various WUAs. Disruptions to irrigation water supply are likely to be unavoidable, potentially for extended periods. The intention in the consultation process would be to use the WUA organizational development process as a point of collaboration and negotiation engagement process, thereby supporting the WUA in action, and strengthening their systems and functions in the process.

Activity 2.2.3: Establishment of contractual approach towards irrigation scheme management

47. The TA will support the preparation and implementation of the contractual approach, linking the FMWR, the RBDA and the WUAs around shared objectives and commitments. This is described in detail in Annex 9.

48. **Transitional Contributions to O&M Costs:** The Project will support WUAs by financing a slice of their O&M costs of irrigation schemes on a declining scale: at 80 percent in year 1, 60 percent in year 2, 40 percent in year 3, and 20 percent in year 4. O&M of the irrigation schemes is carried out by selected Operators who will bill WUAs and expect payment at the beginning of each cropping cycle. There are two cropping cycles per year. To assist WUAs paying these 6-monthly bills, the Project, through the PMU, would provide **block grants** to be agreed annually based on the expected O&M bill from the Operators and the agreed declining scale of project support over time. The block grant would be released to the WUAs in two installments per year, in line with the O&M billing cycle, against achievement of satisfactory performance by the WUAs as reflected in their O&M billing and payment records.[24] These contributions will be provided by the Project to the WUAs on the basis of a prior signed agreement: the *Progressive Transfer Agreement*. This agreement will be established for a period of four years and may be extended by mutual agreement of the parties. A specific section in the *Project Implementation Management Manual (PIMM)* will describe in detail the procedure for establishing this agreement and disbursing the funds. All WUAs legally registered in the Project areas of intervention will be automatically eligible, provided that they are compliant with their own by-laws in terms of governance and accountability.

49. **Buildings and equipment:** the Project would finance an office building, one vehicle and some motorbikes for the Apex WUA on each scheme as a starting capital. The exact list of equipment will be determined based on a needs assessment. For the office building options for using existing buildings will be considered first.

Expected outputs from Subcomponent 2.2

50. The WUAs will be strengthened to manage, operate and maintain the irrigation and drainage systems at turnout and tertiary levels. It is believed that delegating these responsibilities to the farmers will result in systems that are operated and maintained with a resultant improvement in agricultural production and water use efficiency. These benefits include:

- **Improved maintenance of canals**: Maintenance of civil works is essential to ensure that the system can deliver irrigation water to all beneficiaries. WUAs will play a critical role to ensure local engagement in maintaining these systems.

- **Improved water distribution**: WUAs can apply pressure to the RBDA to provide a reliable, timely, and adequate service. Working in partnership with RBDA, WUAs can

[24] The details and modalities will be specified in the Project Implementation Management Manual which will be reviewed and cleared by the Bank prior to effectiveness.

agree on the seasonal cropping pattern and associated water requirements and prepare an agreed irrigation roster. During the seasons, WUAs can work with RBDA to ensure that the roster is followed and water is allocated and distributed to the WUAs. This improved cooperation between the parties will lead to improvement in water delivery and consequently in agricultural production and water use efficiency.

- **Increase in irrigated area**: The redesign of the irrigation system may pose a problem of head-tail end disparities with those nearer the source of water taking a greater share of irrigation water at the expense of the tail-end farmers. WUAs will facilitate dialogue between the farmers, agree on rotational calendars, and provide water to all.

- **Increased level of water fee collection and revenue generation**: The water fee collection is now seen as a tax by the farmers, with the money collected sent to the FMWR. Under the transformation, WUA will be authorized to collect water fees and then receive back from RBDA a specified portion for O&M of the system they will be managing.

- **Enhanced transparency and accountability**: WUA will jointly manage the available water resources, and this will increase the transparency in irrigation management, system maintenance and water fee collection.

Component 3: Enhancing Agricultural Productivity and Value Chains

51. One of the root causes of the decreasing productivity in the large irrigation schemes was the delinking of the extension services in the 1980s, leading to a low input-low output strategy, a reduction in revenues, and farmers' reluctance to pay for services, including water charges. The project under this component aims to re-establish productive capacity of the rehabilitated schemes through rebuilding backward and forward linkages and facilitating farmer's participation in the agricultural value chains. Indeed, increases in yields and crop intensity – which in turn will secure an acceptable economic return of the whole project – will require improved farmers' access to markets, inputs and services, in addition to improvement in water use efficiency through the rehabilitation and institutional re-engineering of the schemes. Efficient services to farmers will also require stronger organizational structures for farmers and adequate delivery channels to minimize the cost of doing business with farmers.

52. This Component will provide resources to enhance farmers' productivity in the rehabilitated schemes, and improve their participation in the value chains development. Activities under the component will be aligned and coordinated with the States and FMARD's programs under the Agricultural Transformation Agenda (ATA) and will include: (i) structuring of and capacity building to farmer organizations for improved access to markets, inputs, and services; (ii) facilitation of value chains development opportunities to increase and improve supply of services along the value chains through a matching grants mechanism; and (iii) introduction and promotion of innovation through a collaborative R&D program. The component will put a specific focus on value chain management and capacity building for improved job opportunities through promotion of small and medium-size local entrepreneurs,

and inclusion of youth and women in project activities, clustered around the following two sub-components:

Subcomponent 3.1: Support to agricultural productivity and market linkages

53. This Subcomponent includes two activities: (a) improving farmers' participation in agricultural value chains, building farmers, WUAs and SMEs capacity on business planning and market linkages, technical and financial management of their businesses, as well as facilitating their access to improved inputs and technologies, extension and financial services. This would be achieved through Farmers Service and delivery Centers at scheme level, the establishment of which will be supported through a technical assistance by savvy agribusiness firm with successful track records in those areas; and (b) matching grants mechanism to unlock the funding constraints of critical activities and the design of sustainable financing scheme value chains development in project intervention areas. The main interface with States is at the Scheme Oversight Committee (SCO) with representation from all relevant stakeholders (FMWR, RBDA, FMARD, State – ADP and Ministries of Agriculture, Local Government, WUA). It will be established to review at regular intervals the implementation of the agreements at scheme level. This SOC will meet at least once before the beginning of each agriculture season to plan the agricultural campaign.

Activity 3.1.1: Establishing Farmers Management and Service Delivery Centers at scheme levels

54. This Subcomponent aims at building WUAs' technical and managerial capacity to improve farmers' ability to access markets opportunities and adequate production support services. To that aim the project will finance the establishment of a Farmers Management Center (FMC) in each of the irrigation schemes. The FMCs will be a one stop shop that will provide technical assistance to farmers and eligible beneficiaries of in the areas of accounting and financial management (e.g. establishing accounting software, book keeping), business planning and establishing out-grower schemes to facilitate mechanization services and commercialization of farmers products, facilitation of access to finance, as well as technical support through extension services (provided directly or through third parties such as the ADPs), training, and R&D in partnership with relevant R&D institutions).

55. Specific services will be customized for each category of clients (apex, intake and unit WUAs, Water User Groups, Youth, and Women Groups, Herders Associations, and SMEs operating in and around the schemes and along the value chains). The FMCs will be built around the existing irrigation projects based on a value chains approach and will be staffed with core personnel of 3-4 specialized professionals in the aforementioned areas, with 100 percent funding of the project for the first two years, beneficiaries contributing to its funding and ensuring ownership gradually through a fees-based service provision (25 percent in the 3rd years, 50 percent in the 4th year, and 75 percent in the 5th year. The remaining 25 percent will be covered by public funding through the restructured RBDA, for M&E, economic analysis and reporting on financial and technical performance of value chains in the various schemes.

Activity 3.1.2: Technical Assistance on farmers-market linkages and for the establishment of the FMCs

56. The project will hire a savvy agribusiness firm for each of the sub-basins covered (namely Hadeija Jama'are and Sokoto-Rima) to support the establishment of the FMC and initiate strong forward and backward linkages along the value chains, using the productive alliance models. In particular, the firm will support the FMCs in developing, documenting, training and communicating on methodologies, procedures and instruments for:

(a) Identifying and developing market opportunities through mapping and assessment of potential off-takers (agribusiness firms, key traders, major urban outlets, etc.), and market information system for major crops being produced in the schemes;
(b) Performing value chain analysis to identify and assess major constraints to address (quality, affordability, availability of improved inputs and technologies/techniques, standards and grading, packaging, storage, transportation, pricing, etc.);
(c) Negotiating technical and commercial partnerships with off-takers, suppliers, and services providers, including financial services;
(d) Identifying and connecting with supporting programs (e.g. extension services) at State (e.g. ADP) and Federal level, in particular under the ATA (GES, FAFIN, SCPZ, Value Chains programs etc.);
(e) Developing business models and facilitating access to financing;
(f) Providing support in planning production activities, managing logistics and organizing delivery to up-takers;
(g) Assisting farmers associations in preparing business plans and proposals for the matching grants to support their implementation under the Subcomponent 3-1; and
(h) Setting up and ensuring quality of accounting financial management systems for the WUAs, and SMEs in project intervention areas.

57. Organizing farmers for efficient access of services will build upon the re-organization of Water Users Associations (WUAs) anticipated in Subcomponent 2.2 above, but it is not excluded that other dedicated organizational structures groupings or structures be envisioned, should the markets so require.

Activity 3.1.3: Matching grants and sustainable financing for value chain development

58. Based on the business plans and commercial partnerships established under Subcomponent 3.1 above, the Project will establish a Matching Grant Mechanism (MGM) to ensure funding of critical activities along the value chains aimed at improving farmers' productivity through access to improved technologies and access to markets and services, such as mechanization equipment or services, storage, farm-gate commodity aggregation, primary processing and packaging centers, transport services, etc. These grants are meant to complement or unlock financial services where existing in project intervention areas, or to mitigate market failure where such services are not provided.

59. The matching grants could also be used to strengthen or scale up on-going initiatives under the ATA such as the Growth Enhancement Support (GES), FADAMA, scheme or

commodity bulking, and processing schemes in projects interventions areas. It will finance on a cost-share basis acquisition of productive assets through farmers' organizations, facilitate establishment or business expansion of SMEs (input suppliers, mechanization services, packaging and processing units, on-farm storage facilities, irrigation and production equipment maintenance and repair, etc.) operating along the value chains in project intervention areas, with specific targeting of women and youth. The MGM should also finance part of development of private sector feasibility studies or business plans for investments in project sites that benefit project primary beneficiaries (e.g. implementation of processing units, as part of a Staple Crop Processing Zones programs in project intervention areas).

60. The MGM will be managed at the PMU level to ensure competition and make the funds fungible between various project intervention sites such as all other project activities. The Agribusiness firm referred to in Sub-component 3.1 will provide technical assistance in developing the MGF detailed management and implementation instruments, which procedures will be outlined in the Project Implementation Manual[25].

61. To ensure sustainability of activities initiated under the matching grants, the project will also finance the feasibility study by the third year of project implementation, of a market-based financing scheme in project intervention areas, building upon the FMARD's Fund for Agriculture Financing in Nigeria (FAFIN) and the upcoming World Bank-assisted Development Finance Project, the result of which will determine whether there are opportunities to invest part of the MGM into a Deposit Credit Cooperative Cash Collateral.

Subcomponent 3.2: Support to innovation and R&D

62. Support would be provided for farmer water schools, applied research such as improving irrigated agronomy, introduction of innovation such as new crops or production techniques as part of emerging commercial partnerships, etc. Innovations from the Project will also be identified and supported for technology transfer within and outside the country. Competitive grants will be made available for selected studies and partnerships on irrigated agriculture to be carried out by research centers, universities, or the private sector. These grants will be provided based on minimum criteria for qualification (such as the research to be executed at the schemes where the project works) and via a selection committee[26].

Activity 3.2.1: Applied research on irrigated agriculture

63. The Project will support demonstrations and adaptive field trials, primarily focusing on irrigated agronomy and agricultural water management during the implementation of the Project. Among possible partners for this activity, consideration will be given to involving the International Water Management Institute (IWMI), the Irrigation Training & Research Center (ITRC) at California Polytechnic State University, and Wageningen Agricultural University

[25] The modalities for the matching grants including eligible percentages and criteria for qualifying will be in the Project Implementation Management Manual which will be reviewed and cleared by the Bank prior to effectiveness.
[26] The details and modalities will be outlined in the Project Implementation Management Manual which will be reviewed and cleared by the Bank prior to effectiveness.

(WUR) with research and capacity building to join ventures with Nigerian institutions on the following themes:

- Analysis of past experience of Participatory Irrigation Management (PIM) in Nigeria and elsewhere to draw lessons to inform the design and piloting of new PIM schemes within the TRIMING project;
- Analysis of the likely impacts of local irrigation interventions on the broader hydrology of the watershed/basin to promote integrated water resources management;
- Applied research on agronomic, soil and water management practices to improve land and agricultural productivity and reduce environmental degradation in the irrigation schemes;
- Development and analysis of agricultural value chains and support services systems to inform knowledge management and capacity building of value chain actors;
- Development of tailor-made decision support tools to provide monitoring and evaluation of performance of the irrigation schemes and to build the capacity of staff involved in these schemes on performance-oriented solutions and management;
- Research to analyze and provide implementable recommendations on policy and economic and institutional support needed to ensure that improved irrigation from the revitalized schemes can translate into increased income and food security for Nigerians and simultaneously lead to sustainable management of land and water resources;
- Research on water storage options in the face of climate variability and change as an input into the design and long-term management of the irrigation schemes; and
- Knowledge management and capacity building on PIM, IWRM, irrigation Value Chain Development, and M&E of irrigation system performance based on research and decision-support tools developed through participation in the TRIMING project.

Activity 3.2.2: Introduction of innovations and dissemination of good agricultural practices

64. As the business partnerships and market linkages are developed, farmers would need to gradually improve their ability to adapt to a rapidly changing environment. The Project will then help with taking informed risks through accompanying the introduction of innovations, new crops, and new techniques to respond to market's needs. It will also support rapid scaling up of proven and adapted technologies and techniques, including innovation in delivering extension services to farmers, using new information and communication technologies (ICT, such as e-extension). The project will therefore finance support and training, communication associated with field trials, introduction of sample equipment for testing, dissemination of technologies, etc. Among possible partners, Africa Rice, the National Agricultural Extension, Research and Liaison Services at Ahmadu Bello University in Zaria, and the Agricultural Research Council of Nigeria (ARCN) should be considered.

65. Implementation of activities under Subcomponent 3.1 will be facilitated by a 'market integrator', a savvy consulting firm with a solid track record on business solutions to farmers, farmers associations, and SMEs in agricultural value chains. The firm will be hired competitively to support the Project management unit and each of the participating RBDA/Irrigation Projects to: (i) develop and implement tool-kits and plans; (ii) establish coordination mechanisms between the FMARD, FWRM, State Programs, and the private sector, (iii) assist farmer organization in market explorations and identification of technical and commercial partners, (iv)

support farmers in participating to various programs under the ATA (GES, FAFIN, etc.); and (v) develop and implement a performance assessment and adjustment framework of the component for the PMU. It is expected that within three years the firm will develop enough capacity for the RBDA/Projects to take over a sustainable farmer support services scheme. The firm and Irrigation Projects Agricultural Services Units will also prepare proposals for consideration in the R&D programs under Subcomponent 3.2.

66. The WAAPP Coordination Unit may assist the Project to coordinate the implementation of Activities 3.2.1 and 3.2.2, and facilitate introduction and transfer of technologies with mechanisms already developed under the project in Nigeria and in other participating countries in West Africa. In particular, WAAPP would focus on raising productivity of existing crops such as rice, using up-to-date technologies from within the country, and benefit from other countries participating in WAAPP to take advantage of the technology transfer network built under the program.

67. The Project will also fund the establishment of Community Radio Stations in all irrigation schemes, and they will be owned and operated by the community. The implementation costs of the communications will include appropriate multimedia mobile vehicles, simplified posters, leaflets, radio/television spots, and videos/DVDs. The Project will provide technical assistance for piloting the use of information technology by communities to increase transparency and availability of real-time information.

Annex Table 2.1: Indicative activities and eligibility criteria for the Matching Grants Mechanism

Characteristics	Indicative Types of Sub-projects		
	Value Chain Business partnerships	**Irrigation**	**Livestock/Fisheries**
Eligible beneficiaries	▪ Legally established Intake and Unit WUAs, ▪ Youth and Women groups ▪ Commercial farms ▪ Small and medium-scale agribusiness/mechanizatio n enterprises and agro-dealers in the value chains ▪ Agribusiness firms establishing out- grower schemes with farmers in the schemes	▪ Legally established apex WUAs Intake and Unit WUAs, ▪ Youth and Women groups ▪ Commercial farms ▪ Small and medium-scale agribusiness enterprises and agro-dealers in the value chains ▪ Agribusiness firms establishing out- grower schemes with farmers in the schemes	▪ Herdsmen/Fishermen and their association, ▪ Small and medium-scale enterprises in livestock/fisheries production, processing and marketing ▪ Youth and Women groups ▪ Traders, butchers and processors of animal products and related associations
Eligible activities	▪ Development of business plans and feasibility studies ▪ Implementation of business plans (including Improved seeds and agricultural inputs, Farm equipment such as leveling paddling, threshing equipment, aggregation centers , Packaging materials, and small scale on farm pre-	▪ Development of business plans and feasibility studies ▪ Irrigation infrastructure and equipment (including civil works, drip/aspersion irrigation equipment, protection fences, etc.), ▪ Start-up production plan (including improved seeds and inputs) ; ▪ Feasibility studies for	▪ Cattle/fisheries -friendly infrastructure within the scheme to facilitate access to grazing and watering areas ▪ Business units including for breeding/fattening, dairy and poultry, units, hatcheries, commercialization); production of animal feed and vet inputs; ▪ TA and training on compliance with SPS norms, pastoralism , fisheries

Characteristics	Indicative Types of Sub-projects		
	Value Chain Business partnerships	**Irrigation**	**Livestock/Fisheries**
	processing units) ▪ Facilitation of access to finance ▪ Training Technical assistance on Quality and Standards, value chain management,	PPP projects ▪ Training	businesses
Funding level per sub-projects(details in the Implementation manual)	Ceiling amount to be established beneficiaries Per category of investments/ Total : $30	Ceiling amount to be established beneficiaries Per category of investments/ Total $10	Ceiling amount to be established beneficiaries Per category of investments/ $5Mn
Beneficiaries' contribution (to be fined tune and confirmed in the Implementation manual)	▪ Farmers and WUAs: 10-20% ▪ SME: 50% ▪ Agribusiness firms (studies and provision of technical assistance only up to 12 months in each scheme)	▪ Associations of smallholders: 50% ▪ SME (up to 20 ha) 80% ▪ Agribusiness firms (studies and provision of technical assistance only up to 12 months in each scheme)	▪ Farmers-Herders conflict prevention infrastructure: 0% ▪ Productive units: herdsmen and related association, Youth and women and related groups 20%; SMEs 50%

Characteristics	Indicative Types of Sub-projects		
	Value Chain Business partnerships	**Irrigation**	**Livestock/Fisheries**
Eligibility criteria	▪ Beneficiary (producer, producers organization, SME, Firms) has at least a 3-year experience in a supply chain targeted by the project ▪ Beneficiary resides in or close to project area ▪ Beneficiary is willing to undergo training related to the demonstration tests and relevant to his/her business plan ▪ Beneficiary maintains an effective financial management system or subscribes to a "management center" ▪ Beneficiary contribute to service cost recovery as necessary ▪ Agribusiness firms guaranties markets, and off-take prices to producers	▪ Beneficiary (producer, producers organization, SME, Firms) has at least a 3-year experience in irrigated production of agricultural products for export targeted by the project ▪ Beneficiary is engaged in agricultural intensification ▪ Beneficiary resides in project area ▪ Beneficiary pays O&M's fees and charges of project-financed irrigation infrastructure ▪ Beneficiary maintains an effective financial management system or subscribes to a "management center" ▪ Beneficiary contribute to service cost recovery as necessary	▪ Beneficiary resides in project area ▪ Beneficiary is willing to undergo training related to the demonstration tests and relevant to his/her business plan ▪ Beneficiary maintains an effective financial management system or subscribes to a "management center" ▪ Beneficiary contribute to service cost recovery as necessary
Technical evaluation criteria	▪ The sub-project addresses a key constraint to the improvement of the value	▪ The sub-project complement or is compatible with the	▪ The sub-project value by-products of the scheme and/or help prevent farmers/herders

Characteristics	Indicative Types of Sub-projects		
	Value Chain Business partnerships	**Irrigation**	**Livestock/Fisheries**
	chain ▪ The sub-project follows a technological package or process validated by the project ▪ Internal rates of return equals or exceeds 15 percent. ▪ The sub-project has no negative environmental impact and, if needed, appropriate mitigation measures will be implemented	design of the scheme, with acceptable technical norms ▪ Internal rate of return equals or exceeds 15 percent. ▪ The sub-project has no negative environmental impact and, if needed, appropriate mitigation measures will be implemented	conflict over use of the resources ▪ The sub-project complies with technical norms The sub-project has no negative environmental impact and, if needed, appropriate mitigation measures will be implemented
Particular criteria	▪ Sub-project promoting youth and women employment and/or Sub-projects submitted by women and youth groups attract special attention	▪ Sub-projects submitted by women and youth groups receive special treatment through a selection criterion accounting for 20 percent of the total points	▪ Sub-projects submitted by women and youth groups receive special treatment through a selection criterion accounting for 20 percent of the total points

Component 4: Institutional Development and Project Management

68. This component will provide support to the building of capacity in the irrigation and water resources sector management in general and to the key project actors in particular. In doing so, the project will build further momentum around the change process, support consensus building and facilitate change management among the different actors at the national, RBDA and local level. The project will also work towards the creation of inclusive and accountable management of the sector and, finally, the evidence-based monitoring of the roll out of these pilots so that appropriate adaptions can be made and lessons for scale up generated. It will also support project management and M&E. In recognition of the different needs and challenges of the selected schemes, support will be tailored to the realities of each scheme. In addition, it will enhance the efficiency of personnel through the provision of advanced IT-based tools, performance-based systems for staff evaluation, modern survey and design techniques as well the overall management of the PMU and the Irrigation Department through administrative and managerial skills enhancements and tools (e.g. management information systems).

Subcomponent 4.1: Institutional Development and Governance

69. This Subcomponent includes five activities.

Activity 4.1.1: Capacity building and training of FMWR staff

70. This activity will mainly focus on developing the capacity and training the staff of the FMWR. A particular attention will be paid to the training of young engineers and to the reinforcement of the capacity of staff from the Irrigation Department and the Department of Dams. Local and external training will be made available to FMWR after a needs assessment and the development of a training program. This will allow the Ministry to reinforce its strength while rolling out its TRIMING Program on one hand while preparing on the other hand for the replacement of senior staff who will be soon retiring. Furthermore, study tours; specific studies and workshops; partnerships between national educational centers (such as National Water Resources Institute in Kaduna and the International Water Management Institute) and universities (e.g. Wageningen); in Kano collaboration is expected to involve the Kano Farm Mechanization Institute in Dambatta, the Kano Irrigation Training Institute in Kadawa.

Activity 4.1.2: Support to RBDAs

71. Through this activity, the project will support the RBDAs in capacity needs assessments, capacity building, and the development of operational plans for better planning and effectively carrying out their activities on dams, reservoirs and primary canals. Through this activity, the project will also help the RBDAs in appointing change management teams within their own structure in order to mainstream change management principles from inside. It would also include support for consensus-building workshops and development and implementation of change management plans.

Activity 4.1.3: Consensus building and supporting the change process

72. This activity would support: (i) additional analysis of potential bottlenecks for change including the different levels of private sector participation and gender impacts, (ii) consensus building around new roles and responsibilities among the different stakeholders, as well as collective visions and plans; (iii) design, implementation and oversight of performance-based agreements for both service providers as well as the local accountability and redress mechanisms; (iv) communication campaigns on reform through appropriate, locally accessible media; and (v) innovations to further align political and financial incentives with local needs, including through the incorporation of locally elected representatives around collective visions and plans.

Activity 4.1.4: Generation, feedback, and dissemination of information

73. This activity would help ensure that pilot schemes are adapted according to evolving contexts and that lessons are generated for the subsequent scale up foreseen. Activities will include: i) design and implementation of an information system and data collection system with an SMS interface, as well as the roll out of the GIFMIS to the scheme level, and iii) public dissemination of results, including through scorecards by scheme level, generating competition for results between participating schemes.

Activity 4.1.5: Strengthening oversight and accountability in the sector

74. Activities to be supported include: (i) support to and development of processes within NIWRMC for standards setting, sector information gathering and development of rules for intervention and stakeholders behavior modification; (ii) public information and transparency activities; and (iii) innovations around complementary social accountability mechanisms at the local, RBDA, and federal level, including grievance mechanisms along the service delivery chain, as proposed under the RPF.

Subcomponent 4.2: Management and M&E

75. Capacity building will be supported at all levels (FMWR, project, RBDA, scheme): (i) under the capacity building part numerous activities will be undertaken including: training in contract management, project management, quality assurance; (ii) under the advocacy line of activities the overall reform agenda will be promoted to make O&M sustainable.

Activity 4.2.1: Project Management

76. This activity will support the establishment of: (i) the Project Management Unit (PMU) to implement the Project, including fiduciary aspects framework for Bank Projects (procurement, financial management, anti-corruption plan, environmental and social safeguards), M&E, computers, vehicles, etc.; training on contract management, WUAs, PIM, etc.; (ii) a Steering Committee (SC) to oversee and review the budget as well as guide and evaluate the performance evaluation of the PMU; and (iii) a Change Management Committee (CMC) to analyze, advise, and make proposals on the change process for large-scale public irrigation schemes in Nigeria.

Activity 4.2.2: M&E

77. Within this activity, three main tasks or building blocks are envisaged:

(a) Development of an Information System to monitor and evaluate the project. A simple but effective monitoring and evaluation system will be put in place. It will be fed by the GIS system discussed above and complemented by more participatory approaches to monitoring;

(b) Complementary studies and analytical work. Provision is made under the Project to carry out prefeasibility studies of schemes to be identified by the FMWR. The resource requirements for the preparation of feasibility studies will be revisited at project mid-term. This activity will also support the development of a communications strategy and its implementation and other studies deemed necessary to support project implementation; and

(c) Development of an Electronic Records and Document Management Systems (ERDMS). The FMWR will be supported in information management with expertise in digitization, record management and Electronic Records and Document Management Systems (ERDMS). The ERDMS will improve the archiving system for reports, studies, maps, drawings, monitoring information and history of the Department of Irrigation and Drainage, Department of Department of Dams & Reservoir Operations, Department of Planning Research & Statistics and Policy as well as any other unit of the FMWR willing to archive its information.

Annex 3: Implementation Arrangements
Transforming Irrigation Management in Nigeria (TRIMING) Project

Project Administration Mechanisms

1. The project will be housed in the Federal Ministry of Water Resources (FMWR), but strong involvement of the Federal and in particular State Ministries of Agriculture will be crucial to the project's success on the agribusiness/marketing side. Other Ministries that need to be involved at the Federal level include FMARD, MET, NIWPC, NIHSA, etc., all of which will be represented either in the proposed Steering Committee or in the Technical Advisory Committee.

2. A **Project Steering Committee** (PSC) is in charge of the overall coordination and policy guidance. It is chaired by the Permanent Secretary (PS) of FMWR and includes representatives of *inter alia:* Federal Ministry of Finance (FMF), Nigeria Meteorological Agency (NIMET), Federal Ministry of Environment (FMEnv), Federal Ministry of Agriculture and Rural Development (FMARD) as well as State Representatives where the project is working (Commissioners for Water and Agriculture) such as Zamfara, Sokoto, Kano, Jigawa, Gombe, Borno and Adamawa as well as NGO representatives.

3. The PSC, established since March 5th 2013, is responsible for: (i) approving the project annual work plan and budget, prepared by the PMU; (ii) providing overall coordination, policy advice, and control of operations; and (iii) approving the updating of the project implementation manual and the financial and accounting manuals. The PSC will meet at least twice a year; one of those meetings will be held immediately after the annual visit to the field, which will include the Ministers of Water and Agriculture as well as the RBDA staff and state and local representatives of the scheme(s) to be visited. The Project Coordinator will serve as Secretary of the PSC meetings.

4. The **Change Management Committee (CMC**) is the emanation of the Inter-ministerial Project Preparation Team (IPPT) established in June 2013. The CMC will provide advice both to the Steering Committee as well as to the Project Management Team. Aside from representatives of the FMWR and FMARD it includes representatives of the following institutions: Federal Ministry of Finance, Federal Ministry of Environment, Sokoto Rima RBDA, Hadejia-Jama'are RBDA, and the Upper Benue RBDA, and on an *ad hoc* or permanent basis various respected leaders in the field of irrigation management, dam safety, and agriculture.

5. A **Project Management Team (PMU)** will manage the project on a day-to-day basis. It will be located at one of the project sites since the project will implement transformative irrigation approaches in northern Nigeria. However, for the first two years it was agreed to have on a transitional basis the PMU in Abuja. The PMU will be responsible for coordination and management of the project, including oversight of all technical, fiduciary, and administrative matters. The PMU will be located in the FMWR, whose mandate includes irrigation development and dam safety measures. This arrangement will ensure skills transfer within an appropriate institutional context, which leads to a higher likelihood of sustainability once the project closes. There are presently (i) project coordinator, (ii) irrigation specialist, (iii) environmental specialist, (iv) social specialist, (v) procurement officer, and (vi) accountant on

board. The following posts are to be filled up at the latest one month after effectiveness: (a) water resources management specialist, (b) agribusiness specialist, (c) M&E specialist, (d) communications specialist, (e) data & information specialist, and (f) internal auditor. The PMU will report to Permanent Secretary of FMWR.

