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Project Information Document (PID)

Appraisal Stage | Date Prepared/Updated: 28-Jul-2024 | Report No: PIDIA00476

Public Disclosure Authorized

BASIC INFORMATION

A. Basic Project Data

Project Beneficiary(ies)	Region	Operation ID	Operation Name
Nigeria	WESTERN AND CENTRAL AFRICA	P179684	Sustainable Power and Irrigation for Nigeria Project
Financing Instrument	**Estimated Appraisal Date**	**Estimated Approval Date**	**Practice Area (Lead)**
Investment Project Financing (IPF)	25-Jul-2024	26-Sept-2024	Water
Borrower(s)	**Implementing Agency**		
FEDERAL GOVERNMENT OF NIGERIA	Federal Ministry of Water Resources and Sanitation		

Proposed Development Objective(s)

The Project Development Objective is to strengthen dam safety and improve management of water resources for hydropower and irrigation in selected areas of Nigeria.

Components

Institutional strengthening and capacity building for Water Resources Management
Irrigation Modernization
Improvements in dam operations and enhancing dam safety
Project Management

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)?	Yes
Is this project Private Capital Enabling (PCE)?	Yes

SUMMARY

Total Operation Cost	**500.00**
Total Financing	**500.00**
of which IBRD/IDA	**500.00**
Financing Gap	**0.00**

DETAILS

World Bank Group Financing

International Development Association (IDA)	500.00
IDA Credit	500.00

Environmental And Social Risk Classification

High

Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

B. Introduction and Context

Country Context

1. **Nigeria, Africa's most populous country, possesses substantial untapped economic potential.** As a diverse federation of 36 autonomous states and the continent's largest country with a population exceeding 218 million, it boasts the fourth largest economy in Africa, reaching a gross domestic product (GDP) of approximately US$253 billion in 2024. Fueled by abundant natural resources, a youthful and entrepreneurial populace, and a vibrant private sector, Nigeria has the capacity to become a prominent player on the global stage. However, despite these prospects, the country faces significant challenges, with over 40 percent of its population living in poverty. Moreover, Nigeria houses the world's second-largest number of people living in extreme poverty and ranks 163 out of 191 countries on the most recent Human Development Index (HDI) report, highlighting its status as one of the least developed nations globally.

2. **The Nigerian economy recovered modestly from the COVID-19 pandemic in 2021, but the momentum faded throughout 2022 and into 2023.** GDP growth rate nearly halved from an average of 7.7 percent in 2000–2009 to 3.6 percent in 2010–2019 on the back of weaker economic fundamentals and lower oil prices. In 2020, the impacts of COVID-19 and the associated global oil price shock were severe, with output contracting by 1.8 percent (–4.4 percent in per capita terms). While growth rebounded to 3.6 percent in 2021, the recovery lost momentum with growth slowing to 3.3 percent in 2022 and further to 3.1 percent in Q3 2023. The most recent deceleration was driven by weak oil production and a disruptive currency demonetization policy that took effect in Q1 2023 adversely affecting the non-oil industrial and service sectors.

3. **Recognizing the need to change course, a new administration since May 2023 has undertaken bold reforms to restore the economic fundamentals for inclusive growth.** The Nigerian Government eliminated an increasingly costly, opaque, and regressive gasoline subsidy that amounted to 2.2 percent of GDP in 2022; unified multiple foreign exchange (FX) windows that distorted relative prices; partly liberalized the exchange rate to better reflect market conditions; and lifted the restriction on purchasing FX at the official market to import 936 product lines. The Central Bank of Nigeria has also restarted issuing securities in open market operations and lifted the cap for commercial banks to deposit funds at the Central Bank. The reduction of excess domestic liquidity and changes toward a more conventional, rates-based monetary policy has led to a rise in domestic market interest rates. Recognizing the short-term adjustment costs of these reforms—particularly through rising inflation—the Government has also rolled out temporary, targeted cash transfers of NGN 25,000 per month, directly benefiting over 60 million people for three months.

4. **Nigeria is considered a fragile and conflict affected, with most of its regions experiencing violence and disturbance.** Currently, the six geopolitical regions of Nigeria face various issues, including political instability, civil unrest, identity conflicts, resource-based disputes, and terrorism. The North-East faces insurgency and terrorism, primarily driven by Boko Haram and the Islamic State's West Africa Province (ISWAP), resulting in the displacement of over 2 million people. The North-Central and North-West regions are plagued by banditry, identity clashes, and communal conflicts, as well as herder-farmer disputes over land and cattle.

