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Report No: PAD4483

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A
PROPOSED GRANT
IN THE AMOUNT OF SDR 87.8 MILLION
(US$125.0 MILLION EQUIVALENT)

ON A
PROPOSED CREDIT
IN THE AMOUNT OF EUR 105.7 MILLION
(US$125.0 MILLION EQUIVALENT)

AND ON A
PROPOSED CREDIT
IN THE AMOUNT OF EUR 126.8 MILLION
(US$150.0 MILLION EQUIVALENT)
FROM THE IDA SCALE-UP WINDOW

TO THE

THE REPUBLIC OF NIGER

FOR A

NIGER INTEGRATED WATER SECURITY PLATFORM PROJECT

September 8, 2021

Water Global Practice
Western and Central Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective August 31, 2021)

Currency Unit =	XOF - CFA Franc (West African Financial Community / *Communauté Financière de l'Afrique de l'Ouest*)
US$1 =	EUR 0.845
US$1 =	SDR 0.702

FISCAL YEAR
January 1 - December 31

Regional Vice President:	Ousmane Diagana
Country Director:	Clara Ana Coutinho de Sousa
Regional Director:	Simeon Kacou Ehui
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Task Team Leaders:	Taibou Adamou Maiga, Aude-Sophie Rodella

ABBREVIATIONS AND ACRONYMS

AFD	*Agence Française de Développement* (French Development Agency)
AfDB	African Development Bank
ARSeau	*Autorité de Régulation du Secteur de l'Eau* (Water Sector Regulation Authority)
ASA	Advisory Services and Analytics
AUE	*Association des Usagers de l'Eau* (Water User Association)
AUEI	*Association des Usagers de l'Eau pour l'Irrigation* (Irrigation Water User Association)
AWPB	Annual Work Plan and Budget
BADEA	Arab Bank for Economic Development in Africa
CAP	Community Action Program
CBA	Cost Benefit Analysis
CBO	Community-based Organization
CERC	Contingent Emergency Response Component
CLE	*Commission Locale de l'Eau* (Local Water Commission)
CLTS	Community-led Total Sanitation
COFOB	*Commission Foncière de Base* (Rural Land Commission)
COFOCOM	*Commission Foncière des Communes* (Municipal Land Commission)
COFODEB	*Commission Foncière Départementales* (Departmental Land Commission)
COVID-19	Coronavirus Disease
CPF	Country Partnership Framework
CSA	Climate-Smart Agriculture
DA	Designated Account
DGGR	*Direction Générale du Génie Rural* (General Directorate of Rural Engineering)
ESF	Environmental
EIB	European Investment Bank
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
ESIA	Environmental and Social Impact Assessment
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
FCV	Fragility, Conflict, and Violence
FIRR	Financial Internal Rate of Return
FM	Financial Management
FSRP	Western Africa Food Security Regional Program
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GEMS	Geo-Enabling Initiative for Monitoring and Supervision

GHG	Greenhouse Gas
GRM	Grievance Redress Mechanism
GoN	Government of Niger
GRID	Green, Resilient, and Inclusive Development
IBRD	International Bank for Reconstruction
IDA	International Development Association
IFC	International Finance Corporation
IFR	Interim Financial Report
INDC	Niger's Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IPF	Investment Project Financing
IsDB	Islamic Development Bank
IVA	Independent Verification Agent/Agency
IWRM	Integrated Water Resource Management
IWSP	Integrated Water Security Platform
LCBC	Lake Chad Basin Commission
LDN	Land Degradation Neutrality
LMP	Labor Management Procedures
M&E	Monitoring and Evaluation
MAG	*Ministère de l'Agriculture* (Ministry of Agriculture)
MDG	Millennium Development Goal
ME/LCD	*Ministère de l'Environnement et de la Lutte contre la Désertification* (Ministry of Environment and the Fight against Desertification)
MEL	*Ministère de l'Elevage* (Ministry of Livestock)
MF	*Ministère des Finances* (Ministry of Finance)
MHA	*Ministère de l'Hydraulique et de l'Assainissement* (Ministry of Water and Sanitation)
MP	*Ministère du Plan* (Ministry of Planning)
MPI	Multi-dimension Poverty Index
3N	Nigeriens Nourishing Nigeriens
NBA	Niger Basin Authority
NGO	Nongovernmental organization
O&M	Operations and Maintenance
ONAHA	*Office National des Aménagements Hydroagricoles* (National Office for Large Scale Irrigation)
PAD	Project Appraisal Document
PANGIRE	*Plan d'Action National de Gestion Intégrée des Ressources en Eau* (National Plan for the Integrated Management of Water Resources)
PBC	Performance-based Condition
PBR	Performance-based Result
PDC	*Plan de Développement Communal* (Communal Development Plan)
PDES	*Plan de Développement Economique et Social* (Economic and Social Development

	Plan)
PDO	Project Development Objective
PIM	Project Implementation Manual
PLEA	*Plan Local de l'Eau et l'Assainissement* (Local Water and Sanitation Plan)
PMU	Project Management Unit
PPP	Public-private Partnership
PPSD	Project Procurement Strategy for Development
PRAPS	*Projet Régional d'Appui au Pastoralisme au Sahel* (Regional Sahel Pastoralism Support Project)
PROLAC	*Projet de Relance et du Développement de la Région du Lac Tchad* (Lake Chad Region Recovery and Development Project)
PROSEHA	*Programme Sectoriel Eau Hygiène et Assainissement* (Water, Hygiene and Sanitation Sector Program)
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SAGE	*Schéma d'Aménagement et Gestion de l'Eau* (Water Development and Management Plan at commune level)
SCAP-RU	*Structures Communautaires d'Alerte Précoce et des Réponses aux Urgences* (Community Early Warning and Emergency Response System)
SCD	Systematic Country Diagnostic
SDAGE	*Schema Directeur d'Aménagement et de Gestion de l'Eau* (Master Plan for Water Development and Management at sub-basin level)
SDAP	Niger Basin Sustainable Development Action Plan
SDC	Swiss Agency for Development and Cooperation
SDR	Special Drawing Rights
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEEN	*Société d'Exploitation des Eaux du Niger* (Niger Water Exploitation Company)
SEP	Stakeholder Engagement Plan
SIIP	Sahel Irrigation Initiative Project
SISEAN	*Système d'Information intégré et de Suivi de l'Eau et Assainissement au Niger* (Integrated Water and Sanitation Monitoring and Information System in Niger)
SISNA	*Système Informatique de Suivi des Nappes Alluviales* (Alluvial Groundwater Monitoring Computer System)
SLM	Sustainable Landscape Management
SMP	Security Management Plan
SNDI/CER	*Stratégie Nationale de Développement de l'Irrigation et de Collecte des Eaux de Ruissellement* (National Strategy for the Development of Irrigation and Stormwater Harvesting)
SOE	Statement of Expenditure
SPC	Shadow Price of Carbon
SPEN	*Société de Patrimoine des Eau du Niger* (Niger Water Asset Holding Company)
SPIN	*Stratégie de la Petite Irrigation au Niger* (Small-Scale Irrigation Strategy)
SSA	Sub-Saharan Africa

STEP	Systematic Tracking of Exchanges in Procurement
ToR	Terms of Reference
UN	United Nations
UWSP	Urban Water and Sanitation Project
WASH	Water, Sanitation and Hygiene
WBG	World Bank Group
WDI	World Development Indicators
WRM	Water Resource Management
WSP	Water Sanitation Program
WSS	Water Supply and Sanitation

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Niger	Niger Integrated Water Security Platform Project (Niger-IWSP Project)	
Project ID	**Financing Instrument**	**Environmental and Social Risk Classification**
P174414	Investment Project Financing	Substantial

Financing & Implementation Modalities

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

Expected Approval Date	Expected Closing Date
30-Sep-2021	29-Dec-2028

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The project development objectives are to strengthen the management of water resources, increase access to water services and improve the resilience to climate-induced water variability in select areas of Niger.

Components

Component Name	Cost (US$, millions)
Component 1: Integrated Investments for Water Security	125.92
Component 2: Expansion of Integrated Water Services	249.08
Component 3: Project Management and Capacity Building	25.00
Component 4: Contingent Emergency Response Component - CERC	0.00

Organizations

Borrower:	Republic of Niger
Implementing Agency:	Ministère de l'Hydraulique et de l'Assainissement (Ministry of Water and Sanitation) Ministère de l'Environnement et de la Lutte contre la Désertification (Ministry of Environment and Ministère de l'Agriculture (Ministry of Agriculture) Prime Minister Cabinet Ministère de l'Elevage (Ministry of Livestock) Société de Patrimoine des Eau du Niger (Niger Water Asset Holding Company)

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

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

DETAILS

World Bank Group Financing

International Development Association (IDA)	400.00
IDA Credit	275.00
IDA Grant	125.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Niger	275.00	125.00	0.00	400.00
National PBA	125.00	125.00	0.00	250.00
Scale-up Facility (SUF)	150.00	0.00	0.00	150.00
Total	**275.00**	**125.00**	**0.00**	**400.00**

Expected Disbursements (in US$, Millions)

WB Fiscal Year	2022	2023	2024	2025	2026	2027	2028	2029
Annual	3.21	20.84	33.59	61.15	82.16	81.83	105.84	11.39
Cumulative	3.21	24.05	57.63	118.78	200.94	282.77	388.61	400.00

INSTITUTIONAL DATA

Practice Area (Lead)

Water

Contributing Practice Areas

Agriculture and Food, Environment, Natural Resources & the Blue Economy

Climate Change and Disaster Screening

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

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	Moderate
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial

6. Fiduciary	Substantial
7. Environment and Social	Substantial
8. Stakeholders	Moderate
9. Other	Substantial
10. Overall	Substantial

COMPLIANCE

Policy

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

[ ] Yes [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes [✓] No

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

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

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

Legal Covenants

Sections and Description

Schedule 2, Section I, A, ,1 (a): No later than thirty days from the Effectiveness Date the Recipient shall establish, and thereafter maintain, throughout the Project implementation period, with composition, mandate and resources satisfactory to the Association, a steering committee, to be chaired by a representative of the Prime Minister and to be composed of the Recipient's key ministries and stakeholders ("Steering Committee").

Sections and Description

Schedule 2, Section I, A, 2 (i): The PMU shall include, with qualifications, experience and terms of reference acceptable to the Association, inter alia (1) by no later than the Effective Date: a Project national coordinator, a financial management specialist, a procurement specialist, an accountant, an environmental safeguard specialist, a social safeguard, gender and social inclusion specialist, a monitoring and evaluation specialist, and (2) by no later than 90 days from the Effective Date: an internal auditor, a communications specialist, a monitoring and evaluation assistant, an assistant accountant, a sanitation and hygiene specialist, a water expert, an environmental expert, a

rural engineer, and an agro-economist.

Sections and Description
Schedule 2, Section I, A, 3: No later than 90 days from the Effective Date, the Recipient shall hire and thereafter maintain in form and manner, and under terms of reference satisfactory to the Association, a Procurement Agent, to assist the PMU in the carrying out of selected procurement activities pursuant to the PIM, the Procurement Plan, and to the Procurement Regulations.

Sections and Description
Schedule 2, Section I, A, 4 (a): The Recipient shall not later than one (1) month after the Effective Date, install and thereafter maintain throughout the Project implementation period, an accounting software for the Project acceptable to the Association.

Sections and Description
Schedule 2, Section I, A, 4 (b): The Recipient shall, not later than six (6) months after the Effective Date, recruit, and thereafter maintain throughout the Project implementation period, an external auditor for the Project with experience, qualifications and on terms of reference acceptable to the Association.

Sections and Description
Schedule 2, Section I, A, 4 (c): The Recipient shall, not later than six (6) months after the Effective Date: (i) recruit, and thereafter maintain throughout the Project implementation period, regional accountants for the Project with experience, qualifications and on terms of reference acceptable to the Association; and (ii) deploy the accounting software installed under Section I.A.4.(a) to all regions under the Project.

Sections and Description
Per ESCP, the GRM shall be prepared and made operational not later than three (3) months after the Effective Date and shall thereafter be complied with throughout the implementation of the project.

Sections and Description
Per ESCP, communication plan shall be available six (6) months after the project effectiveness.

Conditions

Type	Financing source	Description
Effectiveness	IBRD/IDA	Article V, 5.01(a): (a) The Project Management Unit (“PMU”) has been established, including its regional offices, in accordance with the provisions of Section I. A.2 of Schedule 2 to this Agreement.
Type	Financing source	Description
Effectiveness	IBRD/IDA	Article V, 5.01(b): The Subsidiary Agreement has been executed on behalf of the Recipient and the Project Implementing Entity in accordance with Section I.F of Schedule 2 to this Agreement and is in force and effect.

Type	Financing source	Description
Effectiveness	IBRD/IDA	Article V, 5.01(c): The Project Implementation Manual ("PIM") has been prepared and adopted in accordance with Section I.B.1 of Schedule 2 to this Agreement.
Type	Financing source	Description
Effectiveness	IBRD/IDA	Article V, 5.01(d): (d) The Recipient shall prepare, disclose, consult upon, adopt and thereafter implement the Labor Management Plan (LMP) in form and manner satisfactory to the Association, in accordance with national law and the requirements of ESS2, including, but not limited to the prohibitions of sexual exploitation and abuse/sexual harassment, forced labor and child labor.
Type	Financing source	Description
Effectiveness	IBRD/IDA	Article V, 5.01(e): The Recipient shall prepare and thereafter implement a security risk assessment and a Security Management Plan, in form and substance satisfactory to the Association.
Type	Financing source	Description
Effectiveness	IBRD/IDA	Article V, 5.01(f): The Recipient shall prepare, disclose and thereafter maintain through the implementation of the Project, a Biodiversity Management Plan, in form and substance satisfactory to the Association.
Type	Financing source	Description
Disbursement	IBRD/IDA	Schedule 2, Section III, B, 1 (b): No withdrawal shall be made for payments under Category (2), unless the Recipient has hired the Independent Verification Agent.

I. STRATEGIC CONTEXT

1. **A Sahelian country, Niger faces a number of mutually reinforcing challenges aggravating water security,[1] including poverty and a lack of economic diversification, high climate variability, natural resource degradation, fragility and rapid population growth.** Niger's pervasive poverty is intertwined with the complete reliance of entire communities on the exploitation of natural resources, leading to the degradation of landscapes and ecosystems. This reliance is further exacerbated by existing infrastructure gaps and the limited capacity of these communities to withstand the impacts of climate change. Climate change continues to increase the frequency and severity of drought and floods, hasten desertification and render rainfall less predictable, resulting in varying levels of moisture stress over the seasons and thus threatening agricultural productivity and, in turn, food security. The poor management and development of water resources and extensive land degradation due to excessive farming and grazing practices and land salinity have increased competition for scarce resources, including water and arable land. Meanwhile, additional factors closely intertwined with water insecurity – including regional insecurity, youth unemployment, and grievances over the allocation of governmental resources – contribute to high risks of conflict and fragility, leading to poor economic and human capital outcomes. Niger's climate change adaptation and water resource protection measures have proven inadequate to address these challenges, while the lack of a comprehensive social protection system has reinforced prevailing poverty traps.

2. **The Niger Integrated Water Security Platform (IWSP) Project seeks to overcome these challenges through an integrated platform approach to water-related planning, policies and investments.** This approach aims to address issues from the household to the provincial level around the knowledge, management and protection of water resources and associated natural environments, focusing on a few priority basins. Interventions reflect the multi-faceted nature of water security, spanning water resource management (WRM) and ecosystems regeneration, irrigation and optimized rain-fed agriculture, flood and drought management, and sustainable and safely managed drinking water and sanitation. The project is not intended to address all facets of the work in each of these sub-sectors, but rather, provide an approach that strengthens the institutions and practices around the usage and stewardship of water resources. Given the diverse needs across stakeholder groups, an integrated and consultative multi-sectoral approach to water management is required that facilitates data-driven and systematic decision-making towards the sustainable use of these resources under climate change scenarios.[2]

A. Country Context

3. **Poverty and human development indicators place Niger among the most socio-economically challenged countries in the world; the Coronavirus disease (COVID-19) crisis further heightens its vulnerability.** Although the direct impact of the current COVID-19 pandemic has thus far been fairly limited compared to other countries, resulting income and food security shocks could erase the poverty reduction gains achieved in recent years. Pre-crisis, Niger, which has ranked next to last on the United Nations (UN) Human Development Index since 2010 and last in 2019, was already one of the world's poorest nations. Limited access to clean water and sanitation services are significant contributing factors as demonstrated through their substantial contributions to Niger's high multi-

[1] Water security is defined as "the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies plays." (Grey and Sadoff, 2007).
[2] By 2050, temperature in Niger is expected to increase by 1.6 to 2.9°C (and length of heat waves by eight to 28 days), leading to higher evapotranspiration and water stress. Heavy rainfall frequency (16 to 75 percent) and intensity (-4 to +21 percent) are expected to increase (Source: *Climate Risk Profile for West Africa*).

dimensional poverty index [MPI].[3] Geographic and income disparities in access persist, disproportionately impacting the most vulnerable (Niger Poverty Assessment, World Bank 2021). Though poverty rates have fallen in recent years to 41.4 percent in 2019, the country's rapid demographic growth - among the highest in the world at 3.9 percent annually[4] - has resulted in a substantial increase in the absolute number of poor people. Women and the households they lead are especially vulnerable to poverty, accounting for three out of four Nigeriens in poverty.[5]

4. **Niger is exposed to fragility, conflict, and violence (FCV) which undermines its development.** The country has managed to remain stable within a difficult and insecure regional environment despite several risk factors. First, high population growth exacerbates already limited economic opportunity. Second, institutional deficits remain significant: Niger ranks 112th out of 180 countries in the 2017 Corruption Perceptions Index. Furthermore, regional insecurity continues to threaten the country's stability, as there has been an increasing number of attacks on Niger's territory by Boko Haram and other terrorist groups at the Niger-Nigeria-Chad and Niger-Mali-Burkina Faso border regions. The country is currently hosting over 369,000 people displaced by conflict, which has important security and economic implications, as noted by the 2019 Risk and Resilience Assessment (RRA). The resulting increase in military spending has severely strained public resources. Finally, Niger ranks 175th out of 181 countries with respect to vulnerability and readiness to adapt to climate change.[6] Several climate and disaster risk simulations rank Niger with a high risk of extreme heat and water scarcity as well as a high risk of floods.[7]

5. **Improving water security is key to reducing the country's fragility**. A recent analysis (Khan and Rodella, forthcoming) demonstrates the important link between water insecurity and fragility in the G5 Sahel.[8] The region's historically elevated risk of conflict is predicated on variations in water availability, a risk that has substantially increased since 2010 mainly due to climate-induced effects. Irrigated areas are particularly vulnerable, likely reflecting competition for scarce water resources and demonstrating the importance of sustainable management.

6. **Climate change exacerbates the consequences of poor management of ecosystems and landscapes that are critical to improving water availability and agricultural productivity, as well as to increasing the resilience of communities.** Healthy ecosystems clean water, purify air, maintain soil, regulate the climate, and recycle nutrients. They provide raw materials and resources for food, energy, medicines, and other purposes. These "ecosystems services" are the foundation of healthy populations and sustainable economies and constitute a country's natural capital base. Yet in Niger, they have been poorly managed to date, threatened by a rapidly expanding population that results in cleared scrublands and trees, and aggravated by the increased frequency and intensity of floods, droughts, and land degradation due to climate change.[9]

7. **Improving water security can also be a driver for greater spatial and institutional integration.** Important spatial disparities characterize Niger, from natural resources endowments to infrastructure to local governance

[3] Global MPI 2020. *https://ophi.org.uk/wp-content/uploads/G-MPI_Report_2020_Charting_Pathways.pdf.* The country's Human Capital Index of 0.32 is one of the world's lowest, accounting for its life expectancy of 61 years, under-five mortality rate of 84 per 1,000 live births (UN, 2018), under-five stunting of 42.2 percent, and a maternal mortality rate of 509 per 100,000 live births (WHO, UNICEF, UNFPA, World Bank Group and the UN Population Division, 2019). Only about three of every ten Nigeriens can read and learning outcomes are among the region's weakest (Niger CPF, 2018).

[4] World Bank Group. 2018. Niger - Country partnership framework (CPF) for the period of FY18-22. Washington, D.C.: World Bank Group.

[5] https://www.nepad.org/file-download/download/public/14511 *NEPAD. 2012. African Gender, Climate Change and Agriculture Support Program.*

[6] ND-GAIN 2019.

[7] See the GFDDR Think Hazard simulations for Niger at: https://thinkhazard.org/en/report/181-niger

[8] The G5 Sahel includes five countries: Burkina Faso, Chad, Mali, Mauritania, and Niger.

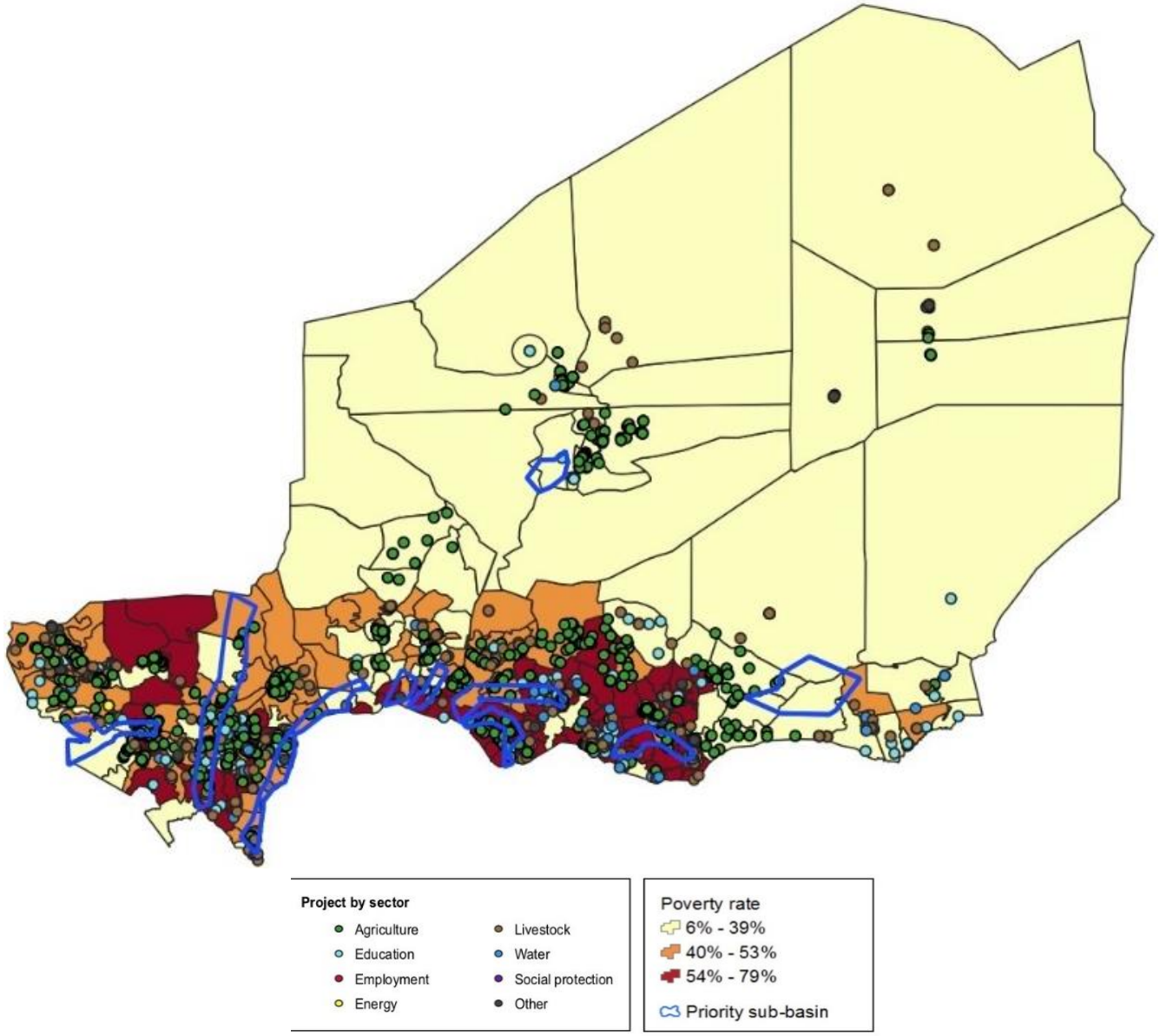
[9] Severe droughts caused food crises in 2005, 2008, 2009, 2010, 2011-2012 and 2017, while floods in 2012 were called the worst in more than 80 years, with 300 people killed, 6,000 injured, and 4 million affected (Source: *Climate Change Knowledge Portal*).

capacity. These disparities are particularly important in the context of unfinished decentralization that puts local governments in charge of WRM. As noted in the Niger Water, Sanitation and Hygiene (WASH) Poverty Diagnostic (World Bank, 2017), a heavy dependence on aid[10] and a fragmentation of donors and partners have led to the establishment of duplicative institutional structures and incomplete and disconnected legal and regulatory reforms, all of which contribute to Niger's institutional weaknesses. Given the critical importance of water across sectors, a focus on water security starting at the commune level and integrating up to the sub-basin level can facilitate spatial integration, intragovernmental coordination, and the adoption of innovative approaches and technologies. As shown in Map 1, a spatial approach based on priority sub-basins, as envisioned by the IWSP project, is well aligned with poverty targeting as well as with greater integration of World Bank interventions (as captured through Geo-Enabling Initiative for Monitoring and Supervision (GEMS) data.[11]

[10] Between 2007 and 2016 donors contributed 8 percent to gross domestic product (GDP) (11 percent in 2015) and financed about a third of the budget.

[11] A spatial analysis was conducted to visualize IWSP interventions and support the development of an integrative approach (based on the National Plan for the Integrated Management of Water Resources – PANGIRE) around priority sub-basins and to identify and reinforce synergies with other projects and interventions.

Map 1: Improving spatial integration: World Bank projects (GEMS), poverty rate and IWSP priority sub-basins



Source: World Bank using Niger Poverty Maps and GEMS data.

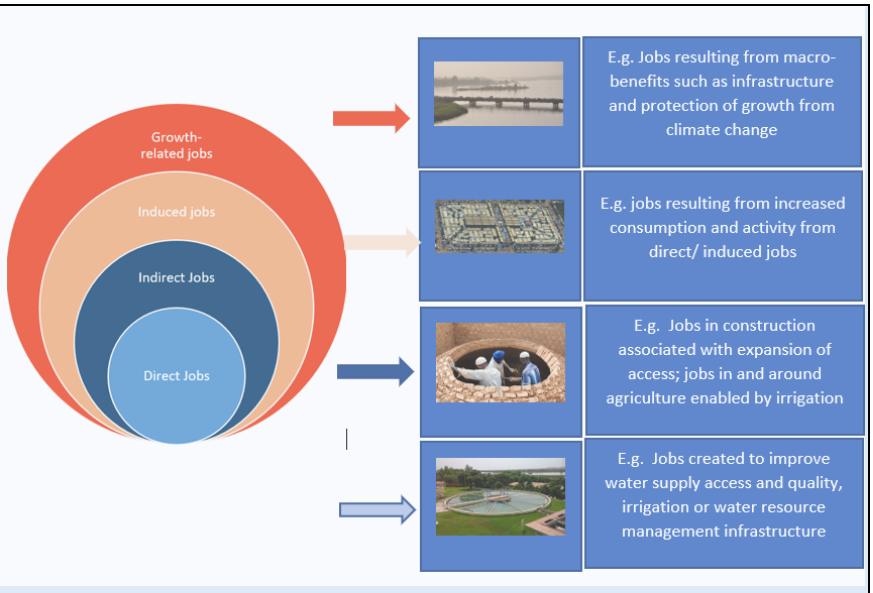
8. **Leveraging the development potential of water will be critical for Niger's recovery from the COVID-19 crisis.** Recent scenarios from the World Bank estimate that between 70 to 100 million people could be pushed into extreme poverty globally as a result of the COVID-19 crisis.[12] A large share of the "new" extreme poor will be concentrated in countries that are already struggling with high poverty rates, with more than a third projected to be from Sub-Saharan Africa (SSA). Fragile countries face an added risk: under the baseline scenario, the number of extreme poor in IDA and FCV countries, both of which include Niger, is projected to increase by 21 and 18 million respectively. Few levers can respond to as wide a range of development concerns as water, including

[12] World Bank estimates of projected poverty impact of COVID-19 (June 8, 2020).

supporting livelihoods, promoting human capital, protecting public health, enhancing food security, reducing climate vulnerability while promoting low-carbon growth, and generating employment for vulnerable groups.

Box 1: No water, no jobs, no growth

In addition to the more widely known benefits of water for public health and human capital, water is a primary driver for employment, economic growth and resiliency. The sustainable management of water resources and the provision of water-related services both directly and indirectly boost job creation. Previous studies have noted that three out of four jobs within the global workforce are water-dependent (World Water Development Report 2016). This reality is even more salient in Niger, a country heavily reliant on subsistence agriculture for livelihoods and food security. In that respect, water security is a pre-requisite for Niger to achieve most, if not all, of its development goals, and to sustain the growth projected to be necessary – 8 to 10 percent over a generation[13] – to overcome the impacts of the COVID-19 crisis, the resulting rise in poverty, and rapid demographic growth.



B. Sectoral and Institutional Context

9. **Water is the bedrock of Niger's development, yet it has not been adequately mobilized to support its efficient, sustainable and coordinated use across sectors.** Niger is one of the hottest and driest countries in the world. The distribution of its population is largely determined by the availability of water, as it is a necessary condition for livelihoods and economic activity in the country. Although three-fourths of Niger is classified as hyper-arid desert, the country's overall water resources are quite significant, estimated at 32 billion cubic meters per year.[14] Most of those resources have not been adequately harnessed, constraining development; less than 1 percent of Niger's surface water and less than 20 percent of its renewable groundwater are currently utilized. As an example, agriculture accounts for over 80 percent of employment, yet less than 1 percent of the total cultivated area is irrigated,[15] leaving a majority of the population in a poverty trap and extremely vulnerable to shocks and deepening gender inequities. Uneven spatial distribution, unsustainable utilization practices and rapid population growth are also straining Niger's water resources, with per capita availability decreasing from 2,300 m^3/year in 2004 to 1,360 m^3/year today.[16] Niger's long-term development requires a twin focus on developing new water resources and improving the management of existing supplies.