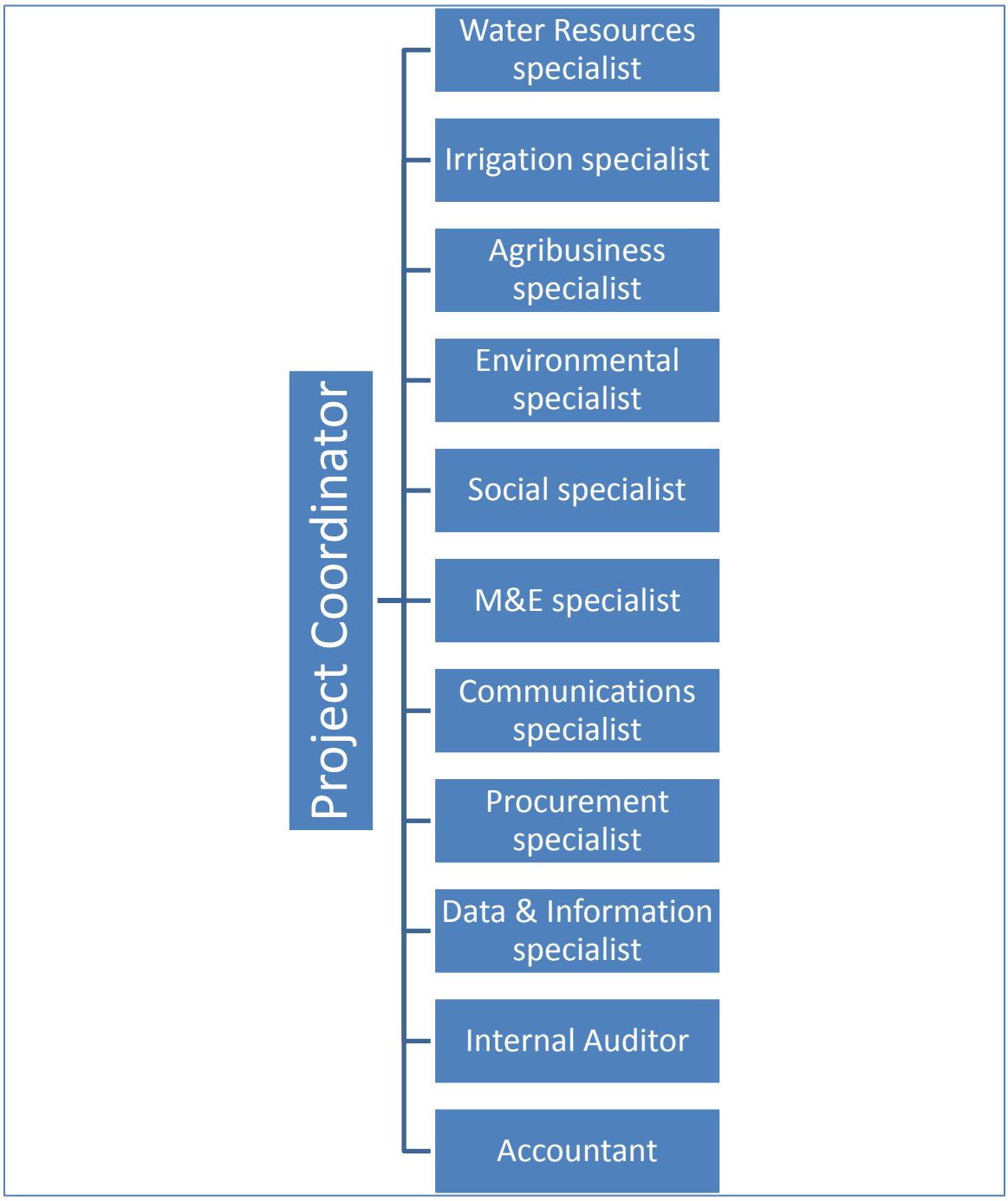
6. **A tri-partite contract will be signed between the River Basin Development Authorities (RBDAs), the Water Users Associations Federations (WUAFs) and the Federal Government.** Operational procedures are largely informal and not recorded in writing, but are embedded to a varying extent in the institutional memory of the scheme management and their personnel. Task teams would be established under senior scheme leadership and in facilitated sessions using available maps, drawings and Google Earth imagery, the key hydraulic elements of the scheme would be spatially defined. Thereafter, the O&M team would document their current operational practices under normal conditions and under conditions of water stress, covering both seasons. A draft operational manual would be developed in as good a form as practically possible. The intention of this process would be twofold: first it would serve to make explicit as far as practically possible the available 'hidden' knowledge residing in technicians and farmers and reinforce their self-perceptions as capable persons who have local-specialist knowledge; secondly it would be an interactive platform where the facilitator can purposefully engage with the future scheme operators and build their capabilities with transformed scheme functioning in mind. During the construction period, once the WUAs are sufficiently well established, the division of responsibility between the RBDAs and the WUAs would be negotiated and the final institutional arrangement, including fee structures, would be signed off. At an appropriate time, the RBDA would hand over responsibility for that portion of the scheme agreed for operation by the WUA.

7. **The Water Users Associations Federation** (WUAFs) and their members would be in charge of maintenance and operations at tertiary and field-canal level and would collect, administer and maintain adequate organizational systems to fulfill this responsibility. The area of operation, fee structure and details of WUA meetings, routine operations and maintenance mechanisms, financial flows in kind or in cash would be systematized and implemented. During the first two years the WUAs would be intensively supported with targeted operational training and supported through monitoring, evaluation and learning feedback, as well as with a phased-in payment structure.

Financial Management

8. A financial management assessment of the implementing entity in line with the Financial Management Manual (March 1, 2010) and the AFTFM Financial Management Assessment and Risk Rating Principles (October 2010) was conducted on November 25, 2013. The objective was to determine whether the implementing entities have acceptable financial management arrangements, which will ensure: (i) that all transactions and balances relating to the project are correctly and completely recorded; (ii) the preparation of regular, timely, and reliable financial statements; (iii) safeguarding of the entity's assets; and (iv) existence of auditing arrangements acceptable to the Bank.

Figure 3.1: Organogram of the Project Management Unit for the Transformation Irrigation Management in Nigeria Project



9. The overall FM risk for the Project is assessed as **Substantial**. This is mainly because of the issues of multiple implementation levels, not because of the control risks associated with the basic elements of the project FM arrangements. The identified FM risks are well mitigated by the use of the FPFMD, which features robust controls (internal and external). The mitigation measures include use of a computerized accounting system, professionally qualified FM staff with appropriate expertise, and independent and effective internal audits that will adopt a risk-based internal audit methodology. The Financial Procedures Manual (FPM) in use at the FPFMD will apply to the Project with some modifications. Regular reporting arrangements and a supervision plan will also ensure that the implementation of the Project is closely monitored and that appropriate remedial actions are taken. The FM risks will be reviewed during project implementation and updated as appropriate.

10. The FPFMD is established at the federal level through the joint efforts of the Bank and government. This unit is presently involved in the implementation of a number of Bank-assisted projects. The Bank's recent reviews showed that the FPFMD is performing satisfactorily. The FPFMD features among other things are the following: (i) all key elements of FM, including: budgeting, funds flow, accounting, internal control, reporting, and audit; (ii) computerized system and robust FM procedures manual; (iii) qualified staff that are well-trained in relevant Bank procedures and requirements, including procurement; (iv) robust segregation of functions/duties; (v) a strong control environment, which is required to mitigate fiduciary risks; (vi) highly independent and well-trained internal auditors; and (vii) full alignment with the government's own FM system but with some important enhancements and controls.

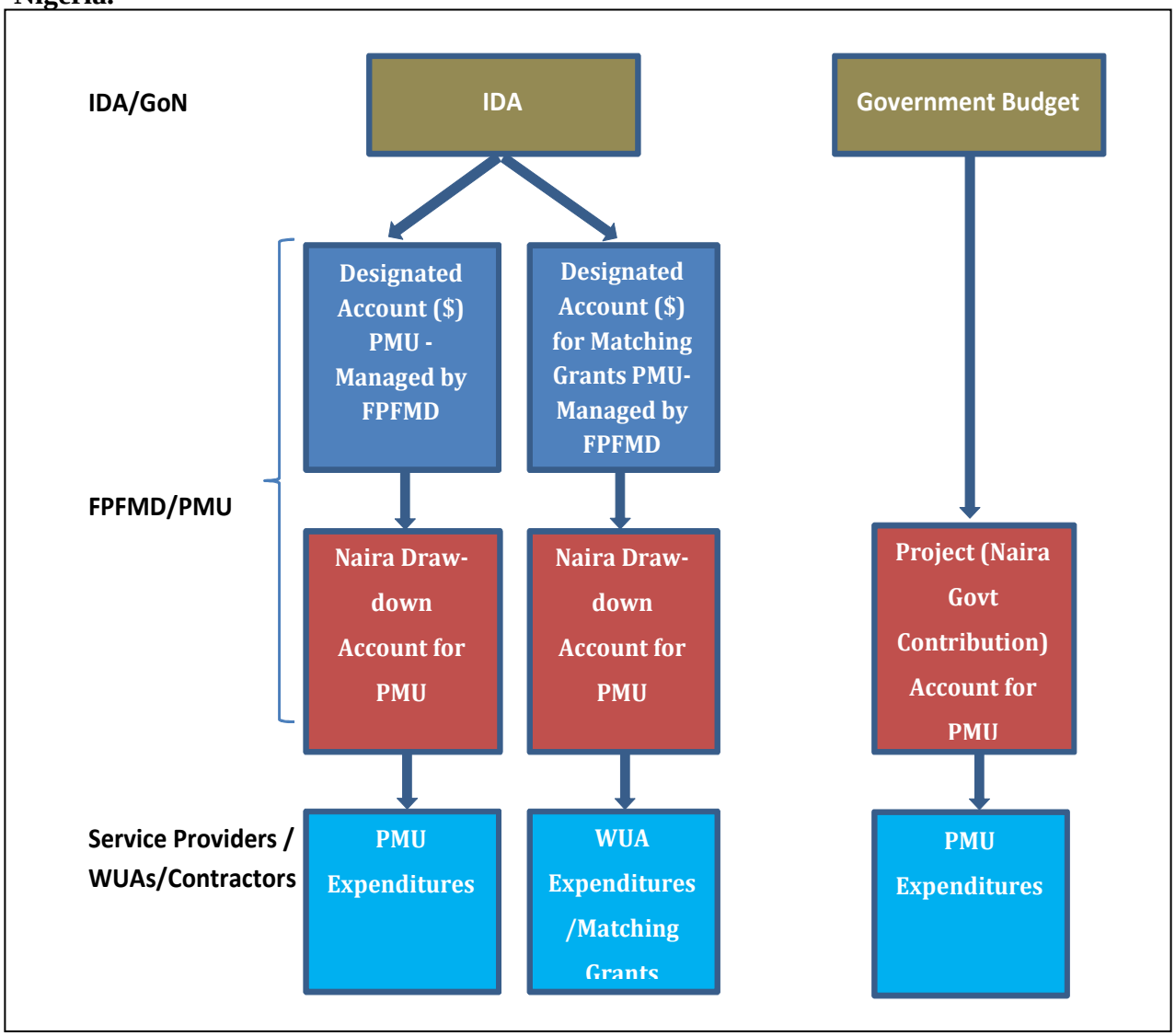
11. The Bank's recent reviews showed that the FPFMD is performing satisfactorily. Key issues noted within the FPFMD are those of unretired advances and inadequate documentation for incurred eligible expenditures. These are mainly the result of inadequate understanding of the Bank's FM requirements. To mitigate the risk arising from these issues, adequate procedures for the handling of advances including remedial actions in the event of default will be elaborated in the FPM with an indicative checklist of appropriate supporting documents for incurred eligible expenditures included in the FPM. IFRs, though submitted timely, are not of appropriate quality.

12. **Planning and Budgeting**: Budget preparation will follow the federal government's procedures as appropriate. On an annual basis, the Project Accountant (in consultation with key members of the implementing unit) will prepare the budget for the fiscal year based on the work program. The timelines for preparation of government budget and project budget will be synchronized. A budget committee will be established to coordinate budget preparation and tracking of financial performance. Detailed procedures for planning and budgeting will be documented in the FPM.

13. **Funds Flow**. Project funding will consist mainly of IDA credit and the beneficiaries' and Government contributions. IDA will disburse the credit through Designated Accounts (DAs) opened with reputable commercial banks acceptable to IDA which will be managed by PMU/FPFMD. The specific banking arrangements are as follows:

- Two USD DAs to which initial deposits and replenishments from IDA funds will be lodged, one for matching grants and one for all other expenditures;
- Two current (Draw-down) accounts each in Naira to which draw-downs from the DA will be credited in respect of incurred eligible expenditures and matching grants, maintaining balances in these accounts as close to zero as possible after payments; and
- One current (Project) account in Naira to which Government contribution will be deposited. This contribution will represent 8 percent of the activities:
    - 1.2.2 (desilting of heavily sedimented reservoirs),
    - 2.1.1 (the implementation of the resettlement action plans for the project) and
    - 40 percent contribution to component 4.
- The first amount to be deposited into the Counterpart Funds Account, will be not later than six (6) months after the Effective Date for an amount equivalent to two million five hundred thousand Dollars (US$2,500,000).

Figure 3.2: Illustrative Funds Flow Diagram for Transforming Irrigation Management in Nigeria.



14. **Accounting:** IDA funds will be accounted for by the Project on a cash basis. Computerized accounting system will be used, utilizing flexible accounting software currently in use at the FPFMD. The software will be expanded to include the project activities. The software will be configured in line with the agreed reporting formats for financial reports i.e. Unaudited Interim Financial Reports and Annual Financial Statements. Annual financial statements will be prepared in accordance with relevant International Public Sector Accounting Standards (IPSAS). Comprehensive Chart of Accounts suitable to the Project that encompass the total project as described in the PAD and Financing Agreement, and reflect all project activities, financing, and expenditures, including government contribution will be developed. All accounting and control procedures will be documented in the FPM, a living document which will be subject to review as appropriate.

15. **Financial Reporting**: Calendar semester Interim Financial Reports (IFRs) will be prepared by the PMU. PMU will submit IFRs to IDA not later than 45 days after the semester. The formats of IFRs were agreed at Negotiation. Annual project financial statements will be prepared and submitted to IDA within 6 months of the end of the government fiscal year by the PMU. Specific reports will be prepared for the Grants that will be reviewed and cleared by the team as part of the IFRs review process, and attached to every withdrawal application.

16. **Internal Control:** Adequate internal controls are in place at the FPFMD. The control features include robust FM procedures manual, relevantly qualified staff that are well trained in relevant Bank procedures and requirements, including procurement; robust segregation of functions/duties and highly independent and well-trained internal auditors – the FM staff are appointed by each State Accountant-General.

17. The project will be audited by an independent external auditor appointed based on Terms of Reference acceptable to IDA to audit the project and certify the financial statements for the project[27]. 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 ML will be submitted to IDA not later than six months after the end of each financial year. Technical audit will equally be conducted.

Disbursements

18. Issues of inadequate documentation for incurred expenditures and poor quality IFRs are flagged in the FM and external audit reports of some on-going projects at FPFMD. Accordingly, the project will use the transaction-based disbursement procedures and not report-based disbursements at effectiveness. When project implementation begins, the calendar semester IFRs produced by the project will be reviewed. Where the reports are found adequate and produced on a timely basis and borrower requests conversion to report-based disbursements, a review will be undertaken by the IDA project team to determine if the project is eligible for report-based disbursement. Details of the disbursement arrangement will be in the Disbursement Letter.

[27] The auditors' terms of reference will need to include additional auditing arrangements for the review of eligible expenditures associated to all grants.

Financial Management Action Plan

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

Table 3.1: FM Action Plan

No.	Action	Date due by	Responsible
1	Train staff in Bank FM procedures and Disbursement Guidelines.	Within 1 month after effectiveness	PMU/FPFMD
2	Appoint external auditor	Within 90 days after effectiveness	PMU/FPFMD
3	Update existing computerized accounting system at FPFMD	Within 90 days after effectiveness	PMU/FPFMD
4	Designate support accounting technicians	Done at negotiations	PMU/FPFMD

Financial Management Implementation Support Plan

20. FM supervision will be consistent with a risk-based approach, and will involve collaboration with the Bank's project team, LOA and procurement. The supervision intensity will be based initially on the PAD FM risk rating and subsequently on the updated FM risk rating during implementation. Given the Substantial residual risk rating, on-site supervision will be carried out 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 SOE review. Additional supervision activities will include desk review of semester IFRs, quarterly internal audit reports, audited Annual Financial Statements and management letters as well as timely follow up of issues that arise, and updating the FM rating in the Implementation Status and Results Report (ISR) and the Portfolio and Risk Management (PRIMA) system. The Bank's project team will support in monitoring the timely implementation of the action plan.

Disbursement Categories

21. Table 3.2 below sets out the expenditure categories and percentages to be financed out of the credit proceeds.

22. Disbursements under Component 2.2 include block grants to WUAs. These WUAs must be legally constituted, recognized by both the state and local government law. Meeting this criterion shall be a condition of disbursement. In additional provision for transparent albeit simple mechanisms for funds utilization and management by the WUAs shall be agreed upon. Disbursement under Component 3.1 will include standard matching grants to producer groups to improve agriculture productivity selected based on a demand-driven process with beneficiary contribution. Disbursement under Component 2.2 the project will include competitive

grant contributions to selected studies and partnerships on irrigated agriculture executed by universities and research centers.

Table 3.2: Allocation of credit proceeds to be financed for eligible expenditures (goods, works, services, training and operating costs) in each category (IDA).

Category	Amount of the Credit Allocated (expressed in million US$)	Percentage of Expenditures to be Financed (inclusive of Taxes)
Component 1. Subcomponent 1.1: Goods, non-consulting services, consulting services and works. Subcomponent 1.2. Goods, non-consulting services and consultants services. Component 2. Subcomponent 2.1: Goods, non-consulting services and consulting services. Subcomponent 2.2. Goods, non-consulting services, consultant services and works.	85	100%
Component 1. Subcomponent 1.2. Large Works for Water Resources Management and Dam Operation Improvement except the desilting of the heavily sedimented reservoirs. Component 2. Subcomponent 2.1: Large Works for Irrigation Development and Management	327	100%
Component 2 (Part 2.2): Block Grants to Support WUAs' O&M	10	100% of amounts paid under the grants
Component 3 Subcomponent 3.1: Matching Grants for Enhancing Agricultural Productivity and Value Chains	12	100% of amount disbursed
Component 3 Subcomponent 3.2: Competitive Research Grants to Support Research and Development	4	100%

Category	Amount of the Credit Allocated (expressed in million US$)	Percentage of Expenditures to be Financed (inclusive of Taxes)
Component 3 Subcomponent 3.2: Goods, non-consulting services and consulting services.	25	100%
Component 4: Institutional Development	23	60%
Refund of Project Preparation Advance	9	Amount payable pursuant to Section 2.07 of the General Conditions
TOTAL AMOUNT	495	

23. **Conclusion:** The Financial Management Assessment conclusion is that subject to the mitigation measures and the action plan being implemented as per agreed time frame, the project has met the minimum FM requirement in accordance with OP/BP 10.00. Further, this objective will be sustained by ensuring that strong and robust financial management arrangements are maintained for the project throughout its duration. Detailed financial management reviews will also be carried out regularly, either within the regular proposed supervision plan or a more frequent schedule if needed, to ensure that expenditures incurred by the project remain eligible.

Procurement

General

24. Considerable progress has been made on procurement reform in Nigeria. A procurement act has been passed, a cadre of procurement staff has been established in the federal civil service, and national bidding documents, acceptable to the World Bank are also now available though they are not yet being widely used. The procurement act provides for the regulating agency to also be involved in procurement implementation. As a result, there is a need to amend some of the provisions of the laws in order for them to be compliant with the tenets of sound public procurement.

25. Procurement activities under the project will be implemented by the Project Coordinating Unit that has been established in the Federal Ministry of Water Resources. The unit will implement all procurement on behalf of the Federal Ministry of Water Resources, the various River Basin Development Authorities and all other project activity implementing agencies.

26. Even though the PMU will implement the procurement activities on behalf of the activity implementing agencies, the activity implementing agencies will be fully involved in identifying

the activities to be included in the annual work plan. They will provide inputs into the technical specifications and terms of reference. In addition they will participate in the bid and proposals evaluations and in the supervision of the contracts that will be executed on behalf of the respective agency. The agencies will also be responsible for the acceptance and the takeover of the goods, services and works for such contracts.

Guidelines

27. Procurement under the proposed operation will be carried out in accordance with the World Bank's "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants" dated January 2011 and its "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants" dated January 2011 and with the provisions stipulated in the Legal Agreement. The various items under the different expenditure categories are described in general below. For each contract to be financed by the credit, the different procurement methods or consultant selection methods, estimated costs, prior review requirements, and time frame will be agreed upon between the Borrower and the World Bank in the Procurement Plan. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

28. **Procurement of Works**. Works to be procured under the project will include: rehabilitation and expansion of irrigation systems, rehabilitation and construction of drainage systems and rehabilitation of farm roads. Procurement of works will be carried out using the Bank's Standard Bidding Document for all International Competitive Bidding (ICB). National Competitive Bidding (NCB) procurement will be carried out using the national SBDs already in use at the federal level and which has been accepted by the Bank for NCBs in Bank-financed projects in Nigeria. Minor civil works estimated to cost US$200,000 or less per contract, which are labor intensive, spread over time and which do not lend themselves to grouping and , therefore unlikely to attract major construction firms and/or foreign bidders, may be procured under shopping procedures as detailed in paragraph 3.5 of the "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants" dated January 2011 and the "Guidance on Shopping Memorandum" issued by IDA on June 9, 2000.

29. **Procurement of Goods**. The goods to be procured under the project will include O&M equipment and machineries such as excavators, bull dozers, graders, tippers, rollers, low beds and water tankers. The goods to be procured will also include vehicles, office equipment, and computers for the PMU and the AIAs. Procurement of goods will be carried out using the Bank's standard bidding document (SBD) for all International Competitive Bidding (ICB). National Competitive Bidding (NCB) procurement will be carried out using the national SBDs already in use at the federal level. Readily available off-the-shelf goods that cannot be grouped or standard specification commodities for individual contracts of less than US$100,000 equivalent may be procured under shopping procedures as detailed in paragraph 3.5 of the "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants" dated January 2011 and the "Guidance on Shopping Memorandum" issued by IDA on June 9, 2000. Procurement of vehicles estimated to cost up to US$500,000 equivalent can also

be procurement under the same shopping procedures, provided they are procured from reputable first line vehicle dealers. The procurement procedures and SBDs to be used for each procurement method as well as model contracts for works and goods procured are presented in the project implementation manual.

30. **Procurement of Information Technology.** Procurement of information technology under the project such as the procurement of a Monitoring and Information System (MIS) will be carried out using the Bank's SBD for Supply and Installation of Information Systems: Single-Stage Bidding is envisaged where it is possible to use off-the-shelf application software packages after making the appropriate reconfigurations.

31. **Selection of Consultants**. Consultancy services will be provided under the operation in the following categories: feasibility studies, design and construction supervision of rehabilitation and construction of irrigation schemes, technical support for the design of intensive training programs for WUA, development of a communication strategy, development of a WUA media toolkit, technical assistance for research and development. Consultancy firms and individuals will be selected from shortlists put together after the PMU have solicited a request for expressions of interest using the World Bank's Standard Request for Proposals (SRFP) where required by the Bank's Guidelines. Shortlists of consultants for services estimated to cost less than US$300,000 equivalent per contract and US$500,000 per contract for engineering design and supervision may consist entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. The appropriate selection method for each consulting contract will be set out in the Procurement Plan.

32. **Operating Costs**. The operating costs will include the staff's travel expenditures, including standard government allowances, equipment rental and maintenance; vehicle operation, maintenance, and repair; office rental and maintenance; materials and supplies; utilities and communication expenses; and bank charges. The operating costs financed by the project will be procured using the federal government administrative procedures that are acceptable to the Bank. The operating expenses will be subject to Statement of Expenditure, SOE review of the Bank.

33. **Training, Capacity Building, and Workshops**. The project coordinating and the activity implementing units will submit their annual training plans to IDA for clearance. The plans will include, but not limited to, the names of the officers to be trained, the training institutions and/or facilitators, the cost contents, the justification for the training, and the estimated cost of the training.

Assessment of the Agency's Capacity to Implement Procurement

34. The procurement decision making process in the Ministry is slow and not well defined. Every procurement decision has to be cleared at the highest decision making level in the ministry and this can lead to delays with the attendant political interference in the procurement process. To address this risk, the procurement decision making process will be well defined in the procurement manual that will be developed as part of the project implementation manual.

Because of the low capacity in the preparation of designs and technical specifications of large works contracts that will be included in the bidding documents, consultants should be engaged to assist the PMU to the design and prepare the technical specifications for the large works packages and other complex procurement that are included in the project. Consultants should also be engaged to assist the PMU in contract management and administration in addition to training the PMU staff in contract administration and management.

Federal Ministry of Water Resources, PMU

35. The overall procurement risk assessment for the project is **Substantial.**

36. The complete procurement risk assessment has been filed in Procurement Risk Assessment and Management System (PRAMS).

Procurement Plan

37. The government finalized an 18-month procurement plan for project implementation that outlines the procurement methods to be used. This plan will be concluded and agreed on by the government and the project team at negotiations. It will also be made available in the project's database and on the Bank's external website. The Procurement plan will be updated with the project team annually or as required, reflecting actual project implementation needs and improvements in institutional capacity.

Table 3.3: Procurement Risk Assessment and Mitigation Action Plan

S/N	Risk	Mitigation Action	Responsi-bility	Action Due Date	Remarks
A	Poor record keeping System	Establish a procurement records management system and train staff in records management	PMU/WB	Within three months of effectiveness	Training will be continuous
B	Lack of contract administration skills	Organize contract administration training for staff	PMU	Not later than three months into project implementation	To improve the contract administrat ion skills of project staff
C	Lack of knowledge of the Bank's procurement tracking system	Train procurement staff in procurement tracking system	WB	Within three months of effectiveness	

38. **Publication of Results and Debriefing**. Publication of contract awards would be required for all ICB, NCB, Direct Contracting and Selection of Consultants for contracts exceeding a value of US$300,000. In addition, where prequalification has taken place, the list of prequalified bidders will be published. With regard to ICB, and large value consulting contracts, the implementing agencies would be required to assure publication of contract awards as soon as the Bank has issued its "no objection" notice to the recommended award. With regard to Direct

Contracting and NCB, publication of contract awards could be in aggregate form on quarterly basis and in local newspapers. All consultants competing for an assignment involving the submission of separate technical and financial proposals, irrespective of its estimated contract value, should be informed of the result of the technical evaluation (number of points that each firm received), before the opening of the financial proposals. The implementing agencies shall specify that any bidder or consultant who wishes to ascertain the grounds on which its bid was not selected, should request an explanation from the Project Coordinating Unit. The Project team shall promptly provide an explanation of why such bid was not selected, either in writing and/or in a debriefing meeting, at their option. The requesting bidder shall bear all the costs of attending such a debriefing.

Procurement Reviews and Thresholds

Table 3.4: Procurement of Goods and Works and Non-consulting Services

	Procurement Method	**Method Threshold US$**	**Prior Review Threshold**
1.	ICB (Goods and Non-consulting services)	Equal to and above US$5,000,000	All
2.	NCB (Goods and Non-Consulting Services)	Below US$5,000,000	Equal to or above US$1,000,000
3	ICB (Works)	Equal to or above US$20,000,000	All
4.	NCB (Works)	Below US$20,000,000	Equal to or above US$10,000,000
	Shopping (Goods)	Below US$100,000	None
	Shopping (Vehicles) - From 1st line distributors	Below US$500,000	None
5.	Shopping (Works)	Below US$200,000	None

39. **Fraud, Coercion**, **Collusion**, **and Corruption**. All procuring entities as well as bidders, contractors, suppliers, and consultants must observe the highest standard of ethics during the procurement and execution of contracts financed under the project in accordance with paragraphs 1.14 & 1.15 of the Procurement Guidelines and paragraph 1.22 & 1.23 of the Consultants' Guidelines.

Table 3.5: 18-month Procurement Plan for Works and Goods

Ref. No.	Description	Estimated Cost US$ million	Procurement Method	Domestic Preference (yes/no)	Review by Bank (Prior / Post)	Comments
01	Rehabilitation of Bakolori Dam and Rehabilitation/Improvement of Bakolori Irrigation Scheme	115	ICB	No	Prior	
02	Rehabilitation and Improvement of Kano Irrigation Scheme	85	ICB	No	Prior	
03	Rehabilitation and Extension of Hadejia Valley Irrigation Scheme	60	ICB	No	Prior	
04	Rehabilitation of 6 No. Dams	40	ICB	No	Prior	
05	Supply and Installation of Hydrometric Equipment for Sokoto Rima Basin	0.6	NCB	No	Post	
06	Flood Plain Mapping for EPP (BIS & MRVIS)	1.35	NCB	No	Prior	
07	Bathymetric Survey of Goronyo, Zobe and Bakolori Dams	0.20	NCB	No	Post	
08	Procurement of Field and Operational Vehicles	0.3	Shopping	No	Post	
09	Procurement of Computers	0.1	Shopping	No	Post	
10	Procurement of Office Equipment	0.1	Shopping	No	Post	

Summary of the Procurement Packages planned during the first 18 months after project effectiveness (*including those that are subject to retroactive financing and advanced procurement)*

Selection of Consultants

40. **Prior Review Threshold**. Selection decisions subject to prior review by Bank as stated in Appendix 1 to the Guidelines Selection and Employment of Consultants are as shown in Table 3.6.