5. **Nigeria's vulnerability to climate shocks has increased due to a combination of political, geographic, and social factors and, specifically, the recent spike in insecurity in the country.** Nigeria is highly prone to river, urban, coastal floodings; water scarcity; extreme heat; and wildfires. Nigeria ranks among the top 10 countries most susceptible to the detrimental effects of climate change and natural disasters.[1] Projected climate change impacts include increased average temperature and changes in precipitation patterns, leading to more frequent floods and droughts. These climate-related risks can have severe implications on livelihoods and result in increased food insecurity, famine, population displacement, conflicts, and biodiversity loss. Climate inaction could cost Nigeria between 6 and 30 percent of GDP by 2050, equivalent to a loss of US$100–460 billion.[2]

Sectoral and Institutional Context

6. Nigeria faces water security challenges, which impact water availability for drinking water, energy and food production, and are increasingly exacerbated by climate change, putting livelihoods and economic development at risk.

7. **Harnessing water storage and dam safety is central to climate change adaptation and mitigation in Nigeria. It is a prerequisite to improving water management for water supply, irrigation, and hydropower generation and offer protection from floods and droughts.** Nigeria has over 400 dams and an estimated total combined storage of 59 billion cubic meter (BCM). 46% of dams are federally-owned and are managed by the Federal Ministry of Water Resources and Sanitation (FMWRS), through River Basin Development Authorities (RBDAs). 48% of dams are state-owned and are managed by a state ministry[3]. Many dams are incomplete and more than 50 percent of the large dams which were built in the 1970s and 80s require rehabilitation. This situation is due in part to institutions responsible for dam management, whether at federal or state level, having inadequate budget, human resources and capacity to ensure dam management, operation and maintenance (MOM) and non-adherence to operational manuals, where they exist. As a result, structures

[1] Climate Scorecard 2019. https://www.climatescorecard.org/2018/11/nigeria-listed-as-one-of-the-10-most-climate-vulnerable-countries/.
[2] World Bank Group. 2020. *Country Partnership Framework for the Federal Republic of Nigeria for the Period FY21–FY25*. November 16, 2020. *https://openknowledge.worldbank.org/handle/10986/35098*.
[3] Dams in Nigeria, Federal Ministry of Water Resources, 2020.

and equipment in several instances broke down or functioned below the installed capacity, limiting dams' potential to mitigate extreme weather events. In 2022, the country faced [4]The World Bank GRADE analysis of the 2022 floods estimated the total direct economic damage to be in around US$6.7 billion, equivalent to 1.6 percent of the estimated 2021 GDP. Combining addressing the root causes of poor dam O&M and the rehabilitation and retrofitting of existing dams would offer substantial opportunities to promote and entrench integrated storage management and sustain the provision of productive and climate-resilient water services including mitigating water[5]related natural disasters including flooding events.

8. **Agriculture remains a key in Nigeria's economy, contributing an estimated 25.58 percent[6] of its GDP and employing over 36 percent of the workforce. However, due to its heavy reliance on rain-fed agriculture, food production is highly vulnerable to climate change and population growth.** Nigeria is endowed with 70.8 million ha of agricultural land area, broken down into eight agro-ecological zones capable of growing a variety of crops such as cassava, palm oil, cocoa, maize, yam, cowpea, groundnut, beans, potatoes, and rice. Most agricultural areas are rain-fed and therefore exposed to water scarcity, which constrains agricultural production in many areas. Nigeria has a tropical climate, with historically longer rainy season in the south, receiving over 2,000 mm annual precipitation, and shorter rainy season in the north, with annual precipitation of below 1,000 mm. Despite having an estimated 375 BCM of surface water and 156 BCM per year of groundwater potential, water is unevenly distributed, and availability per capita is expected to decline. The yield of food-related crops has lagged population growth, leading to declining food self-sufficiency. This situation is worsened by a decline in seasonal water availability due to climate change. For this reason, agriculture production is increasingly dependent on the supplement water that irrigation provides. Otherwise, the overall crop production will not grow in par with the anticipated population growth to maintain food security at its current level. About 26.5 million Nigerians are projected to be food insecure in 2024[7]. The situation is expected to worsen with the population projected to reach 400 million by 2050[8].