10. **Actual water use is significantly below all sectors' demands: increasing gaps illustrate how inadequate water mobilization and management hinder Niger's growth and the need for an integrated approach**. Annual water

[13] World Bank MTI.
[14] Source: PANGIRE 2017.
[15] Ministry of Agriculture and Livestock (MAG/EL). Document de Programmation Pluriannuel des Dépenses 2020-2022 (DPPD 2020-2022).
[16] According to the Water Stress Index (WSI), absolute water scarcity is defined as less than 500 m^3/capita/year, water scarcity is less than 1,000 m^3/capita/year, water stress is less than 1,700 m^3/year, and more than 1,700 m^3/capita/year is no water stress.

requirements to support the development strategies and programs of all sectors will increase from 7.6 billion m^3 in 2015 to more than 9.2 billion m^3 in 2025. Meanwhile, actual water use is projected to increase from 1.2 billion m^3 (2015) to 1.7 billion m^3 in 2025. While the numbers are well below the annual renewable water resources, these gaps highlight the significant underdevelopment of Niger's water resources mobilization infrastructure. Given the diverse needs across stakeholder groups, an ongoing, integrated, and consultative multi-sectoral approach to water management is required that facilitates data-driven and systematic decision-making towards the sustainable use of these resources under climate change scenarios.[17]

11. **The National Action Plan for Integrated Water Resources Management (*Plan d'Action National de Gestion Intégrée des Ressources en Eau*, PANGIRE) provides a strong roadmap to mobilizing Niger's water endowment in compliance with the Niger River Basin Sustainable Development Action Plan (SDAP).** There is a need to address: (i) highly uneven spatial and temporal distribution of rainfall; (ii) insufficient knowledge of water resources; and (iii) absence of institutions to coordinate the management and development for water resources across sectors, for multiple and often conflicting uses. Building on the 2010 water code, the PANGIRE was adopted by the Government of Niger (GoN) in May 2017 and aims to: (i) improve water resources knowledge, (ii) mobilize and develop natural resources and related socioeconomic activities, (iii) preserve the environment and build resilience to climate change, and (iv) improve water governance and strengthen capacity. There is broad consensus that, through the Water Code and the PANGIRE, Niger has developed a harmonized framework and implementation plan for the management and development of its water sector. It bears the vision of a water platform, which would involve systematically coordinating water-related planning, policies and investments across all water-using sectors, and engaging all relevant stakeholders (not only in the government, but also including development partners, private companies, and civil society organizations). With support from different development partners, this framework is being operationalized by the GoN in a phased manner, with the objective of covering all the 15 priority sub-basins of the country by 2030. Along with the World Bank (through this project), the African Development Bank (AfDB), the Swiss Agency for Development and Cooperation (SDC), the Government of Netherlands, and the European Union (EU) are actively supporting the realization of different dimensions of the PANGIRE framework in the country.

Water for Agro-Climatic Resilience

12. **Water is critical to Niger's goal of promoting agriculture and food security.** Agriculture is Niger's most important economic sector, accounting for over 40 percent of national GDP and serving as the principal source of livelihood for over 80 percent of the country's population**.** Agricultural productivity and productivity growth remain low, even compared to neighboring countries, with climate-exacerbated land degradation constituting a major obstacle to improving food security.[18] Niger ranks 101st out of 117 countries according to the 2019 Global Hunger Index[19] and faces stunting rates around 48.5 percent (World Development Indicators [WDI]). By 2080, temperature increases due to climate change of greater than 2°C are projected to further decrease yields of millet and sorghum – Niger's primary staple crops – by 15 to 25 percent.[20] The country is not self-sufficient when it

[17] By 2050, temperature in Niger is expected to increase by 1.6 to 2.9°C (and length of heat waves by eight to 28 days), leading to higher evapotranspiration and water stress. Heavy rainfall frequency (16 to 75 percent) and intensity (-4 to +21 percent) are expected to increase (Source: *Climate Risk Profile for West Africa*).

[18] Agricultural productivity is hampered by strong intra- and inter-annual rainfall variability. Despite the expansion of cultivated areas, per capita land use is declining and causes the low land productivity. Farms are small (average 4.1 ha) and getting smaller, as population growth exceeds agricultural expansion.

[19] With a 2019 GHI of 30.2, considered serious, down from 52.1 in 2000, considered extremely alarming. Global Hunger Index Niger Case Study (2019).

[20] Source: *Climate Change Knowledge Portal*.

comes to food production, further heightening its vulnerably to global crises and price shocks. Yet, Niger has an economically irrigable land potential of more than 270,000 hectares, of which more than 52 percent is located around the Niger River. Recent studies indicate that this potential may be much greater, especially in the Niger River valley.[21] Furthermore, rehabilitating severely degraded lands through soil and water conservation methods or climate-smart and sustainable agriculture practices (e.g., crop and livestock management) will increase productivity, improve farmers' adaptive capacity, reduce erosion from water runoff, decrease flood risks, and help enhance above-ground and soil carbon sinks.

13. **The development of natural resources and related socio-economic activities is a central goal of PANGIRE and forms Pillar 1 of the Nigeriens Nourishing Nigeriens (3N) initiative.[22]** Such development is also expressed through the National Strategy for the Development of Irrigation and Stormwater Harvesting (*Strategie Nationale de Développement de l'Irrigation et de Collecte des Eaux de Ruissellement*, SNDI/CER) drafted in 2005, with implementation supported by the World Bank, the French Development Agency (*Agence Française de Développement,* AFD), AfDB, the Arab Bank for Economic Development in Africa (BADEA), The West African Development Bank, the German Cooperation, the United States Agency for International Development (USAID), and the International Fund For Agricultural Development (IFAD). Although the SNDI/CER estimate of irrigation water demand at around 788 million m^3 is much lower than Niger's potentially available water resources, irrigation development is substantially constrained by the country's deficient water resource mobilization infrastructure and its inadequate technical capacity to manage it. To date, most of the large irrigation systems in Niger are publicly funded and incentives for private investment are limited. Both Niger's Intended Nationally Determined Contribution (INDC) and Land Degradation Neutrality (LDN) targets emphasize sustainable landscape management (SLM) as the core adaptation efforts. These documents highlight co-benefits in the Agriculture, Forestry, and Other Land Uses (AFOLU) sector resulting from implementing and upscaling climate-smart agriculture (CSA) activities such as adapting and building the resilience of agricultural and food security systems to climate change. Furthermore, they identify sustainable land and forest management practices as national priority mitigation measures that increase the resilience of ecosystems and households, sequester carbon, and reduce greenhouse gas (GHG) emissions due to deforestation.

Water Supply, Sanitation, and Hygiene

14. **Increasing access to and improving the quality of potable water and sanitation services in Niger is key to reducing poverty, improving human capital and protecting the population from high climate variability**. A World Bank report[23] has shown how increased access to water and sanitation contributes to improving household resilience to climate variability by limiting the risk of contamination associated with floods and droughts. Access to water and sanitation in Niger is lagging compared to its peers in SSA, particularly in rural areas. Access to at least basic water service was 50 percent in Niger (95 percent in urban and 46 percent in rural), while SSA's average was 61 percent in 2017. Niger is among the bottom ten countries in the world in access to improved water in rural areas. Meanwhile, 68 percent of Nigeriens practice open defecation (11 percent in urban and 79 percent in rural areas), compared with an average 27 percent in SSA (Joint Monitoring Program[24] 2019). Still, it is important to note that important gains have been achieved recently: piped water access has increased between 2014 and 2018 from 31 to 36 percent, including from 18 to 24 percent among the bottom 40 percent (Niger Poverty Assessment,

[21] MUSU/DD: *Politique Nationale de Gestion des Zones 2018* (Humides National Wetlands Management Policy Document 2018).
[22] 3N is a food security and agricultural development strategy and a key component of the GoN's 2017-2021 Economic and Social Development Plan (PDES).
[23] Niger WASH Poverty Diagnostic – 2017: World Bank.
[24] WHO (World Health Organization) and UNICEF (United Nations Children's Fund) Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP).

World Bank 2021). Rapid population growth significantly contributes to the challenge.

15. **Niger's Water, Sanitation and Hygiene Sectoral Program (*Programme Sectoriel Eau, Hygiène et Assainissement,* PROSEHA 2016-2030) aims to provide access to safe and sustainable drinking water and sanitation services for all by 2030.** Its implementation is currently being supported by several development partners, including the World Bank, AFD, SDC, the European Investment Bank (EIB), AfDB, the Danish International Development Agency (DANIDA), the Grand Duchy of Luxembourg, the People's Republic of China, BADEA, Islamic Development Bank (IsDB), the Kingdom of Belgium, and other bilateral donors. The Government and development partners meet every two months as part of the Program's consultation framework to ensure synergies, complemented by an annual sector review meeting.

16. **While the urban water sector has undertaken important reforms since 2001, particularly regarding the development of public-private partnership (PPP) initiatives, more remains to be done, especially in peri-urban and rural areas.** An asset-holding company, SPEN,[25] was established as a public corporation in charge of sector development with a ten-year concession contract. A private operator, SEEN,[26] was simultaneously engaged to operate and maintain the facilities and commercial activities (billing and collection) under a 10-year *affermage* lease contract.[27] Both contracts were renewed for an additional ten years in 2011, which proved essential in Niger's achievement of the Millennium Development Goal (MDG) targets for improved water access in urban areas. The reform, supported by the Government and development partners (World Bank through, most recently, the Urban Water and Sanitation Project [UWSP; P117365], AFD, EIB, People's Republic of China, West African Development Bank, the Kingdom of the Netherlands), has led to an increase in access to potable water from 64 percent in 2001 to 96 percent in 2019, corresponding to an additional 1.7 million people with access. In addition, the efficiency of the pipe network improved from 78 percent in 2001 to 87 percent in 2019. Niger is expected to continue this arrangement after November 2021 – the end of the current *affermage* lease contract.

17. **While the rural water sector has also undergone important reform, insufficient implementation impedes it from responding to existing needs and growing demand.[28]** Water supply systems management in rural centers have proven especially problematic because of increasing demand for both water quantity and quality, with infrastructure limitations preventing household connections. To respond to these challenges, PROSEHA strives to operationalize multi-village water schemes under delegated private sector management. However, the strategy's potential is limited without additional efforts to: (i) strengthen the technical capacity of domestic private operators for effective management; (ii) increase sector financial sustainability by adopting a water tariff structure that progressively ensures cost recovery; (iii) create an enabling environment with adequate government oversight and regulation; and (iv) incentivize private sector investment in affordable innovative technologies, such as water dispensers (standpipes), with the potential to improve access, reduce waste, and ensure auditable,

[25] SPEN : *Société de Patrimoine des Eau du Niger* (Niger Water Asset Holding Company).
[26] SEEN : *Société d'Exploitation des Eaux du Niger* (Niger Water Exploitation Company – Urban Water Utility).
[27] The affermage contract includes a performance contract with various objectives and obligations that must be met by each party, including those related to service quality, extension of network, billing and collections, communications, and the registration and resolution of consumer complaints.
[28] Since 2010, reforms have sought to move away from community-based management to promote delegated management and PPP through three primary actors: (i) Communes that are responsible for public water supply services and own the water supply assets built by the Ministry of Water and Sanitation (*Ministère de l'Hydraulique et de l'Assainissement*, MHA); (ii) Private operators that operate and manage water supply systems under a lease (affermage) management contract with the commune; and (iii) the Water Sector Regulation Authority (*Autorité de Régulation du Secteur de l'Eau*, ARSEau) is an independent body established with support from the World Bank's 2019-2020 DPL series and covers both urban and rural water supply. Although this reform has resulted in the private management of 68 percent of rural water supply systems (1589 out of 2329) as of December 2019, improvements in sector performance and the mobilization of financial resources have been limited. MHA: Annual reports 2019 (*Rapport Annuel et Rapport des indicateurs 2019*).

accountable and secure revenue collection for improved maintenance and expansion. In recent years, the Government has also sought to pilot the transfer of 75 rural centers to SPEN, envisioned to improve service delivery for approximately 1,150,000 people of whom 44 percent are poor. With this arrangement, assets will no longer be owned by the municipalities, but rather by the SPEN.

18. **Although important policy reforms have also advanced in sanitation, implementation remains challenging.** Besides PROSEHA, the GoN has developed a sanitation and hygiene policy document (*Document de Politique Nationale d'Hygiène et d'Assainissement*, DPNHA), pending formal adoption, to reinforce the sector's regulatory framework. Community-led Total Sanitation (CLTS) is the preferred intervention approach, in large part due to limited options for more capital-intensive approaches. Public sanitation infrastructure will need to be prioritized in strategic high-use areas (schools, health centers, marketplaces, etc.) alongside continued work to change social norms, address gender gaps including through menstrual hygiene, and build climate resilience and low-carbon solutions. However, CLTS is just the first step in addressing community-level sanitation in Niger: it is important to recognize that high rates of open defecation are primarily driven by lack of access, not by preferences.[29] Therefore, behavior change campaigns aimed at expanding access should be complemented by financial support for the poor and vulnerable, as well as the development of local actors such as artisans and small businesses across the entire sanitation service chain to promote resilience and sustainability.

Gender, Inclusion and Participation

19. **Gender inequality is pronounced in Niger across a range of socioeconomic, health, and education outcomes, all of which are aggravated by water-related challenges.** Niger ranks near the bottom of the list of countries on the gender equality index.[30] Access to education and the labor market is unequal.[31] Furthermore, school-age girls in Niger lack menstrual hygiene management services,[32] with less than 10 percent of women and girls using menstrual products. While women play important roles in the agricultural workforce, there is a gender gap in farmer productivity which is due to, among other factors, women's lower access to productivity-enhancing agricultural inputs and techniques.[33] Niger has a traditional patriarchal culture, largely governed by religion, whereby women marry early, men generally dominate decision-making in various spheres of society, and women and girls disproportionately bear the burden of fetching water for households.[34] Women have lower participation and voice in water-related decision-making processes. For example, women's representation in community-based water institutions is minimal: only 28 percent of board members in Goulbi Maradi sub-basin institutions (CLE/AUE) are female, and a paltry 5 percent of leadership/decision-making positions in community-based water institutions established thus far under PANGIRE are held by women.[35] This gender gap in voice and decision-making is explained by restrictive gender norms, lower skills, and limited information access for women, including information about the functions and decision-making processes of water-related organizations. The literacy rate for women is 23 percent against 31 percent for men, and only 55 percent of women own a mobile telephone

[29] Niger WASH Poverty Diagnostic (World Bank, 2018).
[30] Niger ranks 154th of 162 countries on the 2019 gender equality index. UN (2019). Gender Inequality Index. *http://hdr.undp.org/en/content/gender-inequality-index-gii*
[31] For example, primary school gross enrollment rate is 70 percent for girls compared to 82 percent for boys, and the employment rate is 36 percent for women compared to 80 percent for men. Source: UN Women (2017).
[32] *https://www.unicef.org/niger/water-sanitation-and-hygiene*
33 World Bank 2019. *Economic Impacts of Gender Inequality in Niger.* For example, plots managed by women on average produce 20 percent less per hectare than plots by men. After accounting for regional differences, socio-demographic, and agricultural variables, the gap increases to 33 percent for female managed plots.
[34] WFP (2017) Women Empowerment in Niger: from Markets to Households to Communities, VAM Gender and Market Study 11
[35] Estimated from SDC-financed PANGIRE 2021 implementation report for three sub-basins (Korama, Goulbi Maradi, Dallol Maouri).

against 77 percent of men in Niger.[36] While Niger presents a relatively resilient social contract, ensuring effective inclusion and participation of all groups in decision making needs to remain a priority. A recent World Bank study[37] ranks Niger as a country with significant civil capacity given its level of state capacity. According to the empirical measurements, Niger exhibits a relatively resilient social contract compared to other countries in the region which may partially account for why Niger is faring better than some of its neighbors experiencing social unrest and conflict. Building on this reality, the project's participative approaches would help ensure the full participation of stakeholders, including women, youth and other marginalized groups (displaced populations and people with disabilities, etc.). This also includes behavioral economics and social engineering approaches to prevent conflict over access to common resources (as used in other World Bank projects, such as the Regional Sahel Pastoralism Support Project [PRAPS; P147674]).[38]

20. **Land tenure in Niger – an additional consideration for gender and inclusion – continues to evolve.** Land tenure in rural areas is based on a 1993 law that recognizes traditional land ownership and common natural resources management, including for irrigated land and pastoralism. This legislation established an affordable and expedited process to secure tenure rights through local land commissions (COFOB, COFOCOM, and COFODEP).[39] However, a 2013 audit noted that few certificates have been issued, either because land commissions were not set up or understaffed, or because beneficiaries were not interested in formalizing their land tenure. The 2020 rural land policy further accounted for local realities and diversity, including requiring that a minimum of 30 percent of plots developed by the GoN and local authorities are granted to women, youth, and vulnerable persons.

C. Relevance to Higher Level Objectives

21. **The long-standing collaboration between the World Bank and the GoN, building on past as well as on-going World Bank programs, has led to the design of this multi-faceted approach to address water security.** Since 2001, the World Bank has been a prominent partner through investment and technical assistance, increasing capacity and knowledge in the sector and enabling the transformative ambition of the IWSP. The Bank has supported investments in water supply, sanitation, and irrigation through water supply investment projects (e.g. Niger UWSP [P117365] and the Sahel Irrigation Initiative Support Program [P154482]). Looking forward, the IWSP will in particular coordinate with the Community-Based Recovery and Stabilization Project for the Sahel "Three Borders" (P173830) and the Kandadji Project (P130174), and will also benefit from advisory services and analytics (ASA) such as Improving Water Resources Management in West and Central Sahel (P173152) and the Sahel Groundwater Initiative (P175105).

22. **The project's objectives are fully aligned with the World Bank Group (WBG)'s Niger Country Partnership Framework (CPF; FY18-22)[40] and the Niger Economic and Social Development Plan 2017-2021 (*Plan de Développement Economique et Social*, PDES).** It is fully aligned with the three focus areas of the CPF by: (i) increasing rural productivity and incomes through improved agricultural productivity and food security by developing small-scale irrigation and associated watershed management committees; (ii) improving human capital by increasing access to improved drinking water and sanitation services; and (iii) strengthening governance by promoting important sectoral reforms that improve service delivery, expand economic opportunity, bolster

[36] UN Women (2021) *https://data.unwomen.org/country/niger*
[37] World Bank (upcoming) Understanding Social Contracts in Africa.
[38] In the Regional Sahel Pastoralism Support Project (*Projet Régional d'Appui au Pastoralisme au Sahel* - PRAPS), multi-actor and multi-scale consultations between stakeholders (local actors and beneficiaries and administrative and traditional authorities) are used to arrive at social agreements on the use of common resources. These agreements are recorded in a social charter.
[39] COFOB: *Commission Foncière de Base* (Rural Land Commission); COFOCOM: *Commission Foncière des Communes* (Municipal Land Commission); COFODEP: *Commission Foncière Départementales* (Departmental Land Commission).
[40] Report No. 123736-NE

economic growth, augment the population's resilience to fragility and climate change, and mitigate climate change through reduced energy use. The project is also aligned with Niger's vision for 2035, as expressed through the Sustainable Development and Inclusive Growth Strategy (*Stratégie de Développement Durable et Croissance Inclusive*, SDDCI), as well as with Niger's PDES (2017-2021), which intends to "*strengthen the resilience of the economic and social development system.*" More specifically, the project supports pillar 2 (Social Development and Demographic Transition), pillar 3 (Accelerating Economic Growth), and pillar 5 (Sustainable Management of the Environment) by increasing water and food security through coordinated and sustainable multi-sectoral investments. By repositioning water at the heart of Niger's socio-economic development and ensuring its sustainable and efficient use, the project received IDA scale-up window financing to facilitate sustainable socio-economic transformation through the implementation of project institutional and capacity building activities and infrastructure investments.

23. **The project also directly contributes to the WBG's corporate goals of ending extreme poverty and promoting shared prosperity, the World Bank's Africa Climate Business Plan, and the World Bank's COVID-19 response.** In accordance with the Niger Systematic Country Diagnostic (SCD-2017), the project targets rural areas with some of the highest poverty rates in the country. Furthermore, these areas are especially vulnerable to climate change, therefore contributing to the Business Plan's action areas "creating climate-resilient landscapes" and "promoting climate smart agriculture." The project similarly aligns with the WBG Climate Change Action Plan 2021-2025. Finally, the project reinforces the WBG COVID-19 response, which recognizes that the crisis can be leveraged to "Rebuild Better" in a greener, more sustainable and resilient way in accordance with the green, resilient, and inclusive development (GRID) approach.[41] The position paper recognizes that landscape and watershed management, ecosystem restoration, sustainable management of forests, and regenerative agriculture and food systems can quickly create jobs and generate long-term benefits such as reduced water scarcity, flood and drought mitigation, higher agricultural productivity, food security, lower carbon emissions, and enhanced carbon sinks – all critical to achieving Niger's first INDC and its LDN targets.

24. **Finally, the project is in line with the CPF FCV filter and strategic objective 3 of the Prevention and Resilience Allocation (PRA – February 2021) to address root causes of FCV and prevent and manage conflicts related to natural resources.** Sub-basin selection gives priority to poor, lagging and/or conflict-prone sub-basins. The project intends to contribute to the reduction of fragility, increase resilience to climate variability, promote inclusive natural resources exploitation, and lay the foundations of socio-economic development. Therefore, the project intervention area includes the particularly fragile and conflict prone regions of Diffa, Tillabery and Tahoua, as well as the Maradi-Dosso corridor (Niger-Nigeria border) which is increasingly prone to armed robbery.

II. PROJECT DESCRIPTION

25. **The IWSP Project operationalizes the GoN's integrated water platform approach for coordination of all water-related planning, policies, and investments to promote water security for all Nigeriens.** At present, water resources management and development is siloed, wherein every sub-sector plans and implements its own activities regardless of implications on other users and on the sustainability of water resources. This has led to signficant adverse consequences and has generated conflict among water users. This project's approach, founded on the GoN's PANGIRE Program, seeks to avoid such impacts and harness synergies across sectors through supporting the systematic and climate-informed planning of all water-related activities and investments at the commune level, in coordination with sub-basin agencies that safeguard the quality and sustainability of Niger's

[41] The WBG COVID-19 Crisis Response Approach Paper: Saving Lives, Scaling-up Impact and Getting Back on Track (June 2020).

water resources. In addition, the IWSP will support the development of critical infrastructure that can allow Nigeriens to better leverage their water resources for both domestic and productive purposes.

Box 2: What is different about the IWSP Project?

The IWSP Project builds on the GoN's strategy for water resources management (particularly the PANGIRE Program) to implement a systematic approach to water security. Recent government reforms and initiatives, currently in their early stages of implementation, take a multi-sectoral approach, referred to as the 'water platform,' that recognizes the importance of decentralized, yet coordinated, decision making to sustainably manage water resources in Niger. The water platform places the commune – the foundational administrative division in Niger's decentralization reforms – at the center of water-related investments across multiple sectors.[42] Sub-basin water platform institutions, meanwhile, will ensure the coordinated use and conservation of water resources across communes.

The water platform aims to ensure systematic and climate-informed planning at the commune level, where water-related activities and investment priorities determined by each associated community are aggregated and harmonized, in coordination with sub-basin agencies that safeguard the quality and sustainability of their water resources, promoting resilience to drought and flood as well as low-carbon options. Project activities are both locally-adapted and mutually reinforcing at regional and national levels to maximize impact and sustainability. Importantly, all project components place an emphasis on strengthening the adaptive capacity of local communities in Niger and their resilience to the impacts of climate change. While the project will be implemented in 10 out of the 15 priority sub-basins of the country, its successful implementation will provide a roadmap for the nationwide expansion of the platform approach in the future. The sustainability of the water platform will be supported through robust citizen engagement across project components and the use of locally-adapted disruptive technologies.

26. **The IWSP Project will coordinate across the World Bank's diverse portfolio in agriculture, environment, and other related sectors, while placing emphasis on how better to harmonize water usage across all sectors.** The project will not duplicate or move into spaces that are occupied by other important programs, such as the PRAPS, Three Borders or Kandadji[43]. Instead, the IWSP Project aims to complement and strengthen the ultimate results of all World Bank-financed and other programs by supporting the foundational role of water resources management so that all users can benefit from this precious natural resource harmoniously and sustainably.

27. **Managing and improving resilience to climate-driven water variability are central to the IWSP Project.** The project will focus on small-scale water management infrastructure to smooth seasonal and inter-year water availability and lay the foundations for the improved long-term planning, use, and sustainable management of water resources. Supported infrastructure will complement existing irrigation infrastructure, and may include water harvesting infrastructure, infiltration weirs (*seuils d'infiltration*) for supplementary irrigation purposes, flood control weirs and river-bank protection – all geared towards adapting to the likely increase in frequency and severity of droughts and floods due to climate change. Such infrastructure will be complemented by the promotion of Natural Assisted Regeneration (NAR) and associated landscape management approaches that reinforce the critical role of watersheds in climate adaptation and mitigation. Activities specifically mitigate climate change by maintaining or enhancing soil carbon and structure, as well as associated ecosystem services.

[42] Traditionally, Water Supply and Sanitation (WSS) interventions were operating within the administrative boundaries of communes whereas Water Resource Management (WRM) interventions would focus on basin and sub-basins entities. Combined with a larger number of central and decentralized actors, this reality rendered even basic coordination difficult.

[43] In fact, there are several World Bank team members that cut across most of these projects, and all fall under the World Bank Sustainable Development Global Practice, ensuring even greater coordination and learning.

28. **The integrated water platform approach will help address the challenge of food security by highlighting and safeguarding Niger's water resources' role in agricultural productivity**. Data collection and management systems will be developed and enhanced to better inform investments with an eye towards water security, resilience to climate-exacerbated droughts and floods, resilient food systems, and climate mitigation. Commune- and community-level sub-basin institutions will enable the participative planning and implementation of activities that enhance agricultural and pastoral output. Additionally, they will disseminate climate-informed information to support improved agricultural practices aimed at simultaneously enhancing resilience and reducing GHG emissions/increasing carbon sinks. Sub-basin institutions will ensure the coordinated use and conservation of water resources across communes. The IWSP Project's support to water resources management and watershed restoration complements the Western Africa Food Security Regional Program (FSRP; P172769),[44] which will adopt an integrated landscape management approach to regional watersheds and floodplains. Technical studies and master plans financed by the project to identify investments under the framework approach explicitly account for the impact of climate change and related uncertainty, while prioritizing climate-mitigating investments such as ecosystems restoration and erosion control measures, water storage (surface, ground), solar-powered water supply and irrigation infrastructure with enhanced energy and resource efficiency, and the promotion of treated fecal sludge as fertilizer to avoid chemical use. The project is also part of a pilot aimed at rating resilience in World Bank projects.[45]

29. **The IWSP Project supports critical infrastructure and rural development activities to improve access to water supply and sanitation (WSS) services and increased use of water for productive purposes.** It targets the expansion of water supply services and public sanitation infrastructure, and the promotion of related hygienic behaviors, as critical inputs to health and wellbeing, as well as institutional reforms that better ensure the quality and sustainability of these services. The project's multi-faceted approach also targets investments and activities that enhance the productivity of irrigated and rainfed agriculture and facilitate livestock rearing and fish farming to foster sustainable income generation while adopting CSA practices. Interventions are founded upon participative planning and a robust communications strategy that seek to amplify the voices of women and the vulnerable in the protection and use of water resources.

30. **The IWSP Project seeks to reduce stark water-related gender inequalities through gender-sensitive planning and design approaches**. These approaches focus on improving the livelihoods of women and girls through: (i) access to water and sanitation services; (ii) access to knowledge and information on water resources; (iii) increased access to assets, agricultural inputs, climate smart agricultural practices and irrigation; and (iv) enhanced awareness, voice and decision-making power in water community-based institutions. Finally, the project will support gender-based violence (GBV) prevention, mitigation, and response mechanisms, with activities and their operationalization to be informed by a comprehensive gender analysis that is currently under preparation.

31. **The project will leverage disruptive technologies with the potential to foster the participative management of Niger's water resources; improve water supply, sanitation, and irrigation service delivery; and increase long-term sustainability beyond the project.** Disruptive technologies will be embedded in the design of relevant project components, spanning three primary classifications: (i) data collection and analysis to improve project design, investment prioritization, and decision making; (ii) citizen engagement through community consultation,

[44] The FSRP is currently under preparation and with a planned FY22 delivery.
[45] Resilience Rating System: A Methodology for Building and Tracking Resilience to Climate Change (*https://openknowledge.worldbank.org/handle/10986/35039*).

with a particular focus on marginalized groups, including women and youth; and (iii) technologies for improved services and sustainability for GRID.

32. **As land in the project area is mostly under the traditional ownership system of the 1993 law, the project will support a land tenure assessment to identify land status, owners and users land, with the support of local authorities.** The specific process for conducting related agreements and transactions will be described in the Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP), in compliance with the legal land framework. Reforestation, land restoration/regeneration, and agroforestry activities will take place through the participation of owners and users. Irrigation activities will take place in the context of Niger's Small-Scale Irrigation Strategy (*Stratégie de la Petite Irrigation au Niger,* SPIN). Following the relevant assessment, a social agreement and charter will be established on common resource use. If land acquisition is required, the process will comply with Niger's relevant legal framework, which was revised in 2008 and is compliant with international standards and practices.

A. Project Development Objective

PDO Statement

33. The project development objectives (PDOs) are to strengthen the management of water resources, increase access to water services and improve the resilience to climate-induced water variability in select areas of Niger.