41. **Shortlist consisting entirely of national consultants**. A shortlist of consultants for services estimated to cost less than US$300,000 equivalent per contract and US$500,000 for engineering design and supervision may consist entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

Table 3.6: Selections Subject to Prior Review by the World Bank

	Selection Method	**Method Threshold (USD)**	**Prior Review Threshold (USD)**
1.	Competitive Methods (Firms); QCBS, QBS, LCS, FCS	Equal to or above 300,000	All
2.	Consultant Qualification	Below 300,000	None
3.	Single Source Selection (Firms & Individuals)	N/A	All
4.	Individuals	N/A	Above 100,000

42. The procurement plan for consultancies for the first 18 months of the project is summarized in Table 3.7.

Table 3.7: 18-month Procurement Plan for Consultancies

Ref. No.	**Description of Assignment**	**Estimated Cost** US$ Million	**Selection Method**	**Review by Bank (Prior / Post)**	**Comments**
01	Engineering Supervision of the Rehabilitation of Bakolori Dam and Irrigation Scheme	2.7	QCBS	Prior	
02	Technical Assistance for Dam Safety Assurance & Training for Dam & Reservoir Dept. and RBDA Staff	2.0	QCBS	Prior	
03	Dam Safety Panel of Experts	1.0	IC	Prior	Series of individual consultant contracts on specific aspects

					of dam safety
04	PPP Technical Feasibility and detailed Design of Dadin Kowa Irrigation Scheme with Transaction Advise	2.0	QCBS	Prior	
05	Engineering Supervision of Rehabilitation and Extension of Kano Rima Irrigation Scheme	1.5	QCBS	Prior	
06	Engineering Supervision of Rehabilitation and Extension of Hadejia Valley Irrigation Scheme	0.65	QCBS	Prior	
Ref. No.	**Description of Assignment**	**Estimated Cost** US$ Million	**Selection Method**	**Review by Bank (Prior/ Post)**	**Comments**
07	Elaboration of Resettlement Action Plan for Kano River and Hadejia Valley Irrigation Schemes	1.0	QCBS	Prior	
08	Elaboration of Resettlement Action Plan for Bakolori Irrigation Scheme	0.29	CQS	Post	
09	Technical Assistance for WUA in Bakolori and Middle Rima Valley Irrigation Schemes	1.5	QCBS	Prior	
10	Technical Assistance for WUA in Kano River and Hadejia Valley Irrigation Schemes.	1.0	QCBS	Prior	
11	Technical Assistance on Farmers-Market Linkages and the Establishment of FMCs	4.0	QBS	Prior	
12	Support to RBDAs; Assessment, capacity Building and Strategic Planning	1.5	QCBS	Prior	
13	Development of Information Database and information System	1.0	QCBS	Prior	

14	Development of an Electronic and Document Management System	1.0	QCBS	Prior	
15	ESIA for Kano River and Hadejia Valley Irrigation Schemes	0.6	QCBS	Prior	
16	ESIA for Dadin Kowa Irrigation Scheme	0.5	QCBS	Prior	
17	Development of M&E Manual	0.06	IC	Post	
18	Development of Financial Management Manual	0.06	IC	Post	
19	Applied Research Grant on Irrigated Agriculture	2.3	N/A	Prior	Grantees will be selected competitively on the bases of Call for Research Proposals

Frequency of Procurement Supervision

43. In addition to the prior review supervision to be carried out by the Bank, the capacity assessment of the implementing agency has recommended that the Bank should carry out supervision missions at least once a year to review procurement actions. These post-procurement reviews should cover at least 20 percent of the contracts subject to post-review.

44. "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA and Grants" dated October 15, 2006, updated in January 2011 (the Anti-Corruption Guidelines) shall apply to the project.

Environment (incl. Safeguards)

45. Environmental Assessment category. The project has been categorized as A because, even though most of the proposed activities are expected to have positive environmental and social impacts, some of the planned activities may have significant adverse impacts that are sensitive, diverse, cumulative, irreversible or unprecedented. In addition, some of these potential impacts may affect areas broader than the sites or facilities subject to civil works. In most cases, however, the activities will involve limited adverse social or environmental impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.

46. Because the full extent of the environmental and social impacts of the project is not known in advance, the Borrower has prepared an Environmental and Social Management Framework (ESMF) and the Resettlement Policy Framework (RPF). The ESMF ensures that the principles and procedures for the development of in-country capacity and compliance with local regulations are established and it serves as the basis for environmental assessment of all future sub -project activities to be carried. Most of the activities are not expected to result in major losses or acquisition of land or in restrictions to sources of livelihoods. However, given the

possibility that some of the activities may involve land acquisition and involuntary resettlement, an RPF has also been prepared. Because the ESMF provides guidance for preparation of ESMPs, integrity studies, and environmental audits, it remains in effect for the Program. It includes a screening process that is consistent with both World Bank operational policies and FGN regulations, and a chapter on project processing that describes the responsibilities of each organization involved in project. The ESMF and RPF were both prepared by the Borrower according to National and World Bank policies and were disclosed in-country in Nigeria and through the World Bank's InfoShop on February 19, 2014.

Safeguards Policies Triggered

47. The following table indicates the seven safeguard policies triggered: Environmental Assessment (OP 4.01), Involuntary Resettlement (OP 4.12), Natural Habitats (OP/BP 4.04), Physical and Cultural Resources (OP/BP 4.11), Pest Management (OP/BP 4.09), Safety of Dams (OP/BP 4.37) and Projects in International Waterways (OP/BP 7.50).

48. **Environmental Assessment (OP/BP 4.01):** Safeguards policy OP 4.01 is triggered, in component 2 and the potential civil work activities include rehabilitation of existing irrigation schemes and expansion including farm structures such as roads, drains, etc. The ESMF was prepared and disclosed on February 19, 2014. The ESMF addresses the mitigation of adverse impacts, and includes an indicative budget for such mitigation activities.

49. **Involuntary Resettlement (OP/BP 4.12**): This policy is trigged because most of the sub-projects could involve minimal or moderate land acquisition and or restriction of access to usual means of livelihood as most of the sub-projects will largely be rehabilitation of existing infrastructure. However, some of the projects may involve minor land acquisition and some displacement (for the most part temporary) of affected people. As part of the safeguards due diligence, an RPF was prepared and disclosed on February 19, 2014.

Table 3.8: Safeguard Policies Triggered

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

50. **Natural Habitats (OP/BP 4.04)** is triggered because some project activities may take place nearto critical natural habitats such as the Hadejia –Nguru Wetlands, a designated RAMSAR site. This is an environmentally sensitive area and mitigation measure necessary to minimize any adverse environmental and social impacts in this wetlands will be incorporated in

the ESIA for the Kano River Irrigation Scheme (KRIS) and the Hadejia Valley Irrigation Scheme (HVIS) that might lead into the Hadejia - Jama'are Komadugu Basin (HJKYB) in which the Hadejia –Nguru Wetlands is located.

51. **Pest Management (OP/PB 4.09):** This policy is triggered because some livelihood enhancement activities involve agriculture and may involve the use of pesticides and subsequent environmental and health risks. Some of these activities may be directly financed by the project, while others may be supported by farmers themselves. Thus, the procurement of any pesticide in a World Bank-funded project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and intended users and in line with World Bank, WHO and FAO standards. The PMP was prepared and disclosed on February 19, 2014.

52. **Physical Cultural Resources (OP/BP 4.11)** is triggered because some activities in components 2 may include civil works that could expose chance finds. These chance find sites may include sacred shrines and burial sites. The environmental and Social Screening Checklist and the Generic Environmental and Social Mitigation Measures Checklist that are annexed to the ESMF will address the Physical Cultural Resource (PCR), and the ESMF includes provisions for addressing such cultural heritage chance finds.

53. **Safety of Dams (OP/BP 4.37):** The project will not be directly be involved in the construction of new dams. However, component 1 includes rehabilitation of dams or to improve dam safety. For this reason, the safety of dams policy (OP 4.37) is triggered, even though the project is not supporting the construction of large dams. The ESMF and RPF checklists would also be used to screen such sub-projects for their potential environmental and social impacts. Dam safety reports and environmental and social audits of the associated facilities would be carried as required.

54. **Projects on International Waterways (OP/BP 7.50**): The project will support drainage activities relying on water from other countries, thus triggering OP 7.50. The GoN via the FMWR sent, on March 31, 2014, a riparian notification to the Niger Basin Authority (NBA) and the Lake Chad Basin Commission (LCBC). In conformity with OP 7.50, all riparian states were notified of the project through their representative authorities, the Lake Chad Basin and the Niger Basin Authority, and both authorities provided a no-objection to the project.

55. The dams depend on rivers and their tributaries with sources and courses (e.g. River Niger, Sokoto and Rima, Hadejia, etc.) outside Nigeria. Thus OP/BP 7.50 is triggered. Since Nigeria is a member of the Niger Basin Authority and Lake Chad Basin Commission, riparian notifications were sent to the Niger Basin Authority and the Lake Chad Basin Commission for onward transmission to riparian states**.**

56. **Cumulative and Induced Impacts**: No long term or cumulative adverse impacts were identified in the ESMF and the RPF. However, the combination of multiple impacts from existing projects, the proposed project, and/or anticipated future projects may result in significant adverse and/or beneficial impacts that would not be expected in case of a standalone project. The ESMF's baseline study identifies relevant existing environmental and social conditions in

Nigeria. In the case of the Hadejia Jama'are basin, the cumulative impact assessment of Kano River and Hadejia Valley irrigation schemes will be assessed.

57. **Alternatives considered**: The ESMF contain sections on "Analysis of Alternatives". They conclude that the "do nothing" scenario would worsen the present situation in the proposed government infrastructure.

58. **Screening Process**: A review process will be put in place to ensure screening of all potential civil work activities for environmental and social impacts prior to approval by the PMU. The screening can be carried out by a designated officer of the PMU (Environmental and Social Safeguards Officers) or the relevant MDA - Federal Ministry of Environment (FMEnv) in accordance with the laid down procedure. This will include an environmental screening sheet showing the estimated impact category of each sub-project destined for rehabilitation and modernization of existing irrigation schemes. The screening process will involve an assessment of the project to determine: (a) the appropriate project categorization for the EA; (b) applicable World Bank environmental and social safeguards; (c) potential for environmental and social impacts; and (d) cultural or other sensitivities. In addition, each project will be screened to identify relevant stakeholders and, the nature and extent of engagement for each stakeholder category.

59. The screening decision has three parts: the assignment of the environmental assessment category, the determination of the safeguards instrument(s) that should be prepared, and the identification of applicable safeguards policies. In the project, most sub-projects financed by the Bank classified as Category A and Nigeria Category 1 will require full ESIAs. The ESMF and RPF provide guidance for screening based on the scale and type of project and the potential impacts that can be envisioned. The project screening reports will be reviewed by the Environmental and Social safeguards Officers and the FMEnv to confirm that all project-financed activities falls within the appropriate Environmental Category and that the recommended action plan is appropriate. The Environmental and Social safeguards Officers will then submit the report of the screening exercise with its recommendations for clearance to the World Bank to proceed with the detailed ESMPs, ESIAs, and/or RAP, and any other safeguards instruments. The executive summaries of all Category A safeguards instruments will be circulated to the World Bank's Board of Executive Directors. As part of safeguards due diligence, a notional budget for mitigation will be specified in the contract documents to ensure provision of the necessary funds for implementation of the approved mitigation measures identified in the ESMPs.

Social (incl. Safeguards)

60. The Project will focus on rehabilitation of existing irrigated land (rather than an expansion of irrigation into rain-fed agricultural land). The positive project impacts for the primary stakeholders are therefore expected to be far more important than the negative ones. Positive impacts include increased water supply and reliability, improved on-farm productivity and financial returns from farming as well as longer-term food security and better nutrition. Establishing improved operation and maintenance (O&M) is critical in creating viable interventions, and long-term financial sustainability will be ensured if increased participation and

ownership can be generated through the establishment of participatory irrigation management supported by functional and inclusive WUAs.

61. Negative impacts may result from failure to achieve changes in the current approach to irrigation management. If the planned participatory irrigation management is not properly sustained, the tail-end users will likely be the first to experience water shortages. The project will seek to mitigate such impacts through a comprehensive stakeholder communication and participation strategy combined with a strong capacity building program at local, RBDA and Federal levels.

62. During construction the livelihoods of some farmers may be affected to varying degrees (in most cases only temporarily), and compliance with national legislation and OP 4.12 will be critical to ensure that all affected persons are compensated in a timely manner. In this process specific attention will be given to the development of grievance redress mechanism at the community level that will be accessible to all stakeholders as well as arrangements for monitoring the implementation of RAPs.

63. **Previous resettlement:** At all sites, considerable resettlement was conducted in the past because of the building of the respective dams and inundation of reservoirs. At least in one case – Bakolori – this process created considerable social tension. In Bakolori, as in the other locations, although difficult at first, farmers have generally adjusted well to their new surroundings following the physical resettlement that took place over 35 years ago. While it appears unlikely that issues related to long-ago resettlement will require mitigation under Bank resettlement policy, to the extent that there are any serious lingering tensions or resentments, these could (based on Bank experience elsewhere) pose significant risks to successful project implementation, and should be addressed to the extent possible.

64. **Gaps between Nigerian legislation and OP 4.12:** There are several differences between OP 4.12 and the Nigeria Land Use Act (LUA) of 1978 which is the country's central piece of legislation relating to land acquisition and resettlement. The LUA outlines the various steps in the process of acquiring land, including the method of compensation, and differences of relevance to this project will have to be identified. Measures must then be taken to ensure that particular gaps are bridged during the implementation of the project. A more detailed discussion of these issues is included in the project's resettlement policy framework (RPF).

65. **Grievance Redress Mechanism:** A well-functioning grievance redress mechanism provides an important way to reduce potential social risks associated with the project. In order to facilitate access and a fair process for all PAPs, it is critical to solve as many disputes as possible at the community level where grievance committees with appropriate local representation should be established. Only disputes that cannot be solved at the local level will be brought to the state level, and the Courts should be seen as the last resort as such cases are likely to exclude less resourceful PAPs. All the steps in this process as well as the response time and final outcome of each individual case must be carefully documented and monitored. The approach may vary depending upon local conditions, but certain key principles must be adhered to and these have been detailed in the project's resettlement policy framework (RPF).

66. **Role and voice of women:** Women are reported to be involved in existing WUA arrangements at Bakolori. Following discussion with women representatives during project preparation it became clear that these groups could better be described as common interest groups (CIGs), and not be directly involved in water management decision-making *per se*, though organized under the ambit of the WUA. These women-CIGs are involved in value-adding micro-processing activities and in small livestock production. In the Hadejia Valley women's groups include about 200 members so far. These groups focus on food processing and small-scale marketing. On all schemes, the future role of women in water-related decision making, particularly where women are active farmers, needs careful attention during project implementation, given the weight of both cultural norms and precedent of limited involvement in water decision-making.

67. **Safeguards Monitoring:** Specific indicators will be developed to monitor progress with regard to RAP implementation, e.g. on timely compensation payments, the functioning of the grievance redress process, standard of living before and after resettlement, etc., and included in the project's overall M&E plan. The Plan will identify and describe the specific indicators to be used, the frequency of monitoring and the baseline against which the indicators will be measured for compliance with the RPF/RAP. The above will require close collaboration between social and M&E specialist to ensure full integration into project's M&E plan. Information on specific measures taken by the borrower/implementing agencies to address safeguard policy issues, such as mitigation measures and compensation to be paid cannot be addressed until the implementation stage when specific interventions are known and RAPs have been prepared.

Land tenure arrangements in the project areas

68. With minor exceptions, land in the project schemes is "owner occupied"[28], as opposed to government-owned land that is leased back to farmers. This is considered preferable in terms of encouraging sound land management by farmers and their participation in WUAs. It also implies that the Project will not be engaging in activities that involve fundamental changes to existing tenure arrangements.

69. However, in assessing land tenure at the project sites, it is important not to interpret the term "owner occupied" too literally. While the term does accurately signify that most land remains in private hands as opposed to government control, there are a growing number of cases where parcels are occupied and used by persons other than the "owner." There is, for example, an increasing incidence of land being leased or loaned to others, or subject to share-cropping arrangements. There is also in some locations an increasingly active land market with land changing hands through sales. Land parcels have been transformed as well through inheritance, sub-division, and consolidation.

[28] Owner-occupied land holdings predominate in the four schemes Bakolori, Middle Rima, Kano River and Hadejia Valley). Note, however, that in all four of these schemes there is a small percentage of land that is government-owned (in case of Bakolori, it is 1,000 ha out of the 21,000 ha). For these small areas, the project may try to develop some initiatives to attract the private sector in order to facilitate input-output linkages. The fifth project scheme, Dadin Kowa, is a special case, described below in the text.

70. Thus, the land tenure situation within the schemes is not static, and project implementation, including support to the establishment of WUAs, will need to be sensitive to the fluidity of the situation. Key to this will be to ensure that detailed design and stakeholder engagement at each of the project sites is accompanied by in-depth analysis of land relations in and around the scheme. Disputes over land in the schemes are reportedly relatively rare, and in the case of Bakolori, this has been confirmed through the ESIA process. However, experience from elsewhere suggests that conflicts may rise as land values increase with successful scheme development, potentially putting pressure on existing land relationships and on those land owners who may be economically or socially vulnerable. It will be important, therefore, that site-special ESIAs, RAPs, and feasibility studies provide as clear a picture as possible of the legal status of farmers' rights, the typology of land tenure arrangements that exist, any discernable trends in land markets and values, landlessness and conflict, and any potential concerns relating to tenure insecurity or conflict over land that may result from or pose a risk for project implementation.

71. **Land allocation processes:** The original development of surface irrigation in each owner-occupied scheme involved a process of the RBDA taking over the land temporarily, installing secondary and tertiary canals, preparing the land, and then returning it to the owners. This process involves the preparation of a map (cadaster) showing current land uses, which is then overlaid by the engineering map for the new irrigation facilities. Existing plots may need to be reconfigured as a result, and in some cases farmers may need to move to other locations in the scheme. However, the guiding principle has been that farmers receive back as much land as they give up, minus a small percentage that is needed for canals or other infrastructure and that is compensated separately. Going forward, where the project supports expansion into new areas (which, as explained in Annex 2, is expected to be relatively limited), or the conversion of existing sprinkler systems, a similar approach is envisaged. Project design includes robust participatory and equitable procedures reflecting international best practice for the land reconfiguration and allocation process, including a grievance mechanism to deal with the disputes that will inevitably arise. The basic features of this process are reflected in the project's Resettlement Policy Framework. While land acquisition resulting from the project is expected to be very limited, it is especially important to ensure that any land taking or reallocation is done in a way that is sensitive to the livelihood profiles of the smallest farmers, for whom even minor land use changes can be a source of vulnerability if not handled properly and in an transparent and consultative way.

72. **Land documentation**: As in most of rural Nigeria, land rights of scheme farmers are customary rights that are not formally documented and registered, and their precise status under formal law is uncertain. In some of the schemes, after the completion of the land (re)allocation process, the RBDAs have issued cards to each farmer confirming their access to the newly irrigated plot. Such cards are valued by the farmers, but they have no clear legal status and, in any event, are not updated as plots are further sub-divided, sold or consolidated. The Project will support at each site the design and implementation of more systematic, cost-effective and sustainable mechanisms for keeping project-level land records, both as a useful scheme management tool but also to help keep land disputes low and in the longer term to lay the ground-work for an eventual formalization of rights.

73. **Commercial investment in land:** As noted above, project design for the most part does not anticipate an emphasis on attracting large commercial operators into project schemes. While promising partnerships between local farmers and commercial enterprises may be explored, this is not expected to take the form at Bakolori, Middle Rima, Kano River and Hadejia Valley of encouraging the leasing of land at the project-supported schemes to investors seeking to establish larger farms (with the possible exception of the small percentages of land in each scheme that are already owned by the Government, as mentioned in footnote 19). This absence of a large investor focus helps limit the social complexity and risks of land issues for the project. Farmers have indicated a very strong preference to hold on to their current land with marked concerns of elite capture should portions of their landholding be given to investors in exchange for irrigation infrastructure.

74. Dadin Kowa represents a special case. By contrast to the other four schemes, it is expected the project will seek to facilitate greater investment in Dadin Kowa both by local commercial farmers as well as outside private investors, with an emphasis on a public-private partnership (PPP) approach. The project will support the required PPP full feasibility studies and transaction advice, and may on the basis of those activities support the implementation of a PPP transaction in Dadin Kowa if there is sufficient private sector interest and strong community support.

75. The proposed approach at Dadin Kowa holds great promise, but will require special diligence during project implementation with respect to land and other social issues. It is widely acknowledged that increased private sector investment in agriculture, if done correctly, represents a very important opportunity for unlocking the economic potential of rural Nigeria. At the same time, there is also compelling evidence from many parts of Africa that poorly managed and regulated investment can result in "land grabs" that undermine local land rights, disrupt livelihoods, weaken food security and diminish the long-term prospects for investment by exacerbating tensions between investors and host communities. The challenge is to attract the 'right' investors in the 'right' projects – i.e. reputable investors with technical know-how and financial depth willing to invest in the kind of productive enterprises that yield a private return and contribute to development goals while protecting the rights and interests of the rural communities. In view of this challenge, the feasibility studies and any subsequent implementation support provided by the project for Dadin Kowa will reflect the emerging international consensus on these issues as represented by the interim Principles for Responsible Agricultural Investment as well as the United Nations Voluntary Guidelines on Governance of Land Tenure. They will also take into account lessons from analytical work carried out by the Bank and others (see Deininger et. al, Rising Global Interest in Farmland: Can it Yield Sustainable and Equitable Results, World Bank, 2010), as well as from ongoing Bank support to commercial agriculture projects in Ghana, Burkina Faso and Senegal.

76. The project will consequently seek to promote an approach to inclusive investment at Dadin Kowa that ensures that (i) affected communities are meaningfully involved in the decision whether or not to make land available for investments, based on informed choices; (ii) that local people secure sustained and well-defined benefits; (iii) that any agreement by local communities to make land (including common areas and natural resources) available for investors involves fair compensation; (iv) that investments are the extent possible structured as ongoing

partnerships between investors, affected communities and Government; (v) that potential impacts on local food security and land relations are specifically assessed and addressed; and (vi) that mechanisms are in place to hold investors accountable to their commitments.

77. Project involvement in land at Dadin Kowa will aim to contribute to secure tenure arrangements both for investors and smallholders, and beneficial outcomes for land owners and users. This will require (i) confirming with certainty existing rights to the land and the absence of disputes concerning those rights, and (ii) ensuring that all land users on a given piece of land (including tenants, sharecroppers, migrants, herders, women and other vulnerable members of the community) – and not community elites and rural community authorities alone – are consulted, protected and benefitted as land transactions are consummated.

Project Monitoring and Evaluation

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

A. Concurrent progress monitoring

79. Under TRIMING, monitoring will assess progress in implementation against timescales and targets, and resource use against budgets. Monitoring will report on progress of implementation on both a quarterly and annual basis. Monitoring will involve two aspects: (i) results monitoring; and (ii) process monitoring and pathway analysis as described below.

80. *Results monitoring.* Input-output monitoring (updated monthly, and reported quarterly and annually) will track the efficiency and effectiveness of project interventions. Inputs (investment costs and quantities of specified inputs) will be compared with outputs actually achieved against annual targets. Shortcomings in target achievement can then guide further analyses to determine how performance can be improved. To do this effectively component 1.1 will support NIHSA's resuscitation and expansion of real-time monitoring network infrastructure of the selected HAs and improvement of the water resources monitoring systems, data archiving and access to rainfall, river flows, and groundwater data for the selected river basins. Findings of internal input-output monitoring will be validated by analyzing samples of collected data on a quarterly basis.

81. *Process monitoring and pathway analysis.* Process monitoring will deal with critical processes that are directly related to the project's objectives. These processes include, for example, formulation and execution of participatory integrated water basin resources plans, execution of large-scale dam restoration and river channelization investments, training of RBDA dam engineers, functioning of water users groups, etc. Monitoring of these types of processes will be combined with 'pathway analyses' to more systematically study and analyze the factors leading to achievement or non-achievement of project intermediate outcomes. Performance of

the implementing agencies and key partners at different levels will also be measured through regular surveys and participatory methods to assess activities according to agreed standards.

B. Outcome and Impact evaluation (discrete monitoring)

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

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

(a) What are the economic and social impacts of the interventions on households and all other non-irrigation water-using sub-sectors including the environmental water needed to sustain the biodiversity and productivity of diverse habitats?
(b) How does the impact of TRIMING interventions compare to those carried out under alternative institutional arrangements, such as the state-financed investments? In other words, how does a multi-sector approach (such as TRIMING) compare to a standalone infrastructure investment?
(c) What mechanisms can be employed to mobilize and sustain community interest (especially water users association) and participation in the construction, operation and maintenance of dams and river channelization investments?
(d) Does the impact of TRIMING spread geographically to areas outside of the immediate proximity of interventions? What is the impact of rehabilitation of farm roads and drainage system on trade and access to markets?
(e) Can the use of community monitoring and crowd sourcing to document the progress of investments increase accountability?
(f) Which category of intervention has the largest impact, and why does it work or not work, and what are the mechanisms through which it produces an impact?

C. Participatory M&E

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

- **Citizen report cards** to assess performance of key implementing agencies at field level. In specific terms, report cards can be used to: a) generate citizen feedback (e.g. WUAs) on the degree of satisfaction with the project-related services provided by various public service agencies; b) establish credible benchmarks to track project implementation progress over time; c) catalyze citizens to adopt pro-active stances to request better accountability, accessibility and responsiveness from project service providers, contractors, and implementing agencies; d) serve as a diagnostic tool for service providers, external consultants and analysts/researchers, to facilitate effective prognosis and therapy; and e) encourage public agencies in the project to adopt and promote citizen friendly practices, design performance standards and facilitate transparency in operations.

Care needs to be taken to ensure that citizen report cards are themselves produced with a degree of transparency yet protecting citizens' privacy to avoid potential retaliation against low scores; and

- **Self-assessment processes** by implementing agencies for evaluating how effectively they are performing relative to project-related functions, and gauging of institutional maturity, inclusiveness, etc. Results will then be used to develop capacity building strategies.

85. For major physical works such as dam and canal restoration, it is envisioned that participating communities will be assisted to monitor level of completeness relative to disbursements, and overall quality of the work. Techniques could include equipping community groups with GPS-enabled digital cameras and other equipment for monitoring physical works improvement over a wider scale. These techniques can also have an ancillary benefit in serving as a valuable environmental education experience for the community members, in particular students.

D. Thematic studies and case studies

86. Thematic studies will supplement and complement other monitoring components through validation of information on indicators of the results framework, as well as provide analytical inputs which go beyond routine monitoring functions. The need for thematic studies will emerge as the results of process monitoring and external quality monitoring indicate a need for specific studies. Specialized organizations with expertise in areas to be studied will be invited for planning and conduct of these studies, to be supervised by the project coordinating agency.

E. Action learning, documentation and reflection

87. The project will proactively undertake documentation of processes, case-studies, best practices and lessons learnt from project experience that can be shared with stakeholders and political institutions to raise awareness and build support for project activities. Documentation will be a continuous process throughout the project duration and across all the project personnel. It will support internal learning and help project authorities to be responsive to ongoing monitoring. The effectiveness of internal learning will depend upon the degree of institutionalization of learning among the various levels of project organization and the communities. A considerable part of learning will take place through a structured set of participatory workshops associated with quarterly and annual reviews at various levels.

88. TRIMING will raise the capacity of the country to collect, store, share and manage data related for the management of dams, irrigation investments and agricultural mechanization and transform this data into usable information across stakeholders to underpin and plan their actions. This requires forging and sustaining "data partnerships" among actors, instilling a culture of open information and mutual learning, and a shift toward more evidence-based decision making on investment and policy.

F. Project Management Information System (MIS)

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

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

G. Institutional Arrangements for Implementing M&E

91. The project's M&E implementation arrangements rest upon a mixed set of responsibilities that balance ownership of M&E and improvement of government systems and capacities with independent verification and impact evaluation. The system will function through a combination of an external third party entity, M&E units at the federal and state levels, and community-level M&E. The PMU will also work closely with the Irrigation Department for the management of the project M&E and MIS.

92. Data collection for M&E and the impact evaluation are unified under the budget for M&E financed under subcomponent 4.2. The impact evaluation will not have a parallel implementation track. The third party entity working on the M&E activities will also cover, at minimum, the data collection for the impact evaluation.

93. *Independent third party M&E service provider*. A key principal of the proposed M&E approach for TRIMING is the use of a highly qualified third party entity to lead the development and operation of the overall M&E system, working in collaboration with and raising the capacities of: (i) project M&E units of the federal and state PMUs, (ii) the water resource management ministries at federal and state levels, (iii) those MDAs responsible for front-line data collection such as NIHSA and NIMET.

94. *There* are a number of reasons for the third party approach. First, by contracting a highly qualified and experienced entity, it is expected that cutting edge M&E approaches will be embedded into the TRIMING system. Second, the low M&E capacity (human resources, systems, and technology) within the proposed implementing agencies at federal and RBDA levels requires a third party to ensure that M&E is operational early in the project. Finally, an appropriate third party entity, working with a high degree of autonomy at all levels in the project, will promote greater transparency and stimulate better governance. The third party entity will help finalize the overall M&E baseline indicators and in collaboration with thematic specialists working closely with their liaison colleagues in partner implementing agencies. The third party entity will also be responsible for placing staff at the field level to manage data collection and

guide communities with various participatory monitoring activities. As part of the umbrella contract, this entity will lead the adoption and roll-out of the overall MIS.

H. Role of Partners (if applicable)

- AfDB has an interest in the Trust Fund for the H-J Basin;
- JICA financed the Irrigation Master Plan development; and
- The EU and IUCN funded the IWRM Plan for the H-J Basin.

Table 3.9: TRIMING theory of change

Current practices and situation	Project Interventions	Changed practices and situation	Project outcomes within 7 years	Long-term impacts outside direct span of project control
Lack of a coherent irrigation subsector development policy coupled with piecemeal planning and political issues.	Shift to development of an integrated irrigation policy and institutional reforms combined with strong implementation capacity development.	Government implements new policies, institutional reforms with a robust workforce.	Improved access to irrigation, drainage services and institutional arrangements for integrated water resources management in targeted areas.	Quality of life increased and poverty reduced - from better irrigation system, improved ecosystem function, higher agricultural productivity and value chains of specific targeted agricultural commodities, more jobs and more secure livelihoods.
Irregular and deferred maintenance of dams, headwork structures and safety monitoring.	Shift to regular maintenance and monitoring of irrigation schemes with the participation of private sector bodies.	RBDAs and governmental institutions adopt an integrated river basin management approach.		
Inadequate and sporadic capital funding for irrigation operations and management.	Shift to regular funding of RBDAs for O&M and better irrigation scheme performance.			
Poor cost recovery model for water charges service fee collected from water users.	Shift to implementation of a pay-user approach based on payee "voice and choice" and operating budget prioritization.	RBDAs and governmental institutions adopt a client-oriented service delivery approach.		
Absence of value chain approaches in post-harvest support services.	Shift to integrated value chain model for targeted agricultural commodities.			