9. **Increase in food production is a must in Nigeria and can be achieved through improving the performance and management of existing irrigation and/or expansion of irrigation service area.** Nigeria has set national target of 500,000 ha of irrigated area by 2030 with the objective of being able to feed the growing population. The country relies largely on Federal and State Governments to continue developing large-scale irrigation development, which it sees as the fastest way to reach that target. Presently, out of the 350,000 ha equipped for irrigation, 260,000 ha are large-scale irrigation systems, the majority of which are owned by federal or state governments. The balance 90,000 ha are small-scale irrigation. The institution responsible for MOM of federal- or state-owned dams is also managing downstream irrigation schemes, which are both undergoing their MOM limitations. The National Irrigation Development Program (NIDP), launched by the Federal Government in 2016 and supported by the World Bank-financed Transforming Irrigation Management in Nigeria (TRIMING) Project (P123112, 2014–2025, US$500 million), is part of Nigeria's recent efforts to reform the irrigation sector and improve its governance. The TRIMING Project, which was designed as a pilot under the NIDP, pioneered transformational management initiatives consisting in introducing, training and empowering Water User Associations (WUAs) as a new model for the MOM of secondary and tertiary irrigation canals in selected Federally-owned schemes, which were until then the responsibility of the RBDAs. However, RBDAs remain in charge of managing the primary irrigation canals. TRIMING successfully tested the MOM by WUAs as part of the rehabilitation of about 32,000 ha of large-scale irrigation. It led to improved production and positive impacts on the livelihood of farmers. However, more

[4] GRADE = Global Rapid Post-Disaster Damage Estimation.
[5] In 2012 and 2022, devastating floods threatened lives, infrastructure, and livelihoods of people.
[6] Nigeria Bureau of Statistics, May 2023.

[7] *Cadre Harmonisé analysis* 2023a.
[8] The Lancet Nigeria Commission 2022.

work is needed to further increase overall financial sustainability in the schemes. The SPIN project builds on the achievements, proof of concept and early lessons of the TRIMING project which it seeks to scale up in other Federally-owned schemes as well as in State-owned schemes nationwide. To do so, the SPIN project will focus on: (a) strengthening the cooperation and partnership between the Federal and state governments for dams and irrigation schemes MOM; and (b) promoting the establishment of WUAs in all Federal- and state-owned irrigation schemes, possibly through amendments of the RBDA Act and/or state legislation.

10. **Out of 36 states, 31 expressed interest in cooperating on irrigation development and management with the Federal Government within the SPIN Project.** Reaching the NIDP target of 500,000 ha irrigation by 2030 will require enhanced cooperation between the Federal Government and all states. Irrigation development and management have historically been divided between Federal-owned (38.7%), state-owned schemes (42.1%), and small-scale schemes with other ownership arrangements (13.3%), with no financial or technical cooperation between the parties. In February 2024, the FMWRS invited the 36 state governments and the Federal Capital Territory to present its ambition to scale up and promote WUAs as a management model and the Commitment, Integrity and Capacity related criteria to be supported, and asked States to express interest in participating in this effort under the SPIN Project. 31 states expressed their interest. Stakeholders' engagement workshops were organized for each of the six geopolitical zones of Nigeria to explain in further details what is expected of participating States, including explaining the selection criteria for states, identify an initial list of possible investments and the timeframe for next steps.

11. **Nigeria currently lacks an estimated 2,000 MW of capacity to cover current demand with acceptable reliability. Hydropower development can play a significant role and can support economic growth and climate change mitigation.** 60 percent of Nigerian population had access to electricity in 2021, excluding 85 million.[9] The national average annual per capita electricity consumption is 147 kWh, which is one-fifth of the average low-middle-income country consumption. Demand is projected to grow at 7–8 percent per year in the medium term. The total exploitable hydropower potential in Nigeria is estimated at 14,120 MW, of which 85 percent is yet to be developed. Currently, hydropower contributes up to 20 percent of Nigeria's energy mix and its development would play a big role in the energy access and transition. As thermal plants in the country face gas supply shortages, Nigeria seeks to increase hydropower in its energy mix, along with variable renewable energy technologies such as solar and wind, to lower energy prices and replace or complement thermal plants as a baseload power source. Hydropower is therefore a promising part of the country's energy transition journey.

12. The currently compartmentalized efforts to increase food production through enhanced irrigation coverage and energy generation through hydropower make the attempts of the Government more disjointed highlighting the need for synergistic and holistic management of water resources. This would require cross-sectoral convergence and inter-institutional collaboration to achieve a water-energy food nexus.

13. **Relevant policy, institutional and regulatory frameworks exist in Nigeria for the governance of water resources, but it needs strengthening.** The 2004 Water Resources Act (the Water Act) is the overarching law governing water resources in Nigeria. It vests in the FMWRS, at the Federal Government level, the responsibility to use and control both surface and groundwater in any water course affecting more than one state.[10] The Water Act confers to the Federal minister extensive decision-making powers, which it exercises through 12 RBDAs and other parastatal institutions. The Integrated Water Resources Management (IWRM) Commission, which has the mandate for water resources regulation, currently exists based on a ministerial directive at the Federal level but it is not enacted by the Parliament. A

[9] *https://trackingsdg7.esmap.org/;* 11 percent of the urban and 74 percent of the rural have no electricity access, and 69 percent of those having no access to electricity belong to the lowest income segment of the population.
[10] Other Federal legislations include the NWRI Act; River Basins Development Authorities Act, 1987; and Nigeria Hydrological Services Agency (Establishment) Act, 2010.