34. Resilience to climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as the "capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure while also maintaining the capacity for adaptation, learning and transformation".[46] The project will help achieve resilience to climate-induced water variability – including the threats of climate-related disasters such as droughts and floods – through financing the promotion and adoption of sustainable land and water management practices at scale, in addition to improving the sustainability and resiliency of water services and related institutions.

35. The project will contribute to improved household incomes, food security, and livelihoods of vulnerable groups, especially those dependent upon natural resources, by financing: (i) improved water resources management through improved monitoring systems and capacity building; (ii) mobilization of water resources and promotion of sustainable use across sectors; (iii) restoration of select watershed landscapes to improve the resilience of agricultural and rural livelihoods to drought and flood, promoting land and water conservation, and the enhancement of carbon sequestration in soils and biomass; (iv) expansion of rural development services, including small-scale irrigation, water-usage related activities for pastoralists, and aquaculture; and (v) improved of access to drinking water and sanitation services with low-carbon and resilience considerations. Project activities will especially target women and youth in accounting for their needs and promoting their socio-economic participation across the project. Table 1 summarizes the PDO outcomes and outcome indicators.

[46] Global Warming of 1.5˚C. An IPCC Special Report (2018).

Table 1: PDO outcomes and outcome indicators

PDO outcomes	Outcome indicators
Strengthen the management of water resources in select areas of Niger	Sub-basins that have operationalized[47] an integrated, climate-resilient, water and natural resources management plan (Number)
Increase access to water services in select areas of Niger	People provided with access to improved water sources (CRI disaggregated by female, rural, urban) (Number)
	People using water for productive purposes[48] (disaggregated by female) (Number)
Improve the resilience to climate-induced water variability in select areas of Niger	Land area under SLM practices (CRI, Hectare)

B. Project Components

36. **Project activities are organized under two core components: (i) Integrated investments for water security; and (ii) Expansion of integrated water services.** These activities are interconnected across components and will be coordinated through the water platform approach to sector planning described above. In addition, two complementary components are included: (i) project management and capacity strengthening; and (ii) the Contingent Emergency Response Component (CERC) to permit the repurposing of project funds to respond to national emergencies.

Component 1: Integrated Investments for Water Security (US$125.92 million equivalent)

Subcomponent 1.1: Management of Water Resources and Climate Risks (US$30.00 million)
Subcomponent 1.2: Restoration of Watershed Environments (US$50.00 million)
Subcomponent 1.3: Mobilization of Water Resources (US$45.92 million)

Component 2: Expansion of Integrated Water Services (US$249.08 million equivalent)

Subcomponent 2.1: Expansion of Rural Development Services (US$59.08 million)
Subcomponent 2.2: Expansion of Water Supply Services (US$170.00 million)
Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication (US$20.00 million)

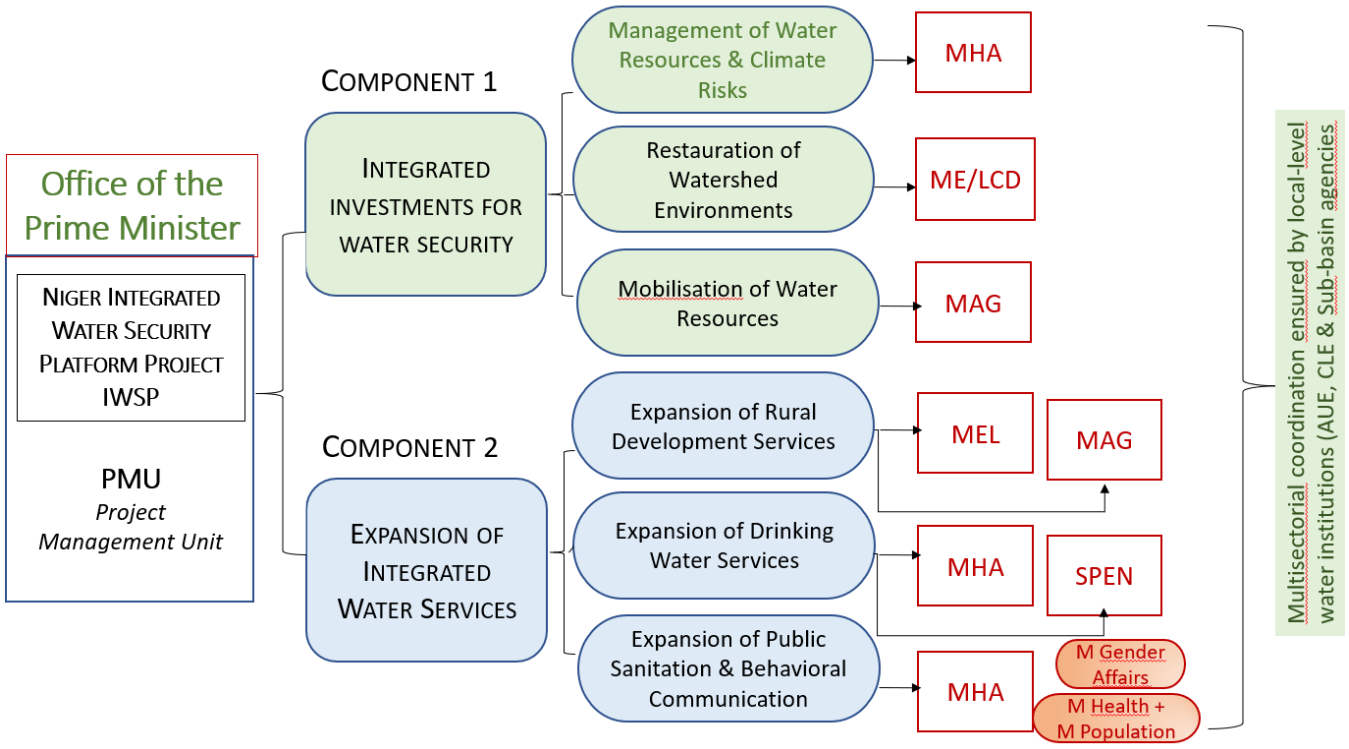
Component 3: Project Management and Capacity Building (US$25.00 million equivalent)

Component 4: Contingent Emergency Response Component – CERC (US$0.00 million)

37. **The institutional arrangements for the project are depicted in Figure 1, and further described in the relevant sections further below.** Because of the centrality of water resources to sustainable economic development in Niger and the multi-sectoral nature of the IWSP, the project will be anchored under the Prime Minister's office (see Figure A2.3 in Annex 2 for greater detail on the institutional arrangements, including on the relationship with other World Bank programs).

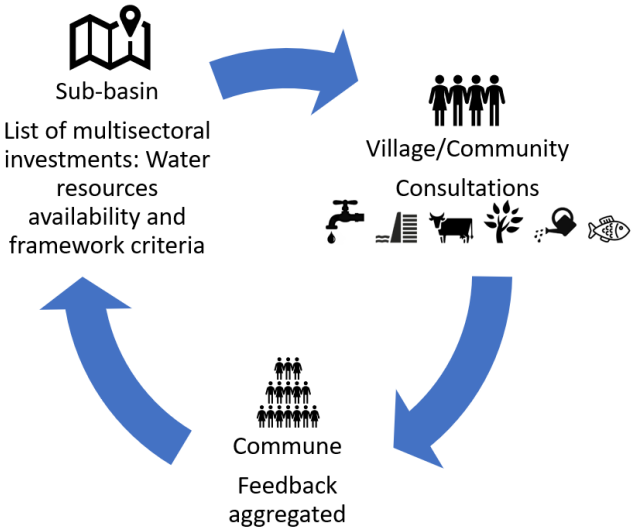
[47] Operationalized means that plans have been drafted, accepted, and budgeted, with annual plans under implementation.
[48] Productive purposes include irrigated agriculture, fisheries and aquaculture, livestock, and any other income-generating activity.

Figure 1: Institutional relationships – the water security platform



38. **The "Water Platform" Approach for Multi-Sectoral Investment Planning**: One of the main transformative features of this project is that the investments to be financed under the below subcomponents will be identified, prioritized and selected through a multi-sectoral (horizontal) and consultative (vertical) process. A multi-sectoral team representing the different implementing agencies across all water-using sectors will hold initial consultations at the village-level to understand local needs and to discuss the long list of possible investments covering landscape restoration, water resources mobilization, irrigation, livestock, fisheries and WSS. The community feedback will be aggregated first at the commune level and then at the sub-basin level. Based on the proposed framework criteria for sectoral activities and a consideration of the overall water resources availability, a revised list of multisectoral investments will be discussed and finalized with the local community. At this stage, the beneficiaries for each specific investment will be confirmed, and the technical preparation of the investments can be started by the respective implementing agencies. As the sub-basin-level PANGIRE institutions (AUEs, CLEs, and *Agences de l'Eau* – water agencies) are gradually established and become functional across the different sub-basins of the country (including through support provided by Subcomponent 1.1), they will become the main mechanism for coordinating this integrated and community-focused approach at local levels in Niger. Figure 2 below portrays a simple stylized version of the consultation and planning cycle for the water security platform.

Figure 2: Stylized depiction of water security platform consultation and planning process



39. **Recognizing that institutional development is a long-term process but also critically needed in the water sector in Niger, the project is adopting an approach that can meet its service delivery objectives while supporting institutional advances through feasible and pragmatic steps.** Therefore, the support for integrated water resource management (IWRM) institutions is graduated into two phases (see Subcomponent 1.1) to allow learning and adaptation. The institutional arrangements are based on the simplest configuration of actors that would still allow water to be managed in an integrated multi-sectoral approach. Beyond inclusion in the platform for planning purposes, support to WSS institutions builds upon twenty years of experience in institutional reform to leverage PPP for improved service delivery. While urban WSS activities leverage and strengthen the existing institutions, the project will directly incentivize the GoN to establish and operationalize effective rural WSS institutional arrangements through an informed and collaborative process (see Subcomponent 2.2).

40. **Some investments under the proposed project have been prepared to the detailed design stage and are ready for implementation, while others will be identified and prepared through launched studies.** However, given that the findings of these studies were not available before project appraisal, a framework approach will guide the selection, preparation, and implementation of investments under several subcomponents. Additionally, activity unit costs were defined to estimate the costs and numbers of beneficiaries for each subcomponent. A detailed project description can be found in Annex 1.

Component 1: Integrated Investments for Water Security (US$125.92 million equivalent)

41. **Component 1 aims to support institutional development for improved water resources management, as well as upstream investments in watersheds restoration and water resources mobilization.** It includes three interlinked subcomponents to be coordinated and implemented by relevant PANGIRE institutions and sector ministries.

Subcomponent 1.1: Management of Water Resources and Climate Risks (US$30 million)

42. This subcomponent supports the implementation and operationalization of PANGIRE. While the PANGIRE rightly emphasizes decentralization and engagement of local communities, the low capacity of state agencies and fragility-related constraints require a pragmatic and incremental approach to institutional development. Accordingly, in the first phase (spanning the first two years) the project will focus on strengthening the technical

and managerial capacity of the recently established water platform institutions[49] in three of the 10 priority sub-basins[50] under IWSP and will involve "learning by doing," as these intitutions will be engaged in the planning and implementation of the multisectoral project-financed investments, building on lessons already being learned through the programs being piloted by the GoN and other development partners. This phase will also support the piloting, assessment, and design of an effective model for the engagement of local communities and civil society dialogue on water in Niger. This model will leverage existing non-governmental organizations (NGOs)/community-based organizations (CBOs) with a proven track record to facilitate the participation of vulnerable groups like women and youth, addressing both self-perceived and socially/externally imposed barriers. The subsequent phase, informed by lessons from the first, will support the establishment and capacity-strengthening of water platform institutions in the remaining seven sub-basins, including the preparation of SDAGE and SAGE[51] development action plans at the sub-basin and commune levels respectively. The second phase will include the expansion of the community engagement and civil society dialogue process for participatory planning and the implementation of multisectoral project investments in all remaining sub-basins.

43. In addition, the project will support the improvement and densification of water resources monitoring systems to improve the reliability and quality of data in an increasingly variable climatic context, which will be gender-disaggregated when relevant. This data will inform gender-sensitive decision-making regarding: (i) the sustainable use of both surface and groundwater; (ii) efficiency improvements; (iii) the identification, design, and implementation of water-related infrastructure and activities; and (iv) response to climate risks. This data will complement the early warning and emergency response system (*Structures Communautaires d'Alerte Précoce et des Réponses aux Urgences,* SCAP-RU) currently being implemented under the Niger Disaster Risk Management and Urban Development Project (P145268). The subcomponent will also finance a national-level assessment for characterizing water users and uses and their vulnerability to seasonal and annual variability of the resource (including sex-disaggregated data and gender analysis), along with their distribution across different sectors and regions of the country, to serve as the basis for designing pragmatic policy for the National Water and Sanitation Fund.[52] In addition, this subcomponent will support: (i) technical assistance on identification, planning, and preparation of large-scale water resources management investments in accordance with the SDAP of the Basins; (ii) knowledge-sharing between different government agencies, and with communities, particularly with respect to water resources and the water-related impacts of climate change; and (iii) involvement of youth and women in the sector. This subcomponent will be implemented by the MHA through the permanent secretariat of PANGIRE in relation with DGRE.

44. Furthermore, under Subcomponent 1.1 and all Component 2 subcomponents, the project will support the introduction of a target of 30 percent for females in leadership/ decision making positions (e.g. President, Secretary, Treasurer) in both existing and newly-established water community-based institutions (including CLEs, AUEs, sub-basin agencies and rural water supply institutions). This will be accompanied by more targeted project-financed gender-sensitization training of project staff and training for female members/leaders of water

[49] These include sub-basin agencies (*Agence de Sous Basin*) at the sub-basin level, local water committees (*Comités Locaux de l'Eau*, CLE) at the commune level, and water user associations (*Association des Usagers de l'Eau*, AUE) at the community level.
[50] Water platform institutions are already in the process of being established in three of the IWSP sub-basins (Korama, Goulbi Maradi, Dallol Maouri) with support from the Swiss Development Corporation, with sub-basin agencies already established.
[51] SAGE: *Schéma d'Aménagement et Gestion de l'Eau* (Water Development and Management Plan at commune level); SDAGE: *Schema Directeur d'Aménagement et de Gestion de l'Eau* (Master Plan for Water Development and Management at sub-basin level)
[52] While the decree for operationalization of the National Water and Sanitation Fund is being prepared by the Government, the design of a water tariffs/pricing framework will require significant analytical work, to ensure that it is efficient, viable, and politically acceptable.

community-based institutions to promote equal opportunities for women in leadership, more gender-sensitive organizational culture and structures, and more active participation in decision-making.

Subcomponent 1.2: Restoration of Watershed Environments (US$50 million)

45. **This subcomponent will support watershed restoration activities using an integrated landscape and ecosystems approach.**[53] In particular, it will involve the clarification of land tenure through the COFOCOM and COFODEP, the establishment of land information systems, and the adoption of SLM practices with the aim to increase climate resilience, enhance carbon sinks, boost net primary productivity (e.g., CSA practices), and contribute to Niger's LDN targets. These activities will be implemented by the Ministry of Environment and the Fight against Desertification (*Ministère de l'Environnement et de la Lutte contre la Désertification*, ME/LCD), complemented by an implementation support consultancy. A framework approach will inform the selection of interventions given that ongoing studies to define the exact magnitude and location of activities in each commune were not finalized before project appraisal. Depending on the watershed, activities may include: (i) reforestation; (ii) land restoration/ regeneration; (iii) agroforestry; (iv) the development of the non-timber forest products value chain; and (v) the development of fisheries and aquaculture in small reservoirs mobilized under Subcomponent 1.3, knowing that fish provides a large part of animal protein and dietary minerals and that more must be done to prepare for the impacts that climate change will have on existing fisheries and aquatic ecosystems. The selection of activities will be based on selection criteria that include, among others, land tenure status, community commitment for sustainable management, whether the site meets technical requirements, vulnerability to climate risks, and the potential to increase carbon sinks. This subcomponent is expected to leverage disruptive technologies, building on relevant experiences in the region and beyond to enable broader participation and the sustainable monitoring of watershed activities and environments. Activities will be closely coordinated with those under the Lake Chad Region Recovery and Development Project (PROLAC; P161706) and the FSRP (P172769) in the regions of Diffa, Tillabery and Zinder. It will also leverage the rural service network previously established through the PACRC project (P125669) in select communes.

Subcomponent 1.3: Mobilization of Water Resources (US$45.92 million)

46. **This subcomponent will support the construction and rehabilitation of multipurpose rainwater harvesting (spreading and percolation weirs), abstraction, and storage infrastructure, as well as flood control and riverbank protection investments on ephemeral rivers.**[54] The main objective of this subcomponent is to improve the resilience of communities to the effects of climate variability through: (i) the mobilization of water resources to support the expansion of integrated water services under Subcomponents 2.1. and 2.2, thereby improving resilience to drought; and (ii) flood prevention for agriculture fields. The investment program will be implemented by the Ministry of Agriculture (*Ministère de l'Agriculture,* MAG), complemented by an implementation support consultancy. This subcomponent adopts a framework approach whereby investments will be selected on an ongoing and dynamic basis in accordance with set criteria, such as land tenure status, community participation, technical preparation, sustainability, and environmental and social considerations. To facilitate this process, the MAG has launched studies to identify critical needs within the project area and better define a set of potential investments (see Annex 1). Further details on the approach and framework criteria are presented in Annex 1.

[53] The underlying goal of integrated landscape planning and management is to find and promote synergies between activities that improve production systems and livelihoods, increase the capacity to cope with increasing risks of drought, flood, and associated soil erosion while supporting biodiversity conservation and ecosystem services, and enhancing carbon capture and storage.

[54] Investments will enhance surface and sub-surface storage via catchments, ponds, and aquifer recharge measures; as well as support abstraction, such as through shallow wells.

Component 2: Expansion of Integrated Water Services (US$249.08 million equivalent)

47. **Component 2 builds upon activities conducted under Component 1**, particularly the management of water resources and associated sub-basin planning under Subcomponent 1.1, improved sustainability and quality of water sources under Subcomponent 1.2, and the mobilization of water resources under Subcomponent 1.3. Furthermore, it will leverage disruptive technologies and information systems and follow a resilient design process to better address known challenges pertaining to the sustainable management of infrastructure and allow for the monitoring of water abstractions and consumption for improved water resources planning and climate adaptation (e.g., drought and flood management).[55] This component will also prioritize energy efficient infrastructure and renewable energy sources for climate mitigation. A phased approach, supported by the use of Performance-Based Conditions (PBCs), will be used in particular for the Rural WASH components given the institutional strengthening needs which are most notable in this space.

Subcomponent 2.1: Expansion of Rural Development Services (US$59.08 million)

48. **This subcomponent will support: (i) the implementation of small-scale irrigation infrastructure prioritizing the use of solar energy and promoting energy efficiency, (ii) water-usage related activities for pastoralists, and (iii) related capacity reinforcement activities.** It will result in: (i) the extension of irrigated land, (ii) improvements in rainfed agriculture water productivity (green water management), and (iii) support to livestock activities in relation to water resources management. The project will use behaviorally informed approaches, such as those employed under PRAPS (P147674), and will employ an extensive communications strategy to reduce conflicts and ensure inclusive access to included infrastructure under both Subcomponents 2.1 and 2.2. The investment program will be implemented by MAG for irrigation-related activities and by Ministry of Livestock (*Ministère de l'Elevage*, MEL) for livestock activities. All activities will leverage development action plans to be developed under Subcomponent 1.1 at the sub-basin and commune levels. The MAG and MEL have launched studies to further define these investments. The project is exploring areas of collaboration with International Finance Corporation (IFC) on irrigation and value chain development through the private sector and improving market access for farmers.

49. Similar to Subcomponent 1.3, a framework approach will be adopted to identify interventions using pre-identified selection criteria, including the prioritization of resource-efficient technologies and renewable energy use, and quality assurance standards. Additional details on the framework criteria and a set of potential activities are presented in Annex 1.

50. **Pastoral water supply to be constructed/rehabilitated include cattle waterers, wells, reservoirs, and storage facilities (US$9.50 million).** The selection of pastoral water supply activities will be based on selection criteria that include, among others, the strategic location for cattle routes and potential synergies with other projects, grazing capacity of the area (to avoid overgrazing), and the number of potential beneficiaries (households and livestock heads) as they relate to the availability and usage of water resources. Rural water supply activities will be implemented by MHA, with the support of MEL. This should ultimately help complement other projects such as PRAPS.

Subcomponent 2.2: Expansion of Water Supply Services (US$170.00 million)

51. **This subcomponent will support the construction, rehabilitation, and effective management of water supply infrastructure to increase access to climate-resilient and low-carbon water supply services in select urban, semi-urban and rural areas.** It includes three main interventions: (i) construction and rehabilitation of primarily multi-

[55] The resilient design process will follow the principles outlined in the World Bank's *Resilient Water Infrastructure Design Brief*, *Building the Resilience of WSS Utilities to Climate Change and Other Threats*, and the *Decision Tree Framework*.

village infrastructure to improve access to safe and reliable drinking water services (basic and on premise) in semi-urban and rural areas, especially those facing risk of drought and flood, including the Gotheye – Tera multi-village system; (ii) supporting enhanced service delivery management capacity; and (iii) urban water supply investments in Niamey. Service provision will target households, as well as schools and health centers. All infrastructure will ensure inclusive access and directly address climate risks, namely water scarcity, droughts, and floods, using a resilient design process. They will also include measures for the protection of water quality to minimize the threat of climate-related water-borne diseases,[56] such as systematic water treatment and the installation of concrete slabs, fencing and drainage systems. Furthermore, infrastructure will prioritize renewable energy (principally new solar-powered systems), energy efficiency improvements,[57] and non-revenue water reductions to minimize fossil fuel-dependent energy-related GHG emissions while improving financial performance. Disruptive technology will be leveraged to improve the efficiency and sustainability of water systems, with specific technologies to be defined through complimentary studies.

52. **Semi-urban and rural water (US$125.00 million):** Activities will be implemented by the MHA and will include the expansion of the Gotheye-Tera multi-village system, which draws water from the Niger River, through supporting the construction of discharge and distribution pipes, overhead water tanks, discharge boosting stations, and stand-posts and other connections. Other specific semi-urban and rural systems and related activities will be identified and prioritized in accordance with the sub-basin and commune level development action plans developed under Subcomponent 1.1. The leveraging of local, commune, and sub-basin level water platform structures will ensure that activities respond to the needs of communities, that they maximize efficiency through multi-village schemes when applicable, and that the quality, sustainability, and resilience of Niger's water resources to drought and floods[58] are enhanced. Studies have been launched by the MHA to identify potential investments, including no regret investments increasing access to water supply for vulnerable populations and livestock that can be undertaken with community participation, but prior to the establishment of relevant platform institutions. Investments in water dispensers (standpipes), where applicable, will support increased access for vulnerable community members, reduce water loss, and ensure cost recovery for maintenance and expansion.

53. In addition to infrastructure, this subcomponent will finance the establishment and operationalization of effective rural water supply institutional arrangements that promote quality, sustainable, and climate-resilient service delivery and PPP, including through the use of PBCs for additional incentive. Additionally, a technical assistance provider will be engaged to support the capacity reinforcement of private operators. This technical assistance provider will have substantial experience as a private operator managing small water supply systems in similar contexts, allowing them to impart critical and relevant capacities and lessons learned to their Nigerien counterparts.

54. PBCs will incentivize the GoN to design, establish, and operationalize improved, financially sustainable, and functioning rural water supply institutional arrangements, including necessary institutional and stakeholders' studies, due diligence, and workshops to determine the best option for the sustainability and resiliency of rural water services. The reform is intended to better support Niger's municipalities in the delivery of rural water supply and promote private sector investment and sustainable business models for operations and maintenance that increase system efficiency and resiliency, building on the regional experiences of Benin and Senegal, among

[56] The incidence of waterborne diseases – such as cholera, schistosomiasis, and other diarrheal diseases – have been shown to increase as a result of climate change: heavy rainfall and high temperatures in particular (Levy et al, 2018).
[57] Electricity generation in Niger is based almost entirely on fossil fuels (coal and oil, *IEA*), which renders energy efficiency and renewable energy use a potentially significant source of GHG emissions reduction.
[58] Improved and coordinated WRM helps ensure year-round water availability and mitigate potential contamination from flood events.

others. PBCs also include incentives to ensure that support to private operators by the technical assistance provider results in the operationalization of systems and processes required for sustainable, climate-resilient, and energy- and water-efficient service provision by those operators. In total, PBCs of US$12.00 million will be used as incentives for the achievement of key results (see details in Annex 6) through their association with project expenditures for institutional capacity strengthening and infrastructure investment activities:

- **PBC 1:** Establishment of improved, financially sustainable, and functioning rural water supply institutional arrangements in accordance with the project implementation manual (PIM). (Planned for Year 4; US$4 million)
- **PBC 2:** Submission of rural water supply annual report to the Board of Directors and the Regulatory Authority ARSEau following approved template defined in agency operations manual (Planned for Years 5-6 for reports in two project implementation years; US$4 million total; scalable 50 percent, or US$2 million, per year)
- **PBC 3:** Technical assistance provider supported at least 60 percent of private operators managing rural water systems constructed/rehabilitated under the project to operationalize accounting and asset management systems (Planned for Year 6; US$4 million).

55. **Urban water supply services will be improved through support to the implementation of Niamey's climate change-informed Water Master Plan,[59] a key element of the Niger Basin SDAP (US$45.00 million).** Although the World Bank has been supporting urban water reform for two decades and important milestones have been achieved, the subsector still needs investment support to fill gaps in peri-urban areas, address population growth, and improve resiliency to climate change, particularly the risk of drought. While other donors are lending support to additional investments under the master plan, this project will specifically support expansion and improvements to the gravity flow distribution network, implemented by the MHA through SPEN. The World Bank's recent experience with a closed satisfactory WSS project and a successful series of DPOs with important sectoral reforms give confidence in the project readiness and capacity to deliver early results.

Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication (US$20.00 million)

56. **This subcomponent will improve sanitation and hygiene services and practices in both urban and rural Niger, prioritizing support for women and girls**. This subcomponent will be implemented by the MHA. About 65 percent of this subcomponent's budget is expected to be allocated to infrastructure construction in critical public settings, using a resilient design process to directly address climate risks, namely droughts and floods. Building upon similar activities under the UWSP, this infrastructure includes: (i) latrines in schools and health centers; (ii) public bathrooms in lorry parks, markets and other public places; and (iii) fecal sludge treatment plants that are sustainably managed and avoid the release of effluent off-site. The reuse of treated fecal sludge as fertilizer for farms will be promoted,[60] therefore reducing the use of chemical fertilizers, and methane emissions resulting from treatment will be managed to the extent possible to reduce GHG emissions. Measures will also be taken to ensure that WASH facilities are available, accessible (e.g. to those with disabilities), and safe. This includes ensuring proper locks, privacy, and gender-appropriate sanitation facilities in open, well-lit, and highly visible spaces to reduce any opportunity for abuse. Women and children will also be consulted regarding the design and location

[59] The Master Plan includes mitigation measures for drought and the variability of water flow in the Niger River, including risk and resiliency plans for utility operations, energy efficiency improvements, and non-revenue water reduction.
[60] As a result of a University of Niamey assessment on reuse, the Government granted the necessary approvals for fecal sludge reuse as fertilizer at the city's first fecal sludge treatment plant.

of the facilities, including safety mapping and consultations with girls about privacy measures and how to better incorporate menstrual hygiene management considerations in WASH facilities.

57. **Beyond key public infrastructure, the subcomponent aims to promote sustainable behavior change and sanitation value chains**. Thirty-five percent of the subcomponent's financing will support: (i) behavior change activities to improve household-level sanitation and hygiene behavior; (ii) the distribution of hygiene kits (including menstrual hygiene products); and (iii) the development of a holistic sanitation value chain. Mass communication through relevant channels will be used to consolidate awareness and promote behavior change, as well as to destigmatize discussions around sanitation through the mobilization of key social figures. To ensure effective communication, messages will be aligned with and tailored to the differentiated priorities, specific interests and concerns of men and women. Additionally, measures targeting a better inclusion of menstrual hygiene considerations in water and sanitation interventions will be devised in consultation with key stakeholders, with the support of the Ministry of Gender and Children's affairs. Better hygiene and sanitation are expected to contribute, in the longer run, to the reduced exposure and improved adaptability of populations (and in particular girls and women) to climate-change induced water-borne diseases such as cholera and diarrhea. Moreover, the subcomponent will aim to establish and promote the development of an effective sanitation value chain – from containment, emptying, transport, treatment, and reuse – involving private sector entities (entrepreneurs and micro-finance institutions) and informed by the extensive knowledge developed in Niger and other relevant countries with the support of the former Water and Sanitation Program (WSP). Altogether, the project will improve fecal sludge collection, treatment, and reuse to increase the resilience of the population by reducing the risk of ground and surface water contamination, and in turn, the prevalence and spread of climate-related water-borne diseases. Finally, to close the access to information gender gap and boost awareness and interest of women in water issues, communications outreach under Subcomponent 2.3 will explicitly provide women with information about water committees or organizations functions and water management decision-making through accessible and user-friendly approaches and media (e.g. through infographics, posters, radio and women's groups). This will be accompanied by broader awareness raising and behavioral communication to address gender inequalities around water issues, as well as emphasize the importance and benefits of women's leadership in water community-based institutions and women's knowledge, capacity, and potential in such roles.

Component 3: Project management and capacity building (US$25.00 million equivalent)

58. This component will finance the operational costs of the Project Management Unit (PMU). It will support: (i) the coordination and management of project activities; (ii) the development and quality control of required documents under the World Bank's Environmental and Social Framework (ESF); (iii) capacity building of project implementation agencies at national, regional and local levels (including requisite skills and knowledge for gender-sensitive water services and resource management); (iv) the monitoring and evaluation (M&E) and knowledge management of project activities, including compliance with the ESF; (v) capacity reinforcement of ministries and other institutions involved, including the rural water supply institutional arrangements developed under the PBCs and the regulation body ARSEau; (vi) consulting services of an independent verification agency (IVA) to ensure compliance of the PBCs and technical studies for disruptive technology; and (vii) supporting the needed technical assistance for procurement, and others.