Risks

Project Stakeholder Risks

Stakeholder Risk	Rating	Moderate
Risk Description:	**Risk Management:**	
Inadequate consensus between the arrays of actors around proposed changes to O&M in the sector could undermine the success of the project. While some steps have been taken to strengthen consensus during project preparation, high level representatives of the RBDAs have been difficult to engage. This risk is made more challenging given the geographic span of RBDAs across 3-4 states/political zones.	Based on earlier analytical work and joint efforts by agencies and DPs, there are the beginnings of a consensus around the reform principles in the sector. The consensus will be strengthened and continually supported throughout the project under Component 4 of the project ensuring that all stakeholders from the community level up to the political representatives in Abuja share a common vision, agree on implementation arrangements, and monitor and track their implementation collectively. Careful sequencing of changes to user rates is needed so that farmers can trust that increases will lead to improvements and WUAs need to have a role in holding the service deliverer accountable for performance, through the Scheme accountability committee.	
Farmers sometimes underestimate the value of water since, if they have it, other parts of the value chain are missing and thus they don't see irrigation alone as being able to improve productivity. At the same time, satisfaction with delivery of irrigation services is critical if farmers are to assume their role in improving the O&M arrangements in the sector and reap the benefits of it for increased agricultural productivity. Without a perceived improvement in the delivery of services, farmers will likely not want to pay increased user rates or be more proactive participants in the sector. At the same time, resolving the perceived unfairness of not	The links between this project, the WSP and a broader array of agriculture projects, including through the alignment of a results matrix to standardize incentives, promotes an integrated approach to using irrigation as part of a coherent strategy to improve agricultural productivity. There is an interim decree from the Minister of Finance, allowing up to 75 percent of internally generated revenue to remain with Heads of Agencies. The proposed act presently before the NA would seek to embed the authority of WUAs to retain locally generated funds for expenditure at the local level. The draft administrative decree as well as draft Act foresees reforms to revenue flows from the local level to Abuja. In addition, a Statement of sector policy for public irrigation schemes and a legal delegation of authority issued by the FMWR is being issued to mitigate this risk. Component 4 will include activities to hire, measure the performance and retain good performing staff, particularly at the RBDA and ministerial level. This can be done through providing non-financial benefits such as study tours, fellowships and academic publications at prestigious institutions. Multi stakeholder consultation and consensus building will be supported under Component 4 throughout the project cycle so that sufficient resources are provided for a supportive process.	

allowing any of the user fees collected at the local level to remain there for investment in irrigation will need to be resolved if farmers are to be active stakeholders in the project. WUAs and staff of RBDAs are frustrated after years of local plans and budgets not being met by the planning and budget process. This has led to demotivation of local civil servants and a distrust of the process. Civil servants may see the involvement of the private sector as a threat and resist it. Some civil servants are also likely to resist a more participatory approach (PIM) as they see it as a threat to their own role and cite capacity deficits among WUAs as a risk. Political leaders have benefited from the approval of funds for their Constituency projects within the RBDA's catchment released under the national budget. Some attempt has already been made to ensure that politicians engage RBDAs to ensure coordination but, in reality, the bulk of the money provided for constituency projects is used for new projects, not O&M, and with little consideration of local plans.	Lessons from recent successes at improving performance through a private element, in the energy sector, which required the buy in of public sector workers, for example, are studied and employed. Component 4 will experiment with innovations to attract an increasing share of constituency funds to meet locally prioritized needs.					
	Resp: Both	Status: On-going	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency: Continuous

Implementing Agency (IA) Risks (including Fiduciary Risks)		
Capacity	Rating	Substantial
Risk Description: Nigeria's civil service is a strong and proud association which has always been pulled	**Risk Management:** Balancing this tension has so far not been achieved and the small size of the PCU is slowing down project preparation and, more importantly, putting the delivery of an effective project at risk. A strong	

between providing representation within it, through a quota system enshrined by the Constitution – and a performance-based system. Balancing this tension is important for project ownership and for ensuring that the best performing civil servants, with in-depth knowledge of the sector, are able to contribute to the project's goals. The PCU sits within the Ministry structure within the Directorate for Irrigation but is dependent on general civil service procedures for authorizing procurements	and motivated PCU, with Ministerial and PS backing is required if it is to lead a reform agenda which requires high-level engagement from other sectors throughout the levels of government. The capacity of the PCU to deliver could be affected by the need to go through cumbersome processes of approval within the Ministry and the WB. The PEIA carried out for the project, along with safeguards, procurement, and financial assessments is being used to identify tensions and weaknesses. To ensure ownership and strong leadership, tensions must be addressed quickly so as not to fester and affect morale. The preparation of the project includes the usual investments in fiduciary and implementation arrangements but develops these with special attention to building consensus between the different levels of government stakeholders and the Bank. Considerations are given, for example, to the PCU to procure up to a certain threshold, once capacity checks have been undertaken to allow them to implement and achieve results, while ensuring basic standards.						
	Resp: Both	Status: On-going	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency:	Continuous
Governance	Rating	Substantial					
Risk Description: Weak contract management, lack of human resources, and poor regulatory compliance. Weak contract management and regulatory compliance present risks to achievement of institutional and policy goals. Lack of management and key staff continuity are risks to momentum of project preparation and implementation	**Risk Management:** During project preparation, it's been agreed on principles for a transparent procurement process that meets the needs of quick delivery with due process. Capacity will then be strengthened according to these principles and in accordance with Bank standards and Nigeria's Procurement Law, with the operation manual providing clear guidance to the Federal-level PCU. Component 4 foresees embedding information as a learning and transparency mechanism and will support project M&E as well as evidence-based decision making and the role out of a transparent across related sectors (water, agriculture, rural development and environment). Third party monitoring at various levels of the project is also foreseen as part of its institutional arrangements.						
	Resp: Both	Status: On-going	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency:	Continuous
Project Risks							
Design	Rating	Substantial					
Risk Description: At present there is a legal and institutional vacuum for some of the proposed reforms particularly for the revenue collection and	**Risk Management:** The FMF issued a revenue retention circular so that the Federal Agencies and parastatals can retain up to 75% of the revenues generated internally. The next step is to have RBDA to delegate the entirety of the 75 percent of the user fees to the scheme level. This can be documented transparently through						

retention for the "water transmission infrastructure". Agencies will continue to invest in new procurements around hardware and construction aspects, with little attention to O&M arrangements, or attention to the principles of PIM and PPPs. It is possible for WUAs to retain user fees under the Cooperatives Act. There is a risk that FMWR and other MDAs will only pay lip service to the idea of full participation of WUAs right from planning and design stages to implementation. Commitment to establishing sound PPP arrangements may wane in light of legislative and regulatory issues that will need to be addressed upfront.	accepted accounting practice. A tailored approach will likely be needed to factor in the management capacities of the various WUAs. Support for this is foreseen under Component 2.2 and 4.1. Additional preparatory work will be needed to fine tune a tailored and gradual approach to the building of local autonomy. Aware that the project promotes new business practices in the sector, the project will adapt a programmatic approach, piloting new practices with heavy investments in facilitated change processes. It will also ensure a minimal standard of institutional readiness in selected sites and project activities will be sequenced to ensure that the institutional building blocks are in place before new – "engineering hardware" "institutional software". Study tours to countries with track records of successful institutional reforms in irrigation and WRM will be used as an incentive and to reward teams that implement new business principles. Strong M&E and a nimble information system is being designed to ensure that the project is able to track progress in real time, to learn and adapt along the way as needed. Resp: Both; Status: On-going; Stage: Implementation; Recurrent: ☑; Due Date: ; Frequency: Continuous
Social and Environmental	Rating: Substantial
Risk Description: Weak enforcement and compliance of environmental and social impact assessments including resettlement action plans and dam safety plans. In particular, legacy issues in schemes like Bakolori and Hadeija pose a challenge. Women are marginalized from many economic activities in the project sites. This often results in their participation in parallel WUA structures but they are not represented in the APEX organizations. There is a potential for conflict in many of the project sites and the competition for	**Risk Management:** There are adequate legal and institutional frameworks in the country to ensure compliance with World Bank safeguards policies triggered by the proposed project. Legacy issues will be addressed by focusing on communities that have been disadvantaged earlier and to ensure that they obtain a fair share of the benefits from the improvement of the irrigation schemes. Safeguards principles are embedded into project component design. A strong team on environmental and social aspects is being assembled. The project will support the NIWRMC towards achieving its WRM mandate including environmental objectives. The needs assessment for WUAs will incorporate a gender perspective. A position for women on new local governance structures will be allotted. Gender sensitive communication strategies will also seek to empower women with information from the project. Traditional authorities will be used in local governance arrangements to mediate local tension around

water resources may also produce conflict. Weak enforcement and compliance for environmental and social impact assessments including resettlement action plans may hinder the project's ability to address legacy issues in selected schemes, impacts on wetlands, and land acquisition issues.	water resources, The investment in an open data, GIS will also support continue supervision and implementation support if conflict arises.						
	Resp: Both	Status: On-going	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency:	Continuous
Program and Donor	Rating	Low					
Risk Description: Donor coordination in the Irrigation Sector in Nigeria is relatively weak. However, coordination among donors intervening in the sector was sought at the early stage of project preparation. Based on this, potential for synergies, and complementarity were identified and discussed between the World Bank, FAO, and AfDB teams.	**Risk Management:** The World Bank, FAO, AfDB have established an informal Irrigation group to enhance their collaboration and coordination. In this process, several meetings were carried out and teams from other institutions participated in the World bank led preparation, pre-appraisal and appraisal missions. The close collaboration and coordination will continue throughout project implementation and through joint missions.						
	Resp: Client	Status: On-going	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency:	Continuous
Delivery Monitoring and Sustainability	Rating	Moderate					
Risk Description: While there have been some successes, contractors have had a history of poor delivery. Timeliness of government and contractor response. Lack of continuity post-project Engineering contractors and other project stakeholders may not fully achieve the results. Project investments may not be effectively maintained after project close.	**Risk Management:** Performance-based service contracts, as well as independent and participatory M&E, are being built into the project to strengthen accountability. The Project team will manage expectations with a strategic communications plan. The Project will also pursue an integrated technical approach to civil works, with due diligence for contracting and monitoring, and community involvement. The Project will also engage local stakeholders closely during project preparation and implementation to strengthen ownership and sustainability. Communities will be involved from the earliest stages of design, and in construction and O&M, including quality assurance and monitoring.						
	Resp: Both	Status: On-going	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency:	Continuous
Other (Optional)	Rating	Moderate					
Risk Description:	**Risk Management:**						

Monitoring and evaluation risks: The absence of credible baseline data on key project indicators poses a risk to the project.	A comprehensive and innovative monitoring and evaluation strategy has been developed around five main components: (a) concurrent progress monitoring (ongoing assessment of inputs, outputs and results, and key processes), and (b) discrete monitoring (outcome and impact evaluations) at periodic points throughout the project. It will also include (c) participatory monitoring, (d) thematic studies and case studies, and (E) action learning, all designed to assess performance against key indicators.					
	Resp: Both	Status: On-going	Stage: Implementation	Recurrent: ☑	Due Date:	Frequency: Yearly

Overall Risk	
Overall Implementation Risk: Substantial	Risk Description: Project may encounter difficulties at the beginning of implementation due to resistance to change by some key actors including: (i) some staff at the FMWR; (ii) RBDAs who would like to keep the status quo; and (iii) some local government members. Some farmers may also need some time to fully understand the concept, their new roles and be ready to play by the rules for the interest of all members of Water Users Associations' members. To note the low literacy level of the farmers in the project areas.

Annex 5: Implementation Support Plan
Transforming Irrigation Management in Nigeria (TRIMING) Project

Strategy and Approach for Implementation Support

1. The proposed Transforming Irrigation Management in Nigeria (TRIMING) Project would focus on capacity building of WUAs, rehabilitation and modernization of irrigation and drainage systems, rehabilitation of dams, development of Basin River planning strategies, groundwater studies, knowledge base, and strengthening the water institutions at state, river basin, and the federal level. The Project would support the GoN on improving the policy framework for irrigation and integrated water resources management. In addition, the Project would support farmers to increase their agricultural productivity through an improvement of the water use efficiency. Safeguard risks for Bank-financed investments in the current project are significant. The World Bank's semi-annual missions will review social and environmental aspects of project implementation as well as overall implementation and advise on and address issues that emerge during implementation.

2. Types of the contracts expected under the Project are as follows:

- Technical Assistance: international/domestic consultancy contracts for firms and individual experts.
- Training – international/domestic training contracts with training institutes or experts.
- Procurement of Construction/Rehabilitation: international/domestic procurement contracts using International Competitive Bidding (ICB), National Competitive Bidding (NCB), or others procedures.
- Procurement of Equipment – international/domestic procurement contracts using International Competitive Bidding (ICB), National Competitive Bidding (NCB), or Shopping procedures.
- Project Operations – No contract is required.

3. The lead implementing agency (FMWR) has limited experience with international procurement. The occurrences of risk are therefore significant. In addition, procurement would be important since a high portion of project funds would be used for contracting consultants to deal with technical studies and knowledge base platforms, construction companies to rehabilitate irrigation/drainage infrastructure, and companies to develop several other activities. Consequently, procurement post review will be carried out annually on 10 percent samples of the contracts awarded during the review period and a procurement supervision mission will be carried out every six months for the first year of the project implementation. Bank procurement staff based in Nigeria, will provide necessary training for PMU staff on Bank's procurement procedures and Guidelines before the effectiveness of the project grant.

4. Implementation support would need to focus significant oversight on the quality of rehabilitation of irrigation and drainage infrastructure, basin river planning/knowledge base, and modernization of irrigation equipment, agro-processing, among others. The supervision process would play a key role in the success of the project. The supervision would need to review capacity building activities to governmental officials and WUAs (farmers), especially those designed to strengthen irrigation, agriculture, and storage/agro-processing. The supervision would also need to

focus in how the incorporation of flood management systems would work. The social impact from the incorporation of early warning advisory in the communities (based on the flood management systems) would need a close follow-up. Third party supervision has been very effective in monitoring of irrigation and drainage infrastructure projects. Several ICT solutions have been researched to improve supervision practices; such as the used of unmanned aerial vehicles, mobile application, Vu-con technology mobile laboratory, satellite information, among others[29]. For instance, the mobile applications were used to evaluate the status of assets in Afghanistan as part of the Horticulture and Livestock Program (HLP). There, fieldworkers gathered data with photos and geographical coordinates in rural areas.

5. The M&E and third party supervision consultancies are also key for a successful implementation of the project. The selection of key indicators at inception of the project is crucial to monitor the project, identify obstacles encountered and possible corrective measures, and assess its impacts. The M&E consultancy will provide support in identifying these indicators and in developing the M&E system, on the basis of the Results Framework. Regular monitoring of inputs/outputs and intermediate outcomes and process monitoring will provide timely information which will be fed back to the PMU and implementing agencies to allow for corrective action, where needed, and follow-up. The third party supervision consultancy will also provide rapid feedback on any sub-standard works found during field inspection. These two consultancies will use modern information and communication technologies for data collection and set up web platforms to enable real-time tracking of project implementation and early feedback.

6. The Implementation Support Plan (ISP) would receive inputs from the World Bank staff, governmental official, consultants, M&E consultancy, and Third party supervision consultancy. Two supervision missions are expected each year; however, due to external conditions the numbers of missions could vary. The below ISP reflects estimates of skill requirements, timing, and resource requirements over the life of the project. All these estimates are flexible and open to modifications over the project implementation. Consequently, the ISP would be reviewed each six months to ensure it remains up-to-date.

[29] World Bank. 2012. "Enhancing Effectiveness in Civil Work Supervision", Washington DC, USA.

Table 5.1: Implementation Support Plan

Time	Focus	Primary Skills Needed	Number of Trips	Resource Estimate	Partner Role	Comments
Year 1 10/14 to 09/15	• Quality control processes • Financial management systems functioning effectively • Procurement practices following Bank norms. • Training as it is needed.	• Team lead • Financial management • Procurement • Hydrologist • Agronomist • Irrigation specialist • Specialist of WUAs • Software developers • Specialists covering quality assurance, data base design, drainage specialists, and climate change	October 2014 April 2015 Total	$100,000 $100,000 $200,000	Staff from PMU and contract 3rd party M&E agency	• Project would likely become effective October 1, 2014. • Supporting smooth start-up following effectiveness.
Year 2 10/15 to 09/16	• Creation of Knowledge base. • Rehabilitation and modernization works for the irrigation and drainage systems. • Studies for the development of the Flood management system. • Capacity building to WUAs • Financial management • Procurement • Environment and social safeguards	• Team lead • Financial management • Procurement • Hydrologist • Irrigation specialist • Specialist of WUAs • ICT in irrigation specialist • Agriculture economist • Civil engineers • Agribusiness specialist • Safeguards • Social specialist • Environmental specialist	*FY16* September/2015 April/2016 Total	$120,000 $120,000 $240,000	Prepare comprehensive project progress report in advance of each mission Prepare AMs for each supervision mission Prepare ISR for each supervision mission	• Building of the knowledge base irrigated agriculture, agro-processing, implementation of integrated basin development strategy • Works related to the rehabilitation and modernization of the irrigation and drainage systems. • Works related to dam safety • Ensure safeguards are built and place.
Year 3	• Monitor progress of several activities	• Team lead • Financial	*FY17*			• Mid-term review

10/16 to 09/17	(component A, B, C, and D) • Support integrated planning processes • Financial management. • Procurement. • Safeguards	management • Procurement • Hydrologist • Irrigation specialist • Specialist of WUAs • Agriculture economist • Civil engineers • Agronomies • Safeguards • Social specialist	September/ 2016 April/2017 Total	$80,000 $80,000 $160,000		
Years 4 to 6 10/17 to 09/20	• Monitor progress of several activities (component A, B, C, and D) • Support integrated planning processes • Financial management • Procurement • Safeguards	• Team lead • Financial management • Procurement • Hydrologist • Irrigation specialist • Specialist of WUAs • Agriculture economist • Civil engineers • Agronomies • Safeguards • Social specialist	*FY18* September/2017 May/2018 *FY19* September/ 2018 April/2019 Total	$80,000 $80,000 $80,000 $80,000 $320,000	Prepare comprehensive project Progress report in advance of each mission Prepare AMs for each supervision mission Prepare ISR for each supervision mission	• General support to monitor progress, provide technical oversight, ideas for improvement, etc.
Year 7 10/20 to 03/21	• Project withdrawal and closure	• Team lead • Financial management • Procurement • Hydrologist • Irrigation specialist • Specialist of WUAs • Agriculture economist • Civil engineers • Agronomies • Safeguards • Social specialist	*FY21* September/ 2020 April/2021 Total	$80,000 $80,000 $160,000	Prepare comprehensive project progress report in advance of each mission Prepare AMs for each supervision mission Prepare ISR for each supervision mission	• ICR mission

Annex 6: Statement of Sector Policy for Large-Scale Public Irrigation Schemes Transforming Irrigation Management in Nigeria (TRIMING) Project

FEDERAL MINISTRY OF WATER RESOURCES

ABUJA NIGERIA

Honourable Minister of Water Resource's Statement on Nigeria Irrigation Sector Strategy for Public Irrigation Schemes

1.0 **Introduction:**

1.1 This Statement on Irrigation Sector Policy (SoISP) is furnished by Honourable Minister of Water Resources to provide the policy and institutional context for the Transforming Irrigation Management in Nigeria (TRIMING) Project, towards supporting the successful realization of the Government's Agricultural Transformation Agenda (ATA).

1.2 Furthermore, the statement represents Government's commitment to the Public Irrigation Sector Transformation Program whose main objective is to contribute to the Government's goals in agricultural production and poverty reduction in Nigeria.

1.3 In line with Government transformation progammes for all sectors, the statement is expected to guide the actions and cooperation of all sector ministries at the Federal, State, and local Government levels dealing with public irrigation schemes.

1.4 Given the relative deficit in the development of infrastructure for irrigation and agricultural sectors as well as the need for serious transformation, it is expected that this sector strategy for public irrigation will be fully supported by successive Governments of Nigeria at all levels.

2.0 Prospects for Closing Production Gaps and Reversing Current Trends:

2.1 Investments to raise yields and productivity from irrigated land must be key elements of a strategy to produce the extra food needed to achieve self-sufficiency in food production, boost agricultural exports, and accelerated commercialization through private sector participation while safeguarding the environment. Alternative options, such as upgrading rain fed farming and increasing international trade in food grains, must also contribute, but will need to be supplemented by a significant increase in production from irrigated agriculture

2.2 Federal, State and Local Government institutions accept the need for change as part of the process of devolution of powers from the center for the purposes of ensuring sustainability of these schemes. The next critical challenge will be deliberate efforts geared towards the removal of current constraints to effeetive participation of farmer organizations, which have been recognized globally as a sustainable means of operating and managing irrigation schemes satisfactorily.

2.3 Accordingly, it is time to follow through on an agenda for change and institutional transformation. As government agencies, the Ministry of Water Resources and the

River Basin Development Authorities, will focus over time, on their role as suppliers of public goods (i.e. bulk water) and regulators of the natural resources around their catchment areas (for the RBDAs).

2.4 The private sector needs to be encouraged to take up more active roles in commercialised agricultural production. Many of these commercial opportunities will promote the participation of a private sector working hand in hand with the government in developing and managing irrigation schemes. In collaboration with partner ministries, the Ministry of Water Resources will work to remove constraints to private sector participation in irrigation as detailed in the FMWR Policy on Private Sector Participation in Irrigation Development and Management

3.0 Challenges of Public Irrigation Subsector: Past Problems and Government Commitment to Required Transformations:

3.1 Government has in the past been the initiator, developer and operator of irrigation schemes to the exclusion of farmers or any other stakeholder participants. Furthermore, rising operation and maintenance costs coupled with deteriorating irrigation infrastructure have brought into focus the issue of sustainability of the schemes under the existing operation and maintenance arrangement.

3.2 As a result, Nigeria's water resources and irrigation sector faces increasingly long-term investment and management challenges which, unless effectively addressed, will be a constrain to the country's economic development. It is therefore essential that the sector policies be reformed, use more effective institutional frameworks, improve planning and management systems, and facilitate increased beneficiary participation if current and future challenges are to be addressed.

3.3 The country has about 3.1 million ha potentially irrigable land area, most of which are in the north. Of a total of 624,000 ha planned for irrigation in 2004, only an estimated 293,000 ha was equipped for irrigation while only 219,000 ha was actually cropped. Since then, cropped areas continue to decline for some time until Governments vigorous intervention in recent times which improved on the irrigated area cropped. Public irrigation development has not done well in the past as farmers were not well served, and productions from irrigated land continue decreasing. Having to face this difficult history, Government has resolved that significant changes and transformation, such as related to operation and maintenance (O&M) have become crucial.

3.4 Accordingly, government views the proposed TRIMING Project as an important pilot operation from which the experiences gained can help the needed reform process. The pilot project has the potential to substantially increase rural production, income generation and employment opportunities, by firstly improving irrigation facilities on 60,000 ha. Furthermore, it intends to develop an additional 30,000 ha of irrigated land (a 100% increase) in the three RBDAs for the use of more than 140,000 farmers, and also to facilitate the generation of an additional 37 MW of power by the year 2017 through PPP arrangement with more than 1.2 million direct beneficiaries and private sector participation. In addition, the Project

also has the potential to reduce public safety risks posed by five large dams in the Northern States by providing flood risk reduction measures.

4.0 Potential Contribution of Public Irrigation Development to Food Security and Poverty Reduction in Northern Nigeria

4.1 While the causes of instability in the northern part of the country are complex and multi-dimensional, underlying grievances linked to poverty and lack of economic opportunities are large contributory factors. Worldwide evidence suggests that creating jobs and livelihood opportunities are some of the most effective ways to address the underlying grievances and perceptions of exclusion that drive conflict and insecurity. The majority of the population of Nigeria's northern states relies directly or indirectly on agriculture for its livelihood (80% of the population is involved in farming, fishing, or livestock rearing). Lack of reliable electric power is a major constraint on economic expansion in general and on RBDA and state public irrigation schemes in particular. It is therefore the intention of government to have a special focus on northern Nigeria and use the proposed TRIMING Project as a vehicle to pilot productivity of public irrigation schemes.

5.0 Commitment to Dam Safety:

5.1 Dams are essential for public irrigation and power production. Dam failures, however, can cause significant damages to lives and assets downstream. Accordingly, government is committed to improving dam safety, not only for the dams targeted under the TRIMING Project, but also dams nationwide. For this purpose, it is the intention of government to establish and maintain capacity for dam safety inspection under the Minister of Water Resources with the objective to ensure compliance with internationally established dam safety standards. In addition, government commits to make the necessary budgetary allocations so as to ensure the operation and maintenance activities required to achieve the set dam safety standards. This funding is to commence under the TRIMING dam component which will serve as a pilot for replication in other FMWR and State-owned irrigation dams.

6.0 Commitment to Transformative Principles and Actions

6.1 Looking at attempts and efforts to effect changes in the way public irrigation schemes were administered in the past, and the inevitable need to ensure that sustainable changes are in the operation of these schemes, I wish to reiterate government's commitment to key principles aimed at achieving justifiable transformation of public irrigation schemes, including the following:

a. **Commitment to financial sustainability and institutional reforms with a view to achieve full cost recovery for the operation and maintenance functions on public irrigation schemes after a transition period;**

b. **Accountability of irrigation agencies to water users, which includes a commitment from agencies to provide satisfactory services to all users of public irrigation schemes;**

c. **Participation of water users through empowered *Water User Associations (WUAs)* that can set and collect fees and also make spending decisions to the extent of the authority that is gradually delegated to them without prejudice to normal government charges.**

6.2 The Federal Ministry of Water Resources (FMWR) recognizes that some of the past problems and constraints can be reduced via appropriate sector management reforms as well as giving adequate support to irrigated agriculture by the active participation of the private sector. FMWR is committed to increasing the performance of scheme operating entities comprising of RBDAs, WUAs and professional service providers and contractors to deliver water and required support services in an effective manner, thereby increasing agricultural production. The current (4th) draft of the Water Resources Bill recognizes WUAs (and consequently Federated Apex WUAs) as Water Resources Institutions for participatory irrigation management.

6.3 The above depends on many factors like: (i) the capacity and willingness of farmers to pay for better water services and access; (ii) significant rise in farmers' incomes, (iii) better allocation of input subsidies; (iv) improvement of the RBDAs' management performance including O&M; (v) implementation of a change for a real client-oriented management approach for the RBDAs and governmental institutions; (vi) implementation of a pay-user approach based on payee "voice and choice" in scheme irrigation management and operating budget prioritization; and (vii) a better allocation of responsibilities between irrigators and the scheme operating entities.

6.4 In order to put into **operation the vision and overall strategy, transformative actions** will be undertaken in these specific areas:

a. **The schemes will be managed in a progressively increasing administrative and financial autonomy with the objective to achieve full cost recovery for the operational and maintenance costs of the water conveyance and distribution.** The large dams having broad public benefits and critical safety requirements will be excluded from this transfer.

b. **To this end, and at the beginning, the responsibility for operation and maintenance of tertiary irrigation and drainage canals will be transferred to the WUAs.** WUAs will be trained and empowered to the a level where they can levy and administer fees necessary to cover their expenditures. Technical and financial assistance will be further be given during the transition period. Transfer of higher-level infrastructure, i.e. secondary and primary canals and drains as well as associated service roads and structures would be considered in due course based on an assessment of the capacity of WUAs to manage them.

c. **The operation and maintenance of the non-transferred infrastructure will remain the responsibility of the RBDAs who will ensure accountability at scheme level.** The RBDAs will have the option to delegate part or all of these services to a **Service Provider**, which could be either a special purpose vehicle

or a competitively selected private contractor. The related costs will be fully covered by the portion of the fees charged to the WUAs that is retained by the RBDAs or service provider. A participatory management approach will be followed so as to ensure accountability on the use of these funds and assess the performance of the irrigation and drainage services provided to the WUAs. This participatory approach will use the following instruments: (i) a performance based service contract between the RBDA or service provider and the WUAs and (ii) a transparent management of the funds allocated for maintenance works which will be committed through open competitive bidding procedure under joint oversight by the RBDA and the users.

d. **The specific arrangements will be described in a Tripartite Memorandum of Agreement (MoA) between the FMWR, the RBDA and the users represented by their APEX organization. This Agreement will be established for a period of three to five years and signed within the period of rehabilitation and expansion works.** It will set the targets in terms of increased production, performance of irrigation and drainage services, fee level and transitional financial support to be received by the WUAs. It will define the portion of the fees collected by the RBDAs that will be retained at scheme level to cover the operation and maintenance expenditures incurred for the provision of irrigation and drainage services by the RBDA or the service provider.

e. **A Scheme Oversight Committee comprising of the RBDA, the representatives from the users, the local authorities and relevant agencies will be established to periodically review the implementation progress of the Tripartite MoU, resolve issues as they arise and report any unresolved matter to the FMWR.**

6.5 In addition FMA&RD is expected to continue to support the states and local-level institutions to increase agricultural productivity and improve value chains (processing, marketing, etc.).

7.0 Memorandum of Understanding (MoU) Between Federal Ministry of Water Resources (FMWR) and Federal Ministry of Agriculture and Rural Development (FMA&RD)

7.1 It is in view of the foregoing that the FMWR signed an MoU with the FMA&RD in October, 2013, which was later updated in March, 2014. The purpose is for collaborative efforts between the two Ministries, dealing with the use of water resources for agricultural development. The implementation of the MoU is facilitated by a joint committee of representatives of the two ministries who meet twice a month. Whereas the implementation is still in its commencement stage, collaborative programmes and projects are being prepared for definitive actions.

8.0 Delegation of Authority

8.1 Accordingly, and in exercise of the powers conferred on the Honourable Minister of Water Resources by the Water Resources Act (CAP W2 2004), the required legal

instrument, delegating authority for the three pilot River Basin Development Authorities to organize the WUAs working on the Irrigation Projects selected by the TRIMING Project with the active support, guidance, and assistance of the *Project Coordinating Unit (PCU)* has been issued. The purpose is for the WUAs to gradually take over the management responsibilities of irrigation and drainage facilities around their respective farm levels. The PCU, with the active participation of the Irrigation and Drainage Department shall take lead in ensuring that these management transfer proceeds in a manner that will guarantee the sustainability of this policy.

8.2 The **Delegation of Authority** issued under the Water Resources Act (CAP W2 2004), anticipates the WUA provisions of the Water Resources Bill (WRB) and allows the RBDAs to organize and give recognition to legally registered WUAs for the gradual purpose of assuming physical, administrative, and financial responsibilities for tertiary level irrigation and drainage facilities including the implementation of any operational services and maintenance and alteration works that may be required for the delivery of irrigation and drainage services to all users. The Delegation further establishes that fees, rates, and/or charges for the costs of any works associated with the provision of irrigation and drainage services will be determined by the RBDAs in agreement with the WUAs.

8.3 In addition, the Circular from Ministry of Finance dated November 11, 2011 authorize parastatals including the RBDAs to retain up to **75%** of their internally generated revenues. This will allow the RBDAs to ensure **financial autonomy** and set up the proposed **accountability system** at scheme level to monitor expenditures related to the non-transferred irrigation and drainage services.

This is a commitment by the Honourable Minister of Water resources on the need for the transformation of the Nigeria Irrigation Sector in general and Public Irrigation Sector in particular.

Made in Abuja this 22nd day of April 2014.