comprehensive National Water Resource Bill, combining the Water Act, the RBDA Act, Nigeria Hydrological Services, and the National Water Resources Institute (NWRI), was presented to the Parliament in 2017 but has not been adopted. For dam safety, the National Environmental (Dams and Reservoirs) Regulations, 2014, establishes the National Environmental Standards and Regulations Enforcement Agency (NESREA) as the regulator to control the effects of dams and reservoirs on the environment and human health. However, the dam safety regulations need to be strengthened to increase focus on MOM, with complementary technical guidelines and protocols.

14. **Water resources and water infrastructure management in Nigeria is governed by the FMWRS and other parastatal entities.** The FMWRS is organized into several technical and non-technical departments including the Department of Dams and Reservoir Operations (DDRO), River Basin Operation and Inspectorate, and Department of Irrigation and Drainage (DID). The 12 RBDAs directly report to the FMWRS. Their role includes the provision of bulk water supply as well as extension and other support services to farmers in irrigation schemes. At the state level, Departments for Water Resources and/or Agriculture and State Water Agencies are responsible for sector management. In addition, there are state-owned dams being utilized for water supply, hydropower generation, and public irrigation. Some of the states[11] have enacted a legislation to establish irrigation development authorities to identify, plan, design, and construct irrigation schemes including regulation, supervision, operation, and maintenance of irrigation infrastructure for optimal performance and water efficiency. All the states acquired considerable experience by implementing a series of National Fadama Development Projects (1992–2019) in institutionalizing a bottom-up approach involving community-driven development and farmer-led irrigation development.

15. **The Federal Government of Nigeria (FGN), through the development of a Hydropower Master Plan (HMP), can increase collaboration between the FMWRS and FMP and attract private investments and partnerships.** The governance and oversight responsibilities for water resources development and hydropower generation are split between the FMWRS and Federal Ministry of Power (FMP). Past studies such as the 2013 National Water Resources Master Plan, 2019 Master Plan Study on National Power System Development, and 2016 Nigeria hydropower site screening do not reflect IWRM to optimize both energy and water. Nigeria would benefit in building on these to update its National Power System Development Plan and prepare a dedicated HMP, which could help: (a) crowd in private financing to modernize deteriorating hydropower systems, including through Public-Private Partnership (PPP) models; (b) identify and prioritize greenfield and brownfield hydropower investments across the country; and (c) improve coordination among the key stakeholders, including the FMWRS and FMP.

C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

The Project Development Objective is to strengthen dam safety and improve management of water resources for hydropower and irrigation in selected areas of Nigeria.

Key Results

(a) Share of Federal and State irrigation schemes under the Project managed by a functioning WUA (a functioning WUA is defined as legally established, staffed, funded and operating irrigation services)

[11] Katsina State, for example.

(b) Area provided with new/improved irrigation or drainage services (Hectare)

(c) Number of beneficiaries with enhanced resilience to climate risks (Corporate results indicator) defined as people protected from floods and droughts through enhanced dam safety and operations, and people benefitting from new/improved irrigation or drainage services

(d) Hydropower master plan prepared and structure a PPP transaction for a hydropower project jointly by FMWRS and FMP (Yes/No).

D. Project Description

16. **SPIN is structured as an Investment Project Financing (IPF). It includes two Performance-Based Conditions (PBCs) to incentivize the crafting of enabling policies and building of long-term capacity.** The Project has four components.

Component 1: Institutional strengthening and capacity building for Water Resources Management (US$30 million)

17. **This component supports institutions at Federal, state, and river basin levels, and collaboration among irrigation, dam safety, and hydropower stakeholders to promote IWRM and help achieve the food, water, and energy nexus in Nigeria.** The component will institutionalize and scale up the implementation structure, processes, and design standards successfully piloted by the TRIMING project while integrating lessons learned. It will, inter alia, bundle irrigation rehabilitation and dam safety of related dam, introduce criteria-based funding allocation and used to prioritize investments in bundled irrigation and dam safety under the Project, promote and institutionalize collaborative water resources management and will strengthen integrated hydropower planning. The component will support three institutional reforms: (a) the FMWRS will develop and adopt national dam safety guidelines and protocols, which will be implemented in all SPIN target dams; (b) Water laws will be developed or updated to legally recognize WUAs in all SPIN participating States; (c) FMWRS and FMP will jointly develop the HMP and prepare at least one priority hydropower project. This component is structured in three subcomponents, as presented below.