Component 4: Contingent Emergency Response Component - CERC (US$0.00 million)

59. This zero-funded component will allow the GoN to quickly mobilize funds in the event of an emergency that requires immediate recovery and reconstruction response. In the event of a crisis or disaster caused by a natural hazard, including climate-related emergencies such as severe drought and flood, this component enables the Government to reallocate IDA project funds to disaster response and recovery purposes under streamlined

procedures. It will therefore support Niger's emergency preparedness and response capacity, including financing of critical emergency goods or emergency recovery and associated services, as well as the targeted provision of post-disaster support to affected households and individuals. Following an adverse natural event, the Government's declaration of disaster in accordance with national law, and adherence to the World Bank's activation policy, the CERC component would be triggered.

C. Project Beneficiaries

60. **The main project beneficiaries are households living in the selected sub-basins, including vulnerable groups such as women and youth and those most vulnerable to climate change, such as farmers and pastoralists.** It is estimated that at least 3 million people will directly benefit from the project's investments, approximately 50 percent of which are women. Categories of beneficiaries include the following:

i. 1,600,000 beneficiaries with improved access to drinking water
ii. 186,800 beneficiaries with using water for productive purposes
iii. Beneficiaries from an additional 149,700 hectares of land area under SLM practices
iv. Beneficiaries with improved WSS services in 300 schools and health centers
v. Beneficiaries accessing 100 public sanitation facilities
vi. 115,000 households provided with services for safe management of faecal sludge
vii. At national level, PANGIRE, MHA, MAG, MEL, ME/LCD, MSP and MPFPE will directly benefit from the project including through support under Subcomponents 1, 2 and 3. Other agencies and institutions at national, provincial and local levels will directly and indirectly benefit from the project through coordination, supervision missions and capacity-building activities.

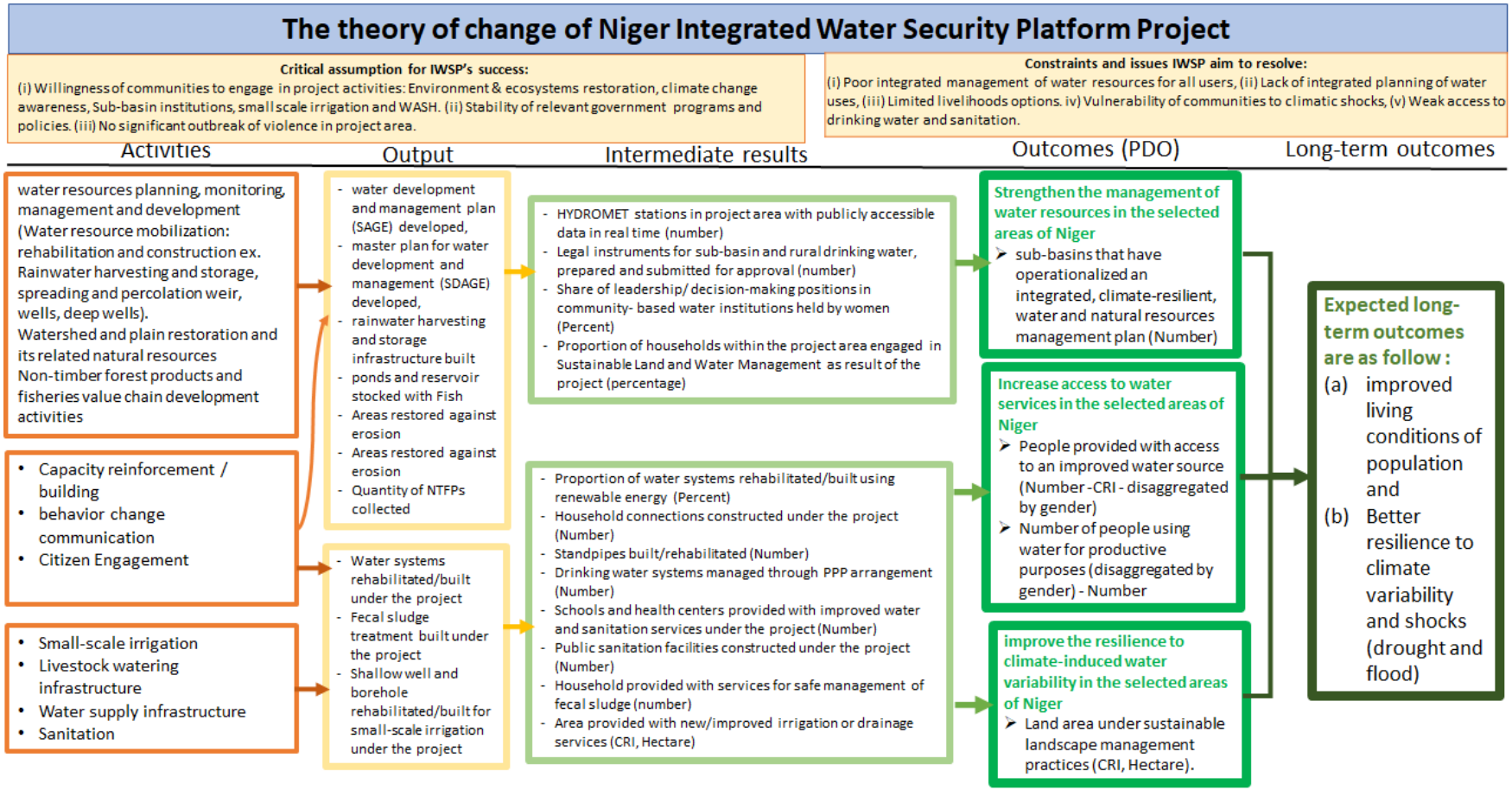
D. Results Chain

61. **The project results chain is described in the theory of change presented in Figure 3.** In response to mounting pressure on land and water resources – accelerated by climate change – the project seeks to support the existing government platform (PANGIRE) to foster the sustainable management of water resources among key stakeholders. Institutions at all levels of government and civil society will be supported to improve their capacity to systematically coordinate water-related planning, policies and climate-resilient investments across all water-using sectors. This integrated approach to water resources management will build the population's resilience to droughts and floods by minimizing land degradation to enhance ecosystem services and safeguarding Niger's water resources. Living conditions will be further improved and water-related conflict reduced through sustainable and climate-resilient access to water for domestic and productive purposes. During the first year of implementation, project activities will primarily involve those included in existing local planning documents (such as the Communal Development Plan [*Plan de Développement Communal*, PDC] and the Local Water and Sanitation Plan [*Plan Local de l'Eau et l'Assainissement*, PLEA]) with sub-basin integrated planning guiding project implementation in subsequent years, as elaborated under Subcomponent 1.1.

62. **Both soft and hard investments under the project are linked to intermediate results, which in turn contribute to the achievement of PDO outcomes.** Water resources planning, monitoring, management and development (water mobilization infrastructure), together with capacity building/reinforcement, citizen engagement, and other technical assistance activities, support the achievement of intermediate results towards the operationalization of integrated and climate-resilient water and natural resources management. These activities support commune-level comprehensive planning and data-driven design of hard investments for WSS, agriculture, fishery, and livestock activities, while safeguarding the availability and quality of water. These intermediate results contribute to the achievement of the PDO result "increased areas with enhanced water

availability", which refers to the mobilization of water through flood control/water harvesting and storage structure and infiltration wears, and soil moisture management including water abstraction structures. Technical assistance activities further compliment infrastructure investments through developing the structures through which water services can be sustained and water resources can be protected.

Figure 3: Theory of Change



The project development objectives are to strengthen the management of water resources, increase access to water services and improve the resilience to climate-induced water variability in select areas of Niger.

E. Rationale for World Bank Involvement and Role of Partners

63. **The World Bank is best suited to support the GoN in its ongoing reform efforts given its continuous engagement in Niger's water sector since 2001 spanning WSS, WRM and irrigation and its ability to support the PANGIRE at scale.** The World Bank has supported WSS projects for two decades and has been prominent in urban water reform through investment programs and capacity strengthening, most recently through the UWSP which closed in December 2020. In WRM, the World Bank has supported implementation of the SDAP through the regional Niger River Basin Management Project (P093806). The World Bank-supported Kandadji Project (P130174) is further supporting the SDAP by enhancing hydropower generation and water management for agriculture in Niger. In addition, the World Bank has supported several ASAs since 2007 to advance knowledge in the sector. World Bank interventions were conducted in partnership with many donors, including particularly the AfDB, the EIB, the AFD, and the SDC.

64. **The project's integrated, holistic approach to investment in the water sector maximizes synergies with other development partners, as illustrated by complementary financing of urban water supply activities under Subcomponent 2.2 by AFD and EIB.** The establishment of water platform institutions under PANGIRE is being supported in other sub-basins by AfDB, EIB, and SDC, and the Government of Netherlands is supporting the ME/LCD in developing a multi-sectoral framework for natural resources management focused on water. Extensive dialogue with these development partners will continue during project implementation to coordinate activities. The team will also seek synergies with Sahel Irrigation Initiative Project (SIIP; P154482), PROLAC (P161706), and Community-Based Recovery and Stabilization Project for the Sahel (P173830).

F. Lessons Learned and Reflected in the Project Design

65. **The IWSP Project's holistic approach to water resources interventions is informed by analytical works and lessons learned from projects within Niger and across the region over the past decades.** The design is founded on several ASAs conducted by the World Bank Water Global Practice (through its global programs) such as the WASH Poverty Diagnostic (P156806), several sanitation-focused ASAs under the auspices of WSP (P133119, P133120, P133121, P154888) and a pilot project on water quality (trust fund – TF0A2608) supported by the Adaptive Safety Nets Program (Social Protection and Jobs Global Practice) in 2017. These ASAs highlight the need for a systematic approach to improving access to water and sanitation by highlighting spatial and income disparities, associated impacts on health and gender-related outcomes, and Niger's demographic challenges. To enable broad-based resilience in the face of climate change, this approach must simultaneously address WRM, WASH, and water in agriculture at scale. The importance of better ensuring water quality at the point of use was also evident in the research, given the multiple pathways through which contamination can undermine health and socio-economic outcomes even when access and service type improve.

66. **There are several key programs and projects the IWSP Project builds upon and is linked to through the objective of sustainable water resources management.** The IWSP Project builds on lessons from World Bank-supported operations, including the Sahel Irrigation Initiative Support Project (SIIP, P154482) that finances small-scale irrigation investments and capacity building of relevant stakeholders. The SIIP has increased the capacity of stakeholders to implement and manage irrigation investments and has led to an increased demand beyond the capacity of the SIIP that will be partially addressed by IWSP. During the SIIP implementation, it was observed that unit costs of irrigation projects are high in Niger. In this context, selection of the most adequate irrigation technology, corresponding to a positive internal rate of return, is essential. The IWSP Project also accounts for lessons from PRAPS (P147674) to ensure that water points for cattle corridors are sustainable, water secure, and mitigate the risk of intercommunal tensions. With respect to urban WSS, the project is informed by the UWSP, which successfully extended service into urban and peri-urban areas while demonstrating the importance of

dedicated project staff and ringfenced procurement processes for effective implementation. The Kandadji Program continues to provide critical lessons related to safeguards, security, WRM, and livelihoods activities related for example to WSS and agriculture. Lessons learned from the use of DPOs in Niger and Performance-for-Results financing regionally to drive reform have been harnessed to design PBCs that have the potential to bring about an effective institutional arrangement for rural water supply. The project's approach to community engagement and participative planning builds upon the vast experience developed over many engagements such as the Community Action Program (CAP1, P065991); CAP2 (P102354); CAP-CR (P125669) and CAP 3 (P132306). Finally, the IWSP also builds on lessons learned in Niger and more broadly in the West Africa region to improve the spatial integration of World Bank projects part of a spatial analysis conducted for the preparation of this project to identify existing and potential synergies using GEMS data as well as other key socio economic and geo-climatic data.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

67. **To ensure a harmonized approach, the Prime Minister office, with its convening power and mandate to coordinate across sectors, is the main anchorage of the IWSP Project.** While Project investments will be identified, prioritized, and selected through a multi-sectoral approach, implementation of specific activities will be conducted directly by the concerned line ministries, leveraging their relevant experience from previous interventions: the MHA including SPEN, the MAG, the MEL and the ME/LCD. Furthermore, the MPFPE and the MSP are also involved for cross-cutting themes (gender/citizen engagement and health/hygiene respectively).

68. **The steering committee,** chaired by the dedicated representant of Prime Minister's Office and composed of the PANGIRE steering committee and representatives of other main stakeholders directly involved in the project, will provide strategic leadership and guidance. The steering committee will meet once per quarter and will work to ensure strong ownership of the project by stakeholders at all levels. It will also approve the annual workplan and budget (AWPB) and supervise project activities.

69. **A central PMU** will be established and housed under the Prime Minister office with the overall responsibility for project oversight and management. The PMU will manage the project's resources, prepare the AWPB, and be responsible for procurement and financial management (FM) in accordance with World Bank rules and procedures. The PMU will be composed of, at a minimum, the following people: (i) the coordinator; (ii) the FM specialist; (iii) the internal auditor; (iv) the procurement specialist; (v) the accountant; (vi) the environmental safeguard specialist; (vii) the social safeguard, gender, and social inclusion specialist; (viii) the M&E specialist; (ix) the communication specialist; (x) the assistant accountant; (xi) the M&E assistant; (xii) the water expert; (xiii) the sanitation and hygiene expert; (xiv) the environmental expert; (xv) the rural engineer; and (xvi) the agro-economist. The PMU will be collectively supervised by all involved ministries through the steering committee, with project technical cells and/or focal points within each ministry participating in relevant decision making.

70. **Procurement and citizen engagement:** Procurement and citizen engagement activities will be supported by external procurement and citizen engagement agents to address the procurement challenges that constitute the main bottleneck for project implementation in Niger, ensure sufficient skills and experience for critical community consultation and grievance redress activities, and to alleviate the work burden on the PMU. However, given SPEN's 20 years of experience implementing World Bank-supported projects, SPEN will directly conduct procurement activities alongside the PMU for associated activities under Subcomponent 2.2. The PMU retains full responsibility for FM.

71. **The central PMU will be reinforced with regional units (regional antennas of the PMU) within each region to ensure field proximity and appropriate management of the project.** Table 2 provides the location of each regional PMU. The regional project antenna will ensure sound financial management and assist in procurement of project activities and will be composed of six persons: (i) the antenna manager; (ii) the rural development specialist; (iii) the procurement assistant; (iv) the accountant; (v) the M&E specialist; and (vi) the team assistance. Select regional antennas will additionally include the following persons to support activities within one or more regions: environmental and social specialists to ensure compliance with environmental and social requirements, and a communications specialist to support communications and citizen engagement activities. All PMU regional antennas will be placed under the authority of the central PMU. Local representation of each ministry at the sub-basin and commune levels will work alongside regional antennas to implement relevant activities.

Table 2: PMU regional antenna locations

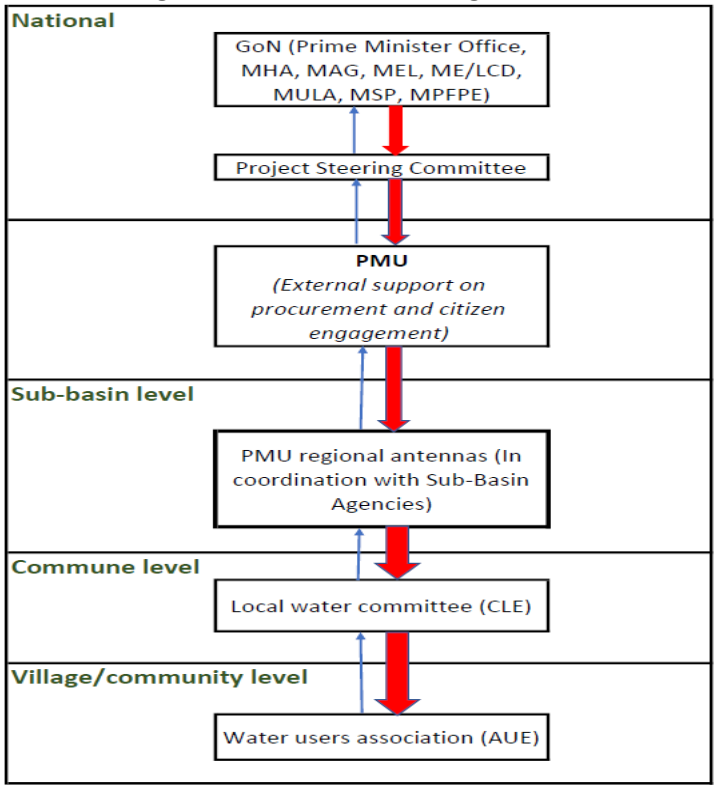
Regions	Agadez	Diffa	Dosso	Maradi	Tahoua	Tillabery	Zinder
Location of the regional PMU	Agadez	Diffa	Doutchi	Maradi	Madaoua	Gotheye	Matamèye
Sub-Basins	Kori Telwa	Manga	Dallol Maouri	Goulbi N'Maradi et Goulbi N'Kaba	Maggia and Tarka valley	Sirba and Dargol rivers	Korama valley

72. **Implementation of activities under Components 1 and 2 will be led by relevant sector ministries and agencies, with support from implementation support consultancies, while Component 3 will be implemented by the PMU.** Implementation arrangements for Components 1 and 2 are as follows:

- Subcomponent 1.1: MHA through the permanent secretary of PANGIRE in relation with DGRE
- Subcomponent 1.2: ME/LCD
- Subcomponent 1.3: MAG
- Subcomponent 2.1: MAG for irrigation-related activities, MEL for livestock-related activities, and MHA with support of MEL for pastoral water supply activities
- Subcomponent 2.2: MHA, including through SPEN for the Gotheye-Tera multi-village scheme and for urban water supply activities in Niamey
- Subcomponent 2.3: MHA

73. **Local-level planning and implementation: Ideally activities are identified through a multi-sectoral "water platform" approach that includes local community-level consultations.** As local-level PANGIRE institutions (AUEs, CLEs, and *Agences de l'Eau*) are gradually established and become functional across the different sub-basins of the country (including through support provided by Subcomponent 1.1), they will become the main mechanism for coordinating this integrated and community-focused approach at local levels in Niger. Prior to their establishment, the activities will nevertheless be identified through a multi-sectoral "water platform" approach that includes local community-level consultations through existing institutions, while accounting for lessons learned from previous projects such as the CAP series. A multi-sectoral team representing the different implementing agencies across all water-using sectors will hold initial consultations at the village-level to understand local needs and to discuss the long list of possible investments covering landscape restoration, water resources mobilization, irrigation, livestock, fisheries and WSS. The community feedback will be aggregated first at the commune level and then at the sub-basin level. Based on the proposed framework criteria for sectoral activities and a consideration of the overall water resources availability, a revised list of multisectoral investments will be discussed and finalized with the local community. The selected activities will be those to be submitted by the central PMU to the project steering committee through the AWPB. Activities are then implemented by the relevant ministries at the national, sub-basin, and commune levels, as per existing institutional arrangements.

Figure 4: Institutional arrangements



74. **Implementation Readiness.** The project preparation advance (PPA) and the project's ESF are finalized and disclosed prior to appraisal and negotiation. The terms of references (ToRs) of key studies (WRM, water in agriculture, environment, WSS) are drafted and the selection process is ongoing. These studies are expected to be achieved by effectiveness to facilitate early implementation. The appointment of PMU staff, the procurement assistance firm and the finalization of the Project Implementation Manual (PIM) are effectiveness conditions for the project. Frameworks for associated sub-projects have been agreed to during appraisal and will be elaborated in the PIM. Finally, urban and semi-urban water activities shall be relatively quick-disbursing, since civil works bidding documents will be ready by effectiveness.

B. Results Monitoring and Evaluation Arrangements

75. **General characteristics.** The PDO performance indicators and the detailed list of results indicators for the components are provided in section VII (Results Framework and Monitoring). This framework consists of expected results, indicators, relevant baseline data of outputs and outcomes, milestones, and a suggested timeline for monitoring progress. The project's M&E system has been designed in accordance with this framework. The system will be available online, with cloud backup, to provide accurate information to verify the progress and eventual achievement of results (outputs, outcomes, and impacts), support learning during implementation, determine accountability for results, and facilitate informed decision-making.

76. **Disruptive technologies.** An emphasis will be placed on the use of disruptive information and communication technologies (ICT) to facilitate data collection and real-time M&E. A combination of satellites, drones, GPS, piezometers, weather stations, mobile phones and tablets will be used to assess agriculture production, the regeneration of fauna and flora, and the management of water resources and water supply systems in coordination with the FSRP Project.

77. **Results measurement for project performance.** A series of baseline studies have been launched as part of the preparatory works. The findings of some of these baseline studies have served to refine targets against which project results will be measured. However, some of these targets are based on a framework approach that was adopted due to delay in implementing the required studies. Routine monitoring (semesterly and annual reports) of implementation will be conducted to facilitate informed strategic decision-making and adjustments as necessary. A mid-term review and an impact evaluation study will be conducted during implementation and at the end of implementation respectively. The mid-term review will include a qualitative survey to capture women's and men's relative levels of satisfaction with project investments. The PMU will be responsible for ensuring strong links between M&E, knowledge management, and strategic communication. The M&E evaluation process will generate knowledge products and services that will be disseminated among project beneficiaries through a range of readily accessible communication channels.

78. **Accountability for results.** The project's M&E system will involve, in addition to required reporting, an accountability mechanism comprising of stakeholder consultations and the mid-term review. Information-sharing and stakeholder engagement throughout the project cycle will be a core component of the project's accountability for results. The PMU will ensure that stakeholders/beneficiaries have access through various channels to timely, relevant, and unambiguous information about the project's M&E findings and are also able to incorporate their views in the project's review and decision-making process.

79. **Harmonization and integration with national and sectoral M&E systems.** The project will make consistent efforts to empower national institutions to ensure that the M&E of project outcomes feed into national M&E systems (MHA, MAG, MEL and ME/LCD).

C. Sustainability

80. **Sustainability of IWRM.** To ensure the sustainability of integrated and climate-resilient WRM, the project will support the establishment and capacity-strengthening of water platform institutions per the PANGIRE vision. The following support will be provided:

a. **Sub-basin level institutional setup:** The project will support the establishment and capacity strengthening of sub-basin agencies through participative processes. These agencies will oversee the preparation of sub-basin development action plans and the coordination of related activities.
b. **Commune level institutional setup:** The project will similarly support the establishment and capacity strengthening of CLEs within all included communes. CLEs will oversee all actions related to planning and implementation of activities at the commune level, in coordination with the sub-basin agency.
c. **Community or village level setup:** Finally, the project will support the establishment and capacity strengthening of AUEs in select communities. AUEs will serve as the primary interface between the water platform and community members, supporting communities in planning and implementing activities within the development plans.

81. **Sustainability of climate-resilient water supply systems and public sanitation infrastructure:** In the urban water supply sector, the project will continue to support the sector's well-established public-private institutional arrangements, which have already led to substantial improvements in operational efficiency and sustainability. To ensure the sustainability of rural water supply systems, the project will support the establishment of effective institutional arrangements, which will support private sector involvement in the management of rural water investments and assets to improve service delivery. The project will be informed by experiences in Benin and Senegal, among others, and accordingly propose a workable setup for Niger. In order to navigate the vested interests and account for the capacity gaps of the sector, the IWSP Project will take a consultative and gradual

approach to reform. The project will provide technical assistance and incentives through PBCs to support further assessment of the sector, the collaborative determination of improved rural water sector institutional arrangements, the detailed design of relevant institutions, the establishment and/or operationalization of any required institutions, and the capacity reinforcement of private operators. For sanitation infrastructure, there are two categories of infrastructure with distinct ownership and management models. Public toilets and sludge treatment plant are owned by municipalities and are legally empowered to recruit a private entity to manage these assets through a lease contract. Conversely, latrines in schools and health centers are operated and maintained by a management committee within the respective institution. The project will further support the establishment and operationalization of a monitoring system that informs sector decision making.

82. **Sustainability of water mobilization for climate resilient agriculture infrastructure:** The operations and maintenance of water mobilization and irrigation infrastructure are ensured by different entities depending upon their scale:

a. The current practice for maintenance of water harvesting and storage infrastructure is that an infrastructure management committee is expected to collect fees from all beneficiaries to cover needed operations and maintenance (O&M) costs. While these committees have performed relatively well on coordination aspects and on notifying the MAG regarding maintenance needs, their performance on financial contributions has been mixed. The project will continue this existing system for O&M of water mobilization investments, with an added focus on strengthening their functional capacity.
b. The MAG is responsible for major rehabilitation works for such infrastructure (example of collapse or heavy damages due to exceptional rainfall), either through the National Office for Large Scale Irrigation (*Office National des Aménagements Hydroagricoles*, ONAHA) or a private contractor.
c. For small scale irrigation, beneficiaries, through infrastructure management committees, are responsible for periodic maintenance and rehabilitation of the system or part thereof (pumps, shallow wells, etc.). The project includes activities to reinforce their capacity.

83. **Sustainability of ecosystem restoration:** In accordance with the national environmental law, a management committee is established within each community's AUE to ensure its protection and management. Once ecosystem restoration activities are completed, each management committee directly generates revenues through agroforestry, timber and non-timber forest products to fund their activities and ensure sustainability.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

84. **Technical analysis.** The Government has commissioned pre-feasibility studies for the various areas of intervention. Since the investments under Subcomponents 1.2, 1.3, and 2.1 will be identified in a multi-sectoral and consultative process to be initiated by the project, it is expected that the implementation phase of these investments will start in the third year of the project. Since many of the investments under Subcomponent 2.2 are pre-identified, they will enter implementation in the first two years of the project.

85. **Economic analysis**. The economic costs and benefits of project interventions have been assessed based on the following development impacts: (i) improved water resources management through enhanced monitoring systems and capacity building; (ii) restored selected watershed landscapes to improve the resiliency of agricultural and rural livelihoods and to promote land and water conservation; (iii) water resources mobilized promoting their sustainable use across sectors, including for small-scale irrigation, fish farming, and livestock; and (iv) improved access to WSS services. A standard cost benefit analysis (CBA) was carried out for all areas of intervention where

benefits could be monetized; the combined project financing to such interventions is US$345 million, 86 percent of total project costs, allocated as shown in Table 3.

86. **Key parametric assumptions for the CBA.** The discount rate used for the CBA is 6 percent, which represents the opportunity cost of investment projects with activities dealing with the mitigation/adaptation of the effects of climate change. The rate of exchange used is FCFA 500 per US$1 and the time horizon for the CBA is 30 years, with the life of infrastructure assumed to be 30 years as well. The economic analysis uses 2020 constant prices for both cost and benefits.

87. **The project as a whole and each of its interventions are found to be economically viable.** The economic internal rate of return (EIRR) and economic net present value (ENPV) were estimated using the incremental CBA method, as shown in Table 3. The EIRR of the project as a whole for the base case scenario is 11 percent and the corresponding ENPV is US$216.21 million. These results indicate that the project considered as a whole generates 5 percent more economic return than alternative projects assumed to generate 6 percent per year return, and such excess return results in a surplus ENPV equal to US$216.21 million. The table also shows estimates of the EIRR taking into account the impact of project activities on GHG emissions, using both the lower and upper limits of the shadow price of carbon (SPC).[61]

Table 3: Economic assessment of project

	All project interventions taken together	Integrated Inv. for Water Security		Expansion of Integrated Water Services					
		Restoration of Watersheds	Mob. of water Resources	Small Irrigation Schemes	Aquaculture Interventions	Development of Livestock	Rural water Supply	Urban Wate Supply	Public Sanitation
EIRR	11.0%	11.3%	11.8%	10.9%	7.3%	10.2%	11.4%	11.9%	8.3%
Lower limit, SPC	12.2%	16.3%	10.6%	9.4%	5.8%	15.8%	13.1%	12.9%	7.9%
Upper limit, SPC	13.4%	20.8%	9.5%	7.8%	4.2%	20.6%	14.8%	13.8%	7.4%
ENPV, US$ million	216.21	44.50	39.76	23.88	0.53	6.33	34.69	52.95	13.56
Funding, US$ million	345.00	50.00	45.92	39.08	5.00	15.00	75.83	94.17	20.00

88. **Component by component results**. The EIRRs by component vary from 7.3 percent for the aquaculture interventions to 11.9 percent for the urban water supply interventions, showing that all subcomponents are economically viable as their EIRRs are above the 6 percent discount rate. The positive results can also be expressed in terms of concrete benefits to the populations in the project areas of intervention: i.e., the project as a whole will benefit 2.9 million people, of which 1.4 million will gain access to water supply in rural areas, 0.7 million will gain access to water supply services in urban areas (Niamey, Gotheye and Tera), and 0.8 million will gain access to sanitation services. Also, the project will generate 27,615 permanent jobs (most of them in irrigated agriculture) and 4,875 jobs during project implementation. And as spillover effect, the project is expected to generate about 7,359 indirect jobs, most of them related to agriculture activities. Moreover, the project is expected to contribute to food security by promoting improvements in crop yields.

89. **A sensitivity analysis was carried out for the base case scenario to assess the impact on the project's economic viability of changes in key parameters.** Taking all components together, a 10 percent investment cost overrun results in the EIRR falling from 11 to 10.1 percent. The base case scenario includes farming during wet and dry seasons; a failure to achieve two harvests per year reduces the EIRR of the project by 1.5 percent, taking the EIRR from 11 percent down to 9.5 percent. However, this reduction makes small irrigation scheme investments not economically viable, with an EIRR of only 4.8 percent, well below the 6 percent discount rate. Yet as a whole, the project is resilient to cost overruns and to not achieving two harvests per year. However, note also that achieving the promising EIRR results will depend on the institutional arrangements defined by the project for

[61] SPC is given as range with a lower and an upper limit of US$40 and US$80 respectively for year 2020, growing at 2.26 percent per year.

handling value chains of high crop yield irrigation practices, for introducing solar energy driven water supply systems proposed for the rural areas, and for the fecal sludge treatment plants financed by the project.