Mrs. Sarah Reng Ochekpe
Honourable Minister

Annex 7: Delegation of Authority to Gradually Transfer On-Farm Irrigation and Drainage Facilities to Registered Water Users Associations

A. Sokoto Rima River Basin Development Authority

FEDERAL MINISTRY OF WATER RESOURCES

OFFICE:
Old Secretariat, Area 1,
P.M.B. 159,Garki,
Abuja Nigeria

☎ 096 - 714 313
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OFFICE OF THE HONOURABLE MINISTER

Ref. No.: FMWR/ID/NIWRMP/746/T3/42 Dated: April 22, 2014

The Managing Director
Sokoto Rima River Basin Development Authority
Km 10, Gusau Road, P. M. B. 2223
Sokoto, Sokoto State

Delegation of Authority to Gradually Transfer On-Farm Irrigation and Drainage Facilities to Registered Water Users Association

As part of its responsibility, Government will continue to construct, operate, and maintain dams, dykes, polders (etc.) including irrigation and drainage systems in conjunction with and active participation of the beneficiaries. The purpose is to deliver, at economic rates, timely and adequate quantities and quality of water through these systems to farmers for the purpose of efficient irrigation practices.

2. The overall capital cost of these schemes was recently estimated at over N170 billion, while the operation and maintenance costs to sustain these schemes were estimated at over N2.0 billion annually. Regrettably, Federal Government's budget allocations to these schemes do not cover this amount and the private sector contributions in this area is only limited to individual farm inputs. As a result, irrigation development has not performed according to expectations. Structures are fast deteriorating, farmers are not served well, and production from irrigated lands has been declining or operating at low-level capacities, with low cropping intensities.

3. The prevailing economic realities in Nigeria today no longer favor a situation in which public irrigation and drainage scheme management is entirely in the hands of the government and its agencies. Studies have shown that these responsibilities are better **shared** with efficient and organized Water Users Associations (WUAs).

CONTINUATION

4. From the foregoing perspectives therefore, and for the purposes of sustainability of these schemes, government is preparing (through a trial program), a gradual handover of the responsibility for the operation and maintenance of **portions** of these schemes to legally registered and organized WUAs in accordance with extant laws and guidelines setting them up. The objective of this policy is to increase the effectiveness and efficiency of the irrigation and drainage systems in general and to increase awareness among irrigation farmers of the need to adopt sound irrigation and drainage management practices in the fields in a manner that will ensure profitable production and sustainability of the schemes.

5. Accordingly, and in exercise of the powers conferred on the Honourable Minister of Water Resources by the Water Resources Act (CAP W2 2004), please find attached to this letter - the required legal instrument, delegating authority for your River Basin Development Authority to organize the WUAs of *Bakolori Irrigation Project, Middle Rima Valley Irrigation Project* with the active support, guidance, and assistance of the Project Coordinating Unit (PCU) of the Transforming Irrigation Management in Nigeria (TRIMING) Project. The purpose is for the WUAs to gradually takeover the management responsibilities of irrigation and drainage facilities around their respective farm levels. The PCU, through the Irrigation and Drainage Department shall take lead in ensuring that these management transfer proceeds in a manner that will guarantee the sustainability of this policy.

6. Under this arrangement:
   a. The FMWR and its relevant Departments, Agencies, Parastatals, Divisions and Units shall concern themselves with the provision of all operation and maintenance of facilities upstream of field or tertiary canal, and downstream of the collector drains to the original river course.

   b. The WUAs will be physically, administratively and financially responsible for:

      i. The operation & maintenance of facilities from the downstream end of secondary canals (as the case may be),
      ii. Operation & maintenance of facilities on the field channels supplying water to their respective farms; and
      iii. Upstream of collector drain up to their respective farms

CONTINUATION

7. In view of the above, farmers and their *WUAs* (as the beneficiaries of these schemes) will be responsible physically, administratively and financially for managing the operation & maintenance of all facilities at the level of tertiary or field channels and ditches. Your *Authority*, through the active guidance of the TRIMING Project supported by the Legal Unit of the Ministry will provide assistance during the first two years to ensure smooth pilot transition.

8. Through the TRIMING Project, the Ministry's oversight functions particularly in relation to these arrangements will be monitored very closely. The objective is to ensure that for every irrigation and drainage project:
   a. A management team of high quality and technical competence is superintending
   b. This team should have probity, accountability, and transparency in financial and administrative transactions so as to minimize fraud and other sharp practices
   c. High quality team so put in place is maintained or even improved upon sustainably through regular training
   d. Funds to be generated by the farmer organizations are not illegally siphoned

9. It is expected that sustainable schemes will emerge with adequate operation and maintenance procedures that are strictly adhered to and properly managed funds and personnel to operate and maintain the schemes. The goal of this shift in policy is to ensure that irrigation infrastructures can be maintained as at when due or even replaced conveniently after their normal economic life. Under this condition, it is envisaged that the level of service provided to the farmers and other stakeholders will be in consonance with the strategic plan of the scheme.

10. You are therefore expected to liaise closely with the Irrigation and Drainage Department of the Ministry and the PCU of TRIMING Project to ensure strict compliance.

Mrs. Sarah Reng Ochekpe
Honourable Minister

FEDERAL MINISTRY OF WATER RESOURCES

ABUJA NIGERIA

DELEGATION OF AUTHORITY

By the powers conferred on me by the Water Resources Act (CAP W2 2004) particularly Section 17, I Sarah Reng Ochekpe, Honourable Minister of Water Resources do hereby delegate and authorize Sokoto Rima River Basin Development Authority thus:

a. Organize and give recognition to legally registered Water Users Associations, *(WUAs)* for the gradual purpose of assuming physical, administrative, and financial responsibilities for irrigation and drainage facilities from the downstream end of secondary canals to the upstream end of secondary drains, through to their respective farm lands, subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

b. Authorize the construction, operation, maintenance, repair or alteration of irrigation and drainage facilities downstream end of secondary canals, including facilities on the field channels supplying water to or draining water from the respective farms of financially active members of WUAs, through drainage facilities ending at the downstream end of secondary drains, subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

c. In conjunction with the *WUAs*, agree on fees, rates, and/or charges for the costs of any works associated with the provision of irrigation and drainage services within the areas they have assumed physical, administrative and financial responsibilities subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

d. This Delegation of Authority is in respect of *Bakolori and Middle Rima Valley Irrigation Projects* only.

Made in Abuja this 22nd day of April 2014.

Mrs. Sarah Reng Ochekpe
Honourable Minister

B. Hadeija Jama'are River Basin Authority

FEDERAL MINISTRY OF WATER RESOURCES

OFFICE:
Old Secretariat, Area 1,
P.M.B. 159,Garki,
Abuja Nigeria

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OFFICE OF THE HONOURABLE MINISTER

Ref. No.: FMWR/ID/NIWRMP/746/T3/42 Dated: April 22, 2014

The Managing Director
Hadejia Jama'are River Basin Development Authority
Maiduguri Road, Hotoro, P. M. B. 3168
Kano, Kano State

Delegation of Authority to Gradually Transfer On-Farm Irrigation and Drainage Facilities to Registered Water Users Association

As part of its responsibility, Government will continue to construct, operate, and maintain dams, dykes, polders (etc.) including irrigation and drainage systems in conjunction with and active participation of the beneficiaries. The purpose is to deliver, at economic rates, timely and adequate quantities and quality of water through these systems to farmers for the purpose of efficient irrigation practices.

2. The overall capital cost of these schemes was recently estimated at over N170 billion, while the operation and maintenance costs to sustain these schemes were estimated at over N2.0 billion annually. Regrettably, Federal Government's budget allocations to these schemes do not cover this amount and the private sector contributions in this area is only limited to individual farm inputs. As a result, irrigation development has not performed according to expectations. Structures are fast deteriorating, farmers are not served well, and production from irrigated lands has been declining or operating at low-level capacities, with low cropping intensities.

3. The prevailing economic realities in Nigeria today no longer favor a situation in which public irrigation and drainage scheme management is entirely in the hands of the government and its agencies. Studies have shown that these responsibilities are better **shared** with efficient and organized Water Users Associations (WUAs).

CONTINUATION

4. From the foregoing perspectives therefore, and for the purposes of sustainability of these schemes, government is preparing (through a trial program), a gradual handover of the responsibility for the operation and maintenance of **portions** of these schemes to legally registered and organized WUAs in accordance with extant laws and guidelines setting them up. The objective of this policy is to increase the effectiveness and efficiency of the irrigation and drainage systems in general and to increase awareness among irrigation farmers of the need to adopt sound irrigation and drainage management practices in the fields in a manner that will ensure profitable production and sustainability of the schemes.

5. Accordingly, and in exercise of the powers conferred on the Honourable Minister of Water Resources by the Water Resources Act (CAP W2 2004), please find attached to this letter - the required legal instrument, delegating authority for your River Basin Development Authority to organize the WUAs of *Kano River Irrigation Project* and *Hadejia Valley Irrigation Project* with the active support, guidance, and assistance of the Project Coordinating Unit (PCU) of the Transforming Irrigation Management in Nigeria (TRIMING) Project. The purpose is for the WUAs to gradually takeover the management responsibilities of irrigation and drainage facilities around their respective farm levels. The PCU, through the Irrigation and Drainage Department shall take lead in ensuring that these management transfer proceeds in a manner that will guarantee the sustainability of this policy.

6. Under this arrangement:
   a. The FMWR and its relevant Departments, Agencies, Parastatals, Divisions and Units shall concern themselves with the provision of all operation and maintenance of facilities upstream of field or tertiary canal, and downstream of the collector drains to the original river course.

   b. The WUAs will be physically, administratively and financially responsible for:

      i. The operation & maintenance of facilities from the downstream end of secondary canals (as the case may be),
      ii. Operation & maintenance of facilities on the field channels supplying water to their respective farms; and
      iii. Upstream of collector drain up to their respective farms

7. In view of the above, farmers and their *WUAs* (as the beneficiaries of these schemes) will be responsible physically, administratively and financially for managing the operation & maintenance of all facilities at the level of tertiary or field channels and ditches. Your *Authority*, through the active guidance of the TRIMING Project supported by the Legal Unit of the Ministry will provide assistance during the first two years to ensure smooth pilot transition.

8. Through the TRIMING Project, the Ministry's oversight functions particularly in relation to these arrangements will be monitored very closely. The objective is to ensure that for every irrigation and drainage project:
   a. A management team of high quality and technical competence is superintending
   b. This team should have probity, accountability, and transparency in financial and administrative transactions so as to minimize fraud and other sharp practices
   c. High quality team so put in place is maintained or even improved upon sustainably through regular training
   d. Funds to be generated by the farmer organizations are not illegally siphoned

9. It is expected that sustainable schemes will emerge with adequate operation and maintenance procedures that are strictly adhered to and properly managed funds and personnel to operate and maintain the schemes. The goal of this shift in policy is to ensure that irrigation infrastructures can be maintained as at when due or even replaced conveniently after their normal economic life. Under this condition, it is envisaged that the level of service provided to the farmers and other stakeholders will be in consonance with the strategic plan of the scheme.

10. You are therefore expected to liaise closely with the Irrigation and Drainage Department of the Ministry and the PCU of TRIMING Project to ensure strict compliance.

Mrs. Sarah Reng Ochekpe
Honourable Minister

FEDERAL MINISTRY OF WATER RESOURCES

ABUJA NIGERIA

DELEGATION OF AUTHORITY

By the powers conferred on me by the Water Resources Act (CAP W2 2004) particularly Section 17, I Sarah Reng Ochekpe, Honourable Minister of Water Resources do hereby delegate and authorize Hadeja-Jama'are River Basin Development Authority thus:

a. Organize and give recognition to legally registered Water Users Associations, *(WUAs)* for the gradual purpose of assuming physical, administrative, and financial responsibilities for irrigation and drainage facilities from the downstream end of secondary canals to the upstream end of secondary drains, through to their respective farm lands, subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

b. Authorize the construction, operation, maintenance, repair or alteration of irrigation and drainage facilities downstream end of secondary canals, including facilities on the field channels supplying water to or draining water from the respective farms of financially active members of WUAs, through drainage facilities ending at the downstream end of secondary drains, subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

c. In conjunction with the *WUAs*, agree on fees, rates, and/or charges for the costs of any works associated with the provision of irrigation and drainage services within the areas they have assumed physical, administrative and financial responsibilities subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

d. This Delegation of Authority is in respect of *Kano River* and *Hadeja Valley Irrigation Projects* only.

Made in Abuja this 22nd day of April 2014.

Mrs. Sarah Reng Ochekpe
Honourable Minister

C. Upper Benue River Basin Development Authority

FEDERAL MINISTRY OF WATER RESOURCES

OFFICE:
Old Secretariat, Area 1,
P.M.B. 159,Garki,
Abuja Nigeria

☎ 096 - 714 313
096 - 736 343
096 - 719 917

OFFICE OF THE HONOURABLE MINISTER

Ref. No.: FMWR/ID/NIWRMP/746/T3/42 Dated: April 22, 2014

The Managing Director
Upper Benue River Basin Development Authority
Mmamba-Fufore Road, P. M. B. 2086
Yola, Adamawa State

Delegation of Authority to Gradually Transfer On-Farm Irrigation and Drainage Facilities to Registered Water Users Association

As part of its responsibility, Government will continue to construct, operate, and maintain dams, dykes, polders (etc.) including irrigation and drainage systems in conjunction with and active participation of the beneficiaries. The purpose is to deliver, at economic rates, timely and adequate quantities and quality of water through these systems to farmers for the purpose of efficient irrigation practices.

2. The overall capital cost of these schemes was recently estimated at over N170 billion, while the operation and maintenance costs to sustain these schemes were estimated at over N2.0 billion annually. Regrettably, Federal Government's budget allocations to these schemes do not cover this amount and the private sector contributions in this area is only limited to individual farm inputs. As a result, irrigation development has not performed according to expectations. Structures are fast deteriorating, farmers are not served well, and production from irrigated lands has been declining or operating at low-level capacities, with low cropping intensities.

3. The prevailing economic realities in Nigeria today no longer favor a situation in which public irrigation and drainage scheme management is entirely in the hands of the government and its agencies. Studies have shown that these responsibilities are better **shared** with efficient and organized Water Users Associations (WUAs).

4. From the foregoing perspectives therefore, and for the purposes of sustainability of these schemes, government is preparing (through a trial program), a gradual handover of the responsibility for the operation and maintenance of **portions** of these schemes to legally registered and organized WUAs in accordance with extant laws and guidelines setting them up. The objective of this policy is to increase the effectiveness and efficiency of the irrigation and drainage systems in general and to increase awareness among irrigation farmers of the need to adopt sound irrigation and drainage management practices in the fields in a manner that will ensure profitable production and sustainability of the schemes.

5. Accordingly, and in exercise of the powers conferred on the Honourable Minister of Water Resources by the Water Resources Act (CAP W2 2004), please find attached to this letter - the required legal instrument, delegating authority for your River Basin Development Authority to organize the WUAs of *Dadin Kowa Irrigation Project* with the active support, guidance, and assistance of the Project Coordinating Unit (PCU) of the Transforming Irrigation Management in Nigeria (TRIMING) Project. The purpose is for the WUAs to gradually takeover the management responsibilities of irrigation and drainage facilities around their respective farm levels. The PCU, through the Irrigation and Drainage Department shall take lead in ensuring that these management transfer proceeds in a manner that will guarantee the sustainability of this policy.

6. Under this arrangement:

   a. The FMWR and its relevant Departments, Agencies, Parastatals, Divisions and Units shall concern themselves with the provision of all operation and maintenance of facilities upstream of field or tertiary canal, and downstream of the collector drains to the original river course.

   b. The WUAs will be physically, administratively and financially responsible for:

      i. The operation & maintenance of facilities from the downstream end of secondary canals (as the case may be),
      ii. Operation & maintenance of facilities on the field channels supplying water to their respective farms; and
      iii. Upstream of collector drain up to their respective farms

CONTINUATION

7. In view of the above, farmers and their *WUAs* (as the beneficiaries of these schemes) will be responsible physically, administratively and financially for managing the operation & maintenance of all facilities at the level of tertiary or field channels and ditches. Your *Authority*, through the active guidance of the TRIMING Project supported by the Legal Unit of the Ministry will provide assistance during the first two years to ensure smooth pilot transition.

8. Through the TRIMING Project, the Ministry's oversight functions particularly in relation to these arrangements will be monitored very closely. The objective is to ensure that for every irrigation and drainage project:
   a. A management team of high quality and technical competence is superintending
   b. This team should have probity, accountability, and transparency in financial and administrative transactions so as to minimize fraud and other sharp practices
   c. High quality team so put in place is maintained or even improved upon sustainably through regular training
   d. Funds to be generated by the farmer organizations are not illegally siphoned

9. It is expected that sustainable schemes will emerge with adequate operation and maintenance procedures that are strictly adhered to and properly managed funds and personnel to operate and maintain the schemes. The goal of this shift in policy is to ensure that irrigation infrastructures can be maintained as at when due or even replaced conveniently after their normal economic life. Under this condition, it is envisaged that the level of service provided to the farmers and other stakeholders will be in consonance with the strategic plan of the scheme.

10. You are therefore expected to liaise closely with the Irrigation and Drainage Department of the Ministry and the PCU of TRIMING Project to ensure strict compliance.

Mrs. Sarah Reng Ochekpe
Honourable Minister

FEDERAL MINISTRY OF WATER RESOURCES

ABUJA NIGERIA

DELEGATION OF AUTHORITY

By the powers conferred on me by the Water Resources Act (CAP W2 2004) particularly Section 17, I Sarah Reng Ochekpe, Honourable Minister of Water Resources do hereby delegate and authorize Upper Benue River Basin Development Authority thus:

a. Organize and give recognition to legally registered Water Users Associations, *(WUAs)* for the gradual purpose of assuming physical, administrative, and financial responsibilities for irrigation and drainage facilities from the downstream end of secondary canals to the upstream end of secondary drains, through to their respective farm lands, subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

b. Authorize the construction, operation, maintenance, repair or alteration of irrigation and drainage facilities downstream end of secondary canals, including facilities on the field channels supplying water to or draining water from the respective farms of financially active members of WUAs, through drainage facilities ending at the downstream end of secondary drains, subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

c. In conjunction with the *WUAs*, agree on fees, rates, and/or charges for the costs of any works associated with the provision of irrigation and drainage services within the areas they have assumed physical, administrative and financial responsibilities subject to such terms and conditions as may be prescribed from time to time by the Honourable Minister.

d. This Delegation of Authority is in respect of *Dadin Kowa Irrigation Project* only.

Made in Abuja this 22nd day of April 2014.

Mrs. Sarah Reng Ochekpe
Honourable Minister

Annex 8: MoU between FMWR and FMARD

FEDERAL REPUBLIC OF NIGERIA

MEMORANDUM OF UNDERSTANDING

BETWEEN

FEDERAL MINISTRY OF WATER RESOURCES
AND
FEDERAL MINISTRY OF AGRICULTURAL AND RURAL DEVELOPMENT

FOR

COLLABORATIVE EFFORTS IN THE DEVELOPMENT AND UTILIZATION OF WATER RESOURCES INFRASTRUCTURE FOR AGRICULTURAL DEVELOPMENT TO ENHANCE FOOD SECURITY AND WEALTH CREATION

OCTOBER, 2013

THIS MEMORANDUM OF UNDERSTANDING is made this ..... day

of..... 2013

BETWEEN

Federal Ministry of Water Resources Area I Old Secretariat Garki-Abuja represented by the Honourable Minister of Water Resources (hereinafter referred to as FMWR which expression shall where the context so admits include its successors-in-title and assigns) of the one part.

AND

Federal Ministry of Agriculture and Rural Development, Area 11 Garki-Abuja represented by the Honorable Minister Of Agriculture and Rural Development (hereinafter referred to as FMA&RD which expression shall where the context so admits include its successors-in-title and assigns) of the second part, FMWR and FMA&RD are hereinafter sometimes referred to individually as a "Party" and collectively as "Parties".

WHEREAS:

A. The parties are two separate Ministries of the Federal Government of Nigeria with distinctive statutory responsibilities;

B. The Parties recognize that their respective responsibilities can complement each other in performing their roles towards achieving the Transformation Agenda of the Federal Government in the Water and Agricultural sectors for ensuring National Food Security.

C. The Parties have agreed to collaborate under the framework of a Memorandum of Understanding, **with the common objective** of carrying out important national assignments that underpin critical areas of food security, employment generation, infrastructural development, wealth creation and social development.

NOW THEREFORE, THIS MEMORANDUM OF UNDERSTANDING (hereinafter referred to as MOU) **WITNESS** as follows:

ARTICLE 1: COMMENCEMENT

1.1 This MOU shall come into force upon the endorsement by the parties.

1.2 The parties may enter into formal agreement with third parties as may be necessary, for the proper implementation of this MOU.

ARTICLE 2:OBJECTIVE OF THE MOU:

The objective of this MOU is to enhance effective utilization of Water Resources Infrastructure to increase agricultural production for the understated purposes:

i) To promote attainment of national food security through increased food production;
ii) To generate opportunities for employment;
iii) To accelerate infrastructural development; and
iv) To create wealth for social development.

ARTICLE 3: OBLIGATION OF PARTIES:

3.1 Obligations of Federal Ministry of Water Resources:

i. To undertake completion of on-going irrigation infrastructures, Rehabilitation/modernization and expansion of the old ones listed in Annex A, in order to facilitate increased food production to ensure National Food Security

ii. To construct all new dams and irrigation facilities, including small, medium and large scale

iii. To make completed dams available for fish production under best practices (cages, pens, raceways etc)

iv. To undertake completion of Small Earth Dams in Annex C, constructed under Millennium Development Goals (MDGs) projects, with additional potential to irrigate up to 10,000 ha.

v. To ensure continued Water Resources Management in the Fadama areas through monitoring and evaluation of water abstraction

4.2 Obligations of FMA&RD

i. Select the agricultural value chains for all the projects;
ii. Registration of farmers in all the irrigated areas.
iii. Organization and strengthening of farmer groups and water users into cooperatives, Associations and clusters
iv. Provide through Growth Enhancement Support the inputs for the respective value chains (seeds, fertilizers, pesticides, feeds, fingerlings/juveniles, brood stock, etc);
v. Support the utilization and management of farm lands for sustainable agricultural development
vi. Support producers with mechanization through service providers;
vii. Support stakeholders through extension and capacity building on modern agricultural practices and advisories on sustained and improved productivity

4.3 Joint Obligations of the Parties:

i. To provide funds for undertaking their respective obligations under this MOU.
ii. To develop small-scale irrigation infrastructures to complement the large-scale ones.
iii. To cooperate and ensure that all the components of National Food Security Programmes are funded, adequately and appropriately.
iv. To cooperate in proffering possible solutions to the two extremes of the challenges of climate change, faced by the farmers in the course of food production.
v. To strengthen the collaboration in the area of Fadama Development projects, in order to ensure an effective and efficient management of the groundwater resources for sustainable agricultural development.
vi. To ensure collaboration between FMA&RD/FMWR/States on extension service delivery to farmers, pertaining to water and agronomic practices;
vii. To facilitate joint monitoring and evaluation of projects that are listed under collaboration;

viii. To develop a work plan and budgetary provisions to facilitate and catalyze the aims and objectives of the projects under the collaboration between the two Ministries.

ARTICLE 5: JOINT PROJECT TEAM5.1 The Parties shall form a joint project team under the co chairmanship of the Permanent Secretaries of the parties, under the directives of the Honourable Ministers of the Parties.

5.1 The Joint project Team shall draw up an plan of action to regulate the successful implementation of this MOU.

ARTICLE 6: MODIFICATION AND AMENDMENT

No modification and amendment of this MOU shall be valid without the written consent of the parties to this MOU. Prior to the implementation of such modification or amendment, any such amendment shall be made as an addendum to this MOU signed by the parties.

ARTICLE 7: APPLICABLE LAW

The construction, validity and performance of this MOU shall be governed by the laws of the Federal Republic of Nigeria.

ARTICLE 8: FORCE MAJEURE

8.1 Any delay in or failure of performance of this Agreement by either party shall not constitute default by such party nor give rise to payment of claims for damages against it if and to the extent that such party delay or failure of performance is caused by Force Majeure such as but not limited to acts of God, acts of war, acts of Government, revolution or fire, floods, earthquake or other causes similar to those enumerated herein which could not have been reasonably foreseen and guarded against and which by exercise of reasonable care and diligence the party is unable to prevent.

8.2 Difficulties in obtaining tools and materials and lack of working personnel shall not be considered as Force Majeure except where they are consequences of the event stated in 8.1 above.

8.3 If either party is prevented from, or delayed in performing any of obligations under this Agreement by reason of Force Majeure, such party shall without delay, notify in writing the other party, the circumstances constituting the Force Majeure.

8.4 Upon receiving such notice, both parties shall reach an Agreement as to the desirability of granting of extension of time or termination of or any other appropriate remedy to the situation.

ARTICLE 9: DOCUMENTS OF THE MOU

The following documents shall be read and interpreted together to understand the full intentions of the parties under this MOU.

i) This Memorandum of Understanding

ii) Annex A: List of Functioning Irrigation and Drainage projects for the collaboration of the Federal Ministry of Agriculture and Rural Development.

iii) Annex B: Fishery Development in the Dam Projects.

iv) Annex C: List of 20Nos. MDG Small Earth Dams Projects for Completion to Irrigate Additional 10,000Ha of Land

v) Annex D: List of functioning irrigation and Drainage Projects for the Intervention of the Federal Ministry of Agriculture and Rural Development (at rate of 70% rice/30% other crops).

vi) Annex E: Agricultural Tractors and Equipment.

ARTICLE 10: TERMINATION

This MOU automatically terminates itself by mutual agreement of the parties or by decision of the President.

ARTICLE 11: NOTICES

Any notice or request permitted to be given or made under this MOU shall be in writing. Such notice or request shall be deemed to be dully given when it shall have been delivered by hand, registered mail or courier services to the parties address indicated in this MOU. Every notice shall be deemed to have been received and given when in ordinary cause of transmission; it should have been delivered at the appropriate address.

ARTICLE 12: INTERPRETATION

In this MOU, the following words and phrases shall have the meanings attributed to them herein:

a) FMA&RD means Federal Ministry of Agriculture and Rural Development;

b) FMWR means Federal Ministry of Water Resources;

c) WATER RESOURCES INFRASTRUCTURE shall include Dams and irrigation and Drainage projects.

SIGNED, SEALED AND DELIVERED BY BOTH PARTIES:

.....

Mrs. Sarah Reng Ochekpe
Honourable Minister
Fed. Ministry of Water Resources

.....

Dr. Akinwumi Adesina, CON
Honourable Minister
Federal Ministry of
Agriculture and Rural
Development.

IN THE PRESENCE OF:

LEGAL ADVISER (FMWR)

Name: Laurat, A. Elayo (Mrs.)

Signature.....

LEGAL ADVISER (FMA &RD)

Abdulkareem Jubril

Signature: .....