Subcomponent 1.1: Institutional Strengthening and Capacity Building for WRM and Hydropower planning at Federal Level (US$24 million)

Activity 1.1.1: Strengthening of dam safety institutional structure, including development and adoption of improved dam safety technical guidelines and manuals (US$4 million)

18. **This Activity will strengthen the capacity and improve the management framework for dam owners, operators, and agencies overseeing dam safety to help address dam safety risks** by: (a) setting up a digital dam asset management system, (b) strengthening the dam safety institutional structure and developing improved national dam safety technical guidelines and manuals to complement NESREA's checklist, and (c) institutionalizing capacity assessment and delivering capacity building for the personnel involved in dam safety, owners, operators, and dam safety organizations at the Federal, RBDA, and dam levels. The Activity will help the FMWRS deploy multi-disciplinary specialists, purchase necessary equipment to perform dam safety mandates both at the Federal and RBDA level, consistent with the legislation for dam safety requirements.

19. **The development and adoption of national dam safety technical guidelines and manuals by the FMWRS is designed as a PBC**. The allocation of US$50 million out of the US$100 million allocation for dam safety investments under Component 3 is linked to the achievement of the PBC. This will incentivize that technical guidelines and manuals are developed, adopted and applied to the rehabilitation of large dams under SPIN.

Activity 1.1.2: Capacity Building of and Support to Federal Institutions and Agencies on Water Resources and Irrigation Management (US$4 million)

20. **This Activity will establish and operationalize a new framework for the co-management of federal irrigation and drainage schemes with the state governments and WUAs.** This activity sets the basis for the sustainability of the irrigation investments under Component 2. Currently, Federal schemes are developed, managed, operated, and maintained entirely by RBDAs[12], and similarly state schemes are managed by state agencies. The new framework will empower the WUAs (to be established through Subcomponent 2.1) with MOM responsibility of secondary and tertiary irrigation canals. The MOM responsibility of primary canals will remain with Federal and state governments owning the schemes. This framework requires a new collaboration between Federal and state levels and with WUAs. The states enact legislation to establish WUAs for both Federal and state schemes located in the State, as was piloted under TRIMING in Katsina and Gombe states. This framework also requires new partnerships between RBDAs and WUAs to optimize the use of irrigation infrastructure and ensure the sustainability of irrigation schemes.

21. **This Activity will also implement capacity building of federal agencies on irrigation modernization, water accounting and irrigation monitoring system,[13] and a nationwide review of the status of irrigation schemes.** Improved water monitoring and management systems support climate change adaptation by mitigating the impacts on agriculture and farmers' livelihoods of precipitation variability and water extremes, exacerbated by climate change.

Activity 1.1.3: Capacity Building of and Support to Federal Institutions and Agencies in Hydropower Development (US$16 million)

22. **This activity will support convergence between the FMP and FMWRS through a joint HMP and feasibility study for at least one prioritized project and ensure alignment with the water resources masterplan**. In particular, this activity will (a) prepare an HMP and climate-smart hydropower investment planning, (b) explore PPP options and preparing at least one large transformative hydropower project, and (c) build the capacity of and support Federal institutions in developing studies, strategies, and plans for improving hydropower planning and management. The activities contribute to both climate change adaptation (through improved inter-sectoral planning of water storage and management) and mitigation (through renewable energy).

23. **A PBC is linked to the adoption of the hydropower masterplan by the Federal Steering Committee (FSC) and the preparation of one priority hydropower project ready for PPP.** The eligibility of US$10 million out of US$16 million of this subcomponent will be dependent on achievement of these objectives (detailed in the Results Framework and annex 4).

Subcomponent 1.2: Institutional strengthening and national knowledge exchange on water resources management at state level (US$1 million)

24. **This subcomponent will support the participating states to develop and adopt legislation to establish WUAs for participatory irrigation management at the scheme level**. There are currently only two states[14] with legislation in place supporting the WUAs. To incentivize the states to adopt such provisions, the adoption of a legislation for WUAs and the provision of a dedicated state budget line to finance irrigation MOM through WUAs are the two eligibility criteria for a state to get financial support for irrigation rehabilitation under Component 2. To support this process, this subcomponent will: (a) provide technical support in the formulation of legislation to establish WUAs, based on experience from other countries, through development of models and organization of national workshops; and (b) establish a knowledge exchange and peer-to-peer learning platform between states on irrigation, the role of water infrastructure in climate change adaptation and disaster risk reduction and WRM.