90. **Assessment of impacts of project activities on green-house-gas (GHG) emissions.** Based on preliminary estimates of project impacts on GHG emissions, the project as a whole contributes to GHG net emission reductions[62] of 3.43 million tons of Carbon Dioxide equivalent (tCO2eq) during the economic lifetime of the project, equivalent to an 114,364 tCO2eq annual average. A summary of gross and net GHG emissions impact by subcomponent is presented in Table 4. When shadow prices of carbon (SPC, lower and upper limits) are taken into account to assess economic viability of the project, the EIRR of the project rises from 11 percent to a range between 12.2 and 13.4 percent (see Table 3), which indicates that the project is not only economically viable but also contributes to the global public good. From a subcomponent-by-subcomponent perspective, the major contributions to GHG emission reductions are the Restoration of Watershed subcomponent (whose EIRR rises from 11.3 percent up to between 16.3 and 20.8 percent) and the Development of Livestock activities (whose EIRR rises from 10.2 percent to the range between 15.8 and 20.6 percent). The Rural and Urban Water Supply subcomponent also contributes significantly to GHG emission reductions, whose EIRRs increase from 11.4 and 11.9 percent to between 13.1 and 14.8 percent and between 12.9 and 13.8 percent respectively. Mobilization of water resources, small irrigation schemes, aquaculture and public sanitation activities contribute to increased GHG emissions, which is reflected in their reduced EIRR by more than one percentage point when taking GHG emissions into account (See Table 3).

Table 4: Project GHG emission impact by subcomponent

	Gross Emissions Economic Lifetime tCO2eq	Net Emissions Economic Lifetime tCO2eq	Net Emissions Annual Average tCO2eq
Subcomponent 1.2: Restoration of Watershed Environments	19,696,204	(2,585,994)	(86,200)
Subcomponent 1.3: Mobilization of Water Resources	491,455	313,632	10,454
Subcomponent 2.1: Expansion of Rural Development Services	58,962	(242,442)	(8,081)
Subcomponent 2.2: Expansion of Water Supply Services	364,857	(1,052,820)	(35,094)
Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication	160,704	136,704	4,557
Total	20,772,181	(3,430,921)	(114,364)

91. **Financial analysis.** Urban water supply investments under a lease contract with SPEN/SEEN have demonstrated to be financially sustainable with remarkable operational and financial performance as evidenced by their financial statements and performance indicators reports. Investments implemented by SPEN will be financially sustainable with a 10 percent financial internal rate of return (FIRR). Rural water supply to be financed by the project to include delegated management and PPP arrangements could achieve financially sustainability with a 9 percent FIRR if performance levels like those at SPEN/SEEN are achieved. Based on cash flow models for prototype farmers, small irrigation schemes could be financially viable with a 9.5 percent FIRR provided high value crops are grown and two harvests per year are produced. Aquaculture and livestock investments could be financially viable, with a 9.3 percent and 8.6 percent FIRR respectively, if financing is allocated based on evidence-based business models and extensive value chain support.

92. **Rationale for public sector financing.** Public sector financing is justified by the strong public good nature that characterizes multipurpose infrastructure, such as the construction of reservoirs, infiltration thresholds, dikes,

[62] The project's gross emissions are estimated at 20.77 million tCO2eq during the economic lifetime of the project, while baseline emissions are estimated at 24.20 million tCO2eq.

and the development of wellfields financed by the project. Public sector financing in irrigation schemes is justified provided that such schemes will contribute to poverty alleviation by making possible drastic improvements in crop yields that would enable Niger to feed its own people. Public financing for expanding access to WSS services is justified by the public health benefits accruing to society at large since, at Niger's current stage of development, it is unlikely that tariffs could be raised to a level that generates the funds to repay finance on commercial terms.

B. Fiduciary

(i) Financial Management

93. **The project's FM functions, including the preparation of consolidated financial reports and withdrawal requests, will be provided by a PMU to be established under the Office of the Prime Minister.** As part of project preparation, an assessment was conducted to determine whether the implementing agency has adequate FM arrangements to ensure that: (i) project funds will be used for purposes intended in an efficient and economical way; (ii) project financial reports will be prepared in an accurate, reliable and timely manner; (iii) project assets will be safeguarded; and (iv) the project is subjected to a satisfactory auditing process. The assessment included budgeting, staffing, financial accounting, financial reporting, funds flow, disbursements, and internal and external auditing arrangements.[63]

94. **The Office of the Prime Minister is the implementing agency of three ongoing World Bank-financed projects,** namely: PFSA 2 (P166602), PARCA (P164563), and PROLAC-Niger (P161706). It has also been recently assigned as the implementing agency of the Three Borders Project (P173830) in Niger.

95. **The assessment revealed that PFSA 2, PARCA and PROLAC have a good track record with FM performance rated "moderately satisfactory."** However, given the limited procurement and FM capacity in the public sector in Niger, these projects were implemented through a dedicated PMU with appropriate risk mitigation arrangements for fiduciary aspects.

96. **The conclusion of the assessment is that the Office of the Prime Minister has in place basic FM arrangements for World Bank-funded projects.** However, the fiduciary risk is assessed to be substantial mainly due to the complex institutional arrangement with five line ministries and the use of the PBC mechanism. In order to mitigate the fiduciary risk and ensure adequate FM arrangements through the new PMU, the following actions need to be completed : (i) prepare and adopt the PIM – including FM procedures such as internal controls, budget process, assets safeguards, and description of roles and responsibilities of all stakeholders, as well as the PBC manual as an annex – before effectiveness; (ii) recruit one FM specialist and one senior accountant before effectiveness; (iii) recruit one internal auditor and an accounting assistant within three months after effectiveness; (iv) acquire accounting software within one month after effectiveness; (v) recruit an external auditor within six months after effectiveness; (vi) recruit regional accounting assistants for each of the seven regions and deploy the accounting software in the regions within six months after effectiveness; and (vii) appoint an Independent Verification Agent (IVA) to certify PBC payments (disbursement condition for PBC).

97. **Eligible expenditures for the PBC disbursements include those expenditures incurred by the Government for semi-urban and rural water investments under Subcomponent 2.2.** These expenditures include infrastructure investments, as well as those required to establish and operationalize effective rural water supply institutional

[63] FM assessments were carried out in compliance with Directives and Guidance Notes, including **World Bank Directive**: Financial Management Manual for World Bank Investment Project Financing Operations issued February 4, 2015 and effective from March 1, 2010; and the **World Bank Guidance**: Financial Management in World Bank Investment Project Financing Operations Issued and Effective February 24, 2015, last February 28, 2017.

arrangements such as consultancies and incremental operational costs, including but not limited to: office furniture; transportation equipment; computer hardware and software; studies; trainings; workshops; allowances and per diem; water, electricity, and communications costs; building rents; maintenance costs; office stationary; incremental salaries (up to 100 percent for first year and up to 60 percent for second year); sector management information systems; and audit costs.

(ii) Procurement

98. **Procurement Regulations.** Procurement activities for the proposed project will be carried out in accordance with the World Bank's "Procurement Regulations for Investment Project Financing (IPF) Borrowers" dated July 2016 and revised in November 2017, August 2018 and November 2020 under the "New Procurement Framework", the "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants" dated July 1, 2016, and other provisions stipulated in the Financing Agreements. The overall procurement risk is Substantial. The PMU will be staffed with dedicated procurement staff and will be also supported by specialized consultants with procurement expertise during implementation.

99. **All goods, works, and non-consulting services** will be procured in accordance with the requirements set forth or referred to in Section VI. Approved Selection Methods: Goods, Works and Non-Consulting Services of the 'Procurement Regulations' and **consulting services** will be procured in accordance with the requirements set forth or referred to in Section VII. Approved Selection Methods: Consulting Services of the 'Procurement Regulations', the Project Procurement Strategy for Development (PPSD), and the Procurement Plan approved by the World Bank. The Procurement Plan, including its updates, shall include for each contract: (i) a brief description of the activities/contracts; (ii) selection methods to be applied; (iii) cost estimates; (iv) time schedules; (v) the World Bank's review requirements; and (vi) any other relevant procurement information. The Procurement Plan covering the first 18 months of implementation has been prepared and agreed to during negotiations. Any update of the Procurement Plan will be submitted for the World Bank's approval. The Borrower shall use the World Bank's online procurement planning and tracking tool – the Systematic Tracking of Exchanges in Procurement (STEP) – to prepare, clear, and update its Procurement Plans and conduct all procurement transactions.

100. **Procurement assessment**. A procurement assessment has been carried out for the implementing agency by World Bank procurement specialists during preparation, in accordance with the World Bank Procurement Risk Assessment and Management System (PRAMS). Based on this assessment, and consistently with the procurement arrangements set forth in the PPSD, the PMU will be relying on (i) the Procurement Agent which will be recruited competitively; and (ii) seven regional implementation units (PMU regional antennas). The full summary of the completed procurement assessments and suggested measures to address identified inadequacies and risks are provided in the Procurement Annex. A brief highlight of the summary is provided in Table 5.

Table 5: Procurement mitigation measures

Implementing agency	Procurement mitigation measure	By when
PMU	• Recruit a procurement specialist dedicated to the project on competitive selection basis. • Recruit procurement assistants for each of Regional Antenna.	One month after effectiveness
	• Recruit a Procurement Agent to assist the PMU by carrying out complex and critical procurement activities according to Legal Agreement, the procurement manual and the project procurement plan.	90 days after effectiveness
	• Draft a procurement manual in the PIM to ensure appropriate implementation of activities in line with the World Bank general framework related to the project. • The manual should describe procurement rules applicable to the project and a clear accountability system, as well as responsibilities for decision making, and describe streamlined procurement procedure when applicable.	Before project effectiveness
	• Advertise at the national level even for small works using requests for quotations (open approach of the market). • Set up third-party supervision and monitoring system. • Provide military escorts to supervision missions.	Throughout project implementation
	• Develop contract management plans for prior review contracts.	Throughout project implementation
	• Train project staff on the new framework (online and/or in person) and the STEP, which will be used to manage all contract transactions and related documents.	Throughout project implementation
	• Set up a filing system at the PMU level to ensure compliance with the World Bank procurement filing requirements. • Ensure timely archiving of all procurement documents and complaints in STEP. • Provide a dedicated room for physical archiving.	Throughout project implementation

101. **Procurement responsibilities**. The PMU will carry out procurement activities and will be responsible for the coordination and quality control of all procurement-related activities funded by the proposed project. The Procurement Agent will assist the PMU by carrying out complex and critical procurement activities according to the legal agreement, the procurement manual, and the project procurement plan. The regional antennas will consolidate regional work plans, budgets and progress reports to be made available to the PMU.

102. All procuring entities, as well as bidders, and service providers such as suppliers, contractors, and consultants, shall observe the highest standard of ethics during the procurement and execution of contracts financed under the project in accordance with paragraph 3.32 and Annex IV of the Procurement Regulations. When procurement is done in the national market, as agreed in the Procurement Plan, the country's own procurement procedures may be used with the requirements set forth or referred to in paragraphs 5.3 to 5.6 related to National Procurement Procedures.

103. **Procurement Documents** will adopt provisions of World Bank standard procurement documents related to environmental, social (including sexual exploitation and abuse [SEA], sexual harassment [SH], and GBV), health and safety risks and impacts, including codes of conduct that include prohibitions against SEA/SH.

PPSD. The Borrower has prepared the PPSD which describes how procurement activities will support project operations for the achievement of the project's development objective and deliver value for money. The procurement strategy is linked to the project implementation strategy at country, regional, and international levels, ensuring proper sequencing of the activities. It considers institutional arrangements, roles and responsibilities, thresholds, procurement methods, prior review, and requirements for carrying out procurement. It also includes a detailed assessment and description of the implementing agencies in charge of procurement (the PMU and SPEN) and the other implementing agencies that will manage contract implementation (MHA, MAG,

ME/LCD, MEL, SPEN), within an acceptable governance structure and accountability framework. Given capacity challenges within the implementation agencies, a procurement agent will be recruited to assist the PMU in procurement activities. Other issues to be considered include the behaviors, trends, and capabilities of the market (i.e. Market Analysis) to respond to the procurement plan. The strategy includes a summary of: Procurement Risk, Mitigation Action Plan, Market Analysis, and Procurement Approaches in a context of fragility. The PPSD (including the procurement plan) outlines the fit for purpose procurement arrangements that best suit the situation for achievement of the PDO, and has been reviewed and found acceptable by the World Bank.

C. Legal Operational Policies

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

104. Projects on International Waterways (OP/BP 7.50): OP 7.50 is applicable to the Project as it supports integrated investments for water security and the expansion of integrated water services in transboundary river basins that are shared with neighboring countries and therefore considered “international waterways,” including the Niger River Basin (shared with Benin, Burkina Faso, Cameroon, Chad, Côte d’Ivoire, Guinea, Mali, and Nigeria) and the Lake Chad Basin (shared with Cameroon, Central African Republic, Chad, and Nigeria). Given the nature of activities financed by this project, the project team determined that the project will not adversely affect the flow, quantity or quality of the water flowing to other riparian countries and will not be appreciably harmed by other riparians’ possible water use. In accordance with the Policy, both the Lake Chad Basin Commission (LCBC) and the Niger Basin Authority (NBA) were notified on March 10, 2021 of the planned annual water abstractions related to the water supply and small-scale irrigation investments under the project. An Addendum to the original notification letter was sent to the NBA on July 22, 2021 to provide additional information on other relevant investments concerning the Niger River Basin. The LCBC and the NBA confirmed their agreement with the project on May 26, 2021 and July 27, 2021 respectively. A memo confirming the completion of the OP 7.50 notification process was approved by the World Bank regional management on August 4, 2021.

D. Environmental and Social

105. **The environmental risk rating is substantial.** The environmental risks, both contextual risks and potential risks induced by the project investments, are deemed substantial due to the specificity and footprint of the areas of intervention. Project Environmental and Social Review Summary (ESRS) assessing the environmental and social risks and impacts has been prepared and disclosed. The environmental and social assessment carried out during the preparation of the project Environmental and Social Management Framework (ESMF) highlighted the positive and negative impacts associated with the IWSP implementation. Key positive impacts are: (i) the strengthening of the legal and institutional framework of the integrated water resources management strategy which will improve the management of water resources; (ii) the improvement of rural communities livelihoods; (iii) job creation for local communities mainly youth; (iv) local workforce promotion; (v) promotion of income-generating activities; (vi) building local communities and decentralized services technical capacities; (vii) restoration of ecosystems services and (viii) improvement of productivity and food security etc. Negative environmental impacts include: (i) the risk of accidents to workers and populations due to the movement of construction machinery; (ii) non-compliance with safety instructions; (iii) poor organization in the work areas; (iv) water and soil contamination; (v) pollution and nuisances (noise, dusts and visual degradation of the landscapes; (vi) ecological and social risks linked to hazardous materials and waste; (vii) risks to the health and safety of workers and neighboring

populations; (viii) risks of cumulative impacts on biodiversity (uprooting of trees and cutting of shrubs), as well as on soils (erosion); (ix) risks of exclusion of certain social categories of people (because of their sex or their social status, etc.); (x) risk of possible economic displacement (with loss of land, property or access to goods, more or less temporary, leading in particular to a loss of source of income or other means of subsistence); (xi) GBV/SEA/SH risks on worksites; and (xii) risks of degradation of cultural and historical heritage; etc.

106. **The social risk of this project is rated as substantial reflecting:** (i) the social context with high fragility and conflicts prevailing in the area; (ii) anticipated land acquisition of proposed activities, expected economic displacement during civil works, disruptions on people's livelihoods, impacts on income-generating activities, and restrictions of access to resources; (iii) increased risk of commercial sex and spread of HIV/AIDs and COVID-19 diseases, SEA/SH of girls and women in rural areas, and SEA/SH associated risks; (iv) potential impacts on vulnerable groups including pastoralists, especially women pastoralist; (v) potential community health and safety issues; and (vi) labor related impacts including labor influx and child labor. In addition to this, the risk of SEA/SH has also been assessed to be substantial using the World Bank SEA/SH screening tool.

107. Insecurity in the Sahel region continued to deteriorate throughout 2020**.** The Sahel region is currently experiencing a multidimensional crisis characterized by armed conflict, political instability, and large-scale displacement. In Niger, the regions of Tillaberi, departments of Tera and Gotheye, and Diffa face the most significant threats from armed groups and violent extremism. In the regions of Maradi and Zinder, the security risks are related to the fluidity of the border and cross-border criminality/opportunistic crime. In addition, the recent deterioration in the security situation in the three borders area with Mali and Burkina Faso has a negative impact on Tillaberi region with violent attacks by non-state armed forces spilling over from neighboring countries. In Niger, 1,114 fatalities were recorded in 2019, similar to 2015 figure but nearly five times the number of fatalities in 2017. About 60 percent of killings were recorded in Tillabéri region, with most civilian fatalities caused by jihadi groups—including an attack on January 2, 2021, which left 100 dead.[64]

108. In light of these risks, the Borrower has prepared a Security Risk Assessment (SRA) as part of the preparation of the Security Management Plan (SMP). This assessment was submitted and cleared by the World Bank prior to the project appraisal. It was agreed that the Borrower will prepare the security risks management plan to get World Bank no objection before project effectiveness. This will be done in accordance with ESS1 (Environmental and Management) and ESS4 (Community Health and Safety), which require the Borrower to assess, manage, and monitor potential human security risks and impacts arising from the implementation of World Bank-funded operations. These risks and impacts include threats to human security through personal, communal, or interstate conflict, as well as more general crime or violence. The SMP will identify, manage, and where possible recommend mitigation measures to protect against risks posed by intensifying levels of conflict and violence in selected project areas. The SMP will also examine issues such as the geographic spread of security incidents related to the presence of non-state armed groups or ongoing military operations, tensions between community members in relation to the water basins in particular, and the potential impact on project activities. The SMP will describe how and by whom security will be managed and delivered; the resources required; how the PMU will deploy in insecure conditions; and the behavior that is expected of security personnel if armed forces, police, or gendarmerie are involved in any project-related activities.

109. To manage and alleviate environmental and social risks, the Borrower identified several mitigation measures through prepared safeguards instruments and committed to their implementation through the Environmental and Social Commitment Plan (ESCP) disclosed on September 1, 2021. Indeed, the Government has prepared the following documents which were disclosed by the Government and the World Bank on August 10, 2021 prior to

[64] *https://www.theguardian.com/world/2021/jan/02/at-least-70-killed-in-suspected-islamist-attacks-in-niger*

the project appraisal: (i) a Pest Management Plan (PMP); (ii) a Resettlement Policy Framework (RPF); (iii) a Stakeholder Engagement Plan (SEP) with its proper GRM; and (iv) a Labor Management Plan (LMP). An ESMF which includes a Grievance Redress Mechanism (GRM) and a GBV/SEA/SH action plan was subsequently disclosed on August 19, 2021. The Government has also prepared the following documents to be prepared and disclosed prior to project effectiveness: (i) a Biodiversity Management Plan; and (ii) a Security Management Plan (SMP). Where applicable, ESIA/Environmental and Social Management Plan (ESMP) and RAP will be prepared, consulted, approved and disclosed before the start of civil works.

110. The biodiversity in fragile ecosystems and Ramsar areas will be protected through measures focused on improving the knowledge of actors (governmental technical services, NGOs, Associations, local communities) on the management of fragile ecosystems and wetlands. Capacity building of these actors will be supported around themes related to the management and conservation of biodiversity, particularly in Ramsar sites and other fragile ecosystems. Niger is a contracting party to the Ramsar Convention and must ensure that its commitments and obligations are respected. To this end, all measures will be taken to respect the commitments made to promote the wise use of wetlands in the areas concerned.

111. The Borrower's institutional capacity to implement the project within the ESF is considered moderate due in particular to the lack of experience and familiarity with the ESF in the proposed PMU. In this regard, at national and regional levels, the Borrower will recruit a full-time qualified environmental and social safeguard specialist, and a part time GBV specialist. The project will organize several training sessions on ESF to implementing agencies and stakeholders.

112. **Gender.** Project interventions aim to address women's socio-economic, water and sanitation needs and challenges. This includes freeing up girls and women's time for productive activities (e.g. through the expansion of water resources/services), and empowering women to take on leadership positions in community-based organizations, amongst others. Women are under-represented in membership and leadership in water committees and organizations. This is due to various factors such as patriarchy and socio-cultural norms (assigning women with household and caregiving responsibilities and men with breadwinner/decision-making roles), lower access to information for women and lower capacity to participate actively in decision-making. The project will address this gap through actions such as raising community awareness about the importance of women's participation and leadership in water-related decision-making processes, enhancing women's access to information about water committees/organizations functions and water management decision making processes through tailored information campaigns targeted to women, introducing targets for women in leadership roles in water committees/organizations, and supporting women's active participation in decision-making through skills training of female committee members and leaders, and other actions.[65] These gender actions will be further fine-tuned and strengthened based on the findings of the gender assessment. Progress will be monitored through an indicator on female leadership in community-based water organizations. The project will also track women's enhanced access to improved water sources and agricultural assets or services.

113. **SEA/SH.** Preventing, mitigating, and responding to violence against women and girls will be promoted through the provision of safe and gender appropriate public sanitation infrastructure, as well as mainstreamed under this project by, for example, incorporating clauses in this regard in bidding documents or a Code of Conduct for management and workers, and trainings/ sensitization sessions on SEA/SH, and child abuse and exploitation.

[65] For example, water committee/organization meetings will be only scheduled at times and in locations to facilitate women's participation. Where needed for cultural reasons, separate women's groups or subgroups could also be set up to promote women's active participation in decision-making. For female water committee/organization members (including those in leadership positions), specialized regular capacity building will be provided to enhance their technical, leadership, communications, and conflict resolution skills.

Furthermore, a SEA/SH risks assessment was conducted using the World Bank's tool developed for projects that include civil works during project preparation. The SEA/SH risk is considered as Moderate with key risks being linked to the pre-existing high prevalence of intimate partner violence and sexual violence, harmful social and cultural norms across the countries, a weak legal context, and the distant project areas that might make the supervision of activities difficult. A SEA/SH Risk Mitigation and Response Action Plan (as part of the ESMF) has been prepared and disclosed on August 20, 2021.

114. **GRM.** The GRM will establish a two-pronged GRM to allow affected stakeholders to raise grievances and seek redress if and when they perceive that a negative impact has arisen from project interventions. The GRM will be designed in consultation with relevant government and non-government stakeholders including communities. It will establish accessible processes to submit complaints as well as clear procedures from investigation to resolution and feedback. The GRM will include the provision for appeal if aggrieved parties are dissatisfied with the outcome. A communication sensitization campaign will be implemented aiming at raising awareness and informing stakeholders on how to use the GRM procedures and stipulating the investigation and resolution sequential process and timeline. The project GRM will include provision for ethical and survivor-centered management of SEA/SH related complaints. Local GRM committees will be composed of at least one and preferably two females. The GRM system that will be set up will be complemented by training and information sessions of communities on nonviolent methods of resolving conflicts, in particular, conflicts related to water management.

V. GRIEVANCE REDRESS SERVICES

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

VI. KEY RISKS

116. **The project's *overall risk* rating is Substantial.** Political and governance, institutional capacity, fiduciary, environmental and social, and security risks are assessed as Substantial, while macroeconomic, sector strategies and policies, and technical design risks are considered moderate. Based on explanations of risk ratings and proposed mitigation measures provided, the residual risks are considered substantial, but this will be reassessed during implementation.

117. **Political and governance risks are Substantial.** The new project coordination and management unit to be recruited within new implementation agencies may not be aware of World Bank procedures. In addition, high risk security contexts in some project areas (Tillaberi, Tahoua and Diffa) may affect project design and implementation. To mitigate these risks, the project team had first worked to secure high-level political commitment. Close collaboration with the designated technical staff may help overcome potential delays in project preparation. To address security concerns, mitigation measures include the use of disruptive technology and security escorts for

field visits. In addition, the PMU of the recently closed UWSP (P117365), is lending its experience with World Bank procedures to support the project preparation until effectiveness.

118. **Macroeconomic risk is Moderate.** The COVID-19 crisis is inflicting significant negative economic impacts, leading to a plummeting growth rate from 5.8 percent in 2019 to 1.0 percent in 2020. The pandemic will work through external channels such as reduced regional and global demand, lower-than-planned Foreign Direct Investment (FDI), plummeting commodity prices and tighter financing conditions in regional markets. Domestically, prevention and mitigation measures will impose significant disruptions and increase unemployment. The combined effect of these external and domestic shocks will adversely affect output, exert significant pressure on inflation, and strain public finances needed to support mitigation measures, including coping mechanisms for firms and individuals and support to the health system. It should be noted that the macroeconomic projections underpinning the assessment of COVID-19 impacts were conducted under considerable uncertainty as to the duration of the pandemic, its depth, and the nature of economic impact. Mitigation will depend on the extent to which the project team will be able to correctly estimate the costs of all intervention items and associated supply channels. The project team designed the project in such a way that potential inflation and other external shocks will have limited impact on the project during the implementation. The project is designed to rapidly adapt to developments in the COVID-19 pandemic, and other unforeseen crisis, both in terms of components adjustments and the use of the CERC component, to support additional government response.

119. **Sector Strategy and Policy risks are Moderate.** This multi-sectoral project supports distinct, yet wholly complementary, policies and strategies. Synergies between all supported activities will be vital, yet even coordination within one ministerial department can be difficult in the Niger context. Since at least three ministries will be directly involved in implementation, coordination is a major concern. Mitigation measures and an inter-ministerial committee will be officially set up to help the project coordination and management unit. In addition, the annual program will be issued and approved by a steering committee made up of all relevant ministries. Project activities will be in line with sector policies without jeopardizing the required synergy and complementarity for project implementation.

120. **Technical Design risks are Moderate.** The project design is based on field missions and specific studies conducted to inform the project. In addition, the design is informed by other projects implemented in Niger (Project Keita, Millennium Challenge Corporation [MCC] integrated project), as well as similar international projects and sectoral studies. However, the synergy between the various implementing departments may be a concern. To anticipate this risk, all project missions, workshops and meetings between the World Bank team and the counterpart will be as inclusive as possible. These events will be complemented by systematic consultations from the design phase to the implementation phase and will involve line ministries and regional and local level representatives.

121. **Institutional Capacity for Implementation and Sustainability risks are Substantial.** The institutional capacity of Niger was assessed in 2018 to be limited. The UWSP has demonstrated the MHA's very limited capacity to deliver the sanitation component, mainly due to fiduciary aspects. A more complex project like IWSP Project is likely to be more difficult for government departments (MHA, MAG/EL or ME/LCD) to manage. This is a concern at substantial risk. Mitigation measures include the establishment of a project management and coordination unit. This unit will recruit fiduciary, safeguards, and technical staff to help the ministries manage and coordinate project activities. Capacity reinforcement of both ministerial project teams and focal points will help improve the management of the project. In addition, internal and external audits will help keep the project on track in accordance with standard rules and procedures. Guidelines will be provided through implementation and procedures manuals.

122. **Fiduciary risk is Substantial.** As highlighted in the institutional capacity section, the overall fiduciary environment is characterized by significant weaknesses in the integrity of FM and procurement systems. There is an

ongoing risk of fraud and corruption that could potentially impact compliance with World Bank fiduciary policies. As mitigation measures, a detailed action plan to mitigate fiduciary risks will be prepared, and a fiduciary team will be recruited and trained to support the project during the preparation and mid-term phases.

123. **Environment and Social risks are Substantial.** Negative environmental risks, both contextual and potential risks induced by the project investments, are deemed substantial due to the sensitivity of the areas of intervention, the severity of climate events, the advanced state of land and biodiversity degradation, the loss and damage of ecosystem services, the overconsumption of water resources, the introduction of invasive species and pests. The potential for cumulative impacts exists but they can be readily avoided or mitigated by adequate mitigatory and/or compensatory measures. The social risk of this project is rated as substantial reflecting: (i) the social context with high fragility and conflicts under which this project will be implemented; (ii) insecure land rights of vulnerable groups (including pastoralists and women); (iii) community health and safety risks, especially those related to security and labor influx; (iv) labor risks (including forced labor and child labor); (v) physical and/or economic displacement risks; and (vi) risks related to weak stakeholder engagement and weak operationalization of project-level grievance mechanisms (including the SEA/SH grievance channel). Furthermore, the program is being developed in a legal/regulatory context where there is uncertainty or conflict as to jurisdiction of competing agencies, and where the legislation or regulations do not adequately address the risks and impact in these areas. The Borrower's institutional capacity to implement the project under the ESF is considered weak given expanded scope of the ESF and the lack of experience and familiarity with the ESF in the PMU.

124. Environmental and social mitigation measures will stem from the integrated water resources management approach advocated by the project, which highlights new patterns of environmental governance to avoid, reduce and reverse land degradation, to promote soil fertility restoration, to boost organic matter, and increase carbon storage in soils, to encourage climate-smart and nutrition-sensitive agriculture, as well as to increase tenure security over individual land and communal lands, support and reinforce sustainable institutional arrangements on the use and access to natural resources (co-management agreements between local users' associations, private sector, municipalities, and deconcentrated line departments) and strengthen social capital and solidarity networks. All measures aimed to mitigate these risks are included in safeguards instruments, including RPF, SEP, LMP and PMP that were disclosed on August 10, 2021. The ESMF, which includes a GRM and a GBV/SEA/SH response and mitigation action plan (that will also be included in ESMPs as needed), was disclosed on August 19, 2021. A security risk assessment was completed and cleared by the World Bank as a separate document. A SMP will be developed prior to project effectiveness and will be used during implementation. Institutional capacity strengthening measures will also be developed and implemented. Commitments regarding these risks are captured in the ESCP that has been reviewed and agreed upon by the World Bank and publicly disclosed.