7

ANNEX A

LIST of functioning Irrigation and Drainage Projects for the collaboration of the Federal Ministry of Agriculture & Rural Development

S/N	PROJECT NAME	DEVELOPED AREA (HA)	POTENTIAL CROPS
1	Kano River irrigation Project, Kano State	16,500	Rice, Tomatoes& Wheat, groundnut
2	Hadejia Valley Irrigation Project, Jigawa State	4,200	Rice, Tomatoes& Wheat, groundnut
3	Bagwai Irrigation Project, Kano State	273	Maize, Tomatoes, groundnut
4	Middle Rima Valley Irrigation Project, Sokoto State	1,436	Rice, Tomatoes& Wheat, groundnut
5	Jibia Irrigation Project, Katsina State	3,000	Maize, Tomatoes & Wheat, groundnut
6	Bakolori Irrigation Project, Zamfara State	11,000 (15,000 proposed)	Rice, Tomatoes& Wheat, groundnut
7	Azare-Jere Irrigation Project, Kaduna State	2,000	Maize & Tomatoes, groundnut, soya beans
8	Duku-lade Irrigation Project, Kwara State	200	Rice, maize
9	Oke-Odam irrigation Project, Ogun State	40	Maize, vegetable
10	Owiwi irrigation Project, Ogun State	200	Maize, vegetable
11	Itoikin Irrigation Project, Lagos State	141	Rice & Tomatoes
12	Geriyo Irrigation Project, Adamawa	550	Maize, vegetable
13	South Chad Irrigation Project, Borno State	6,000	Tomatoes & Wheat, rice
14	Sepeteri Irrigation Project, Oyo State	180	Maize, vegetable

15	Zaria Kala-Kala Irrigation Project, Kebbi State	1,000	Rice & Onion, wheat
16	Zauro Polder Irrigation Project, Kebbi State	1,000	Rice & Onion, wheat
17	Middle Ogun Irrigation Project, Oyo State	680	Rice & Maize, wheat
18	Lower Ogun Irrigation Project, Ogun State	200	Rice & Maize, wheat
19	Sabke Irrigation Project, Katsina State	1,000	Maize & Tomatoes, gorundnut
20	Shagari Irrigation Project, Sokoto State	220	Maize & Tomatoes
	Total	49,820	

ANNEX B

FISHERY DEVELOPMENT IN THE DAM PROJECTS

S/N	PROJECT	LOCATION	CAPACITY
1	Gurara	Kaduna State	880 mcm
2	Goronyo	Sokoto State	942 mcm
3	Challawa Gorge	Kano State	930 mcm
4	Tiga	Kano State	1,968 mcm
5	Doma	Nassarawa State	2,200 mcm
6	Dadin Kowa	Gombe State	2800 mcm
7	Ikere Gorge	Ogun State	265 mcm
8	Owiwi	Ogun State	40 mcm
9	Owena	Ondo State	36.25 mcm
10	Amuazari	Imo State	1.5 mcm
11	Swashi	Niger State	16 mcm
12	Kampe	Kogi State	250 mcm
13	Bakolori	Zamfara State	450 mcm
14	Alau	Borno State	5.6 mcm
15	Obudu	Cross River State	2.5 mcm
16	Sabke	Katsina State	31.6 mcm
17	Liberty	Plateau State	20 mcm
18	Bokos	Plateau State	5.0 mcm

ANNEX C

LIST OF 20 NOS. MDG SMALL EARTH DAMS PROJECTS FOR COMPLETION TO IRRIGATE ADDITIONAL 10,000HA OF LAND

S/NO	NAME OF PROJECT	LOCATION (STATE)	RBDA
1	Upgrading of Pankshin Dam and Transfer of Water to Anper and other Settlements	Plateau	LBRDA
2	Construction of Dam and Irrigation Scheme in Gindin Dorowa, Wukari LGA,	Taraba	UBRBDA
3	Yedsasam dam	Yobe	CBDA
4	Ebonyi river project	Ebonyi	AIRBDA
5	Construction of Agwatashi Dam	Nassarawa	LBRDA
6	Construction of Kwang Dam	Plateau	LBRDA
7	Construction of Garkawa Dam	Plateau	LBRDA
8	Construction of Gindim Dam	Plateau	LBRDA
9	Construction of Amper Dam	Plateau	LBRDA
10	**Construction of Dull Dam**	Plateau	LBRDA
11	**Construction of Kagadama Dam**	Nassarawa	LBRDA
12	**Construction of Dawaki/BOI Dam**	Nassarawa	LBRDA
13	**Atavu Ingaba Dam and Irrigation**	Kogi	LBRDA
14	**Atakpo Ibusa Dam and Irrigation**	Delta	BORDA
15	**Construction of Ankpa Dam**	Kogi	LBRDA
16	Construction of Igbaye Dam	Osun	OORBDA
17	Sarki Power Earth Dam	Niger	UNRBDA
18	Construction of Gwarangah		
19	Ugwnagbor Dam Rehabilitation		
20	Construction of Rumirgo Earth Dam, Each in Askira Uba LGA and Chata in Hawul LGA	Borno	CBDA

ANNEX D

LIST OF FUNCTIONING IRRIGATION AND DRAINAGE PROJECTS FOR THE INTERVENTION OF THE FEDERAL MINISTRY OF AGRICULTURE & RURAL DEVELOPMENT (AT RATE OF 70% RICE/30% OTHER CROPS)

S/N	PROJECT NAME	DEVELOPED AREA (HA)	PROPOSED AREA OF COVERAGE (HA)			
			RICE	MAIZE	TOMATOES	OTHERS(Wheat)
1	a. Kano River Irrigation Project, Kano State	16,500	11,550	-	2,400	2,400
2	b. Bagwai Irrigation Project, Kano State	273	-	150	123	-

3	Hadejia Valley Irrigation Project, Jigawa State.	4,200	2,940	-	1,260	-
4	a. Middle Rima Valley Irrigation Project, Sokoto State	1,436	1,005	-	430	-
5	b. Shagari Irrigation Project, Sokoto	220	-	154	66	-
6	a. Jibia Irrigation Project, Katsina State	3,000	-	2000	1000	-
7	b. Sabke Irrigation Project, Katsina State	1,000	-	600	400	-
8	Bakolori Irrigation Project, Zamfara State	11,000	7,000	2,000	1,200	800
9	Azare-Jere Irrigation Project, Kaduna State	2,000	-	1,500	500	-
10	a. Zaria Kala-Kala Irrigation Project, Kebbi State	1,000	700	-	-	300
11	b. Zaura Polder Irrigation Project, Kebbi State	1,000	700	-	-	300
12	Geriyo Irrigation Project, Adamawa State	550	-	550	-	-
13	South Chad Irrigation Project, Borno State	6,000	-	3,000	2,000	1,000
14	Duku-Lade Irrigation Project, Kwara State	200	200	-	-	-
15	a. Oke-Odam Irrigation Project, Ogun State	40	-	40	-	-
16	b. Owiwi Irrigation Project, Ogun State	200	-	35	165	-
17	c. Lower Ogun Irrigation Project, Ogun State	200	200	-	-	-
18	Itoikin Irrigation Project, Lagos State	141	98	-	42	-
19	a. Sepeteri Irrigation Project, Oyo State	180	-	144	36	-
20	b. Middle Ogun Irrigation Project, Oyo State	680	476	204	-	-
	TOTAL	49,820	24,869	10,377	9,622	4,800

ANNEX E

AGRICULTURAL TRACTORS AND EQUIPMENTS

Total Hecterage:	-	42,430ha
Rice	-	23,819ha
Maize	-	7,120ha
Tomatoes	-	7,748.8ha
Others	-	3,400ha

1 Requirements (40,000ha)

- Tractor + implement - 400 tractors Service Provider

2. Rice (23,819ha)

Expected production output - 23,819 x 4 tonnes = 95,276 tonnes

- ✓ Threshers
- ✓ Reapers
- ✓ Combine Harvester

3. Maize (7,120 ha)

Expected production output - 7,120 x 3 tonnes = 21,360 tonnes

- ✓ Shellers

4. Tomatoes (7,918ha)

Expected production output - 7,918 x 25 tonnes = 197,950 tonnes

- ✓ Rubber Package

5. Others (Wheat) 3,400ha

Expected production output -

- ✓ Reapers
- ✓ Threshers

NOTE: The input is to be handled by Service Providers.

i. Fertilizer Requirement @ 2 bags/ha @ N2,750/bag x 42,439 – N116.71m (GES)

ii. Seed Requirement:

a. Rice - 23,819 Ha @ N90/kg GES = N107.19m

b. Maize- 7120 Ha @ 25kg/ha @ N90/kg GES = N16.02m

c. Tomato - 7,748.2 Ha @ N1,000/kg = N3.87m

Other Crops -N/A

NB

The above agricultural inputs are part of the contribution of FMARD towards the draft of the MOU. However, there is the need to update the figures based on the increase in the hectarage added to our earlier submission.

Annex 9: Approach towards Improving Irrigation Management
Transforming Irrigation Management in Nigeria (TRIMING) Project

A. Policy framework

1. Nigeria faces challenges of ensuring proper and sustainable management of water resources for both domestic and agricultural use. The absence of an officially approved irrigation policy and strategy together with relevant laws to underpin the policy is one of the major bottlenecks limiting progress in irrigation development and expansion in the country. Poor management and maintenance of the many public irrigation schemes has led to major deterioration of irrigation infrastructure and underutilization of the infrastructure and natural resource base. All public irrigation schemes are still managed centrally, many without effective Water Users Associations (WUAs), and where associations have been formed, they are too weak to manage and maintain the parts of the schemes for which they are meant to be responsible. In addition there are currently no institutions at Federal or State levels providing training for the much needed irrigation technicians or for WUA trainers and facilitators to support the irrigators. The need for policy and an accompanying implementation strategy is widely recognized, leading to the current policy revision process underway with FAO-support. Similarly, the need to facilitate and promote private sector investments is also emphasized by Government in the Agriculture Transformation Agenda.

2. The rigidity in Nigeria's irrigation institutions is appreciable. The FMWR formulates policy through the National Council for Water Resources (NCWR) which is chaired by the FMWR. Its members include all the State commissioners responsible for water resources development, as well as representatives of the other federal agencies which are also concerned with water use, notably the RBDAs, the National Electric Power Authority (NEPA), the Inland Waterways Department (IWD), and the Federal Ministry of Agriculture and Rural Development (FMARD). Water management institutions and practices have an overly centralized character which has been recognized internally and externally and has led to the development of two key draft instruments to modernize the institutional framework: the National Water Resources Bill which will facilitate a move to globally recognized integrated water resource management, and the Draft National Irrigation Policy which among other aims for participatory irrigation management with farmers playing a central role in operations and maintenance.

3. **The proposed National Water Resources Bill** (with reference to Draft #4, March 2013) is a key instrument of reform to achieve decentralized water management through the establishment of 8 hydrological zones (basins) each with a Catchment Management Office (CMO) reporting to the Nigerian Integrated Water Resources Commission with a primary role of licensing, allocation, and regulation.

4. In the draft Bill, the existing RBDAs will be responsible for development, construction and operation and maintenance of irrigation and drainage systems among other water resources development responsibilities. While this is not a fundamental deviation from existing practice, it is important to note that the draft Bill makes provision for the devolution of operational and maintenance responsibilities of parts or entire irrigation systems to WUAs, including the following key functions:

- operation and maintenance of an irrigation, erosion control and drainage system or sub-system as determined by an Authority;
- involvement in the Authority's decision-making processes for the larger irrigation system;
- purchasing of bulk water from a watercourse or extracting groundwater from an aquifer and distribution of the water to its members according to an approved irrigation plan;
- ensuring efficient and economical use of water;
- collection of irrigation service fees from its members and management of its fund.

5. While the draft Bill has no legal standing yet, it is in the final stages of public comment and may be adopted during the project period. Alignment of the project institutional interventions with the draft Bill is judicious, while compliance with current legislation is essential.

6. **The draft National Irrigation Sector Policy** reflects much of current global best practice, and its primary objective is to improve the performance of the water services in irrigated production. In particular, the draft policy seeks to institutionalize Integrated Water Resource Management (IWRM) and effect a transition from publicly-funded schemes to be commercially viable irrigation through farmer- or farmer group-managed schemes. More specifically farmers will take responsibility for the operation and maintenance through the formation of, and intensive support to, WUAs, so as to institutionalize Participatory Irrigation Management (PIM) and Irrigation Management Transfer (IMT) from Government to the WUAs.

7. Much is made of the trend toward PIM and IMT over the past 20 years, but results in other regions of the world show that there is a need for pragmatic locally-tailored solutions rather than imposition of rigid or theoretical models. This means WUA structures and responsibilities need to be negotiated locally with the key principles of decentralization and financially sustainable operations and maintenance in mind. There is widespread agreement within the FMWR, as reflected in the draft policy and in ongoing preparatory studies, that irrigation management needs to be decentralized in line with PIM and IMT principles.

B. Legislative Basis for Irrigation Management

8. The Federal Ministry of Water Resources (FMWR) is the apex organ of government which has the statutory responsibility for policy formulation, management and development of water resources and public sector irrigation throughout the federation. Originally established in 1975 the FMWR was merged and de-merged with the Federal Ministry of Agriculture and Rural Development (FMARD) three times between 1977 and 1993. Currently, the Ministries are separate, and this presents a key institutional challenge in integrating agricultural support and water management elements essential for successful on-farm productivity enhancement. This discontinuity, which is also a global irrigation challenge, is further illustrated by the fact that public irrigation schemes fall under the FMWR, while individual irrigation farms (or fadama) fall under the FMARD.

9. Legislatively, water management falls under Water Resources Act (CAP W2 2004) which vests all powers in the Minister of Water Resources, and while the RBDAs were

statutorily empowered to comprehensively plan and develop the Nation's water resources, they are not delegated any specific powers in the Act as such, though the Minister can make delegations to the authority. There are 11 River Basin Development Authorities (RBDAs) which were established between 1973 and 1976 with the Niger River, given its size, divided into Upper and Lower RBDAs. They are largely aligned to hydrological boundaries but in some cases are also demarcated by administrative and/or political borders for practical reasons. The RBDAs are public parastatals accountable to the FMWR, with development and management responsibilities for water resources including: water pollution, flood defense, public irrigation schemes (private schemes fall under MOA), rural water supply, fisheries, bulk water retail, and water-related conservation.

C. Current water management practices and experiences at scheme level

10. **RBDA managed 'projects'**: Presently, irrigation schemes are managed by an RBDA 'project management team' located at the on-site 'project' headquarters. The RBDAs historically handled all aspects of irrigation farming support including water operations and management, farm systems support (particularly the provision of inputs such as fertilizer and mechanization) and agro-processing. This was formally changed in 1989 to focus on water provision only with extension meant to be carried out by State or ADP staff for their own projects and farmers, though these services were rarely extended to include public irrigation project farmers. De-facto, the RBDA scheme staff have continued with their original role of a multi-purpose support agency for farmers, but the inefficiency of these centralized public entities is one of the primary motivators for transformation on public schemes.

11. **Cooperatives Act used for WUA establishment:** Presently WUAs are established using the extant Nigerian Co-operatives Societies Act (1993, 90) and Co-operative Societies Regulations, given the absence of more specific legislative instruments. Responsibilities are defined in a set of bye-laws. While this is an adequate instrument for defining organizational purpose, membership, activities and financial management, it has the drawback that membership (of water users in this case) is not compulsory. In some countries where other water users were intended to be included in a WUA which has a wider mandate than irrigation (such as cattle-herders, fisher-people, upstream water users, etc.) and who have had no or limited direct incentive to be a WUA member, then their involvement cannot be ensured to the potential detriment of other impacted users. But experience both in Nigeria and outside of Nigeria has, however, shown that the issue of compulsory membership on irrigation schemes *per se* has not been a limiting factor as irrigation farmers do have a direct incentive to be involved i.e. to get sufficient water on time.

12. **WUA concept adopted:** It is significant that despite the absence of specific enabling legislative instruments for WUA establishment, substantive progress has been made in the last seven years prompted by the WUA structure envisaged in the National Irrigation Policy. Schemes included in TRIMING have to some extent embraced the concept of PIM and on initiative from the FMWR, the RBDAs and the scheme management (employed by the RBDAs) have established WUAs at various levels. While the effectiveness of these WUAs has been weak in ensuring equitable and reliable water management, there have been gains made in introducing the concept of farmer-managed WUA principles to both farmers and Government personnel.

The planned project interventions will build on these positive aspects already in place and focus on transforming functions and institutional arrangements which have not been effective.

13. **WUAs at 3 levels:** The current scheme-level WUA structure adopted wholly or in part on the TRIMING schemes and with varied success, has three tiers:

- UNIT WUAs (at tertiary canal level) are intended to be responsible for the operation, maintenance, and management of tertiary and field channel and drainage systems, while representing the farmers at the secondary or 'Intake WUA' level;

- INTAKE WUAs are supposed to be responsible for O&M of secondary canals, and water distribution into the tertiary canals from the 'intake', while also representing the Unit WUAs at Federated level; and

- The Federated Water User Association (APEX WUA) is intended to have an oversight role over the Intake and Unit WUAs and provide a conflict resolution platform as well as provide representation in relationships with the RBDA and other parties.

14. **Unit WUA is a key organizational building block**: The UNIT WUAs typically comprise between 30 and 100 farmers who share the smallest constructed hydraulic unit which is a tertiary canal. Through the UNIT WUA, farmers are meant to collaborate around water management activities including: maintenance and cleaning of the tertiary canals and drains; water scheduling and monitoring of distribution; fee collection; and conflict resolution, among other. It is both widely appreciated and functionally necessary that the UNIT WUA be enabled to conduct these activities facilitated through a process of intensive training. It is the intention that success at this lowest level will allow the WUA to upscale to the secondary level and after some time the main canal level, noting that OMM may be by direct involvement or other arrangements as appropriate.

15. **Need for financial self-determination**: Presently the WUAs are not permitted to retain any water service fees that are collected for their own use in operations and maintenance activities as it is a requirement of the Federal Treasury that revenue collected in relation to use of public infrastructure must be remitted to the Federal Treasury. Treasury is supposed to allocate funds to the RBDAs for irrigation scheme operation and maintenance but this is always considerably less than what the scheme management requires and in many months the funds remitted are reportedly minimal or zero. The RBDAs budget from the Federal treasury is unreliable in its timing and amount and maintenance responses are inconsistent and ad-hoc. Related transactional costs and inherent risks to the farmers are high and the net result is scheme degradation over time, unreliable supply or failure. Going forward it is therefore essential that a portion of collected water user fees are retained by the WUA in a systematic way to allow them to operate, manage and maintain the appropriate elements of the irrigation system which are delegated to them.

16. The absence of a regulatory mechanism to achieve fee retention for own use by the WUAs is widely highlighted as a critical limitation at present to sustainable OMM and requires immediate reform. It is pertinent that the draft Water Resources Bill contains expresses

provision for WUA formation and fee retention which would obviate this challenge, but the Bill may not be promulgated in time for project commencement and other legal instruments and reforms are needed.

D. Approach to Change

17. Against the current institutional backdrop **the Government has signed a Statement of sector policy (SoSP) which sets out specific measures that will be progressively implemented to pilot the institutional reform process in selected schemes within the TRIMING project.** The SoSP envisages the following:

- The schemes will be managed with progressively increasing administrative and financial autonomy with the objective to achieve full cost recovery for the operational and maintenance costs of the water conveyance and distribution. The large dams having broad public benefits and critical safety requirements will be excluded from this transfer.

- The responsibility for operation and maintenance of tertiary irrigation and drainage canals will initially be transferred to the WUAs, followed by higher level infrastructure (secondary and primary canals and drains) in due course based on an assessment of the capacity of WUAs to manage them.

- The operation and maintenance of the non-transferred infrastructure will remain the responsibility of the RBDAs. The RBDAs will have the option to delegate part or all of these services to a service provider which could be either a special purpose vehicle or a competitively selected private contractor. Related costs will be fully covered by the portion of the fees charged to the WUAs.

- The specific arrangements will be described in a Tripartite Memorandum of Agreement between the FGN, the RBDA and the users represented by their APEX organization. This Agreement will be established for a period of three to five years, will include fee setting, and will be signed before launching any rehabilitation and expansion works.

18. Based on the intentions set out in the SoSP, the project strategy for institutional establishment of autonomous irrigation management structures at scheme level is to define contractual arrangements involving the RBDA, the WUAs and where appropriate, a professional third party to formalize performance of the irrigation and drainage services, and ensure financial accountability on funds contributed for OMM. There are three organizational levels that follow from the hydraulic nature and strategic importance of the irrigation system.

Level	Organization in charge	Main service objectives
Distribution	WUAs (several levels of organization)	Equitable distribution Fee collection
Transmission	Operator (Different options)	Reliable bulk water supply Efficiency
Storage	RBDA (Dam Department)	Water resources allocation Public safety

19. *Distribution* means that part of the irrigation scheme which is managed and operated by the WUA themselves and always includes the tertiary canal and drain, and may include higher level canals depending on the capacity on the WUA. *Transmission* includes the bulk water conveyance system from the dam to the upstream end of the distribution system, and the corresponding drainage works. *Storage* includes large dams which have broad public benefits and substantial safety issues and OMM of which will therefore remain with the RBDA. For OMM of the transmission and distribution systems various options have been formulated requiring different legal instruments to give effect to these.

E. Institutional arrangements for *Distribution*

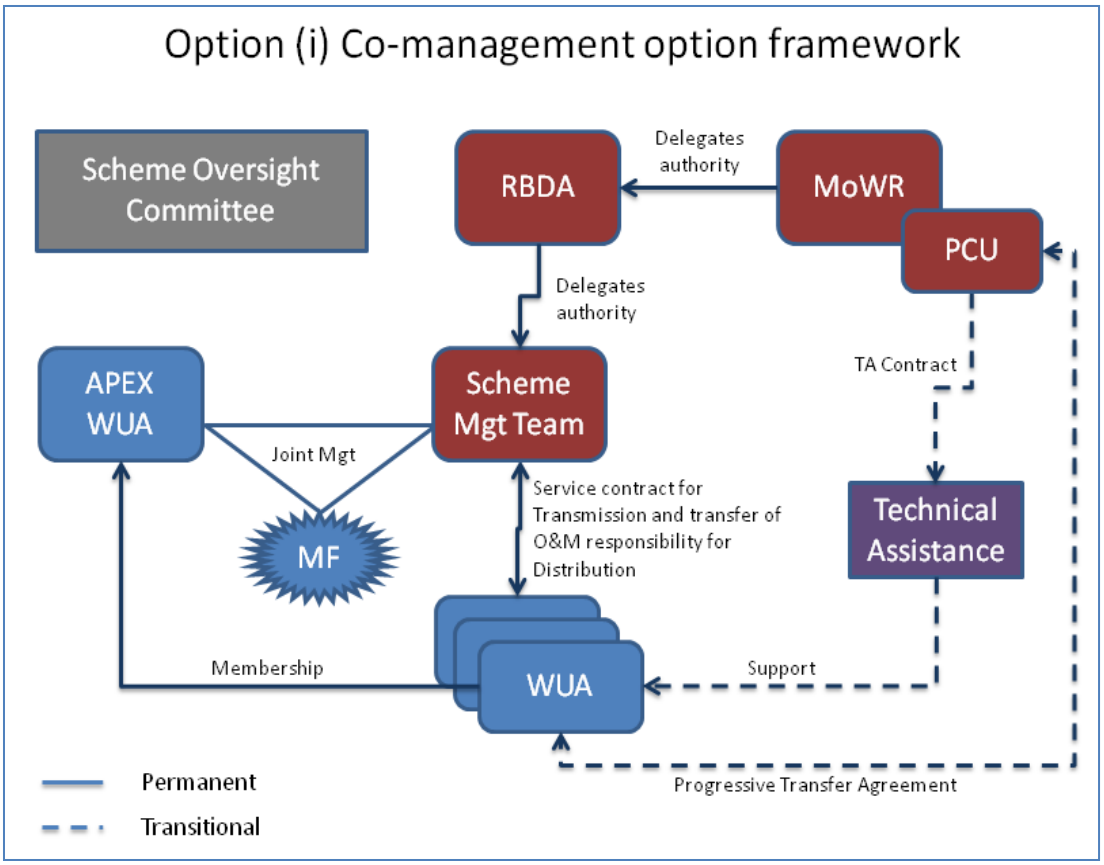
Two agreements are needed to ensure a legal basis for operation of the distribution system by the WUAs under the extant Water Resources Act (CAP W2 2004).

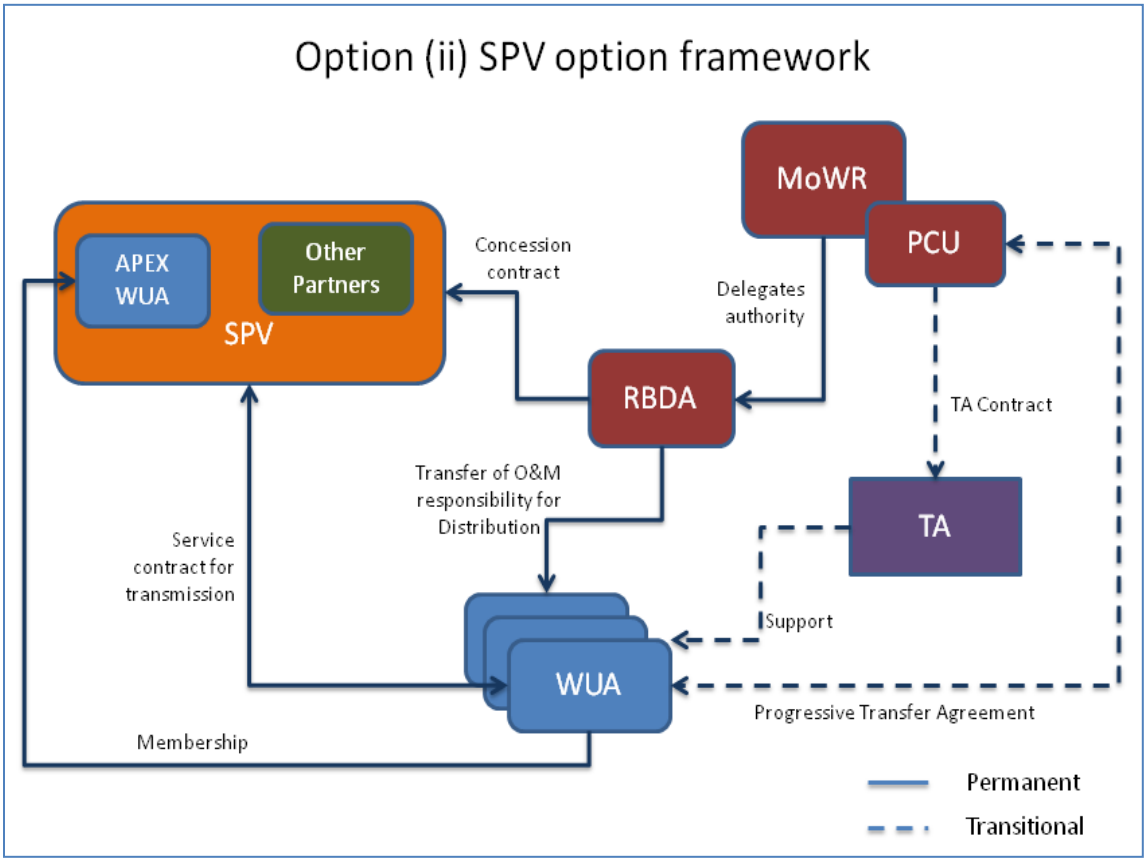
20. First, a **Delegation of Authority** from the MOWR to the RBDA is needed to establish and support WUAs to assume physical, administrative and financial responsibilities for irrigation and drainage facilities at defined hydraulic and water distribution levels on the schemes. The Delegation of Authority allows the RBDAs to organize and give recognition to legally registered Water Users Associations (WUAs) for the gradual purpose of assuming physical, administrative, and financial responsibilities, initially for tertiary level irrigation and drainage facilities and subsequently higher level infrastructure as competencies allow, including the implementation of any operational services and maintenance and alteration works that may be required for the delivery of irrigation and drainage services to all users. The Delegation further establishes that fees, rates, and/or charges for the costs of any works associated with the provision of irrigation and drainage services will be determined by the RBDAs in agreement with the WUAs.

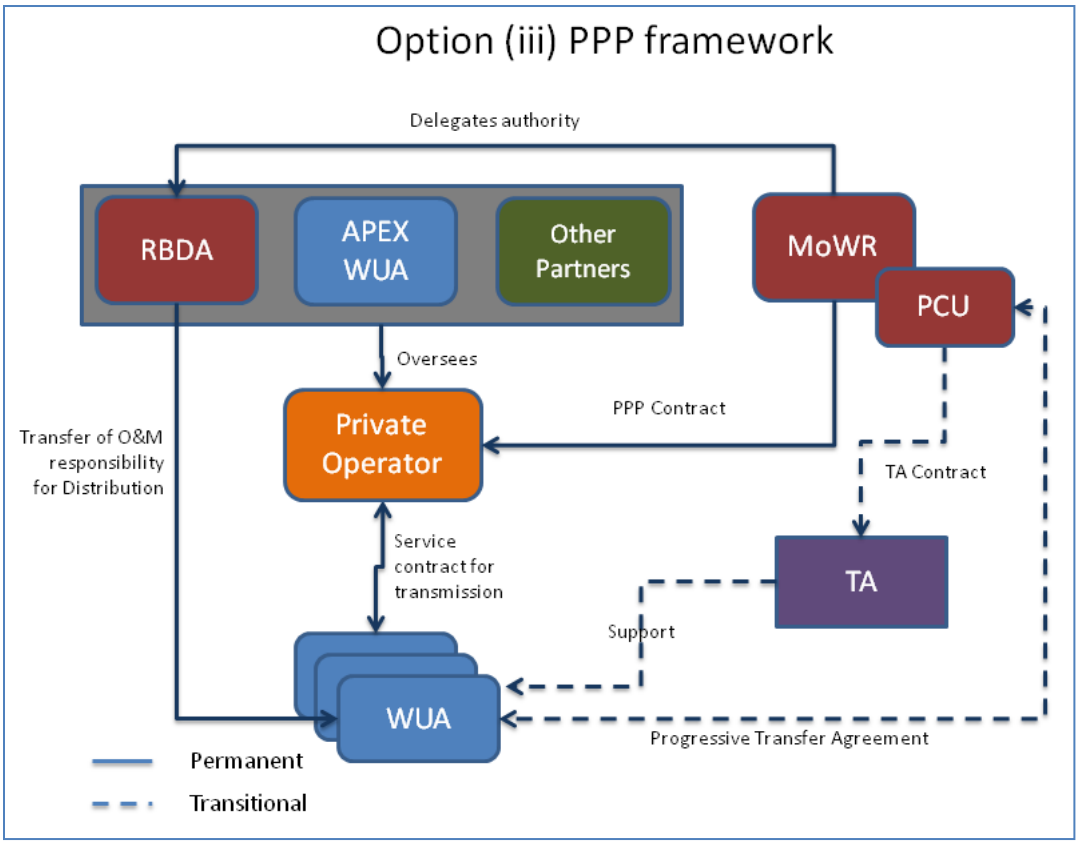
21. Second, the **RBDA will enter into an agreement** with the WUAs setting out their rights and responsibilities, first at tertiary level and subsequently higher levels of infrastructure as WUA competency allows. WUAs will be assessed using an established Sustainability Monitoring Tool (such as the SUMO methodology[30]) which will be used to benchmark WUA organizational functionality and sustainability leading to greater autonomy.

22. It is a practical organizational step to establish a bank account with related administration and organizational systems at the UNIT WUA (tertiary canal level) as it is at this level that initial irrigation management transfer will initially take place. While it is a significant organizational development task to support many hundreds of UNIT WUAs (tertiary level) to be established with financial competency and maintain bank accounts, this must be balanced with the risks of all cash funds going directly into a central WUA account with resultant serious consequences for scheme operation in case that mismanagement should occur. A highly decentralized financial management system is well proven in other developing countries and any mismanagement is localized and immediately in the realm of response by individual farmers who have elected their representatives at the UNIT WUA (with 30 to 100 farmer members only). In addition, financial management training is both relatively simple and would be done alongside the extensive organizational development that would anyway be required for the other numerous key functions

[30] Developed by Jan Bron (published version forthcoming).


Option (i) Co-management option framework
Scheme Oversight Committee
RBDA
Delegates authority
MoWR
PCU
Delegates authority
APEX WUA
Scheme Mgt Team
TA Contract
Joint Mgt
MF
Service contract for Transmission and transfer of O&M responsibility for Distribution
Technical Assistance
Membership
WUA
Support
Permanent
Transitional
Progressive Transfer Agreement


Option (ii) SPV option framework
MoWR
PCU
APEX WUA
Other Partners
SPV
Concession contract
Delegates authority
RBDA
TA Contract
Transfer of O&M responsibility for Distribution
TA
Service contract for transmission
Support
WUA
Progressive Transfer Agreement
Membership
Permanent
Transitional



needed for effective PIM at this tertiary level. Consultations during project preparation show this is preferred by present scheme management, the Department of Irrigation, and by the existing UNIT WUAs.

F. Institutional arrangements for *Transmission*

23. Three options have been determined as legally practical and organizationally viable and would be considered for application on each scheme depending on local conditions and stakeholder preferences: (i) Co-management (between the APEX WUA and the relevant RBDA). This arrangement would formalize the existing arrangement but would ensure fundamental change in the involvement of farmers in decision-making, and in ring-fencing a substantial portion of collected revenue for use in scheme OMM. Fee retention would be based on the circular from FMF dated November 11, 2011, making provision for 75 percent of collected revenue to be retained at the RBDA, and which condition would be included in the SoSP and the Financing Agreement for the duration of the project. A contract between the APEX WUA and the RBDA / Scheme Management Team (SMT) would ensure balanced decision-making of a jointly managed Maintenance Fund (MF); (ii) an alternative arrangement is that of a Special Purpose Vehicle (SPV) which would be based on the PPP Act, establishing a new legal entity which would be co-owned by the APEX WUA, the relevant RBDA, and partners. The SPV would obtain a Concession Contract from the FGN to operate and maintain the transmission canals of the scheme and thereby provide irrigation water to the WUAs; and (iii) the third option is that of a more conventional PPP (private partner selected by bidding) also based on the PPP

Act, with an O&M contract (or other form of PPP contract) in place. The APEX WUA and RBDA would jointly oversee the PPP and monitor service delivery and financial transactions. These three options are shown in the schematics above.