25. **The transfer of appropriate level of MOM of irrigation schemes from RBDA to WUAs is necessary to address the build, neglect, and rebuild cycle irrigation development is facing in Nigeria.** Over time, RBDAs lost both adequate

[12] Except schemes under the TRIMING Project were WUAs have been established.
[13] In coordination with the Water Security and Governance Dialogue ASA (P178444).
[14] Gombe State and Katsina State.

budgetary provisions and human resources for irrigation MOM, leading to a growing number of schemes becoming dysfunctional. Federal subventions are not sufficient and user contributions are almost non-existent. TRIMING addressed this by introducing service agreements, whereby, in return for improved service, users pay a cost-reflective contribution called Irrigation service fee (ISF) and organize themselves in WUAs to take up MOM of secondary and tertiary irrigation canals. The SPIN project builds on early lessons from TRIMING.

Subcomponent 1.3: Improving WRM at river basin level (US$5 million)

26. **The SPIN Project will support RBDAs and state actors in refocusing their efforts on IWRM and resource planning at river basin level and in enabling partnerships with WUAs for MOM of irrigation and drainage facilities.** This subcomponent will: (a) improve MOM of water resources' infrastructural assets; (b) strengthen hydrological monitoring, water allocation and WRM at the basin level through installation of modern tools for management of reservoirs; (c) strengthen capacity for bulk water supply planning and irrigation scheduling at the scheme level to ensure farmers receive water when needed; and (d) enhance cost recovery for MOM of assets through supply of bulk water for various socioeconomic sectors, in particular irrigation schemes. While Subcomponent 1.2 supports State Water Legislations, the SPIN will also facilitate the revision of the RBDA Act to introduce legal recognition of WUAs and cooperation on WRM among states sharing a River basin.

27. **To support such a decentralized management model, a Field-Level Leadership (FLL) program will be established by the Federal Government to support RBDAs, state governments, and WUAs**, for performance improvements. The FLL will include a leadership program for women focused on enhancing women's technical and leadership skills in irrigation management, and preparing women for managerial roles, enabling them to make decisions that impact women farmers.

28. **The implementation of activities in support of RBDAs will be in close collaboration with the Department of River Basin Operations and Inspectorate of the FMWRS.** A technical working group will be established within the Department of River Basin Operations and Inspectorate, involving technical persons from RBDAs to support centralized activities. RBDAs will increase stakeholder participation in planning and complaint redress.

Component 2: Irrigation Modernization (US$350 million)

29. Component 2 will support the rehabilitation and revitalization of 40,000 ha of irrigated command area, through a comprehensive modernization program combining improving irrigation and drainage infrastructure while implementing the institutional reforms presented in Component 1. While potential investments sites were pre-identified across all geopolitical zones, the Federal and state schemes[15] which will be supported by the SPIN Project will be determined based on technical and implementation readiness criteria agreed with the FMWRS. Component 2 is structured in three subcomponents.

Subcomponent 2.1: Mobilization and Development of Water User Associations (WUAs) (US$20 million)

30. **This Subcomponent will support the creation of WUAs in all irrigation schemes under the project and will provide capacity building.** Building on the achievements of the TRIMING project, it will focus on organizing farmers sharing tertiary irrigation and drainage canals in Water User Groups (WUGs), which will constitute building blocks for establishing WUAs to manage secondary and tertiary irrigation canals. One of the key lessons emerging from the TRIMING Project is the need for WUAs to be strengthened as inclusive, self-managed, and accountable institutions of farmers. The subcomponent will build the capacity of WUAs to undertake their primary responsibilities: maintaining the secondary- and field-level water conveyance system, facilitating crop planning, estimating water requirements, ensuring equitable and sustainable irrigation scheduling and delivering irrigation services to members, and fixing and collecting irrigation and drainage service fees from members to recover the MOM costs to help them sustainably manage the water conveyance

[15] Hereinafter, federal-financed schemes are referred as Model 1 and state-financed schemes are referred as Model 2

system. The WUA establishment and their capacity building on WRM will enable farmers to have direct responsibility on the MOM and improve their adaptive capacity to water variability and climate change impacts. Moreover, well maintained irrigation and drainage systems contribute to mitigating the effects of both floods and droughts. The implementation of Subcomponent 2.1 will be done by the Federal Project Management Unit (FPMU) in close collaboration with RBDAs and states. The coordination of activities and oversight will be taken up by the state governments. RBDAs will set up a dedicated WUA unit as part of the bulk water supply to provide facilitation support to WUAs and the states. The activities of this subcomponent are further detailed in annex 2.

Subcomponent 2.2: Irrigation and Drainage Infrastructure Investments (US$320 million)

31. **This Subcomponent will support rehabilitation and upgrading of water distribution and conveyance systems aimed at increasing the irrigation command area, strengthening resilience to climate hazards such as droughts (through delivery of stored water) and floods (through drainage), minimizing conveyance losses, and improving the reliability and timely delivery of irrigation and drainage services.** This activity will finance: (a) studies and/or design reviews of irrigation schemes; (b) based on approved technical design, preparation of relevant Environmental and Social Framework (ESF) instruments, including, ESIAs, Environmental and Social Management Plans (ESMPs), and Resettlement Action Plans (RAPs) as required, and monitor their implementation; (c) rehabilitation of irrigation and drainage civil works; (d) associated engineering supervision; and (e) installation of critical canal monitoring system. Water resources for majority of schemes to be rehabilitated would be supplied by existing dams. Rehabilitation of these existing dams are covered under Component 3.