125. **Other: security risks are Substantial.** Security risks are principally linked to increasing armed attacks in the project area, population displacement due to conflict, food insecurity resulting from climatic factors and the occupation of land by armed groups and displaced persons, increased poverty due to the disruption of socioeconomic activities, weakened social cohesion as a result of suspicion and mistrust between communities, and inter-communal conflict. Comprehensive and geographically adapted risk mitigation measures will be conducted as part of the project to best ensure the safe implementation of activities, promote the sustainability of constructed infrastructure and supported institutions, and mitigate the potential that activities could aggravate existing tensions. A SMP will be prepared prior to project effectiveness to elaborate these strategies.

VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Niger

Niger Integrated Water Security Platform Project (Niger-IWSP Project)

Project Development Objectives(s)

The project development objectives are to strengthen the management of water resources, increase access to water services and improve the resilience to climate-induced water variability in select areas of Niger.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Strengthen the management of water resources in select areas of Niger				
Sub-basins that have operationalized an integrated, climate-resilient, water and natural resources management plan (Number)		3.00	9.00	11.00
Increase access to water services in select areas of Niger				
People provided with access to improved water sources (CRI, Number)		0.00	700,000.00	1,600,000.00
People provided with access to improved water sources - Female (RMS requirement) (CRI, Number)		0.00	350,000.00	800,000.00
People provided with access to improved water sources - rural (CRI, Number)		0.00	481,250.00	1,100,000.00

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
People provided with access to improved water sources - urban (CRI, Number)		0.00	218,750.00	500,000.00
People using water for productive purposes (Number)		0.00	65,380.00	186,800.00
Women using water for productive purposes (Number)		0.00	32,690.00	93,400.00
improve the resilience to climate-induced water variability in select areas of Niger				
Land area under sustainable landscape management practices (CRI, Hectare(Ha))		385,000.00	437,395.00	534,700.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Component 1: Integrated Investments for Water Security				
HYDROMET stations in project area with publicly accessible data in real time (Number)		0.00	50.00	50.00
Legal instruments for sub-basin and rural drinking water, prepared and submitted for approval (Number)		2.00	9.00	11.00
Share of leadership/ decision-making positions in community- based water institutions held by women (Percentage)		5.00	20.00	30.00
Proportion of households within the project area engaged in Sustainable Land and Water Management as result of the project (Percentage)		0.00	20.00	40.00

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Grievances registered and addressed within the GRM timeframe (Percentage)		0.00	40.00	90.00
Component 2: Expansion of Integrated Water Services				
Proportion of water systems rehabilitated/built using renewable energy (Percent) (Percentage)		0.00	30.00	65.00
Household connections constructed under the project (Number)		0.00	1,600.00	4,500.00
Standpipes built/rehabilitated (Number)		0.00	840.00	2,400.00
Drinking water systems managed through PPP arrangement (Number)	PBC 1, 2, 3	0.00	35.00	100.00
Schools and health centers provided with improved water and sanitation services under the project (Number)		0.00	105.00	300.00
Public sanitation facilities constructed under the project (Number)		0.00	35.00	100.00
Household provided with services for safe management of fecal sludge under the project (Number)		0.00	40,500.00	115,000.00
Area provided with new/improved irrigation or drainage services (CRI, Hectare(Ha))		0.00	1,900.00	5,400.00
Area provided with new irrigation or drainage services (CRI, Hectare(Ha))		0.00	1,750.00	5,000.00
Area provided with improved irrigation or drainage services (CRI, Hectare(Ha))		0.00	140.00	400.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Sub-basins that have operationalized an integrated, climate-resilient, water and natural resources management plan	This indicator measures the number of sub-basin that have drafted, accepted, budgeted, with annual plans under implementation their master plan for water development and management (SDAGE). it is important to note that sub-basin level SDAGE is an aggregation of commune level water development and management scheme (SAGE). This means that:(i) the CLEs established, (ii) meetings to setup their planning though the SAGE, and (iii) start their investment activities planned in subcomponent 1.3. And have enhanced water availability after investment such as mobilization of water through flood control/water harvesting and storage structure and infiltration wears including water	The data collection is two times every year (one every six months).	The data source will be from regional coordination units and communes benefiting from this investment.	The methodology of the data collection will be based on a check list for each commune. when the three requirements are met then, the commune has met the eligilibility	The data collection responsibility is on the involved communes and the regional project coordination unit.

	abstraction structures, that can be used for multiple purposes including irrigation, livestock, fish farming. It includes the surface flooded by water and irrigated area that benefiting from this storage (surface and infiltration water).				
People provided with access to improved water sources	This indicator measures the cumulative number of people who benefited from improved water supply services that have been constructed through operations supported by the World Bank.	Two times a year (every six months)	Ministry of Water and Sanitation, Project Management Unit	Periodic assessment of the project implementation at least every six months.	Project Management Unit and Ministry of Water and Sanitation.
People provided with access to improved water sources - Female (RMS requirement)	This indicator measures the cumulative number of people who benefited from improved water supply services that have been constructed through operations supported by the World Bank.	Every six months	Ministry of Water and Sanitation (MHA) and Project Management Unit (PMU)	periodic survey of the project implementation (at least every six month)	MHA and PMU
People provided with access to improved water sources - rural		Every six months	MHA and PMU	periodic survey of the project implementation (at least every six months)	MHA and PMU

People provided with access to improved water sources - urban					
People using water for productive purposes	This indicator will measure the number of beneficiaries that are having access to water for productive purposes. This includes beneficiaries of irrigation, fisheries and aquaculture, livestock, and others. 80.000 for water mobilization infrastructure, 90.000 for irrigation, 15.000 for livestock and 10.000 for fishery and aquaculture and 5.000 for other.	The indicator will be monitored every six month	Beneficiary communes and PMU and concerned ministries.	Periodic survey of project implementation activities	
Women using water for productive purposes					
Land area under sustainable landscape management practices	The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes; Adoption refers to change of practice or	every 6 months	MAG, MHA, ME/LCD, beneficiary communes and Project Management Unit	Periodic survey on project implementation activities	Beneficiary communes and PMU

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

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
HYDROMET stations in project area with publicly accessible data in real time	This indicator provides the number of HYDROMET stations in project area with publicly accessible data in real time (website, specific social media)	At least every six months	sub-basins agencies and permanent secretary of PANGIRE	data collected from piezometers, meteorological station, surface water flow measurement stations	Permanent Secretary of PANGIRE and sub-basin agencies

Legal instruments for sub-basin and rural drinking water, prepared and submitted for approval	This indicator measures the number of legal instruments prepared and submitted for approval to allow the establishment of sub-basin agencies, rural drinking water dedicated institution.	every year	Ministry of Water and Sanitation and the permanent secretary of PANGIRE.	The assessment of the project implementation	Ministry of Water and Sanitation and the permanent secretary of PANGIRE
Share of leadership/ decision-making positions in community- based water institutions held by women	This indicator measures the participation of women as leaders (e.g. board members) in the sub-basin organizations and the proposed rural water supply institution. It is measured as a ratio of the total female leaders over the total members in the sub-basin institutions (CLE, AUE, sub-basin agency) and the proposed rural water supply institution. Baseline has been estimated based on the report establishing the CLE and AUE in the region of Maradi, on Goulbi Maradi sub-basin in seven communes (Safo, Madarounfa, Gabi, Dan Issa, Sae Saboua, Tibiri and Maradi 1).	Every year implement ation survey	Communes and regional project management units	Periodic survey of project implementation	Communes and regional project management units

Proportion of households within the project area engaged in Sustainable Land and Water Management as result of the project	This indicator measures the ratio of households in the project area that is engaged in Sustainable Land and Water Management as result of the project. It is calculated by dividing the number of households engaged with the total number of households in the project area.	every six months	PMU, MHA. ME/LCD and beneficiary communes	periodic survey of project activities ME/LCD and PMU	ME/LCD and PMU
Grievances registered and addressed within the GRM timeframe	This indicator measures the percentage of grievance that are registered and addressed in the timeframe defined in the grievance mechanism.	Every six month	PMU and CE implementation NGOs	periodic survey of project implementation	PMU
Proportion of water systems rehabilitated/built using renewable energy (Percent)	This indicator measures the proportion of water supply systems build and/or rehabilitated for drinking water, Irrigation and livestock that use renewable energy (solar energy). It is measured through the ratio of systems equipped with solar energy over the total systems built/rehabilitated by the project.	Every six months	Ministry of Water and Sanitation and Project Management Unit	Project implementation periodic survey	Ministry of Water and Sanitation

Household connections constructed under the project	This indicator measures the number of household water connections delivered by the project. NB: The assumption is to have at least 30 household connections by drinking water supply system Plus those built in the urban perimeter.	Every six months	SPEN, MHA and project management unit	Periodic project implementation survey	SPEN and MHA
Standpipes built/rehabilitated	This indicator measures the number of standpipes rehabilitated/built by the project to provide drinking water supply to the population. NB: the assumption is that every system provide at least 20 standposts.	Every six month	MHA, PMU, Beneficiary communes	Periodic survey of project activities	PMU, MHA
Drinking water systems managed through PPP arrangement	This indicator measures the number of drinking water supply system under PPP arrangement for sustainable service delivery	Annually	MHA and Project Management Unit	annual survey on the project implementation	MHA and Project Management Unit
Schools and health centers provided with improved water and sanitation services under the project	This indicator measures the number of health centers and schools provided with water and sanitation services under the project considering gender and inclusion dimension of the	Every six months	Ministry of water and sanitation; Project Management Unit	periodic survey of project implementation	Ministry of water and sanitation

	infrastructure.				
Public sanitation facilities constructed under the project	This indicator measures the number of public toilets constructed under the project and considering gender and inclusion.	every six month	Municipalities and regional antenna of project management units.	Periodic survey of project implementation to measure progress	Beneficiary municipalities and regional antenna of project management unit.
Household provided with services for safe management of fecal sludge under the project	This indicator measures the number of households that are having access to the services for fecal collection, transportation and containment/treatment at the fecal sludge treatment facilities built under the project.	The frequency of data collection is every six month.	Project Management Unit (PMU), MHA, Municipalities of Niamey and Maradi	Periodic survey of project activities	PMU and MHA
Area provided with new/improved irrigation or drainage services	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).	Every six month	Ministry of Agriculture, PMU and beneficiary communes	Periodic survey of project activities	MAG and PMU
Area provided with new irrigation or drainage services	Measures in hectares the total area of land provided	every six month	MAG, PMU and	Periodic survey of project activities	MAG and PMU

	with new or improved irrigation or drainage services in operations supported by the World Bank.		beneficiary communes		
Area provided with improved irrigation or drainage services	Measures in hectares the total area of land provided with new or improved irrigation or drainage services in operations supported by the World Bank.	every six month	MAG, PMU and beneficiary communes	Periodic survey of project activities	MAG and PMU

Performance-Based Conditions Matrix

PBC 1	Establishment of improved, financially sustainable, and functioning rural water supply institutional arrangements in accordance with the project implementation manual (PIM).			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	No	Yes/No	4,000,000.00	
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2022	Yes		800,000.00	Delivery of desk review of rural water supply institutional arrangements in accordance with PIM (Y/N)

2023	Yes	1,000,000.00	Acceptance of desk review, completion of stakeholder consultation, and endorsement of institutional arrangements (Y/N)
2024	Yes	1,200,000.00	Preparation and endorsement of required documentation to operationalize endorsed institutional arrangements (Y/N)
2025	Yes	1,000,000.00	Preparation and submission of government decree and related package and MHA participation in quality control committee (Y/N)
2026	No	0.00	N/A
2027	No	0.00	N/A

PBC 2	Submission of rural water supply annual report to the Board of Directors and the Regulatory Authority ARSEau following approved template defined in agency operations manual			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	Yes	Yes/No	4,000,000.00	
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	Yes			
2022	No		0.00	N/A
2023	No		0.00	N/A

2024	No		0.00	N/A
2025	Yes		2,000,000.00	Submission of annual report (Y/N)
2026	Yes		2,000,000.00	Submission of annual report (Y/N)
2027	No		0.00	N/A

PBC 3	TA provider supported at least 60 percent of private operators managing rural water systems constructed/rehabilitated under the project to operationalize accounting and asset management systems			
Type of PBC	**Scalability**	**Unit of Measure**	**Total Allocated Amount (USD)**	**As % of Total Financing Amount**
Output	No	Yes/No	4,000,000.00	
Period	**Value**		**Allocated Amount (USD)**	**Formula**
Baseline	No			
2022	No		0.00	N/A
2023	No		0.00	N/A
2024	No		0.00	N/A
2025	No		0.00	N/A
2026	Yes		4,000,000.00	At least 60% of private operators supported to operationalize accounting and asset management systems (Y/N)
2027	No		0.00	N/A

Verification Protocol Table: Performance-Based Conditions	
PBC 1	Establishment of improved, financially sustainable, and functioning rural water supply institutional arrangements in accordance with the project implementation manual (PIM).
Description	PBC 1 is intended to incentivize the design and establishment of effective and financially sustainable rural water supply institutional arrangements. Both the rural water supply institutional arrangements and the sector sustainability strategy fully address critical elements as described in the PIM, including but not limited to the following: (1) roles and responsibilities for capital and operational expenditure financing (including tariff and subsidy policies), asset management, construction quality assurance, water quality, monitoring, and regulation; (2) institutional capacity requirements and detailed roadmap to address any existing gaps; (3) strategies to support development of private operators and actors across the value chain; (4) strategies for citizen engagement and participative planning; and (5) strategies for ensuring that women and marginalized communities are represented in sector decision-making. To facilitate the verification process and a more responsive flow of funds to support associated activities, PBC 1 is disaggregated into Performance-Based Results (PBRs) as follows: a. PBR 1.1 disburses against the delivery of a desk review of the rural water supply institutional arrangements drawing from the previously conducted assessments, which proposes two options for the institutional arrangements to improve service quality and sustainability and respective roles and responsibilities of the sector (e.g., overall responsibility by an independent rural water agency or the expansion of SPEN's mandate) in accordance with the PIM (Planned for Year 1; US $ 0.8 million) b. PBR 1.2 disburses against the acceptance of the desk review, the completion of stakeholder consultation (workshops), and the endorsement of improved, financially sustainable, and functioning rural water supply institutional arrangements by the MHA, MF, MP, and the Niger commune association (Planned for Year 2; US$ 1 million). c. PBR 1.3 disburses against the preparation of the required documentation to operationalize the endorsed institutional arrangements in accordance with the PIM, which includes organizational structure, mandate, legal framework, operations manual, and draft legislation, and their endorsement by the MHA, the MF, and the Niger commune association; (Planned for Year 3; US $ 1.2 million) d. PBR 1.4 disburses against the preparation and submission of the government decree and related package to establish the endorsed rural water supply institutional arrangements and the participation of the MHA representative in the quality control committee to be set up by the Prime Minister's cabinet (Planned for Year 4; US $1 million)
Data source/ Agency	PMU and MHA

Verification Entity	Independent Verification Agent (IVA)
Procedure	The IVA will conduct a desk review of documentation provided by the PMU and MHA - including reports, required institutional manuals and documentation, meeting minutes, and legal documents - to verify the consultative design of rural water supply institutional arrangements in according with the PIM and that steps required towards its establishment and operationalization have been achieved.
PBC 2	Submission of rural water supply annual report to the Board of Directors and the Regulatory Authority ARSEau following approved template defined in agency operations manual
Description	Upon establishment of the rural water supply institutional arrangements, PBC 2 is intended to facilitate its operationalization by incentivizing the submission of an annual report to Board of Directors and ARSEau for two project implementation years following establishment. The report is to follow an approved template defined in the PIM, but shall include, at a minimum, details on the registry of public and private service providers, female representation within staff and in leadership positions, and status of critical support activities. These activities include supervision of water providers, water quality monitoring, IEC/BCC, and a pro-poor financing policy (including a combination of tariffs and subsidy) (US$ 4 million total; scalable 50%, or US$ 2 million, per year).
Data source/ Agency	MHA and PMU
Verification Entity	IVA
Procedure	The IVA will conduct a desk review of documentation provided by the MHA and PMU to verify the lead rural water supply institution's submission of an annual report, following the approved template in the PIM, to both the Board of Directors and ARSEau.
PBC 3	TA provider supported at least 60 percent of private operators managing rural water systems constructed/rehabilitated under the project to operationalize accounting and asset management systems
Description	To best foster the establishment of functioning and sustainable rural water supply systems private operators, PBC 3 incentivizes a technical assistance provider, to be hired under the Project, to support these nascent operators in developing required skills, competencies, and management systems. PBC 3 will disburse against verification that at least 60 percent of private operators managing rural water systems constructed/rehabilitated under the project have benefited from such support, such that they have operationalized accounting and asset management systems in accordance with the PIM (US$ 4

	million).
Data source/ Agency	MHA and PMU
Verification Entity	IVA
Procedure	The IVA will conduct a desk review of documentation provided by the MHA and PMU to verify that the technical assistance provider has supported the private operators in developing required skills, competencies, and management systems and that, as a result, these operators have operationalized accounting and asset management systems in accordance with the PIM.

Annex 1: Detailed Project Description

1. **The IWSP operationalizes an integrated water platform approach that enables the coordination of all water-related planning, policies, and investments to promote water security for all Nigeriens.** This approach, envisioned by the GoN's PANGIRE program, will support the systematic and climate-informed planning of all water-related activities and investments at the commune level, in coordination with sub-basin agencies that safeguard the quality and sustainability of Niger's water resources. This helps ensure that project activities are both locally-adapted and mutually reinforcing at regional and national levels to maximize impact and sustainability. Although the project will be implemented in a selection (ten out of fifteen) of priority sub-basins, its successful implementation will provide a roadmap for the future nationwide expansion of the platform. Consultations supported by the Niger Water Platform Technical Dialogue (TF0B1557) have enabled the identification of ten priority sub-basins in seven regions for this initial project: the Kori Telwa (Agadez), the Manga Agricol Valley (Diffa), the Dallol Maouri Valley (Dosso), the Goulbi Maradi and the Goulbi Kaba (Maradi), the Maggia and the Lower Tarka Valley (Tahoua), the Sirba Valley and the Dargol Valley (Tillabery), and the Korama Valley (Zinder). All ten are priority sub-basins for PANGIRE and two include Wetlands of International Importance (Ramsar sites). Table A1.1 details Niger's estimated water resources, the total water requirements per sector strategy and estimated/projected total water withdrawals.

Table A1.1: Annual renewable water resources, total water requirements per sector strategy, and estimated/projected total water withdrawals (in millions m3)

	2015	2020	2025
Surface water resources	**30 000**		
Groundwater resources	**2 500**		
Water requirements per sector strategy	**7 604**	**8 496**	**9 214**
Irrigation	*4 059*	*4 865*	*5 485*
Drinking Water	*126*	*176*	*235*
Industry and mining	*33*	*40*	*48*
Livestock	*225*	*253*	*284*
Ecological water flow	*3 160*	*3 160*	*3 160*
Total water withdrawals (estimated or projected)	**1 200**		**1 700**

Source: PANGIRE-2017

2. Project activities are organized under two core components: (i) Integrated investments for water security; and (ii) Expansion of integrated water services. These activities are interconnected across components and will be coordinated through the water platform approach to sector planning described above. In addition, two complementary components are included: (i) project management and capacity strengthening; and (ii) the CERC to permit the repurposing of project funds to respond to national emergencies .

3. Some investments under the proposed project have been prepared to the detailed design stage and are ready for implementation, while others will be identified and prepared through launched studies. However, given that

the findings of these studies were not available at project appraisal, a framework approach will guide the selection, preparation, and implementation of investments under several subcomponents. Additionally, activity unit costs were defined to estimate the costs and numbers of beneficiairies for each subcomponent..

Component 1: Integrated Investments for Water Security (US$125.92 million equivalent)

4. **Component 1 aims to support institutional development for improved water resources management, as well as upstream investments in watersheds restoration and water resources mobilization.** Recognizing that institutional development is a long-term process, this component adopts a phased approach to establishment and strengthening of the local water platform institutions that will serve as the foundation for integrated water services, supported by Component 2 of the IWSP. It will also finance investments for the protection and sustainable development of water resources, including watershed restoration activities and water harvesting and storage infrastructure for multipurpose water mobilization. It includes three interlinked subcomponents to be coordinated and implemented by relevant PANGIRE institutions and sector ministries: (i) Management of Water Resources and Climate Risks; (ii) Restoration of Watershed Environments; and (iii) Mobilization of Water Resources.

Subcomponent 1.1: Management of Water Resources and Climate Risks (US$30.00 million)

5. **This subcomponent will support the establishment and capacity-strengthening of water platform institutions at the sub-basin, commune, and local levels.** In addition, it will support the improvement and expansion of water resources monitoring systems to inform the coordinated development of key water mobilization infrastructure for agriculture and livestock, ecosystems preservation and restoration activities, and WSS. Resulting investment prioritization, planning, and monitoring will therefore directly support the identification and implementation of activities under Components 1 and 2. The subcomponent will be implemented by the MHA through the permanent secretariat of PANGIRE.

6. **Water resource governance:** Given that perceptions of water scarcity and development priorities vary among stakeholders, effective water resources management necessitates inclusive institutional mechanisms that facilitate knowledge sharing and decision making. Although PANGIRE's permanent secretariat is in place at the national level, its institutional framework is not yet fully implemented, particularly at the sub-national level. This subcomponent will therefore aim to: (i) support the operationalization of integrated water resources management institutions at the sub-basin, commune and village levels; and (ii) advance the design and implementation of the financing mechanism for the GoN's water and sanitation fund.

a. **Local Water Platform Institutions:** Based on the lessons of global experience in IWRM governance, the PANGIRE vision emphasizes subsidiairity and decentralization, and targets an operationalization timeframe of 13 years (2017-2030). The GoN is being supported in PANGIRE implementation by a number of development partners, varying both by themes as well as geographic focus. During the project preparation stage, the World Bank team has supported the PANGIRE Permanent Secretariat in developing a coordination framework for the multiple ministries and development partners to prevent overlaps/conflicts, to ensure synergies between different activities, and to identify critical gaps. In line with this framework, the project will support the establishment of water platform institutions in the project sub-basins: (i) sub-basin agencies at the sub-basin level; (ii) local water committees (CLEs) at the commune level; and (iii) water users association (AUEs) at the community level. Although this vision of IWRM institutions has been developed through extensive consultations and has been legislated since 2017, the significant instutional development effort required necessitates that the project adopts a phased and incremental approach. The first phase – spanning

the first two years of the project – will focus on strengthening the technical and managerial capacity of the recently established water platform institutions in three of the 10 priority sub-basins.[66] This will be achieved through a "learning by doing" approach, whereby these intitutions will be engaged in the planning and implementation of multisectoral project-financed investments. This phase will also support the piloting, assessment, and design of an effective model for the engagement of local communities and civil society dialogue on water in Niger. The subsequent phase, informed by lessons from the first phase implementation, will support the establishment and capacity-strengthening of water platform institutions in the remaining seven sub-basins, including the preparation of development action plans at the sub-basin and commune levels. This second phase will also leverage the framework for natural resources management that is being developed by the ME/LCD with support from the Government of the Netherlands. Finally, it will include the expansion of the community engagement and civil society dialogue process for participatory planning and the implementation of multisectoral project investments in all remaining sub-basins.

b. The above-mentioned institutions will serve key roles in sub-basin water planning, management and regulation processes, including sectoral allocations, monitoring, and enforcement. Resulting sub-basin development action plans, municipal three-year plans, and local development plans are foundational to the IWSP (components of SDAGE and SAGE), as they will inform the selection of activities to be implemented under Components 1 and 2 upon establishment of the water platform institutions. These plans will be undertaken in a participatory manner, with mechanisms to ensure the engagement of women and youth. In line with the phased approach for operationalization of sub-basin level IWRM institutions, the implementation of project investments will also be correspondingly phased, starting with the three sub-basins where the IWRM organizations have already been established. In the other sub-basins, certain small-scale, no-regret commune-level activities may be advanced, if needed, through coordination and community outreach facilitated by the permanent secretariat of PANGIRE and regional PMUs.

c. **Technical Assistance and Capacity Building:** The project will support various measures to strengthen knowledge, capacity and decision-making for IWRM at the different institutional levels. These include: (i) support to MHA/DGRE for identification, prioritization, planning and preparation of large-scale and long-term water resources infrastructure investements; (ii) the preparation of sub-basin development action plans; and (iii) preparation and updating of training materials and curricula. These measures will facilitate the preparation of national as well as sub-basin-level plans to improve water security in the country, and help strengthen the capacity of associated institutions.

d. **National Profile of Water Uses and Users:** An important element of PANGIRE is the operationalization of the Water and Sanitation Fund (for which the establishment decree is already in the approval circuit of the government), which will finance water infrastructure and is intended to be supported by user fees. In order to develop a pragmatic framework for user charges, it is critical to understand the current profile of water uses and users in the different sectors and geographies of the country, to serve as the basis for designing pragmatic management and regulatory measures. Accordingly, the project will finance a national-level assessment for

[66] Institutions are being established in three IWSP sub-basins (Korama, Goulbi Maradi, Dallol Maouri) with support from Swiss Development Corporation.

inventorying water users (using sampling-based approaches) to assess the distribution and characteristics of water use, including elements such as abstraction volumes, capacity, willingness to pay, etc. Data will be gender-disaggregated and the assesment will include a gender analysis.

7. **Building and Harnessing Shared Knowledge:** Water sector stakeholders, including water users and authorities at all levels, must have shared access to and a common understanding of scientifically-validated knowledge of their water resources, including both surface water and groundwater. The assessment of existing water resources data collection and monitoring systems, as well as their analysis, dissemination and use is underway. Based on this assessment, the project will finance the establishment, rehabilitatation and/or scaling up of a hydromet network[67] to improve the availability and quality of data to inform water resources management activities and build resilience to changing climate conditions at all adminstrative levels. The resulting network will inform gender-sensitive decision making with respect to efficient water allocation and consumption across multiple uses, and the selection and design of water-related infrastructure and activities. Activities may include, among others:

a. Reinforcement/rehabilitation of the existing piezometric network in the project area;
b. Reinforcement/rehabilitation of surface water measurement instruments where relevant in the project area (Sirba and Dargol rivers, for example);
c. Installation of meteorological stations in the ten sub-basins within the project area;
d. Improvement of the SISNA[68] and SISEAN[69] databases and related data collection mechanisms, with updated data on to be published in a bi-annual bulletin for improved knowledge sharing.
e. Implementing a national water resource laboratory or upgrading of the LANSPEX laboratory and upgrading of a selection of water laboratories operating in the regions, and the installation of a reference academic water laboratory (provided with the necessary international certifications) to permit the regulator to monitor and enforce drinking water quality and academics to pursue water resources research while training water quality specialists;
f. Capacity building of relevant stakeholders for the management of data collection, treatment and outreach through relevant communication channels, including the portal of MHA, periodic PANGIRE reports, and the hydromet network, in coordination with the NBA and the LCBC;
g. Enhancement of the SCAP-RU, currently being implemented under the Niger Disaster Risk Management and Urban Development Project (P145268), through improved data collection; and
h. Relevant trainings, technology pilots, evaluations, and studies under a shared knowledge program to be elaborated annually. This will include novel mechanisms for knowledge sharing among national and regional institutions, including exchange visits of country experts, youth training/internships programs, collaborative programs with international and local universities and scientific partners (such as IAEA), and documentation and dissemination of lessons learned. It also includes the use of innovative approaches and new technologies to enhance information sharing, data collection and analysis.

8. **Finally, this subcomponent will support participatory citizen engagement, with two main objectives: (i)strengthening trust and dialogue between the Government and citizens, as well as among and between communities; and (ii) promoting socially inclusive and sustainable adaptation practices through IWRM activities.** A focus will be given to communities which suffer a chronic lack of basic social services, insufficient

[67] Considering synergies with other projects (FSRP, SCD, etc) that are also supporting hydromet system improvement.
[68] SISNA : Système Informatique de Suivi des Nappes Alluviales (Alluvial Groundwater Monitoring Computer System)
[69] SISEAN : Système d'Information intégré et de Suivi de l'Eau et Assainissement au Niger (Integrated Water and Sanitation Monitoring and Information System in Niger).

economic opportunities and high poverty rates. Furthermore, as women in Niger have historically been the custodians of natural resource management good practices, their strong involvement will be critical to identifying constraints to sustainable natural resource management, defining relevant solutions, and implementing them. Specific activities will include: (i) the strengthening of communications and planning mechanisms at the national, commune and community level and between communities (water user association, local water committee, sub-basin water agency) and the state; (ii) the promotion of civic engagement and social inclusion through consultations with local communities, women and youth;[70] and (iii) the establishment of GRMs to address issues related to perceived negative impact resulting from project interventions and mitigate local tensions, including those arising from environmental degradation and climate change impacts (see Section V: Grievance Redress Services). The use of disruptive technologies is being looked into to ensure that the approach developed will be sustainable beyond the project cycle. Due to the intensive nature of citizen engagement interventions under the project, a consultancy with demonstrated experience in gender-sensitive approaches will be engaged to implement these activities.

Subcomponent 1.2: Restoration of Watershed Environments (US$50.00 million)

9. **This subcomponent will support watershed restoration activities using an integrated landscape and ecosystems approach.** The underlying goal of integrated landscape planning and management is to find and promote synergies between activities that improve production systems and livelihoods, and those supporting biodiversity conservation and ecosystem services. In particular, this subcomponent will involve the clarification of land tenure through the COFOCOM and COFODEP, the adoption of SLM practices, and the establishment of land information systems. These activities will be implemented by the ME/LCD. A framework approach is used to inform the selection for these interventions given that studies to define the exact magnitude and location of activities are expected to be finalized by project effectiveness. Depending on the watershed, activies may include: (i) reforestation; (ii) land restoration/regeneration; (iii) agroforestery; (iv) the development of the non-timber forest products value chain; and (v) fisheries and aquaculture. The selection of activities will be based on selection criteria including, among others, land tenure status, community commitment for sustainable management, technical requirements for the site, vulnerability to climate risks, and the potential to increase carbon sinks. In addition, investments that use or risk polluting waters of an international waterway, its tributaries and connected aquifers and of transboundary aquifers will be excluded. This subcomponent will leverage disruptive technologies, building on relevant experiences in the region and beyond, to enable broader participation and sustainable monitoring of watershed activities and environments. Activities will be closely coordinated with those under the PROLAC Project (P161706) and the FSRP (P172769) in the regions of Diffa, Tillabery and Zinder. It will also leverage the rural service network previously established through the PACRC project (P125669) in select communes.