G. Operationalizing the change process

24. The engagement process in each specific scheme under the Project will follow a number of specific steps that will be sanctioned by appropriate formal agreements. These agreements will include framework agreements defining the specific objectives and processes to be followed in general terms and contractual (binding) agreements that will describe the services to be received and payments thereof.

25. The first step will be implemented in parallel with the engineering design activities for rehabilitation of new construction and will result in the signing by the Federal Government, the RBDA, and the Apex WUA of a *Tripartite Planning Memorandum of Agreement* (TP-MoA). This MoA will describe for a period of three to five years: (i) the specific objectives pursued by the Project in terms of enhanced irrigation and drainage services as well as increased agricultural production; (ii) the commitments made by the parties thereof – financing of construction works, technical assistance, contributions to O&M costs of WUAs on a sliding scale, and other relevant Project activities for the Government, service delivery performance targets for the RBDA, and progressively increasing O&M cost recovery for the users including payment of the "transmission service" fee to the RBDA towards full O&M cost recovery; (iii) arrangements made for transparent management of the irrigation service fees collected for O&M purposes; (iv) other components of the fee, i.e. payment to be made by the RBDA to the Consolidated Revenue Fund (minimum of 25 percent); and (v) measures for the environmental and social sustainability of the scheme, notably towards other groups of users like herders, fishermen, etc. A Scheme Oversight Committee (SOC) with representation from all relevant stakeholders will be established to review at regular intervals the implementation of the TP-MoA.

26. The second step will be to ensure that adequate delegations of authorities are established for the purpose of autonomous management, operation, and maintenance of the scheme jointly by the RBDA and the WUAs (all levels). The already established delegation of authority from the Minister to the three RBDAs authorizes the RBDAs to delegate management of the tertiary infrastructure (*distribution* service) to the WUAs and to sign irrigation and drainage services contracts with the same WUAs for the delivery of water at tertiary canal intake (*transmission* service). In addition, in the case of the co-management option, a specific delegation of authority or similar will need to be established within the RBDA to specify the responsibilities delegated to the Scheme Management Team (the staff from the RBDA in charge of O&M) and the resources allocated thereof out of the proceeds of the *transmission* service fee. Based on this delegation, the Scheme Management Team will be able to sign the *Service contract for Transmission and transfer of O&M responsibility for Distribution*, linking the RBDA to the WUA. In the case of the SPV or PPP option, the service delivery contract will be signed by the operator, and the RBDA will sign the transfer of O&M responsibility to the WUA.

27. In addition, and to manage the flow of funds during the transition period, i.e. until such time as the WUA is financially autonomous, the FMWR, through the PMU, will sign a

Progressive Transfer Agreement with each WUA. This binding contract will define the obligations of the WUA in terms of governance and accountability and describe the disbursement process for the *transitional contributions on a sliding scale* that will be paid by the Project to help the WUAs cover their O&M costs. This contract may also further specify specific arrangements made for the rehabilitation works financed under the project during construction period as need be. Another agreement will be signed with the Apex WUA in case it needs financial or in-kind (building, equipment) support.

28. In the case of the co-management options (and possibly for the other options as well) a *Maintenance Fund* will be established by the RBDA to ensure accountability and transparency over the use of the funds recovered for maintenance purposes. All maintenance works will be contracted out on a competitive basis with representation from the users through their Apex WUAs at all steps of the procurement and implementation process. To the extent possible, multi-annual performance-based contracts (using the model of the road maintenance contract) will be used. The percentage of the total fees collected to be remitted by the RBDA to the *Maintenance Fund* will be negotiated upfront and specified in the TP-MoA. It is expected that an approval from the General Accountant Office will be required for the RBDA to open the bank account hosting the Maintenance Fund.

29. The detailed outline of all contracts and process to be followed for their establishment and signing will be described in the *Project Implementation Manual* (PIM). Once all these agreements are in place, rehabilitation works can start. In the case of expansion works a specific timeframe will be established for each expansion area with a view to conduct the WUA establishment activities in parallel with the construction works. It has to be noted that when there are active construction contracts on the scheme, these will need to be closed before starting any construction under the project.

H. Principles in the Establishment of WUAs for Effective Irrigation Water Management

30. The fundamental principles for the transformative interventions at the Water User Association level guide both the envisaged structure and the functions of the WUA. These principles are:

- Fairness and Equity: An association shall be operated in a fair and equitable manner in terms of decision making and the allocation of irrigation water.
- Rational Use of Resources: An association shall manage the canal network within its Service Area in a rational manner so as to prevent waste, over-watering, erosion, salinization and pollution, as well as to promote the protection of the environment.
- Compulsory Membership: Membership in WUA is compulsory to all of the resource users, both land and water, land-owners and those leasing, borrowing, or using land through any other accepted mechanism of land access, where land is within the accepted boundary of the association. As there is no legal basis for this requirement at present, the power of social sanction will be used to give effect to this principle.
- Voluntary and open membership: Membership in the WUA is voluntary and open to all others within the accepted boundary of the association (i.e. where the boundary extends

beyond the irrigation fields themselves) that can make use of its services and are willing to accept the corresponding responsibilities.

- Democratic control: WUA members enjoy equal right to vote (one member one vote) and participate in decisions affecting the WUA without regarding to the amount of water or land or the volume of the business. Voting right may, however, be suspended for members who are not in compliance with the WUA bylaws or are in debt with the WUA. The WUAs are autonomous, within the framework of law and regulations, serving and controlled by its members.
- Non-Discrimination: WUAs are non-discriminatory and a member of an association shall not suffer discrimination on any basis, in relation to gender, race, nationality, sex, religion and politics.
- Transparency and Participation: An association shall operate in a transparent manner and shall promote effective participation in its management bodies.
- Education and Training: WUAs actively promote the education of their members, committee members, employees if any and others, along with the public in general, in the economic, social, democratic and mutual self-help principles of WUAs.
- Cooperation among other WUAs in the WUA Federation: WUAs within their capability will actively cooperate with other WUAs in order to best serve the interest of their irrigation water user members and their needs.

I. Strengthening the role and voice of women in WUAs

31. Women were reported to be involved in existing WUA arrangements at Bakolori and Hadeija IS among other, but on discussion with women representatives it was evident that these were common interest groups (CIGs) and women were not directly involved in water-management decision-making per se, though organized under the ambit of the WUA. These women-CIGs were involved in value-adding micro-processing activities and in small livestock production. Subsequent engagement with both men and women leadership demonstrated the ability of women to be vocal and articulate in the presence of male leadership. Contrary to initial perceptions, and the weight of both cultural norms and a precedent of limited involvement in water decision-making, there is an evident willingness on the part of both men and women to embrace constructive change and increase women's role in core WUA affairs. The future role of women in water-related decision making, particularly where women are active farmers, will therefore need to draw careful attention in the WUA organizational design, setting of bye-laws and in the WUA member training process. Strategies to be adopted could include the proviso that at least one woman should be on the WUA committee, possibly as a Treasurer, where capable and appropriate. A similar proviso could be enacted on the APEX WUA.

J. Willingness and Ability to Pay

32. Currently irrigation scheme management charges between US$18 and US$30 per season for irrigation water services which is too low for sustained O&M. Collection rates are highly variable and unreliably reported, but typically between 17 and 25 percent on Bakolori IS, with 100 percent reported on a sector of Kano IS, but not verified. Willingness and ability to pay investigations have shown that substantially higher fees are justified. Willingness to pay at Bakolori averaged US$86/ha/annum (2013), while at the 85 ha pumped scheme at Dadin Kowa

farmers had high collection rates of the fee of US$102/ha/annum. Ability to pay based on net enterprise margins with water-service charges estimated at 7-10 percent (a reasonable international benchmark) arrived at a figure of US$169-241/ha/annum, using conservative rice yields of 5.5 tons/ha. Estimates of operation and maintenance costs based on OMM activities that would be required for the feasibility level design of Bakolori IS arrived at an annual fee of US$89/ha/annum which is close to the willingness to pay and substantially lower than the likely ability to pay based on projected net farm enterprise margins. It is therefore reasonable to conclude that farmers are able to cover the OMM costs into the future to ensure sustainable scheme operation and maintenance.

33. Key to fee-collection is reliable water supply; the role of the WUAs in allocation and delivery of water is therefore central. Explicit rules of delivery (schedules of days and times) and monitoring thereof will be addressed in the WUA training process, tailored for each WUA. Agreements for billing and water supplies will be made between the UNIT WUA and the appropriate service provider (RBDA-WUA, SPV or PPP) leading to the delivery of water to the head of tertiary canal or higher levels as appropriate over time. Where water is not delivered in sufficient quantity and on time, agreements will be structured and WUA members trained so that the farmers will be able to seek redress through the WUA. Local level traditional leadership will play a key role in conflict resolution. Rules would be established and formalized during the WUA establishment process and articulated in the WUA bye-laws. A key challenge to be addressed at the UNIT WUA level will be the definition of appropriate responses to those farmers unable, or unwilling to pay, which will need to be explicitly addressed and negotiated with participant farmers in the WUA training process.

Annex 10: Public Expenditures in Irrigation and Water Resources Management Transforming Irrigation Maintenance in Nigeria (TRIMING) Project

1. *What are the sources of funding for water and irrigation services in Nigeria? What is the size of government grants vis-à-vis internal revenues of the RBDAs? What is the process for making the RBDA budget, what role does the RBDA play in the process? What financial management issues around revenue collection and management, accounting and recording keeping, as well as procurement are evident in the sector?* This annex sheds light on these and other PFM relevant issues in the sector, based on fieldwork carried out to the proposed sites, as part of the preparation of this project

A. Funding Arrangements

2. Financing for water resources comes from two sources – allocations from the federal budget and internally generated revenue, with the latter applying to agencies in the sector with potentials for revenue generation. Inefficiencies and the political process around the budget affect the two sources in different ways, and they are therefore treated separately here.

Budgetary Allocations

3. The federal government makes annual budgetary allocations to the Federal Ministry of Water Resources, but parastatals under the Ministry also generate and use part of their internal revenues. Budgetary allocations currently constitute the main source of funding to the sector. Allocations cover all classes of expenditure: personnel, administrative overheads (the two of which the Treasury classifies as recurrent expenditure), and capital expenditure. They also cover operations and maintenance (O & M) expenditure, classified under capital expenditure, although they are mostly recurrent in nature. Budgetary allocations cover activities of the ministry headquarters and its parastatals, including the 12 River Basin Development Authorities (RBDAs), as shown in *Figure A10.1*.

4. Actual allocations to the sector averaged ₦67.7 billion between 2010 and 2012[31] *(Figure A10.1)*, compared to the approved budget allocation (average) of almost ₦106 billion. (The Treasury has not published the 2013 financial statements as at the time of preparing this Annex in March 2014). This represents a 36 percent deviation of actual expenditure from the approved expenditure, or put differently, a 64 percent budget performance.[32] The pattern of allocation shows capital expenditure dominated budgetary allocations to the sector, averaging 92.5 percent of the approved budget and 91.7 of actual spending. However, the level of performance (implementation) of the capital budget is lower than that of the recurrent budget; capital budget performance averaged 63.3 percent between 2010 and 2012, as against an average of 71.5 percent for recurrent spending. Interestingly, administrative overheads achieved an average of

[31] Restriction of the analysis to fiscal 2010-2012 is due to the difficulty of isolating water-related spending from the consolidated expenditure of the Federal Ministry of Agriculture and Water Resources (FMAWR). Agriculture and Water resources formed one single ministry in 2008/9, but neither the National Treasury, which supplied the audited reports from which this data came, nor the FMWR could provide information that would enable disaggregation of the data. The current Federal Ministry of Agriculture and Rural Development (FMARD) could also not help.

[32] This annex discusses factors accounting for the state of affairs below.

105 percent, implying a tendency to spend above the approved budget for administrative costs. The performance of personnel was, on average, 80 percent.

Figure A10.1: FG Budgetary Allocations to the Water Sector, 2008 - 2012 (Naira Millions)

Budgetary Allocations to Ministry of Water Resources (including Irrigation & River Basin Development Authorities), 2008 - 2012 (Naira Millions)																
	2008*		2009*		2010**		2011		2012		2013		Average (2010-2012)			
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual†	Budget	Actual	% Variace	% Perf
Total Expenditure, of which	120,844.45	120,025.78	167,097.05	182,008.01	156,716.45	66,979.07	70,456.37	88,378.90	90,639.16	47,632.42	88,227.91	N/A	105,937.33	67,663.46	-36.1%	63.9%
Recurrent, of which	6,826.23	6,094.43	28,168.35	43,080.16	856.87	701.24	8,420.55	11,501.05	14,407.09	4,742.83	7,920.95		7,894.84	5,648.37	-28.5%	71.5%
Personnel (main ministry)	5,528.35	4,833.61	5,497.20	18,262.88	240.77	212.47	1,542.74	4,313.49	6,545.33	2,147.49	1,071.82		2,776.28	2,224.49	-19.9%	80.1%
Overheads (main ministry)	1,297.88	1,260.82	993.48	5,950.41	616.10	488.77	768.63	1,953.46	1,734.28	834.06	432.99		1,039.67	1,092.10	5.0%	105.0%
Rec. Subv (Pers+O/H)	-	-	21,677.67	18,866.86	-	-	6,109.18	5,234.09	6,127.49	1,761.27	6,416.15		4,078.89	2,331.79	-42.8%	57.2%
Capital Expenditure (CAPEX)	114,018.22	113,931.35	138,928.70	138,927.85	155,859.58	66,277.83	62,035.82	76,877.85	76,232.07	42,889.59	80,306.97		98,042.49	62,015.09	-36.7%	63.3%
Budgetary Allocations to RBDAs, 2008 - 2012 (Nominal naira)																
Recurrent Expenditure Allocation to RBDAs	N/A		N/A		3,910.66	3,409.38	5,741.40	4,920.78	5,773.19	1,656.72	5,475.35	N/A	5,141.75	3,328.96	-35.3%	64.7%
Capital Expenditure Allocation to RBDAs			3,787.83	3,293.85	36,394.71	36,394.71	37,776.79	24,690.31	49,891.20	26,608.23	79,165.97		41,354.23	29,231.08	-29.3%	70.7%
Total Expenditure Allocation to RBDAs			3,787.83	3,293.85	40,305.37	39,804.09	43,518.19	29,611.08	55,664.39	28,264.95	84,641.32		46,495.98	32,560.04	-30.0%	70.0%
Percent Recurrent Expenditure	5.6%	5.1%	16.9%	23.7%	0.5%	1.0%	12.0%	13.0%	15.9%	10.0%	9.0%		7.5%	8.3%		
Percent Capital Expenditure (CAPEX)	94.4%	94.9%	83.1%	76.3%	99.5%	99.0%	88.0%	87.0%	84.1%	90.0%	91.0%		92.5%	91.7%		
RBDAs' CAPEX as % of Total (CAPEX)			2.7%	2.4%	23.4%	54.9%	60.9%	32.1%	65.4%	62.0%	98.6%		47.4%	52.5%		

Source: Audited Financial Statements of the Federal Government of Nigeria, 2008 - 2012

*Allocations are for both agriculture and water resources; they were one ministry then; official data does not separate the two; however, allocations to the 12 RBDAs are available in some years

**Water and agriculture demerged in the second quarter of 2010, but separation of personnel allocations happened only in 2011. Personnel (main) cost is not for the FMWR, but for two agencies that later became its partastatals

†The Treasury has not published audited financial statements for 2013 as at the time of writing this in March 2014

5. Since 2010, when water separated out from the Ministry of Agriculture, capital allocations to the 12 RBDAs have dominated capital expenditures to the water sector. Actual capital allocations to the RBDAs was 54.9 percent, 32.1 percent, and 62.0 percent of total capital allocations to the sector in 2010, 2011, and 2012 respectively. This represents an average of 52.5 percent for 2010-2012. However, recent inefficiencies and over-politicization of the budget process has introduced additional distortions into capital allocations to RBDAs and reduced their effectiveness and impact.

6. The end of the medium-term sector strategy (MTSS) approach to budgeting in fiscal 2010 has not helped efficient spending in the sector. The federal government designed the MTSS to accompany the medium-term expenditure framework (MTEF) as part of the budget and fiscal reforms, which began in 2004/2005. Under the MTSS, some development partners[33] provided funding support to the Budget Office of the Federation (BoF) to build capacity in ministries to develop, prioritize, and cost medium-term investment strategies. The government mainstreamed the MTSS into the annual budgeting process by selecting most of its projects from the MTSS, thus simplifying budgeting and making emerging budgets more realistic and affordable. MDAs also felt committed to implementing the budget and achieving results, since they could recognize their input in the approved budget. However, the government discontinued the MTSS exercise in 2007 as funding assistance from donors lapsed, making it easier to include *ad hoc* projects, which do not necessarily reflect sector goals, e.g., those funded as 'constituency projects'.

[33] Principally UK DFID, the World Bank, and the UNDP.

7. Current budgeting practices illustrate how the role of politicians can distort the medium-term goals of the sector and give greater weight to individually prioritized projects over those determined as policy priority by the sector through a planning process. The practice is as follows. First, RBDAs receive a capital ceiling from their parent Federal Ministry of Water Resources for their core mandates, following the ministry's receipt of a budget envelope from the Federal Ministry of Finance. However, the ceiling provided to the FMWR and to the RBDAs is arbitrary and does not reflect local needs or a policy vision. For example, the FMWR received a capital budget envelope of ₦23 billion naira for Fiscal 2014, out of which it provided a uniform ceiling of ₦1.0 billion to each of the 12 RBDAs,[34] notwithstanding that the RBDAs are not of equal sizes, do not have the same needs, and do not cover the same scope of operations. Thus, RBDAs fit their budget proposals submitted to the FMWR into this ceiling, leaving out many needs in the process. It is not clear that RBDAs adopt transparent procedures or well-defined criteria in deciding on priority projects to include in their submissions.[35] Consequently, RBDAs resort to 'lobbying' for additional budget, as other government agencies also do. They do this by asking legislative committees and influential legislators for increases in their budget proposals. Respective 'lobbying' efforts meet with varying degrees of success, depending on the 'political clout' that the particular RBDA (and other agencies) can muster. For example, the three RBDAs in *Figure A10.2*, each received a ceiling of ₦1.0 billion for their core mandate in Fiscal 2013. However, the final budget approved for the Sokoto-Rima RBDA was ₦2,828.6, i.e., nearly three times the ceiling. By contrast, the other two RBDAs received much lower increases of ₦217.4 billion (Hedeija-Jama'are) and ₦132.50 billion (Upper Benue).

Figure A10.2: Composition of 2013 Budget of Three Select RBDAs (Naira Millions)

Composition of Capital Allocations to RBDAs

	2013		
RBDA	Budget	Release	Actual
Sokoto-Rima	6,787.00	6,048.40	6,048.4
Core/Mandate Projects	2,818.60	2,080.00	2,080.0
Constituency/Zonal Inervention Projects	3,968.40	3,968.40	3,968.4
Hadeija-Jama'are	5,127.60	4,755.70	4,755.7
Core/Mandate Projects	1,217.40	1,625.10	1,625.1
Constituency/Zonal Inervention Projects	3,910.20	3,130.60	3,130.6
Upper Benue	3,315.71	2,168.60	2,168.6
Core/Mandate Projects	1,132.50	1,054.00	1,054.0
Constituency/Zonal Inervention Projects	2,183.21	1,114.60	1,114.6
Total	15,230.31	12,972.70	12,972.7
Core/Mandate Projects	5,168.50	4,759.10	4,759.1
Constituency/Zonal Inervention Projects	10,061.81	8,213.60	8,213.6
% Core/Mndate Projects	33.9%	36.7%	36.7
% Constituency/Zonal Intervention	66.1%	63.3%	63.3

8. Constituency projects introduce another dimension to politicization of the budget process. Constituency projects are projects that legislators insert later on in the budget process (just before approval) to serve their particular constituents. Individual legislators decide their project preferences, but disbursements are up to the annual limits fixed by the legislators themselves. The limits are ₦120 million for each of the 106 senators and ₦75 million for each of the 360 federal representatives. Insertion of constituency project into the budget results in at least four conflicts between the executive and the legislature: (i) the projects' potential for destabilizing macroeconomic projections behind executive budget proposals, (ii) legislators refuse to submit their proposals through the formal screening process, (iii) the non-federal nature of most of the expenditures,[36] and (iv) implementation arrangements.

[3434] This ceiling was the same as in fiscal 2013.

[35] RBDAs only make proposals for their core/mandate programmes; not constituency projects, as explained below.

[36] Nigeria's constitution delineates roles expenditure roles for the three tiers of government; for instance is not responsible for provision of water supply to rural communities. That is the role of state governments; the federal is responsible for management of water resources.

9. In order to resolve the issue of implementation arrangements between the Executive and the Legislative, both parties agree to assign execution of the project to a federal agency with relevant mandate in the sector, and/or with active presence in the beneficiary community. Consequently, responsibility for executing constituency projects across the states and local governments falls on RBDAs, because of their grassroots presence and the relevance of their core mandates to many constituency projects. Constituency projects and the mandate projects of RBDAs thus run on parallel tracks and, as *Figure A10.2* illustrates, the Treasury releases funds to them separately. RBDAs also account for them separately.

10. In 2013, constituency projects represented 66 percent of the total budget of the three RBDA and 63 percent of total funds released to them. *(Figure A10.2)*. RBDA records reviewed in preparation of this Project suggest that these may, or may not, have anything to do with water. Records from RBDAs show that the constituency projects they executed include the following types:

- Purchase and distribution of motorcycles to villagers
- Provision of water to state government-owned secondary schools
- Sinking and motorization of boreholes (including solar boreholes) for the supply of drinking water
- Provision of hand pumps for boreholes
- Construction of water treatment plants
- Construction of drainage culverts
- Supply of reservoirs and overhead tanks, etc.
- Construction of new earth dams
- Farmers' support programme, etc.

11. However, some RBDA engineers, interviewed for this project, seem grateful that constituency projects are, at least, keeping them busy, given the low budget for their core activities.

Share of Budgetary Allocations in Aggregate Public Spending

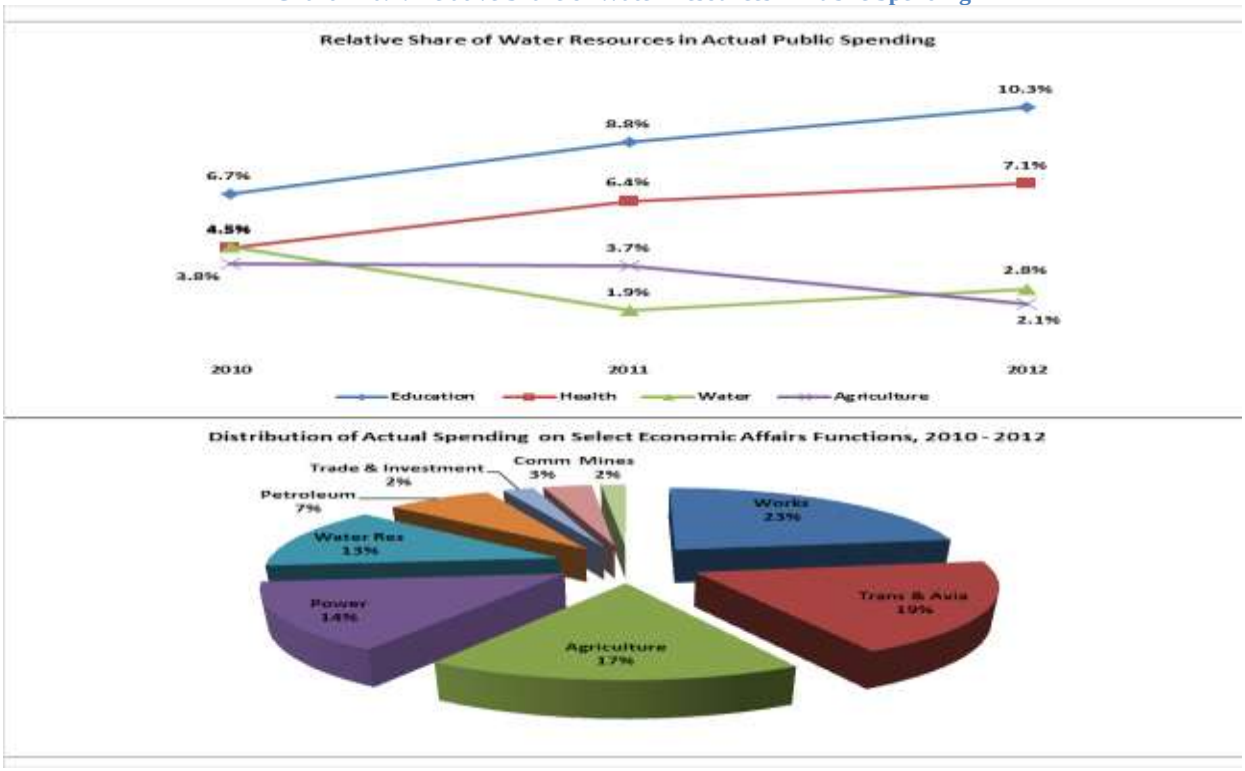
12. Actual Federal Government spending on water has varied greatly in the last 3 years and resulted in an overall decline. Water commanded a share of 4.5 percent in 2010, declined sharply in 2011 to 1.9 percent, before rising in 2012 to 2.8 percent *(Chart A10.1)*. This trend contrasts with developments in the education and health sectors, which had significantly larger and steadily rising allocations. Trends in water and agriculture spending were both unstable, with agriculture rising and falling as well. Perhaps this is due to a focus on MDGs and the tendency in some developing countries to treat water and agriculture more as economic activities which users can contribute to.

13. However, allocations to water also rank low within the larger economic affairs sector *(Chart A10.1)*. Average allocation to water resources ranks it fifth within the sector, behind works, transport and aviation, agriculture, and power, in that order. This suggests that funding water resources is not priority in the economic affairs. However, it is important to note that Nigeria's federalist constitution does not assign primary responsibility for water supply and agriculture to the Federal Government as it does in the construction of trunk roads (works) and

aviation, for instance. The FG's roles in water and agriculture are those of facilitation, regulation, research, and similar activities.

14. The volatility of allocations, in addition to the small shares of the sector budget, are of concern, since they make it difficult for managers to plan and keep projects on schedule. Delays in paying contractors often lead to cost escalations, since contractors who demobilize from site because of unpaid certificates will usually request for cost variation before they mobilize back. Often, the delay is for several years, sometimes, more than a decade. For example, the Dadin Kowa Irrigation Project in Gombe state has remained at the pilot stage, more than 20 years after commencement.

Chart A10.1: Relative Share of Water Resources in Public Spending



Internal Revenue

15. Parastatals under the Federal Ministry of Water Resources generate internal revenue, as other parastatals with revenue potentials do, but the treatment of such revenue has changed over time. Parastatals used to retain all of their internal revenues before 1999, as usually authorized under their respective enabling laws. Upon return to democracy in 1999, the National Assembly directed all parastatals to pay over their internally generated revenues into the national treasury, taking their stand on a constitutional provision requiring consolidation of all public revenues. This directive posed practical difficulties for parastatals, whose enabling laws envisaged augmentation of their budgeted expenditures from their internal sources. To ameliorate the situation, the Federal Ministry issued an interim directive to parastatals in 2011, authorizing

them to apply up to 75 percent of their internal revenues to their budgetary expenditure, remitting only the balance to the Treasury.

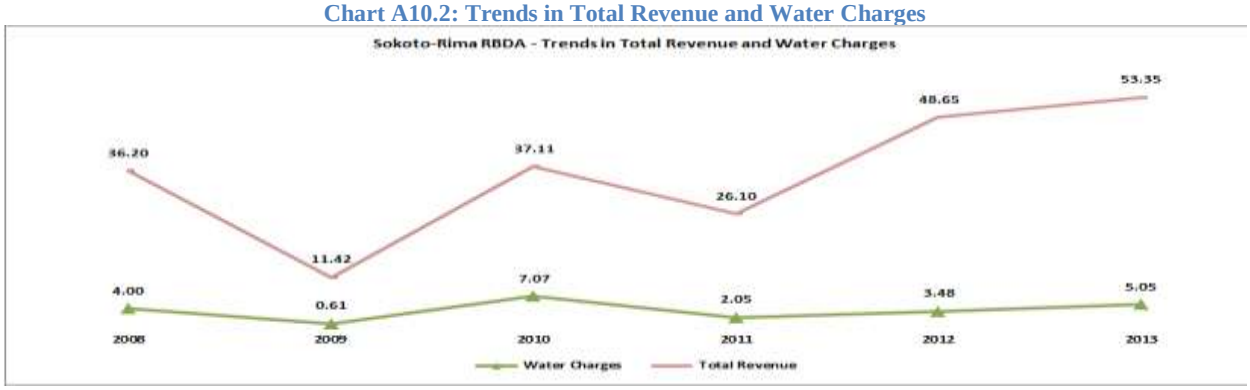
16. RBDAs typically generate revenues from multiple sources, which *Figure A10.3* below groups into seven categories. The Figure shows that water charges constitute only about 10 percent of the average collections of Sokoto-Rima RBDA from 2008 to 2013. The most important revenue source is contractor registration, sale of tender documents, and supervision fees charged contractors. *Chart A10.2* illustrates the little growth in revenue from water charges over the years. Water charges grew by only one million naira in the five years between 2008 and 2013, representing a 26 percent growth. By contrast, contractor registration, etc., nearly tripled in the same period. The size of collections from this source partly explains why water charges are underperforming – water charges are not nearly as important as contractor charges. Perhaps RBDAs would have paid more attention to water charges, had there not been contractor charges yielding such huge benefits. However, it should be noted that the Procurement Act prohibits procuring entities to register contractors, let alone charging them fees. The regulator (BPP) is the only body authorized to register contractors, and is not allowed to charge a fee. Similarly, supervision fees are an illegal surcharge on contractors. The cost of supervising a contractor is ordinarily a budgetary cost of managing a contract.