Subcomponent 2.3: Irrigation Management Modernization (US$10 million)

32. **The aim of the subcomponent is to operationalize management tools, information and communication technology equipment, and management information systems to make the irrigation infrastructure deliver reliable, accountable, and sustainable irrigation and drainage services.** This subcomponent will: (a) develop a Comprehensive Irrigation Management System to track the condition of canal assets for optimizing maintenance and investment planning; (b) establishing water accounting systems, incorporating enhanced use of climate-related data to monitor water availability, formulation of service delivery standards, and establishment of service regulations; and (c) establishing benchmarking systems of service delivery and performance assessment of the participating irrigation systems. Such activities pertain to basin/sub-basin planning, water accounting and data-driven allocation decisions across multiple uses and multiple schemes. These activities will be implemented in parallel and in correspondence with the construction works (rehabilitation or expansion) financed under the Subcomponent 2.2 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 procured ICT equipment will be aligned with the international standards on energy efficiency.

33. **This subcomponent will also promote climate-resilient water management strategies and change irrigation management strategies to reduce climate vulnerabilities (for example, irrigation schedules) and improve water and energy efficiency of the rehabilitated systems.** The energy efficiency of the irrigation schemes will be ensured by maximizing the use of gravity, and solar pumps when necessary. The resilience of the communities to water-related disasters such as drought and flood will be also strengthened through the operationalization of the irrigation monitoring systems. Moreover, the irrigation management modernization will improve the quality of service provided by the operator. Key performance indicators will be defined among RBDAs and WUAs on the performance satisfaction of service provided against water delivery plan.

Component 3: Improvements in dam operations and enhancing dam safety (US$100 million)

34. **This component will strengthen the dam safety management system in the country and will rehabilitate and improve the safety of prioritized dams and associated appurtenances**. The project will not finance the construction of any new dam. Planned activities are neither intended to alter the original schemes, change their nature, nor expand dam

extents to make them appear as new or different schemes. Priority will be given to select dams that provide downstream irrigation services to the schemes which will be identified under Component 2. The safety of dams is key to climate adaptation by ensuring water delivery for water supply, hydropower, ecosystem conservation and irrigation to mitigate droughts, protecting against dam break flooding, and storing excess water to mitigate floods following high precipitation.

35. This component will: (a) conduct a Dam Safety Portfolio Risk Assessment Exercise including establishing and implementing a risk indexing screening method for dams in Nigeria and selecting dams for rehabilitation works; (b) prepare an Emergency Action Plan (EAP), an O&M manual, including operational protocols, dam health monitoring and reporting protocols, and an instrumentation plan for dam safety. The EAP will include safety protocols that address safety concerns specific to women and persons with disabilities; (c) perform rehabilitation works including measures for seepage reduction, hydrological and structural safety measures, strengthening main dam body and foundation, and improving basic dam facilities and dam safety instruments; (d) prepare and implementing sediment management plans, through bathymetric surveys and feasibility studies, piloting of institutional models, and plans for treatment of upstream drainage catchments with construction of sediment-retaining check-dams and river bank protection structures; and (e) apply nature-based solutions to dam/reservoir operation and management. Details on the activities are in annex 3.

Component 4: Project Management (US$20 million)

36. **The main objective of this component is to effectively implement, monitor, and evaluate project activities.** It involves establishing the FPMU and Technical Units (TUs) at the Federal level and State Project Implementing Units for the state irrigation schemes to oversee and coordinate project implementation, as well as setting up a monitoring and evaluation (M&E) system. Component 4 will also support the establishment of the FSC and Technical Steering Committee for the project, with ministerial representations from the FMWRS, FMP, and other relevant agencies. An external M&E agency will be contracted to provide support on the assessment of project activities and their impact. The component includes financing for consultancies, trainings, materials, office equipment, and operating costs.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Area OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