10. **Citizen engagement activities are integrated into the project design and are at the core of the project interventions to foster strong ownership and community participation.** This subcomponent will build on participative approaches. Technical advisory services and equipment will support community land zoning, natural resource mapping, and coping and feasibility studies for the development of land restoration/soil conservation, ecosystems regeneration, and sustainable livelihoods-generating activities through community-level resilience plans that will be formulated through community consultations. This will include where applicable, small-scale community-level fisheries and aquaculture activities within small rainwater-fed reservoirs developed through Subcomponent 1.2 that will be supported through the rehabilitation or construction of infrastructure

[70] Activities may include trainings on local-level identification and prioritization of community investments, women's participation in decision-making and the monitoring, maintenance and sustainability of investments, the provision of equipment to support community groups in their daily operation, and GBV prevention sensitization sessions.

(conservation centers, dryers) and the organizing and training of fishermen and fisherwomen. Depending on the level of fish production and outlets for the flow of spawning fish, dryers and/or conservation centers may be included. The approach will be aligned with Niger's strategy for fisheries and aquaculture development that promotes sustainable fishing with a view towards ensuring the conservation, management and development of fishery resources, while respecting ecosystems and biodiversity, to better combat food insecurity and poverty. As the use of chemicals is forbidden by law in Niger for aquaculture and fisheries, these activities will not adversely impact the quality of associated waterways. The project will also support the participation of women at all levels of management and implementation, including in the establishment, training, and capacity building of community-level committees (such as AUE, CLE, etc.) for all activities. Feedback from the community consultations and community-level committees will be integrated into project interventions. Activities will leverage also partnerships with the private sector when possible and draw on lessons learned from the Keita projects, the Niger basin water resources development and sustainable ecosystems management project. The implementation of this activity may be outsourced to dedicated and social mobilization-experienced NGO(s) and/or consultancy firm(s).

Subcomponent 1.3: Mobilization of Water Resources (US$45.92 million)

11. **This subcomponent will support the construction and rehabilitation of multipurpose rainwater harvesting infrastructure and wells for water mobilization,[71] flood control weirs, and riverbank protection investments on ephemeral rivers for protecting agricultural fields.** These investments will be designed and implemented by MAG, through an implementation support consultancy. Infrastructure, such as spreading and percolation weirs and water abstraction equipment (wells), will consider the configuration and underlying geological composition of each sub-basin. Spreading weirs, ponds and shoreline control works will allow farmers to be more resilient to erratic rainfall patterns, which undermine production through both extreme rainfall events/shocks and repeated lower intensity events. Spreading weirs, for example, control and store rainwater in the soil to enhance agricultural production.

12. **Eligibility and appraisal criteria for all sub-projects:** The subcomponent framework includes investment selection criteria and quality assurance standards spanning eligibility, prioritization, planning, technical preparation, financial and economic analysis, environmental and social management, long term O&M sustainability, community participation and IWSP. Key criteria and standards are presented below:

- **Location.** Sub-projects should be from the seven regions, namely: Sirba-Dargol, Dallol Maouri, Tarka-Maggia, Teloua, Goulbi Maradi et Kaba, Korama, and Manga.
- **IWSP**. Sub-projects should be reviewed by the water platform institutions that safeguard the quality and sustainability of Niger's water resources, in line with the IWSP approach. Sub-projects must follow all social, environmental, and FM requirements of the project.
- **Scheme selection.** While the GoN is still in the process of operationalizing the water platform institutions, early investments will be limited to interventions with a positive demonstrative impact on the environment and affected people both locally and regionally.
- **Environmental and social suitability.** Environmental and social assessment (including the corresponding permits and official screening decisions) establishing the impact on the environment and likely affected people both locally and regionally, demonstrated beneficiary support, risks and mitigating factors. All investments must comply with the Environmental and Social Management Framework (ESMF). In

[71] Investments will enhance surface and sub-surface storage via catchments, ponds, and aquifer recharge measures; as well as support abstraction, such as through shallow wells.

addition, investments that use or risk polluting waters of an international waterway, its tributaries and connected aquifers and of transboundary aquifers will be excluded.

- **Farmer demand and participation**. Willingness of farmers in the sub-project area to engage in the project. Farmer engagement and contribution plan, detailing, inter alia, the number and location of farmers to be engaged in each sub-project, the consultation and decision mechanism for engagement, and contractual relations between the beneficiary farmers and the central authorities, should be conducted.
- **Technical and economic sustainability**. All the technical components of investments (water mobilization, water lifting devices etc.) should have a strong resource efficiency dimension during the economic lifetime of the investment. Economic analysis must be conducted for all subprojects and the incremental economic benefits must be taken into account. O&M costs must be estimated based on specific calculations for each subproject and will be managed by infrastructure management committees.
- **Adaptation to the relevant hydrographic system(s).** Sub-projects should clearly state its adaptation to the relevant hydrographic system in the supply and demand analysis. Each sub-project will be part of the relevant sub-basin development action plans, municipal three-year plans, and local development plans.
- **Prioritizing efficient technologies**. As a priority of the GoN, financing will prioritize modern and efficient technologies.

13. Detailed information on implementation arrangements, including framework eligibilities, sub-project selection, implementation of technical activities and safeguards, and administrative and fiduciary procedures will be detailed in the PIM to be prepared prior to effectiveness.

14. The typology, distribution and geographic location of investments being prepared by the MAG General Directorate of Rural Engineering (*Direction Générale du Génie Rural*, DGGR) is shown in Table A1.2. Specific investments will be detailed through the studies and verified against the framework criteria. The total amount of these investments is US$57.40 million. Since this will serve as a long list from which the project investments will be selected, on the basis of framework criteria application and community consultations, the financing for Subcomponent 1.3 has been estimated at US$45.92 million.

Table A1.2: Rainwater harvesting, abstraction and storage infrastructure for water mobilization

Sub-basin	Type of infrastructure	Unit	Quantity	WRM for irrigation potential (ha)	Improved Rainwater Productivity (ha)	Aquaculture (ha)	Protected agricultural fields from flood (ha)
Sirba et Dargol	Small reservoirs with small collective perimeters, downstream for livestock and fish farming	U	6	420	900	1500	-
	Spreading Weir (Seuils d'épandage)	U	5	120	280	0	0
	Percolation weir (Seuils d'infiltration)	U	7	245	0	0	0
	Pond control works	U	5	100	150	0	0
	Sand dams for supplementary irrigation	U	14	150	0	0	0
Dallol Maouri	Shore line refurbishment	Km	12	-	-	-	1200
Tarka et Maggia	Spreading Weir Tarka	U	10	300	400	0	0
	Spreading Weir Maggia	U	10	300	400	0	0
Teloua	Percolation Weir	U	4	120	-	-	-
	Percolation Weir (Rehabilitation)	U	5	150	-	-	-
	Shoreline refurbishment	Km	8	-	-	-	400
	Flood dikes	Km	5	-	-	-	-
	Rehabilitation of wells	U	400	200	-	-	-
Goulbi Maradi et Kaba	Spreading Weir	U	4	300	200	-	-
	Spreading Weir (Refurbishment)	U	5	450	250	-	-
	Percolation weir Goulbi Gabi	U	8	200	-	-	-
	Shoreline refurbishment Goulbi Maradi (km)	Km	10		-	-	500
Korama	Spreading Weir	U	5	375	250	-	-
Manga	Pond control works Komadougou	U	5	100	-	-	-

Component 2: Expansion of Integrated Water Services (US$249.08 millions equivalent)

15. **Component 2 takes a multifaceted approach to bolstering Niger's low human capital; support to rural economic development activities – such as agriculture, livestock, and aquaculture – will foster sustainable income generating activities, while the comprehensive package of improved WASH facilities and practices in households, schools, and health centers will result in improved early childhood survival and health and educational attainment.** It includes the following subcomponents: (i) expansion of rural development services; (ii) expansion of water supply services; and (iii) expansion of public sanitation infrastructure and behavioral communication. This component builds upon activities conducted under Component 1, particularly the management of water resources and associated sub-basin planning under Subcomponent 1.1, improved sustainability and quality of water sources under Subcomponent 1.2, and the mobilization of water resources under Subcomponent 1.3. Furthermore, it will leverage disruptive technologies and information systems and follow a resilient design process to better address known challenges pertaining to the sustainable management of rural water infrastructure and allow for the monitoring of water abstractions and consumption for improved water resources planning and climate adaptation (e.g., drought and flood management). This component will also prioritize energy efficient infrastructure and renewable energy sources for climate mitigation.

Subcomponent 2.1: Expansion of Rural Development Services (US$59.08 million)

16. **This subcomponent will support economic development in the project area through the implementation of small-scale irrigation infrastructure, water usage-reated activities for pastoralists, and related capacity reinforcement activities.** It will be implemented in the sub-basins of Sirba-Dargol, Dallol Maouri, Tarka-Maggia, Teloua, Goulbi Maradi and Kaba, Korama, and Manga and will result in: (i) the extension of irrigated land (4,726 ha) and (ii) improvements in agricultural water productivity through green water management (2,830 ha).

17. ***Support to small-scale irrigation activities.*** The typology, distribution and geographic location of investments being prepared by the DGGR (MAG) is shown in Table A1.3. The total cost of these investments is US$53.20 million. Since this will serve as a long list from which the project investments will be selected on the basis of framework criteria application and community consultations, the financing for small scale irrigation investment has been conservatively estimated at US$43.10 million.

18. Small-scale irrigation investments will cover individual level (0.2-3.0 ha) on-farm equipment (solar or petrol pumps, Californian or drip irrigation) and community (10-20 ha) level small scale irrigation schemes (open concrete canal network) in accordance with SPIN. The strategy requires that any activity be initiated through a motivated request from potential irrigators, that it is consistent with the relevant AUE's local development plan, and that beneficiaries contribute financially to its development (5 percent cover the cost of the investment and while also taking into consideration potential gender implications).[72] Activity design will reflect lessons learned from projects like SIIP and the IFC pilot on small-scale solar-powered drip irrigation in Niger. For example, feedback from the implementation of the SIIP demonstrates the importance of including all aspects of water resources mobilization (infiltration weir; water harvesting structure; abstractions for small-scale irrigation, livestock watering, and other purposes; etc.) as part of an integrated management plan for sub-basins. This activity will be facilitated by AUEs and CLEs established under Subcomponent 1.1 to simultaneously strengthen their project management skills.

19. **Small-scale irrigation investments will build upon and be closely coordinated with complementary activities under the SIIP and PROLAC project**. The SIIP and IWSP project areas overlap, mainly in Dosso, Tahoua, Tillaberi

[72] A required financial contribution may exclude women farmers unless subsidies/grants are provided to women (see: Millennium Challenge Corporation 2020. Climate Resilient Agriculture Grants in Niger Empower Women-Managed Enterprises).

and Agadez regions, and share similar features with respect to their focus on climate-resilient irrigation. The support of the SIIP to operationalize small-scale irrigation investments and capacity building of stakeholders proved to be not only time consuming but also led to an increased demand for small-scale irrigation investments at a level beyond the project's capacity. There is therefore an opportunity to scale up those interventions through the IWSP to address this unmet demand. Furthermore, the focus of the IWSP project on reinforcing activities at the scale of the watershed will also help strengthen synergies across projects. Similar coordination is required with the PROLAC in the regions of Diffa and Zinder. This coordination will be facilitated by the fact that SIIP and PROLAC team members are among the core team of the IWSP and that their primary implementing agency is also the MAG. One key challenge in the Sahel region is that the unit costs of irrigation projects, both for rehabilitation and new construction, are higher on average than in the rest of the world.[73] Niger is particularly impacted as a land-locked country. Transportation costs for irrigation equipment (e.g., motor-pumps, PVC pipes, sprinkler and drip irrigation equipment, etc.) and other hardware costs (e.g., cement), together with import taxes, are high. For instance, the cost of an irrigation system with solar pump and drip irrigation system may vary between US$6,000 to US$9,500 per hectare (SIIP- Niger).

20. Irrigation investments will help secure the livelihoods of smallholders and small farming enterprises through the development of sustainable jobs in a rural economy that is heavily reliant on the agri-food sector for employment generation. Due to increases in productivity and quality and related increases in economic activity, additional jobs will be created downstream in the value chain, including for storage, logistics, processing and distribution. IWSP is prospecting mutual areas of collaboration with IFC to engage the private sector.

21. Sub-projects will be implemented following the subcomponent framework approach. Guiding principles for investment development, as well as technical models adapted to each region, are presented below:

Eligibility and appraisal criteria for small scale irrigation sub-projects:

- **Location.** Sub-projects should be from the seven regions, namely: Sirba-Dargol, Dallol Maouri, Tarka-Maggia, Teloua, Goulbi Maradi et Kaba, Korama, and Manga.
- **IWSP.** Sub-projects should be reviewed by the water platform institutions that safeguard the quality and sustainability of Niger's water resources, in line with the IWSP approach. Sub-projects must follow all social, environmental, and FM requirements of the project.
- **Environmental and social suitability**. Environmental and social assessment (including the corresponding permits and official screening decisions) establishing the impact on the environment and likely affected people both locally and regionally, demonstrated beneficiary support, risks and mitigating factors. All investments must comply with the Environmental and Social Management Framework (ESMF). In addition, investments that use or risk polluting waters of an international waterway, its tributaries and connected aquifers and of transboundary aquifers will be excluded.
- **Farmer demand and participation**. This intervention will be in accordance with SPIN. Willingness of farmers in the sub-project area to engage in the project and partially cover the cost of the investment (5 percent in-cash) is required to create ownership and thus promote sustainability. Farmer engagement and contribution plan, detailing, inter alia, the number and location of farmers to be engaged in each sub-project, the consultation and decision mechanism for engagement, advanced land consolidation objectives, and contractual relations between the beneficiary farmers and the central authorities, should

[73] Inocencio, et al. 2007. Costs and Performance of Irrigation Projects: A comparison of SSA and Other Developing Regions. International Water Management Institute. 81 pp. (IWMI Research Report 109)

be conducted. Water storage facilities will serve multiple purposes as explained under Subcomponent 1.3, with costs separate from small-scale irrigation sub-projects.

- **Technical and economical sustainability**. All the technical components of investments should have a strong resource efficiency dimension during the economic lifetime of the investment. Farmers should also be assessed on their ability to make contributions (O&M costs) required of them, based on current and anticipated income and expenditure and track record of payment for water to AUEIs.[74] Economic analysis must be conducted for all subprojects and the incremental economic benefits must be taken into account. Sub-projects should demonstrate a positive IRR, considering the agricultural added value in terms of incremental profitability of crops against the without project scenario and considering all investment and operational expenses without factoring in any subsidies.
- **Adaptation to the relevant hydrographic system(s).** Sub-projects should clearly state its adaptation to the relevant hydrographic system in the supply and demand analysis. Each sub-project will be part of the relevant sub-basin development action plans, municipal three-year plans, and local development plans.
- **Prioritizing efficient technologies**. As a priority of the GoN, financing will prioritize the use solar energy and efficient technologies.

22. Detailed information on implementation arrangements for SSIs, including framework eligibilities, sub-project selection, implementation of technical activities and safeguards, and administrative and fiduciary procedures will be detailed in the PIM to be prepared prior to effectiveness.

23. Based on the principles detailed above, the small-scale irrigation models are defined in Table A1.3 with cost per hectare[75].

Table A1.3: Small-Scale Irrigation Technical Models by Project area

Sub-Basin	Water Mobilization Infrastructure	Water lifting device	Water application system	Total Irrigation Area
Sirba-Dargol Valley	• Collective intake from Small-earth dams (100 ha)	• Gravity	• Open concrete main canal/earth secondary canals	500
	• Collective wells with well points (15 ha/well)	• Petrol centrifugal pump	• Californian	360
Dallol Maouri Valley	• Individual Washbore tubewells (1 ha)	• Petrol centrifugal pump	• Californian	250
	• Individual Washbore tubewells (1 ha)	• Petrol centrifugal pump	• Drip	50
	• Collective deep tubewell (20 ha)	• Solar pump	• Drip	50
	• Collective deep tubewell (20 ha)	• Solar pump	• Californian	350
Maggia-Tarka valleys	• Tarka individual Tubewells (1 ha)	• Petrol centrifugal pump	• Drip	16
	• Tarka individual Tubewells (1ha)	• Petrol centrifugal pump	• Californian	90
	• Tarka Collective improved well system (10 ha)	• Petrol centrifugal pump	• Californian	600
	• Maggia collective improved well system	• Petrol centrifugal pump	• Californian	100

[74] The Irrigation User Association (*Association des Usagers de l'Eau pour l'Irrigation*, AUEI) is responsible for the management of irrigation, drainage and flood protection infrastructure and equipment in the service area. The AUEI has the authority to set and collect water tariffs from its members. Ministerial Order 2016-063.

[75] For cost breakdown, refer to tables below in Chapter V.

Sub-Basin	Water Mobilization Infrastructure	Water lifting device	Water application system	Total Irrigation Area
Goulbi Maradi & Kaba	• Collective tubewells (12 ha)	• Solar pumps	• Californian	360
Korama valley	• Washbore tubewells (1ha)	• Petrol centrifugal pump	• Drip	200
	• Individual Wells with (1ha)	• Petrol centrifugal pump	• Californian	800
	• Collective wells (10 ha)	• Petrol centrifugal pump	• Californian	200
Manga Valley	• Washbore tubewells (1ha)	• Petrol centrifugal pump	• Californian	250
	• Collective tubewells (10 ha)	• Electrical pumps powered with generators	• Californian	100
	• Collective tubewells (10 ha)	• Solar energy pumping	• Californian	150
Teloua Valley	• Tubewells • Wells with well points	• Petrol centrifugal pump • Solar pumps	• Californian • Californian	300 150

Support livestock development activities (US$15.00 million)

24. **This subcomponent will focus on supporting water-usage related activities around water points for cattle.**[76] These water-usage activities include the construction/rehabilitation of cattle waterers, wells, reservoirs, and storage facilities, cattle corridor activities and the production and processing of animal fodder for intensive breeding, providing equipment to help transform fodders and capacity reinforcement activities, to promote water-related development hubs around water points. Activities will comply with the National Strategy for Pastoral Water Supply and will be selected in accordance with sub-basin development action plans, municipal three-year plans, and local development plans supported under Subcomponent 1.1. They will additionally be coordinated with similar activities under the PRAPS 2 (P173197). Technical studies have been launched and are expected to be completed by project effectiveness to inform implementation. For this reason, this component will also adopt a framework approach to identify and prioritize interventions. Activities will be prioritized and selected based on selection criteria to include, among others, consistency with the strategic location of cattle routes, potential synergies with other projects, grazing capacity of the area (to avoid overgrazing) and the number of potential beneficiaries (households and livestock). Both the IWSP Project and PRAPS (P147674) will: (i) make use of behaviorally informed approaches; (ii) employ an extensive communications strategy to reduce the potential for conflict; (iii) ensure inclusive access to included infrastructure; and (iv) explicitly incorporate design elements to build resilience to climate-related disasters, such as drought and floods. This subcomponent will be led by MHA with the support of MEL for some water infrastructure like wells, boreholes and small water systems for cattle.

25. **The project is exploring areas of collaboration with IFC on value chain development through the private sector and improving market access for farmers. In this context, the project will support the productive alliances** between farmers and agribusinesses within particular value-chains with the aim of linking farmers to markets. Parties of a productive alliance will be connected through a business proposition, or “business plan”, which describes the capital and services needs of participating farmers and proposes improvements that would allow them to upgrade their production capacities and skills to strengthen their linkage with the market. The project

[76] The experience of multiple user systems pilot in Mali and Burkina Faso with the support of other donors is notably being considered.

will support outreach and promotional activities to identify commercial partners and private financing entities to form alliances with farmers, and formulate business proposals.

Subcomponent 2.2: Expansion of Water Supply Services (US$170.00 million)

26. **This subcomponent will support the construction, rehabilitation, and effective management of water supply infrastructure to increase access to water supply services in selected urban, semi-urban and rural zones.** It includes four main interventions: (i) construction and rehabilitation of primarily multi-village infrastructure to improve access to safe and reliable drinking water services (basic and on premise) in semi-urban and rural areas; (ii) supporting enhanced service delivery management capacity; and (iii) urban water supply investments in Niamey. Service provision will target households, as well as schools and health centers. Specific semi-urban and rural activities – both drinking and pastoral-related – will be identified and prioritized in accordance with the development action plans at the sub-basin and commune levels developed under Subcomponent 1.1 as part of the integrated water platform. The leveraging of local, commune, and sub-basin level water platform structures will ensure that activities respond to the needs of particular communities, that they maximize efficiency through multi-village schemes when applicable, and that the quality and sustainability of Niger's water resources are protected. Support will be provided to promote of private sector investment and sustainable business models for operations and maintenance.

Increasing semi-urban and rural access to drinking water services (US$125.00 million)

27. **Drinking water services will be increased in semi-urban and rural areas through the following activities to be implemented by the MHA (US$75.00 million):**

- Construction of new deep wells, equipped with submersible solar-powered electric pumps, to supply clean drinking water;
- Construction of related transmission mains from boreholes and overhead water tanks for network storage and supply;
- Construction and installation of systematic water treatment systems, including chlorination;
- Construction of water distribution networks and collection points (standpipes, water troughs, connections to public institutions and households);
- Rehabilitation of water points and schemes;
- Installation of water dispensers where applicable to reduce waste and enhance revenue collection for improved maintenance and expansion.
- Technical studies and civil works supervision; and
- Supporting rural water reform for sustainability and better service delivery.

28. Studies have been launched by the MHA to identify potential investments, including no regret investments increasing access to water supply to vulnerable populations and livestock that can be undertaken with community participation, but prior to the establishment of relevant platform institutions. Activities will be prioritized and selected based on pre-identified criteria, including: (i) high population density; (ii) low access rate to drinking water services; and (iii) relative beneficiary acceptance of water supply system management by a private operator. All infrastructure will ensure inclusive access and directly address climate risks, namely water scarcity, droughts, and floods, using a resilient design process. They will also include measures for the protection of water quality, such as systematic water treatment and the installation of concrete slabs, fencing and drainage systems. Furthermore, infrastructure will prioritize renewable energy (principally new solar-powered systems to replace

existing diesel-powered systems) and energy efficiency improvements to minimize fossil fuel-dependent energy-related GHG emissions while improving financial performance.

Framework of rural water supply investment including livestock watering

Water Supply Systems:

This section explains the variation in applicable unit costs across project regions:

- **Agadez:** In the identified sub-basin (Telwa), borehole depth varies from 100 to 120 meters and the production of one deep well is enough to sustain one multi-village water supply system. Raw materials like gravel and concrete are available. Borehole depth complies with the country average.
- **Diffa:** The underground aquifer is as deep as in Agadez. However, raw material like gravel needs to be imported approximately 200 km away from Zinder region, explaining the difference in the unit cost of a standpost.
- **Dosso:** Borehole depth varies between 100 to 120 meters with good production to supply water to small towns and multi-village systems. Raw materials like gravel and sand may be accessible within 30 to 100 km. However, the cost of water supply systems is at the country average.
- **Maradi:** Borehole depth varies between 80 to 100 meters. The borehole cost is below the country average and raw materials (gravel and sand) are available within 20 to 50 km.
- **Tahoua:** Borehole depth is significantly above average, ranging from 300 to 500 meters. The borehole cost therefore drives the cost of water systems far above the country average.
- **Tillabery:** The area of Sirba-Dargol exhibits a rocky substratum place where boreholes are less productive compared to the country average. More than two boreholes are generally needed to supply water systems when not using surface water.
- **Zinder:** The Korama sub-basin exhibits a mix of rocky substratum and a generalized aquifer with a depth of less than 100 meters. The sub-basin average water supply system cost is within the country average.

29. Unit costs in Table A1.4 are based on available data for at least 10 to 15 years. All water supply systems will be powered by solar energy or the national electricity, or both. In order to minimize the operational cost and reduce GHG emissions, diesel generators will not be used.

30. Unit costs and number of beneficiaries are drawn from the PROSEHA document: (i) for a multi-village water supply system (several standposts, household connections, and several villages connected to the network), the average number of beneficiaries is estimated as 7,500 persons; (ii) for a simple water supply system with several standposts and some household connections, the average number of beneficiaries is estimated as 2,500 persons; (iii) for a compact water supply system with a water abstraction facility, a pumping system (well, borehole), an overhead water tank, and one bloc outlet (standpost with two to four taps), the average number of beneficiaries is estimated as 750 persons; and (iv) a pastoral pumping station provides water on average to 750 persons and 3,000 livestock units.

Selection criteria for water supply systems:

31. Activities will be selected based on a set of criteria, including but not limited to: (i) the population density, (ii) low access rate to drinking water services, (iii) beneficiaries' acceptance of the management of water supply system by a private operator; and (iv) beneficiaries' commitment to the equitable management of standposts

according to best practice in the country.[77] The choice of the type of water supply system to be implemented will depend on the concentration of villages to served and the number inhabitants. For example, in situation where the distance between villages is less than 10 km, a multi-village water supply system is preferred. Compact water supply systems are ideal when the distance between villages is more than 10 km and the total village population is between 500 and 1000 inhabitants. Simple water supply systems are preferred in small towns or villages of more than 2,000 inhabitants, provided that there are no other villages within 10 km.

[77] Standpost management normally requires the acceptance of an agreed price, to be publicly posted, and cleaning and maintaining the water point (changing the taps when not working). Any usurious mark-ups result in the firing of the standpost manager. A drinking water users association supervises the management of the water point.

Table A1.4: Unit costs of water infrastructure

Designation	Description	Unit cost in USD						
		Agadez	Diffa	Dosso	Maradi	Tahoua	Tillabery Zone de Socle	Zinder
Multi-village water supply system	Multi-village water supply system is composed of water abstraction infrastructure (deep well, row surface water including treatment process), water tank, pumping station, distribution network providing connection to multiple villages through standposts and household connections	500.000	500.000	500.000	400.000	900.000	550.000	500.000
Rural water supply system	Village water supply system is composed of water abstraction infrastructure (deep well, row surface water including treatment process), water tank, pumping station, distribution network providing connection to the village through standposts and household connections	160.000	150.000	160.000	150.000	400.000	240.000	160.000
compact water supply system	This is a water supply system that includes the water abstraction infrastructure (Deep well or well), storage tank and outlet through a standpost.	120.000	110.000	120.000	110.000	NA	150.000	120.000
Pastoral pumping station	This is a water supply system that includes the water abstraction infrastructure (Deep well or well), storage tank, distribution network and outlet through watering points and standposts for the population	400.000	400.000	NA	NA	700.000	NA	200.000
Standpost	A standpost/standpipe may have one to four taps. It often has concrete slab, water meter, concrete blocks, closed structure and taps	1.400	1.700	1.400	1.400	1.400	1.400	1.400
Household connection	Household water connection is a connection to household with extension pipe of 30 meters, water meter, tap.	400	400	400	400	400	400	400

32. In addition to infrastructure, this subcomponent will finance the establishment and operationalization of effective rural water supply institutional arrangements that promote quality, sustainable, and climate-resilient service delivery and PPP, including through the use of PBCs for additional incentive. Additionally, a technical assistance provider will be engaged to support the capacity reinforcement of private operators. This technical assistance provider will have substantial experience as a private operator managing small water supply systems in similar contexts, allowing them to impart critical and relevant capacities and lessons learned to their Nigerien counterparts.

33. PBCs will incentivize the GoN to design, establish, and operationalize improved, financially sustainable, and functioning rural water supply institutional arrangements, including necessary institutional and stakeholders' studies, due diligence, and workshops to determine the best option for the sustainability and resiliency of rural water services. The reform is intended to better support Niger's municipalities in the delivery of rural water supply and promote private sector investment and sustainable business models for operations and maintenance that increase system efficiency and resiliency, building on the regional experiences of Benin and Senegal, among others. PBCs also include incentives to ensure that support to private operators by the technical assistance provider results in the operationalization of systems and processes required for sustainable, climate-resilient, and energy- and water-efficient service provision by those operators. In total, PBCs of US$12 million will be used as incentives for the achievement of key results (see details in Annex 6):

- **PBC 1:** Establishment of improved, financially sustainable, and functioning rural water supply institutional arrangements in accordance with the PIM. (Planned for Year 4; US$4 million)
- **PBC 2:** Submission of rural water supply annual report to the Board of Directors and the Regulatory Authority ARSEau following approved template defined in agency operations manual (Planned for Years 5-6; US$4 million total for reports in two project implementation years; scalable 50 percent, or US$2 million, per year)
- **PBC 3:** Technical assistance provider supported at least 60 percent of private operators managing rural water systems constructed/rehabilitated under the project to operationalize accounting and asset management systems (Planned for Year 6; US$4 million).

34. **Expansion of a multi-village system in the Gotheye-Tera area (US$50.00 million):** The GoN has requested the World Bank to close the financing gap of the multi-village system of Gotheye-Tera, which is currently being supported by the EIB. This multi-village system is part of Dargol-Sirba sub-basin actions to improve the resilience of the population in terms of access to drinking water supply in a challenging hydrogeologic context where access to groundwater is inefficient because of the rock substratum of the area (Liptako). Related activities, implemented by SPEN and supported by the EIB and the World Bank, include the construction of: (i) a water treatment plant of 35,000 m3/day in Gotheye; (ii) discharge and distribution networks of 106 km between Gotheye and Tera; (iii) four booster pumping stations; (iv) five overhead water tanks; (v) an additional 60 km of distribution network; and (vi) approximately 100 stand posts and 2,100 new household connections. The EIB financing focuses on the surface water treatment plant, the first transfer pumps and a selection of the discharge pipes. The financing of the proposed World Bank project will support the following system expansion activities to be implemented by the MHA through SPEN:

a. 70 km of discharge and distribution pipes;
b. Overhead water tanks;
c. Discharge boosting stations (intermediate pumping stations between Gotheye and Tera); and
d. Stand-posts and other connections (schools, health centers, etc.).