Figure A10.3: Reported Actual Revenue of Sokoto-Rima RBDA

Sokoto-Rima RBDA: Revenue Generation By Item (In Summary), Naira Millions

		2008	2009	2010	2011	2012	2013	Average	Percent
1	Contr Reg/Tender/Super Fees	13.20	3.91	16.79	7.00	28.24	38.00	17.85	188.09
2	Rent of Qters (staff + non staff)	6.54	1.52	6.13	6.18	10.41	3.97	5.79	-39.39
3	Water Charges	4.00	0.61	7.07	2.05	3.48	5.05	3.71	26.49
4	Renting Out of Eqpmt	4.08	2.63	2.21	2.01	2.60	1.88	2.57	-54.09
5	Land Lease	2.78	0.28	4.48	1.88	1.82	3.75	2.50	35.09
6	Raw Water	0.08	-	0.25	6.75	-	-	1.18	-100.09
7	Misc Receipts	5.54	2.46	0.17	0.23	2.11	0.70	1.87	-87.49
	Total Revenue	36.20	11.42	37.11	26.10	48.65	53.35	35.47	47.39

Chart A10.2: Trends in Total Revenue and Water Charges



17. RBDA schemes manage the majority of revenue sources[37] on behalf of the RBDAs, but there are significant weaknesses in their accounting processes. First, there is a distinct lack of coordination in revenue management responsibilities. The Services (not the Accounts) Department of RBDAs supervises activities of the schemes, and it knows their revenue targets. However, the schemes collect and deposit the revenue in RBDA accounts, which the Services Department does not control. The Accounts offices control these revenue accounts, but they do

[37] Excluding contractor registration, etc., collection of rent, and miscellaneous charges

not know what revenue levels to expect. However, Services Department, Accounts Office, and the schemes do not reconcile their records. This is the same model of the revenue administration that operates in mainline government at the federal, states, and local governments, where the Office of the Accountant General (Treasury) accounts for only revenues paid into the treasury.

18. Some of these weaknesses in revenue collection and accounting in the RBDAs enable underfunded schemes to unofficially find other sources of funding for their operations. For example:

- Schemes offset administrative and O & M costs from their revenue collections, without properly accounting for them, because either the HQs' does not fund them at all (Hadeija-Jama'are and Upper Benue) or it does so irregularly (Sokoto-Rima).
- Most schemes do not keep record of their collections and expenses at all, preferring that the FMWR/ HQs provide accounting information. Records are grossly incomplete and inadequate in those schemes that attempt to provide such information.
- Some internal control and accountability challenges arise from the practice of using Water Users Associations (WUAs) as collection agents, integrity, and capacity problems. Most WUA officials, who are the primary collectors of these revenues are not literate and have problems with record keeping. In addition to this capacity issue, questions of integrity, occasionally arise.

B. Issues Affecting Budget Implementation

19. *Figure A10.1* showed a relatively low capital-budget implementation level of about 63 percent. Factors accounting for this low-level implementation include processes around budgeting, procurement, and cash management.

20. Current project identification and budgeting procedures affects execution. The processes do not consider RBDAs to have the capacity and no proper costing of projects is done. Typically, a RBDA would be simultaneously managing over 200 different procurements, including of constituency projects. Further, poor costing methods rendered approved budget costs unrealistic, being either excessive or grossly inadequate. Cost projections do not usually involve principles of activity costing.

21. Current public procurement practice also affects project execution. For example, RBDAs commence procurement planning after budget approval by the legislature, rather than in advance. This leaves insufficient time to complete all procurement processes; late approval of the budget compounds this problem. Usually, the regulatory authority does not abridge the procurement procedure, and insists on following due process. Compliance often means untimeliness in project execution and utilization of funds. The better approach would be to complete procurement planning and all contracting and procurement formalities - including preparation of project specifications - prior to budget approval. Budget approval should signal commencement of actual tendering. However, RBDAs are reluctant to do this since they do not know what (new constituency) projects the budget will contain.

22. Use of cash rationing, rather than proactive cash planning, also adversely affects budget implementation. Presently, not all government agencies use cash budgeting, although the Fiscal Responsibility Act 2007 requires it. Consequently, there is no forward projection of cash flows. Thus, there is no forewarning of the likely timing of cash surpluses and deficits and therefore, no advance plan of how to invest interim excess cash and minimize the disruptive impact of temporary cash deficit. Government's cash management approach percolates cash receipts until they are sufficient to support a release warrant. This often causes a late release of quarterly warrants, affecting ability to implement the capital budget. However, the new Treasury Single Account (TSA) system and the Government Integrated Financial Management Information System (GIFMIS) rolled out in April 2013 should help address the issue, once perfected.

23. Finally, release warrants appear to declare 'intention to fund', and no longer represent actual funding through the budget. As currently practiced, the FMF issues release warrants to authorize the Treasury to pay for approved budget items listed therein. A warrant simply indicates the commitment of the government to pay for the procurement of those items. However, the procurement regulator will not grant a 'no objection' except the procuring entity can show evidence that the funds are sitting somewhere in the control of the entity. This can only happen after the Treasury has released the funds to the entity. Thus, the government must 'back' release warrants with cash. Delays between cash backing and release warrant further affect ability to implement the capital budget. *Figure A10.4* shows the respective dates of release warrants and cash backing from 2007 to the end of the first quarter of 2012. The Table also indicates the government's recent efforts to reduce delays.

Figure A10.4: Capital Expenditure Appropriation, Releases, & Utilization

Summary of Releases & Disbursements for CAPEX										
	Nominal Naira Millions, %					Real 1990 Naira Millions, %				
Year	Appropriation	Act Release	Utlization	% Release	% Utlization	Appropriation	Act Release	Utlization	% Release	% Utlization
2000	3 246,02	3 346,02	3 346,02	103,1%	100,0%	1,99	2,06	2,06	103,1%	100,0%
2001	838,18	838,18	838,18	100,0%	100,0%	0,52	0,52	0,52	100,0%	100,0%
2002	2 776,73	2 776,73	2 776,73	100,0%	100,0%	1,61	1,61	1,61	100,0%	100,0%
2003	6 271,00	6 271,00	6 271,00	100,0%	100,0%	3,13	3,13	3,13	100,0%	100,0%
2004	9 099,00	9 099,00	9 099,00	100,0%	100,0%	4,21	4,21	4,21	100,0%	100,0%
2005	4 166,37	4 166,37	4 166,37	100,0%	100,0%	1,60	1,60	1,60	100,0%	100,0%
2006	12 562,44	11 142,56	10 149,09	88,7%	91,1%	4,03	3,58	3,26	88,7%	91,1%
2007	17 633,08	4 591,77	4 020,56	26,0%	87,6%	5,41	1,41	1,23	26,0%	87,6%
2008	97 027,02	51 224,24	16 738,76	52,8%	32,7%	48,34	25,52	8,34	52,8%	32,7%
2009	81 709,90	81 076,64	65 812,24	99,2%	81,2%	23,69	23,51	19,08	99,2%	81,2%
2010	39 019,39	39 018,09	39 017,33	100,0%	100,0%	8,91	8,91	8,91	100,0%	100,0%

Note: Fiscal 2008 & 2009 Data related to the Federal Ministry of Agriculture & Water Resources (FMAWR), not FMARD

Annex 11: Economic and Financial Analysis
Transforming Irrigation Maintenance in Nigeria (TRIMING) Project

A. Introduction

1. A financial and economic analysis was prepared by the consultants working on the feasibility and design studies for the Bakolori Irrigation Schemet (BIS). The analysis for the other irrigation projects (KRIS, MRVIS, HVIS and DKIS) to be developed is in their respective initial stages of studies and is still not available. During the TRIMING project appraisal most of the assumptions used for the BIS analysis were checked and some of them adjusted, based on field observations and mission findings. A summary of the appraisal mission assessment is presented in this Annex, including preliminary estimations on the expected impact of the other proposed projects as the investment cost per ha of those schemes vary in different locations, and assuming similar cropping patterns as in BIS.

2. The main BIS proposed interventions include: (i) dam rehabilitation and safety improvements, (ii) rehabilitation of existing irrigation and drainage infrastructure; (iii) development of surface irrigation and drainage systems on former sprinkler land, (iv) repair and upgrading of flood protection dykes, (v) management, operation and maintenance (O&M) of irrigation/drainage systems; (vi) WUA development and support services; (vii) fisheries program, and (viii) agribusiness and PPP support. The main benefits of these interventions are expected to be obtained from: (i) expansion of irrigated crop area, (ii) increased cropping intensity and development of higher crop yields; (iii) improved farm incomes from irrigated crop and enhanced livestock production; (iv) reduction of expected economic losses due to flood events, and (v) enhanced livelihoods for fishing households.

3. **Link of economic analysis with project development objectives.** Rehabilitating and/or expanding irrigation services -- and making these sustainable by appropriate institutional reforms, in particular with the development of WUAs -- is laying the basis for increased agricultural productivity as contained in the development objectives. The economic analysis that was undertaken provides estimates of the expected incremental agricultural benefits. It is those benefits which then further result in increased farmers' incomes and the related multiplier effects that reduce poverty.

4. **Rationale for public funding**. Dams and reservoirs are large, multi-purpose public assets for which public funds are needed to maintain them and to thereby also assure their safety for the downstream populations. Public funding for construction, operation, and maintenance is also necessary for the larger/primary irrigation canals. Private operators will be reluctant to engage in large-scale investment across multiple states without the full power of the state behind. For the smaller/tertiary canals, the initial investment for construction still requires public resources, but the project will actively encourage users to become fully responsible at the tertiary level for the maintenance and operation of the canals.

5. **Value added of WB involvement.** Given the complexity of irrigation schemes, the required know-how, and the number of stakeholders involved, the World Bank is well placed to support this project due to its experience and successes in large-scale public irrigation and the associated agricultural development knowledge, in addition to its convening power to bring

together various stakeholders to work toward the achievement of this large-scale investment. The project will combine and apply these experiences, providing a unique window of opportunity to integrate a strategic approach to productivity enhancement, diversification, and value chain development. This includes experience gained in the development of WUAs, in sectoral policy and institutional transformation, in community and matching grant programs, and from achievements and lessons learned in Nigeria and elsewhere.

6. The **development impact** of the project would be an improved access to irrigation and drainage services and strengthened institutions for integrated water resources management and agriculture service delivery in selected large-scale public schemes in Northern Nigeria. Thereby the project would contribute to reducing extreme poverty in northern Nigeria and promoting shared prosperity. This will be achieved through increasing the area of irrigated land by 50,000 hectares and the value chain development for the outputs produced. This will benefit 140,000 farmers, including youth and women, and will result in 1,065,000 direct beneficiaries.

B. Crop and Livestock Production

7. The rehabilitation of the irrigation, drainage and flood protection infrastructure, together with the provision of agricultural and marketing support services, will allow for increasing the current cropping intensity for the 21,225 ha of cultivated land to be served with irrigation, from 115 percent to around 180 percent with a higher productive and diversified cropping pattern. Currently farmers cultivate traditional crops as maize, beans and vegetables with low yields mainly for family consumption. The project diversification and support services will lead to improvement in the net farm incomes of the smallholders creating employment opportunities resulting from an expansion of production, processing, transport and marketing of crops and livestock products. Most of the post-harvest benefits have not been quantified for this economic analysis.

8. Crop productivity of paddy rice is expected to increase from 3.7 to 6 tons/ha by introducing the System of Rice Intensification (SRI) technologies[38]; maize from 2.2 to 5 tons/ha, millet from 1.2 to 2 tons/ha, sorghum from 1.6 to 3 tons/ha, wheat from 2 to 3 tons/ha, and pulses from 1.5 to 2 tons/ha. Together with crop diversification (vegetables, sweet potatoes, fruits, etc.) and land use intensification, a substantial improvement in the net farm incomes of smallholders would follow. The provision of livestock extension services will also increase livestock productivity contributing to improve the farmers' income by the adoption of better production practices including the production of improved feed and animal husbandry.

C. Fisheries Development

9. The Bakolori reservoir has an estimated storage capacity of 450 million m^3 of water covering an area of about 9,000 ha at maximum flood. There are a number of fishing households living in small villages close to the reservoir, but there is still big potential to expand the fish

[38] According to a 2012 USAID farmers trained by the E-ATP SRI events in Nigeria have gotten yields up to 10 tons/ ha. SRI is an innovative technology to produce "more crop per drop of water" that has proved to work in more than 40 countries. Compared to the commonly known flooded rice production, successful applications of SRI have shown that farmers can raise their paddy yields by 50 to 100 percent or more, while using fewer farm inputs, especially water.

catch and increase income from fishing and ancillary activities. Furthermore, a few households within the project area are engaged in fish farming activities. There are about 35 hectares of fish ponds, but most of these ponds are abandoned. In addition to rehabilitation of these fish ponds, the introduction of fish-rice culture (covering an area of about 200 ha) is also envisaged. The proposed fisheries interventions are primarily aimed at providing additional livelihoods for local communities within the vicinity of the reservoir as well as in the project area.

D. Mitigation of Flood Losses

10. Currently the BIS command area is protected by flood protection dykes constructed when the original project was developed. However some of these dykes have been breached at a number of points with frequent flood damage to crops, to private property and also to public infrastructure. In extensive areas agriculture is not possible due to floods that persist during the whole rainy season. The reconstruction and upgrading of the dykes will mitigate these recurrent economic losses recovering areas for cropping during the rainy season. The estimated value of the expected avoided losses in flood affected areas was estimated and included in the analysis. In addition, the rehabilitation of the dam infrastructure will also ensure the safety of the dam and consequently prevent substantial economic losses and damage resulting from probable breaches. The value of the avoided economic damage on crops, settlements and public infrastructure has also been estimated.

E. WUA Development and Agribusiness/PPP Support

11. The project will also provide assistance for strengthening existing WUAs and provide them with support to encourage the development of simple agribusiness and PPP enterprises. These interventions would also provide significant economic and social benefits, such as improving products' farm prices and farmers' income and employment opportunities, while developing crop storage, processing and marketing facilities to strengthen the relevant value chains for the proposed diversified production activities around the BIS. The economic benefits of these interventions were not quantified for this assessment.

F. Main Assumptions for the Analysis

12. For estimating agricultural benefits, financial and economic crop gross margins per ha were estimated by valuing the physical inputs required and the expected output in terms of their market and economic prices. The crop gross margins in the present, future without (FWO) and future with (FW) project situations are summarized in Table 11.1.[39]

[39] Detailed budgets are presented in Tables 1 to 10 in project files (TRIMING EFA.xlsx).

Table 11.1: Gross Margins in Present, Future Without and With Project (Naira per ha)

	Yields (kg/ha)		Income after Labor Costs		
Crop			**Present**	**Future With Project**	**Expected Increase**
Maize	2,200	5,000	31,625	127,625	403%
Sorghum	1,600	3,000	22,625	57,725	255%
Millet	1,200	2,000	1,842	15,692	852%
Rice	3,700	6,000	99,305	201,734	203%
Wheat	2,000	3,000	35,500	59,450	167%
Pulses	1,500	2,000	40,775	53,500	131%
Vegetables	15,000	25,000	82,900	196,500	237%
Sweet Potatoes	10,000	15,000	19,350	59,200	306%
Dairy Cattle	500	1,500	-5,950	15,000	-
Beef Fattening	250	350	43,700	61,600	141%

13. Border prices for internationally traded goods (rice, maize, wheat, pulses and fertilizers) were derived from the World Bank commodity price projections for 2015. These prices were adjusted for sea freight, insurance, transport, handling and processing costs (when necessary) to determine economic border prices and equivalent economic farm gate prices. Economic prices for rice, maize, wheat, pulses and fertilizers derived on an import parity basis show that differences with the farm-gate prices received by farmers show small variations (less than 10 percent). Hence, for the economic analysis, market prices were adjusted with conversion factors (CF) of 1.024 for rice, 1.072 for maize and 1.025 for wheat in order to reflect their economic values. Fertilizer prices were corrected with 0.91 as CF. Labor costs were based on the wage rates prevailing within the project area averaging around Naira 550 per day for most farm operations. Given the high levels of underemployment within the project area, a shadow wage rate of 70 percent of the market value was used to determine the opportunity cost for labor.

14. The economic gross margins per hectare for the FW and FWO project multiplied by the respective crop areas in the BIS for each scenario allowed estimating the expected net incremental benefits from the project investments. Similarly, net livestock benefits were also estimated for both scenarios (based on the respective livestock populations and net margins). The current cropping pattern was based on information provided by farmers. Adopting a conservative assumption, crops grown are not expected to vary significantly in the FW scenario. Overall, the project's cropping intensity will increase from 115 percent to 180 percent while no increase in cropping intensity is likely without the improved supply of irrigation water and the proposed support services. With the project it was anticipated that a significant expansion of the rice area in both the wet and dry seasons would occur. It was also assumed that the production of maize will significantly increase in the dry season. Vegetable and sweet potato production is also expected to grow during the dry season, but local market demand constitutes a constraint for this expansion in the short to medium term. Hence, these higher value crops would not exceed 14 percent of the cropped area.

G. Financial Analysis

15. Farm budgets were prepared to determine the impact of the project interventions on farm income using an average farm size of 2.0 ha. Based on the estimated existing and FW cropping patterns, the likely net returns to farmers in the present and FW project situations were estimated, including the typical livestock activities. Average change in beneficiaries income allows estimating the financial impact of the project. Net farm incomes were estiimated both before and after the payment of the irrigation fees required to meet annual operation and maintenance (O&M) costs of the irrigation and drainage systems. The summary results for both scenarios are presented in Table 11.2. The detailed farm budget is presented in Table 11 in the project files.

16. With the project expectations are to achieve a significant increase in the net family income on the average household in the BIS, from Naira 259,000 to Naira 781,000 per annum (after irrigation fees). This income increase will result from the farm production intensification which will require 407 person days of family work instead of the curent 186 person days with their traditional cropping pattern, and also an increase in the productivity of labor that would increase from about Naira 1,390 to 1,918 as return of worked days. Average family income would increase by three times the level to be obtained without the project. Irrigation O&M costs after rehabilitation would only represent only about 10 percent of the expected incremental income made possible by the project. From these numbers, farmers will have the capacity and willingness to pay the full O&M cost of the irrigation and drainage systems making the project improvements sustainable. These figures also demonstrate that the project is financially attractive for beneficiaries to undertake the proposed changes.

Table 11.2: Net Farm Income and O&M Costs

Farm in	Present	FW Project	
		Excluding O&M Costs	Including O&M Costs
Net Value of Production	429,000	1,188,000	1,188,000
Self-consumption	157,000	159,000	159,000
Production Costs	170,000	355,000	407,000
Net Income (incl. self-consumption)	**259,000**	**833,000**	**781,000**
Family Labor Use (days)	186	407	407
Returns per Family day	1,390	2,046	1,918

H. Overall Project Benefits

17. **Agriculture.** The economic analysis was estimated over a 20 year period using 2013 constant prices and a discount rate (opportunity cost of capital) of 12 percent. It was assumed that the project would be implemented along the first 7 year period. The aggregation of net margins following the existing and expected cropping patterns allowed estimating the benefits in the present, FWO and FW project scenarios. The differences between scenarios determined the expected economic impact of project improvements including the intensification and diversification of the cropping pattern together with the improved crop yields to be induced by the project investments. As a result of these increased production, the net agricultural value of

production to be obtained by farmers within the project area were estimated to grow by Naira 7.8 billion per annum (from the current Naira 4.4 million to Naira 12.2 billion per annum at full development in year 10). Agricultural benefits were estimated to account for about 90 percent of the overall incremental production of the project.

18. **Fisheries.** The rehabilitation of 35 ha of fisheries within the project area was estimated to generate a net economic benefits of Naira 15.0 million per annum, while the introduction of 200 ha of fish-rice culture would produce a net economic benefit of about Naira 39.8 million per annum. In addition, it is estimated that the development of capture fisheries within the Bakolori reservoir will result in an increase in the fisheries catch of about 100 tons per annum. The net economic benefits from investments in reservoir fisheries were then determined by deducting fishing and transport costs from the gross economic value of the incremental fish catch. The net benefit of capture fisheries was estimated at Naira 12.5 million per annum. In total, the fisheries benefits were therefore estimated at Naira 67.3 million per annum (or 0.7 percent of overall increased production). Tables 12 and 13 in the project files show the details of the fisheries activities.

19. **Flood Protection Dykes Benefits:** The benefits of the reconstruction of the flood protection dykes were estimated through the expected avoided losses and damages caused by flooding. Estimates were based on a hydrological analysis of the impact of three flood scenarios and their probability of occurrence: (i) 1 in 5 year events, (ii) 1 in 10 year events, and (iii) 1 in 20 year events. The estimated flood maps together with the expected duration of the events provided flooded areas and flooded profiles for each of the three scenarios. The expected economic value of losses and damaged houses and public infrastructure for the different flood scenarios allowed for the estimation of the annual expected net value of avoided losses once the dykes are rehabilitated. The value of the damage to houses was based on the estimated number of households affected by flooding and an average value of damage of Naira 80,000 per household, while the avoided damage to public infrastructure was assumed to be about 50 percent of value of damage to the settlements. Table 11.3 presents the estimated value of avoided losses and damage to crops, houses and public infrastructure for the three flooding scenarios.

Table 11.3: Impact of Flooding and Value of Economic Losses

Impact of Flooding	**Flood Scenario**		
	1 in 5 Year	**1 in 10 Year**	**1 in 20 Year**
Area Flooded (ha)	6,800	7,600	8,300
No. of Households Affected	900	1,500	2,000
Economic Losses ('000 Naira)			
Crops	301,783	337,287	368,354
Houses	72,000	120,000	160,000
Public Infrastructure	36,000	60,000	80,000
Total Value of Losses	**409,783**	**517,287**	**608,354**

20. **Dam Rehabilitation and Prevention of Dam Breaches**: To determine the economic benefits of the rehabilitation of the dam infrastructure, the losses and damage caused by flooding resulting from a dam breach were evaluated. The estimates of losses and damage were also based

on a hydrological analysis of the impact of a dam breach. Based on the flooded area and flood profile, the expected economic value of the crop losses and damage to houses and public infrastructure were then estimated. The value of the damage to houses was derived from the estimated number of households affected and an average value of damage of Naira 160,000 per household, while the value of the damage to public infrastructure was assumed to be about 50 percent of value of damage to the settlements. A recurrence of 1 in 70 year probability was assumed for the estimations. Table 11.4 presents the estimated economic losses and damage to crops, houses and public infrastructure. The estimated benefit from avoided damages in this case due to a breach in the dam accounts for about 14 percent the overall economic benefits.

Table 11.4: Impact of Dam Breach and Value of Economic Losses

Area Flooded (ha)	170,900
No. of Households Affected	100,000
Economic Losses and Costs ('000 Naira)	
Crops	3,095,952
Houses	16,000,000
Public Infrastructure	8,000,000
Cost of Emergency Repair	2,980,800
Total Value of Losses and costs	**30,076,752**

21. It was estimated that mitigating losses by the flood protection rehabilitation works and by the improvement of the dam safety would contribute with about an equivalent of Naira 670 million per year, or about 8 percent of the value of benefits expected from the project.

I. Project Costs

22. The investment required for the proposed works in BIS (i.e. rehabilitation of dam and flood protection dykes, as well as the rehabilitation/construction of surface irrigation systems) as well as other project components (e.g. O&M, WUA development/support, fisheries program, and agriculture and agribusiness/PPI support) were based on estimates made by the technical specialists preparing the detailed design of the project. These costs were distributed over a 7 year implementation period. The base capital cost would be 28.1 million (US$173.2 million). As contingencies are included, cost would reach to Naira 31.3 million (US$193.5 million). With a net irrigated area of 21,285 ha, the investment – including dam safety and flood control - averages Naira 1.47 million per ha (US$9,090). The economic costs excluded taxes and import duties as these are transfer payments within the economy. A standard conversion factor (SCF) of 0.97 was applied to local materials, machinery, equipment and skilled labor. The cost of unskilled labor was corrected with a CF of 0.7. Adding 11 percent for contingencies the economic project costs were estimated at Naira 26,951 million (US$166.4 million). The financial and economic costs of the project components are summarized in Table 11.5.

Table 11.5: Financial and Economic Capital Costs ('000 Naira)

Project Component	Financial Cost	Economic Cost
Dam Rehabilitation and Flood Protection	5,122,679	4,730,657
Irrigation and Drainage	19,852,908	18,193,127
Management, Operation and Maintenance	897,969	811,554
WUA Development and Support Services	326,937	312,862
Fisheries Programme	145,495	132,967
Agribusiness and PPI Support	1,714,506	59,539
Base Cost	28,060,494	24,240,706
Physical Contingencies	3,280,877	2,711,140
Total Capital Cost	31,341,371	26,951,847

23. The O&M costs of the dam, flood protection works and irrigation/drainage infrastructure were estimated at Naira 388.2 million (US$2.40 million). With a net irrigated area of 21,285 ha, the annual O&M costs would be Naira 18,238 per ha (US$113). In economic values, and the O&M costs became Naira 352.0 million (US$2.17 million). The annual costs of support services were also included in the analysis to ensure that agricultural production increases as expected and continues to grow after completion. Through the irrigation fees, all O&M costs of the irrigation system and the main agricultural support services will be covered. It was assumed that Naira 538 million will be collected annually (US$3.26 million per annum).

J. Economic Results and Sensitivity Analysis

24. The incremental net benefit stream was then used to estimate the economic internal rate of return (EIRR) and net present value (NPV) of the project investments proposed for the BIS, calculated at a discount rate of 12 percent. **The EIRR of the BIS was estimated at 13.5 percent** with a NPV of Naira 1.94 billion (US$12 million). Table 11.6 presents a Summary of the economic costs and benefits expected for the BIS. These results show that the proposed project investment is justified even without considering most of the indirect benefits as mentioned above.

25. A sensitivity analysis was also undertaken to test the effects from changes in the cost and benefit assumptions for the BIS. A decrease in capital costs of 20 percent would increase the EIRR to 16.4 percent, while a cost increase of 20 percent would reduce the EIRR to 10.8 percent. An increase in benefits of 20 percent provides an EIRR of 16.5percent and a benefit decrease of 20 percent reduced the EIRR to 9.1 percent. With a combination of a 20 percent benefit increase and a reduction in project costs of 20 percent, the EIRR would increases to 20.3 percent. In contrast, a benefit reduction of 20 percent together with a 20 percent increase in costs, the EIRR would fall to 6.6 percent. Based on these results the proposed investment appears to have a robust justification. As the other proposed investments in the MRVIP, KRIP, HVIP and DKIP and the respective development plans are defined, similar financial and economic analysis would be prepared to verify the viability of the investments.

Table 11.6: Bakolori Irrigation Project

ECONOMIC BUDGET (AGGREGATED)

(In Naira Million)

	Without Project	With Project									
	1 to 20	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 to 20**
Main Production											
Grains	971	971	971	1,000	1,122	1,359	1,801	2,350	2,820	3,097	3,180
Rice	1,760	1,760	1,760	1,822	2,024	2,388	3,045	3,783	4,329	4,636	4,734
Vegetables	655	655	655	704	851	1,109	1,561	2,044	2,364	2,521	2,569
Crop Residues	227	227	227	234	255	290	352	416	458	478	484
Livestock Products	868	868	868	891	943	1,051	1,212	1,381	1,491	1,525	1,525
Fisheries	-	-	23	45	67	67	67	67	67	67	67
Dam Failure and Flood Protection	-	-	213	427	640	640	640	640	640	640	640
Sub-total Main Production	4,481	4,481	4,717	5,123	5,902	6,905	8,678	10,681	12,169	12,963	13,199
On-Farm Use											
Livestock Products	57	57	57	58	60	64	69	75	79	80	80
On-Farm Consumption											
Grains	971	971	971	971	971	971	971	971	971	971	971
Vegetables	408	408	408	408	408	408	408	408	408	408	408
Livestock Products	193	193	193	193	193	193	193	193	193	193	193
Sub-Total On-Farm Consumption	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572
Net Value Of Production	2,852	2,852	3,088	3,493	4,270	5,270	7,037	9,034	10,518	11,311	11,547
Purchased Consumption											
Grains	-	-	-	6	8	16	22	13	2	-	-
INFLOWS	2,852	2,852	3,088	3,487	4,262	5,254	7,015	9,021	10,516	11,311	11,547
Production Cost											
Investment											
Dam Rehabilitation and Flood Protection	-	1,857	1,840	1,580	-	-	-	-	-	-	-
Fisheries Developmet Costs	-	-	53	102	-	-	-	-	-	-	-
Sub-total Investment Costs	-	1,857	1,893	1,682	-	-	-	-	-	-	-
Operating											
Purchased Inputs											
Seeds	166	166	166	174	188	210	242	261	254	241	237
Fertilizers	329	329	329	343	384	456	581	710	793	833	846
Agrochemicals	69	69	69	71	79	92	117	144	164	175	178
Livestock Products	24	24	24	28	42	68	117	176	223	252	261
Irrigation Fees	117	117	117	120	141	181	260	364	460	520	538
Other Inputs	71	71	71	73	78	87	101	116	124	128	129
Oxen/Machinery Hire	735	735	735	761	825	936	1,120	1,295	1,384	1,417	1,427
Sub-Total Purchased Inputs	1,722	1,722	1,722	1,789	1,973	2,303	2,863	3,447	3,821	3,993	4,043
Labor											
Family Labor	736	736	736	761	830	952	1,163	1,384	1,526	1,593	1,613
Sub-total Operating Costs	2,458	2,458	2,458	2,549	2,803	3,255	4,025	4,831	5,346	5,586	5,657
Sub-Total Production Cost	2,458	4,316	4,351	4,231	2,803	3,255	4,025	4,831	5,346	5,586	5,657
Other Investments											
Irrigation and Drainage Systems	-	1,889	2,694	3,592	3,556	2,746	2,746	2,190	-	-	-
WUAs Development and Support Services	-	93	75	75	30	30	30	30	-	-	-
Agribusiness and Agricultural Development Suppo	-	236	236	236	236	236	236	236	-	-	-
Management, O&M of I&D Systems	-	85	172	140	237	116	116	-	-	-	-
Sub-Total Other Costs	-	2,302	3,176	4,042	4,060	3,127	3,127	2,456	-	-	-
OUTFLOWS	2,458	6,618	7,527	8,273	6,862	6,382	7,153	7,287	5,346	5,586	5,657
Cash Flow	394	-3,765	-4,439	-4,786	-2,600	-1,128	-138	1,734	5,170	5,725	5,891
Net Economic Benefits	1,966	-2,194	-2,867	-3,214	-1,028	444	1,434	3,306	6,742	7,297	7,462

IRR = 13.5%, NPV = 1,937.12

Annex 12: Map of Project Areas
Transforming Irrigation Maintenance in Nigeria (TRIMING) Project