37. **Environmental** and social (High). Environment and Social (E&S) impacts/risks from proposed project activities are anticipated on water resources and use, air quality, terrestrial ecology, biodiversity, natural resources, land use, human and socio-economic context, public and land resources from the disposal of muck and other wastes which will vary depending on the extent of rehabilitation activities proposed. Potential E&S risks include issues of occupational health and safety of workers, community health and safety issues, grievance as a result of poor implementation of the interventions and compensation (where it becomes relevant), and weak dam operation and maintenance and emergency preparedness and potential dam failure. Poor stakeholder engagements can also impact the project if stakeholders are not adequately consulted. Impacts on land and assets are likely in dams and irrigation areas. Also, considering the specialized nature of rehabilitation works, using skilled migrant labour could potentially lead to potential Sexual

exploitation and abuse/Sexual harassment (SEA/SH) risks, poor labour practices. Security risks level is equally high, since the project is implemented in areas of conflict and volatile settings, which was also an issue for the TRIMING Project. The Borrower will prepare Environmental and Social Assessments (ESAs) such as Environmental and Social Management Framework, Resettlement Policy Framework, Labor Management Procedure and Environmental and Social Commitment Plan before completion of Appraisal. Other sub-project ESAs such as Environmental and Social Impact Assessments (ESIAs), Environmental and Social Management Plans (ESMPs) and Resettlement Action Plans and other specific instruments will be prepared during project implementation. Security Management Plans (SMPs) and Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) Action Plans will also be prepared. A dam safety panel of experts will be hired by client to assess the safety status of the dams and surrounding areas, status of dam operation and maintenance and emergency preparedness and provide recommendations for dam safety measures. Effective stakeholder engagement will also be supported, guided by a comprehensive Stakeholder Engagement Plan (SEP) to be developed during project preparation. The strategy will outline systems and processes to ensure that stakeholders and the public are active participants in all project design and implementation aspects.

E. Implementation

Institutional and Implementation Arrangements

38. **The FMWRS is the lead implementing ministry for the project, in collaboration with the FMP and participating state government.** Given the administrative structure, as defined by the constitution of Nigeria, the project will be executed through the Federal and state governments. The project implementation arrangements are to strengthen the roles, responsibilities, and accountabilities of the administrative structure of the country and aim in reforming the devolution and institutionalization of the water sector architecture. An inter-ministerial PSC will be set up with mandate of discussing overall project direction, and concurring project outputs for World Bank's no objection. The PSC will consist of the FMWRS, FMP, Federal Ministry of Finance (FMF), Federal Ministry of Agriculture and Food Security (FMAFS), Federal Ministry of Environment (FMEnv), Federal Ministry of Budget and Economic Planning (FMBEP), Office of the Vice-President (OVP), and commissioners of water resources and agriculture in participating states**.** The PSC will be mandated to meet at least once in six months and will be co-chaired on rotation basis for one year each by the Ministers of FMWRS and FMP. Establishment of the PSC and holding the first meeting will be an effectiveness condition for the project. The Federal Technical Committee (FTC) will provide overall technical guidance. The Federal Technical Committee will be chaired by the Permanent Secretary of the FMWRS and will include Directors of Irrigation and Drainage, Dams and Reservoir Operations (DRO), River Basin Operation of the FMWRS, Director of Renewable Energy of the FMP, relevant Directors from FMAFS and FMEnv, and Managing Directors from participating RBDAs.

39. **The FMWRS will set up a Federal Project Management Unit (FPMU) staffed with competent multi-disciplinary experts from both the FMWRS and FMP fully dedicated to managing the project.** The FPMU will be lean, with only responsibility for coordination, fiduciary, that is, procurement and financial management (FM), M&E, and environmental and social management. The technical arm of the FPMU will be handled by TUs hosted in the Departments of Irrigation and Drainage and DRO of the FMWRS and the Department of Renewable Energy of the FMP. The appointed experts from the ICRC and BPE will be part of the Hydropower TU in the Department of Renewable Energy of the FMP to support operationalization of the PPP action plan and other activities around private sector participation in hydropower development. The TUs will be responsible for preparing terms of reference for technical consultants, specifications, lead evaluations of technical proposals, and other technical documents required for the project's implementation.

CONTACT POINT

World Bank

Jun Matsumoto
Senior Water Resources Management Specialist

Pravin Karki
Senior Hydropower Specialist

Emmanuel Chinedu Umolu
Senior Water Resources Management Specialist

Borrower/Client/Recipient

FEDERAL GOVERNMENT OF NIGERIA
Stanley Nyeso George
Director IERD
nyekenso@gmail.com

Implementing Agencies

Federal Ministry of Water Resources and Sanitation
Esther Oluniyi
Director, Irrigation and Drainage Department
akinronk@gmail.com

FOR MORE INFORMATION CONTACT

The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 473-1000
Web: http://www.worldbank.org/projects

APPROVAL

Task Team Leader(s):	Jun Matsumoto, Pravin Karki, Emmanuel Chinedu Umolu

Approved By

Practice Manager/Manager:	Anna Cestari	25-Jun-2024

Country Director:	Ndiame Diop	28-Jul-2024