Increasing access to drinking water services in the City of Niamey (US$45.00 million)

35. **Urban water supply services will be improved through support to the implementation of Niamey's climate change-informed Water Master Plan, a key element of the SDAP.** Although the World Bank has been supporting urban water reform for two decades and important milestones have been achieved, the subsector still needs investment support to fill gaps in peri-urban areas, address population growth, and improve resiliency to climate change. Support to Niamey's water master plan responds to projected population growth and adaptation to climate change, and complements existing financial support of 160 million euros by the EIB, the AFD and the Government of the Netherlands (DRIVE). Supported investments include: (i) a third water treatment plant for the city; (ii) three elevated water tanks; (iii) the transmission line to the tanks; (iv) rehabilitation works of the water supply system; and (v) expansion and improvements to the distribution network. Specific allotments of this investment program are provided in the Table A1.5 below. This subcomponent will be implemented by MHA through SPEN.

Table A1.5: Niamey water supply master plan investment allotments

Niamey water supply master plan supported by EIB, DRIVE, AFD and WBG		
Activity description of activities	**Estimated cost for each allotment**	**Donors that are engaged**
Lot1: construction of water treatment plant of 100,000 m3/day	Euros 60.49 million	EIB and DRIVE
Lot2: discharge pipe of around 29 km between the treatment plant and overhead water tank R18	Euros 40.88 million	EIB
Lot3: construction of the water tank R18 of 5000 m3 and two boosting stations with their reservoirs	Euros 16.33 million	EIB
Lot4: construction of two water tanks R19 (5000 m3) and R20 (3000 m3) including the discharge pipe	Euros 19.37 million	AFD
Lot5: rehabilitation works on existing thanks, pumping stations, discharge pipes	Euros 11.31 million	AFD
Lot6: distribution networks to be installed on the right (320 km) bank side of Niger river in Niamey city	US$22.45 million	WBG
Lot7: distribution networks to be installed on the left (330 km) bank side of Niger river in Niamey city	US$22.55 million	WBG
Lot8: household connections and standpost RG	Euros 4.4 million	AFD
Lot9: household connections and standpost RG	Euros 3.9 million	AFD
Technical studies	Euros 3.32 million	AFD/EIB

Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication (US$20.00 million)

36. **This subcomponent will improve sanitation and hygiene services and practices in both urban and rural Niger, prioritizing support for women and girls.** Using the data collected by the service delivery survey (SDI) and other complementary administrative data, a priority list of sites most critical for investment will be defined, considering both risk and impact, as well as guarantees for maintenance of infrastructure. Specific investments will be identified in accordance with the development action plans at the sub-basin and commune levels developed under Subcomponent 1.1 and will involve a resilient design process to directly address climate risks, namely droughts

and floods. The subcomponent will be implemented by the MHA, with studies having been launched by the MHA to identify potential investments, including no regret investments that can be undertaken with community participation, but prior to the establishment of relevant platform institutions. The project is expecting to allocate about 65 percent of this subcomponent's budget to infrastructure construction in critical public settings. This infrastructure includes: (i) latrines in schools and health centers; (ii) public bathrooms in lorry park, market and other public places; and (iii) two fecal sludge treatment plants, in Niamey and Maradi respectively, where sustainable management can be insured. The fecal sludge treatment plants will not impact the quality or quantity of waterways, as the selected treatment process (lagoons and drying beds) excludes discharge of residual water after treatment. Instead, residual water will be used to irrigate an on-site biological fence and treated dried sludges will be reused by small scale farmers.

37. **Beyond key public infrastructure, the subcomponent aims to promote sustainable behavior change and sanitation value chains.** Thirty-five percent of the subcomponent's financing will support: (i) behavior change activities to improve household-level sanitation and hygiene behavior; (ii) the distribution of hygiene kits (including menstrual hygiene management); and (iii) the development of a holistic sanitation value chain. Mass communication through relevant channels will be used to consolidate awareness and promote behavior change, as well as to destigmatize discussions around sanitation through the mobilization of key social figures. Additionally, measures targeting a better inclusion of menstrual hygiene considerations in water and sanitation interventions will be devised in consultation with key stakeholders, with the support of the ministry of Gender and Children's affairs. Better hygiene and sanitation are expected to contribute, in the longer run, to the reduced exposure and improved adaptability of populations (and in particular girls and women) to climate-change induced water-borne diseases. Finally, the subcomponent will aim to establish and promote the development of an effective sanitation value chain – from containment, emptying, transport, treatment, and reuse – involving private sector entities (entrepreneurs and micro-finance institutions) and will be informed by the extensive knowledge developed in Niger and other relevant countries with the support of the former WSP. Activities will leverage local, commune, and sub-basin level water platform structures established under Subcomponent 1.1 to ensure their suitability to the local context and coherence with relevant development plans.

Framework of sanitation infrastructure

Sanitation Infrastructure: Four types of sanitation infrastructure are planned for this project: (i) school latrines block; (ii) health center latrines block; (iii) public toilets; and (iv) fecal sludge treatment plants. Based on project implementation over the past 10 years, unit prices are as follows:

- **School latrines block:** The block has three latrines and the unit cost of each block is on average US$7,000. Each latrine will provide service to an average of 10 pupils, with 30 pupils for a block of three latrines.
- **Health center latrines:** The block is similar to those for school latrines, with each latrine serving 10 people.
- **Public toilets:** These toilets have bathrooms, latrines and urine settings. Water connection is also provided. The average unit cost is estimated at US$10,000 for four cabins and US$12,000 for five cabins. Every cabin is meant to serve 30 people a day.
- **Fecal sludge treatment plant:** Two sludge treatment plants have been built in Niamey. Based on this experience, the estimated unit price for one plant is US$5.00 million. Each fecal sludge treatment plant is meant to provide service for 400,000 to 500,000 people a day.

Component 3: Project management and capacity building (US$25.00 million equivalent)

38. This component will finance the operational costs of the PMU. It will support: (i) the coordination and management of project activities; (ii) the development, quality control of required documents under the World Bank's ESF; (iii) the capacity building of project implementation agencies at central, local and community levels; (iv) the M&E and knowledge management of project activities, including compliance with the ESF; (v) capacity reinforcement of ministries involved, including the rural water supply institutional arrangements developed under the PBCs and the regulation body ARSEau; (vi) consulting services of an IVA to ensure compliance of the PBCs and technical studies for disruptive technology; and (vii) supporting the needed technical assistance for procurement, and others.

39. The PMU will carry out all aspects of project management and implementation, including FM, procurement, environmental and social risks management, M&E, and sector and donor coordination. However, to support effective management and implementation, an institutional study was conducted to determine the most appropriate institutional setup. This study has proposed to outsource the procurement and citizen engagement activities to bypass the procurement challenges that constitute the main bottleneck for project implementation in Niger and to alleviate the work burden on the PMU.

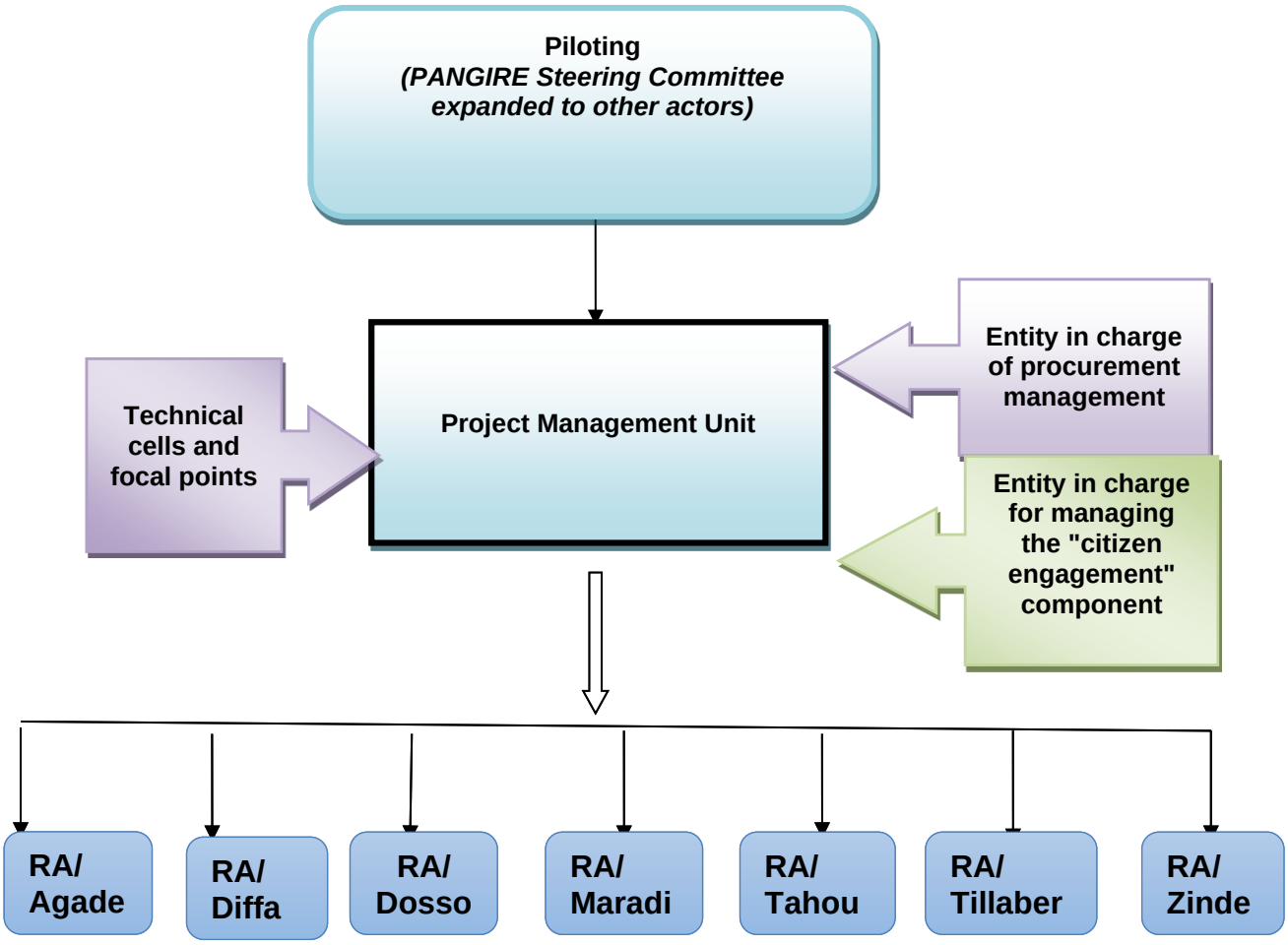
Component 4: CERC (US$0.00 million)

40. This zero-funded component will allow the Governments to quickly mobilize funds in the event of an emergency that requires immediate recovery and reconstruction response. In the event of a crisis or disaster caused by a natural hazard, this component enables the GoN to quickly reallocate IDA project funds to disaster response and recovery purposes under streamlined procedures. It will therefore support Niger's emergency preparedness and response capacity, including financing of critical emergency goods or emergency recovery and associated services, as well as targeted provision of post-disaster support to affected households and individuals. Following an adverse natural event, the Government's declaration of disaster in accordance with national law, and adherence to the World Bank's activation policy, the CERC component would be triggered.

Annex 2: Implementation Arrangements and Support Plan

1. A diagnostic was conducted during project preparation to identify the preferred institutional arrangement for the project to promote the overall sustainability of the water security platform supported by the project. The proposed institutional arrangement includes: (i) a steering committee; (ii) a PMU with regional antennas; and (iii) the definition of roles and responsibility and guidelines for institutional collaboration. It also proposes implementation process for WRM investments and arrangements for the operationalization of WRM institutions.

Figure A2.1: Project institutional setup for implementation



Note: RA = Regional Antenna.

2. **The steering committee:** It has a strategic leadership role to provide guidance and monitoring of project activities through the AWPB and oversee annual project implementation reports. Given that PANGIRE already has a steering committee, the National Water and Sanitation Commission (CNEA),[78] the IWSP project will not create a new steering committee. Instead, the CNEA will be extended to other actors and under the chairmanship of the Prime Minister's Office. The consolidation of the IWSP steering committee with that of the PANGIRE reinforces

[78] CNEA: Commission Nationale de l'Eau et de l'Assainissement

their alignment. As part of the management of the IWSP, the composition of the PANGIRE steering committee will be extended to other actors under the chairmanship of the Ministry of Water and Sanitation, including representatives of:

- Ministry of Planning (*Ministère du Plan*, MP)
- Ministry of Water and Sanitation (*Ministère de l'Hydraulique et de l'Assainissement,* MHA)
- Ministry of Agriculture (*Ministère de l'Agriculture*, MAG)
- Ministry of Environment and the Fight against Desertification (*Ministère de l'Environnement et de la Lutte contre la Désertification, ME/LCD)*
- Ministry of Livestock (*Ministère de l'Elevage*, MEL)
- Ministry of Health (*Ministère de la Santé Publique*)
- Ministry of Women's Promotion and Childs' Protection (*Ministère de la Promotion de la Femme et de la Protection de l'Enfant*)
- High Commission for Initiative 3N (*Haut Commissariat à l'Initiative 3N*)
- Parliamentarians Network for the World Bank (*Réseau des Parlementaires pour la Banque Mondiale)*[79]
- NGO or women's association working in the WSS sector

3. **The responsibility of the steering committee:** The steering committee will meet at least four (4) times a year (one meeting per quarter) and will work to ensure better ownership of the project by stakeholders at all levels through the exercise of strategic leadership role. More specifically, its main responsibilities will be to:

- Define the strategic direction of the project and ensure that it is respected by all stakeholders by ensuring that the project's activities are consistent with its own objectives, which are aligned with those of national sectoral policies and strategies.
- Identify and/or validate the reforms the water sector needs.
- Ensure synergy in business planning.
- Review every six months the progress made by the project and, more generally, the country's progress in accessing clean water and sanitation.
- Approve AWPB and monitor its implementation.
- Approve semi-annual progress reports and annual audit reports.
- Ensure compliance with the commitments of the various parties with respect to the technical and financial implementation of the project.
- Ensure better identification by the departments involved of their targets when developing the annual work plan.
- Ensure good coordination of development partner interventions.
- Review and decide on any specific document submitted for its assessment by the coordination of the project.

4. **PMU:** The reality is that Niger administration has limited capacity as highlighted by many reports including the assessment made for implementing the Program for Results (PforR) investment lending operations on Niger and Mali (P164373 and "enabling environment assessment for introducing PforR for better service delivery": World Bank). For example, the perception survey conducted as part of the 2012-2015 PDES evaluation showed that "on average all services combined, 43 percent of the actors surveyed are weakly supported by public services". This view is a translation of the administration's 'weak ability to deliver quality services'. The IWSP cannot ignore these

[79] The involvement of the Parliamentarians Network aims to strengthen accountability in the management of the IWSP, particularly given the project's highly sensitive nature and the regional security context.

constraints by taking unnecessarily risks, especially in the context of a highly strategic intervention. In doing so, the project's management system must sufficiently protect the project from the contingencies of the administration while being contributing to improvement in the administration's performance through IWRM. These requirements will be supported by the use of a PMU with technical, managerial and fiduciary capabilities, whose members will be recruited through competition in the labor market. The PMU must be organized in such a way as to ensure visibility and a permanent and quality dialogue with stakeholders including the various ministries involved.

5. The national ownership of the project is not limited to the implementation of the project by a system controlled by the administration. It also relies on the ability of the government to exercise real leadership by being appropriately involved in the management, implementation, and M&E of activities. National ownership of the IWSP by various stakeholders, including ministries, can be also be strengthened by monitoring the implementation of the AWPB and by aligning activities with project objectives and national programmatic frameworks.

6. The PMU manages the project's resources and ensures that they are used in accordance with the rules and procedures in force. More specifically, its mission is to:

- Ensure that the rules and procedures agreed to in the project are implemented.
- Ensure that decisions made by the steering committee are implemented.
- Ensure synergy between key players in the project.
- Supporting water sector reform.
- Accompanying the establishment of IWRM institutions (Basin Agencies, Local Water Committees "CLE", Associations of water users "AUE").
- Support the strengthening of communal management through the support of the regional antenna of the PMU by implementing certain activities by referring to the CAP approach by ensuring the integration of environmental restoration actions.
- Manage the project's bank account.
- Prepare requests for withdrawal of funds.
- Keep the accounting and produce the project's financial statements on time.
- Prepare, one month before the end of the current year, the detailed AWPB for the coming year, ensuring that activities are aligned with the project's objectives.
- Lead contracting and adhere to compliance with contracting and management procedures.
- Prepare and conduct implementation support, audits, and M&E missions.
- Develop and implement the project's communication strategy.
- Manage the project's personnel and assets.

7. PMU members will be required to sign a performance contract, which is an additional guarantee of project management effectiveness. The PMU will be composed of the following core staff, which must be in place by effectiveness:

- A coordinator
- An FM specialist
- A procurement specialist
- An accountant
- An environmental safeguard specialist
- A social safeguard, gender, and social inclusion specialist

- An M&E specialist

8. To ensure a permanent and quality dialogue between the IWSP and key stakeholders, the project management will be supported by a technical pool of experts, representative of the thematic involved. These experts, who will be either consultants to be mobilized as needed or permanent members of the PMU, shall be in place no later than 90 days from effectiveness and include, at a minimum, the following areas of expertise:

- An internal auditor
- A communications specialist
- An M&E assistant
- An assistant accountant
- A water expert
- A sanitation and hygiene expert
- An environmental expert
- A rural engineer
- An agro-economist
- A GBV specialist

9. Citizen engagement activities will be outsourced and entrusted to NGO(s) and/or consultant firm(s) justifying a proven expertise in this area.

10. **Technical Cells or Focal Points:** Depending on the volume of activities and their diversity, a technical cell or focal point will be instituted in each of the ministries directly involved in the implementation of the IWSP. Thus, where the volume of activities is large and they are further diversified, a technical cell composed of representatives of the relevant directorates will be established within the relevant ministry. Otherwise, a focal point may be designated. The technical cells and focal points will ensure greater visibility of the departments they represent and greater involvement in the implementation of the project. They will be as tasks to:

- Establish sectoral programs of activities to be poured into the AWPB.
- Ensure a quality and ongoing dialogue between the ministries and the project.
- Participate in implementation support missions, mid-term review, and follow-up-assessment.
- Support the preparation of the steering committee sessions.
- Follow the implementation of activities to boost the consumption of credits.

11. To effectively support the implementation of IWSP, each technical cell or focal point must develop its own roadmap aligned with the overall planning of the project. The relevant project technical specialists can support technical discussions in the technical cells and with the focal points.

12. **Implementation of activities under Components 1 and 2 will be led by relevant sector ministries and agencies, with support from implementation support consultancies, while Component 3 will be implemented by the PMU.** Implementation arrangements for Components 1 and 2 are as follows:

a. Subcomponent 1.1: MHA through the permanent secretary of PANGIRE in relation with DGRE
b. Subcomponent 1.2: ME/LCD
c. Subcomponent 1.3: MAG
d. Subcomponent 2.1: MAG for irrigation-related activities, MEL for livestock-related activities, and MHA with support of MEL for pastoral water supply activities
e. Subcomponent 2.2: MHA, including through SPEN for the Gotheye-Tera multi-village scheme and for urban water supply activities in Niamey

f. Subcomponent 2.3: MHA

13. **Procurement:** Procurement remains a major concern in project management notably due to the persistent delays that characterizes it. Those delays are one of the factors that limit the use of allocated financing and are mainly due to the low pro-activity and the low responsiveness of national players at all levels. Project coordination units who have theoretically the fiduciary responsibility, are quite often divested of this responsibility in favor of commissions set up within departments. These commissions feel so "powerful" that they tend to break free from respect for existing procurement procedures.

14. The Niger Public Procurement Code allows the outsourcing of the procurement tasks. Ultimately, the article 10 of the decree No 2016-641/PRN/PM of December 1st, 2016, under the code of public procurement and public service delegation allows this outsourcing. It can be done through “delegated management” or “technical assistance”. In the context on this project with many procurement activities involving many departments, it is wise to opt for the delegated management through a contract with specialized entity. The specialized entity will thus be responsible for conducting the procurement process according to World Bank procedures and ensuring its integrity and proper execution for a period that can be extended beyond the completion of the project. The project procurement specialist will, among others, serve as an interface between the specialized entity and the PMU to monitor the progress. It is important to note, however, that given SPEN’s 20 years of experience implementing World Bank-supported projects, SPEN will directly conduct procurement activities alongside the PMU for associated activities under Subcomponent 2.2. The PMU retains full responsibility for FM.

15. This specialized entity can be recruited through a competitive bidding or through a single sourcing with a United Nation agency like UNOPS. This entity will under the responsibility of the PMU which ensures the fiduciary responsibility of the whole project.

16. **Regional antennas of the project:** to ensure better proximity with beneficiaries and national coverage of the project, it is strategically required that antennas be set up in all regions (Agadez, Diffa, Dosso, Maradi, Tahoua, Tillabery and Zinder). These antennas will be placed under the authority of the PMU to which they are accountable. They will be in the communities closest to the sub-basins, as noted in Table A2.1.

Table A2.1: Locations of regional project antennas

Regions	Agadez	Diffa	Dosso	Maradi	Tahoua	Tillabéry	Zinder
Locations	Agadez	Diffa / Mainé	Doutchi	Maradi	Madaoua	Gotheye	Matamèye
Sub-basins	Kori Telwa	Manga	Dallol Maouri	Goulbi N'Maradi and Goulbi N'Kaba	Maggia and Lower Tarka Valley	Sirba Dargol	Korama

17. The sub-basin-based approach reinforces the anchoring of the IWSP in the PANGIRE and avoids scattering by focusing interventions on specific points (sub-basins) in order to bring about the lasting changes sought.

18. The role of the antennas is to bring the project closer to its beneficiaries by supporting the implementation of activities at the scale of each of the identified sub-basins. More specifically, they will be responsible to:

- Ensure that project objectives and central guidelines are met.
- Monitor and evaluate the implementation of the project's activities.
- Ensure the availability and sharing of relevant project information.
- Mobilize stakeholders and bring them together towards the project's objectives.
- Build the integrated water management capabilities of stakeholders.
- Ensure that information on the programme of activities and related resources is reassembled
- Manage project funds and staff in the respective sub-basins.
- Ensure the proper management of the project's resources in their respective area of intervention (sub-basins).
- Support various missions (implementation support, audit, supervision, others.

19. Each antenna will consist of: (i) the antenna manager; (ii) the rural development specialist; (iii) the procurement assistant; (iv) the accountant; (v) the M&E specialist and (vi) team assistance. Select regional antennas will additionally include the following persons to support activities within one or more regions: environmental and social specialists to ensure compliance with environmental and social requirements, and a communications specialist to support communications and citizen engagement activities.

20. **Implementation process for WRM investments**: investments will be identified, prioritized and selected through a joint, multi-sectoral process for, irrigation, fisheries, livestock, rural drinking water supply, needs for landscape restoration etc, including but not limited to construction and rehabilitation of multipurpose water harvesting infrastructure and wells for water mobilization, spreading and percolation weirs and riverbank protection investments on ephemeral rivers for protecting agricultural fields.

21. **Identification and prioritization of investments**: Relevant government agencies (MAG, MHA, MEL, ME/LCD) and Communes with local communities are responsible for the identification and prioritization of the investments at the sub-basin level. The first step includes the preparation of possible long list of multisectoral investments, that may be feasible in a given village, based on existing sub-basins/commune level plans. A multi-sectoral team of technical agencies will consult with communes/each village, with the long list of possible investments (Annex 1) to be discussed with the communities and beneficiaries and seek their feedback. The PMU, supported by its relevant regional antenna, will ensure the fiduciary responsibility and technical advice to government agencies and communes. When Sub-Basin institutions (AUEs, CLEs and Sub-Basin agencies) are in place as per PANGIRE Institutional setup, the identification and prioritization process will be conducted by Sub-basin institutions in relation with government agencies; the PMU and its regional antennas will continue ensuring the fiduciary responsibility and technical advice. When this first stage process of commune/community feedback is complete, the multi-sectoral team will aggregate the feedback at the sub-basin level and appraises the feasibility of investments while using the proposed framework criteria as well as the overall water resources availability and demand. The long list of multi-sectoral investments for each commune/village will be revised accordingly. The multi-sectoral team of technical agencies will go back again to the commune/community with the revised list and informs them on their findings, and if required make additional adjustments and confirm beneficiary's willingness in participating and their contribution in line with SPIN and other sectoral strategies. In this context, the village level investment plan will be confirmed.

22. **Annual investment program**: The PMU, with the support of its thematic experts and with the support of the Technical Cells or Focal Points of the sectoral ministries, will select the investments that will be submitted to the steering committee for validation. The investment program is elaborated on annual basis; when required,

adjustment can be made four time a year at the meetings of steering committee.

23. **Construction for the irrigation investments**: the implementing agency for irrigation (MAG), with the fiduciary support of PMU and through an implementation support consultancy, will: (i) support the beneficiaries of each identified investment to organize themselves in an appropriate farmers group which will work with MAG to formally request the investment, collect and pay the needed contribution, sign the agreement for investment with MAG, and commit to O&M of the investment (these groups will not be same as AUEs but will be a part of or represented in the AUE, once they are established); (ii) conduct the technical preparation; and (iii) and ensure the works supervision and commissioning.

24. **Construction for the drinking water supply investments**: The hydraulics directorate (MHA-DGH), through an implementation support consultancy, will perform the technical preparation of investments, while also supporting the beneficiaries of each identified investment to organize themselves in an appropriate beneficiary voice (*AUE-SPE*) to be part of AUE when in place. In fact, new water systems are normally[80] managed through private operator who is contracted by the beneficiary commune, and AUE-SPE are representing the consumer voice. Communes are responsible to set up the O&M arrangement in close collaboration with MHA. The Commune, with the fiduciary support of PMU and through an implementation support consultancy, will select the Operator, elaborate and sign the service contract. The commune will supervise the contract execution.

25. **Works for landscape management investments**: The ME/LCD, with the fiduciary support of PMU and through an implementation support consultancy, will identify the NGO in charge of the field organization of the labor-intensive activities involving local communities.

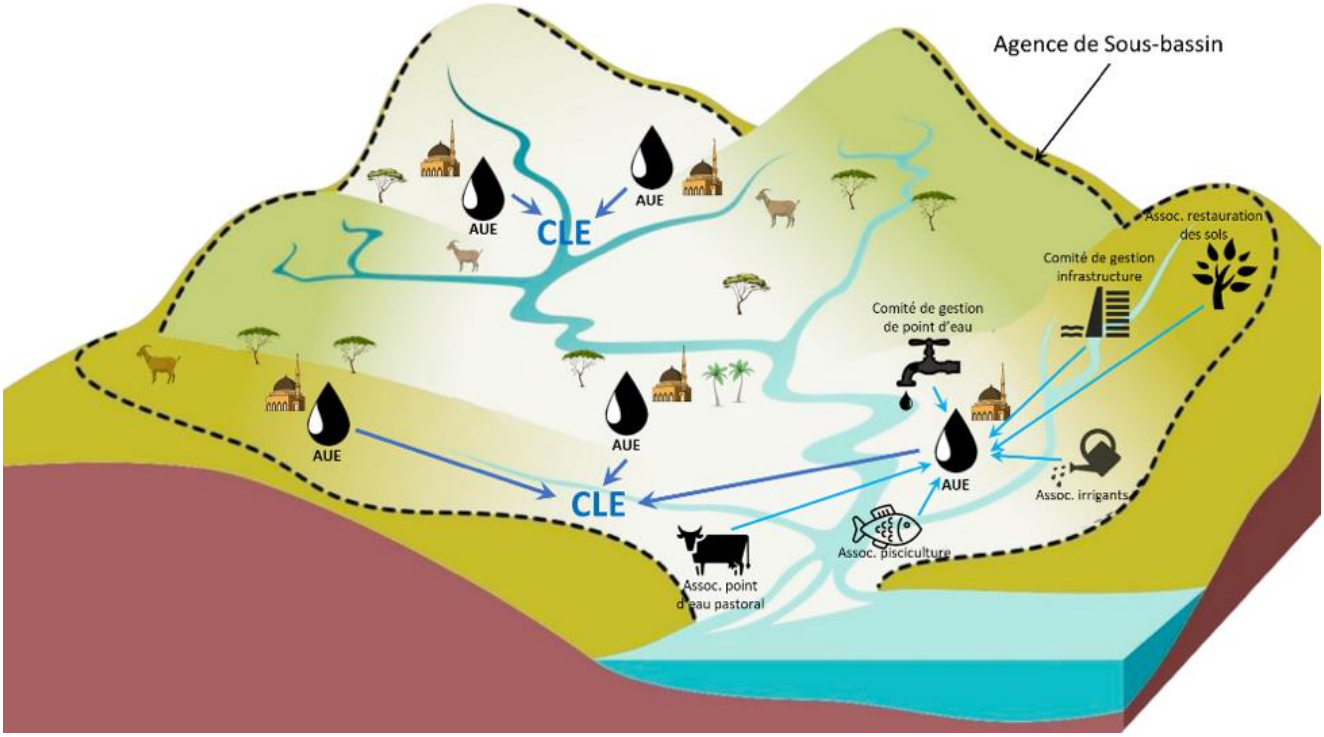
26. **Construction for the livestock investments**: The hydraulics general directorate (MHA-DGH), with the fiduciary support of the PMU and through an implementation support consultancy, will perform the technical preparation of investments, elaborate and sign the works contract and ensure the works supervision and commissioning on behalf of the Ministry in charge of livestock (MEL). The MHA and MEL, with the fiduciary support of PMU and through an implementation support consultancy, will support the beneficiary region of the infrastructure to select the manager through a PPP contract. The beneficiary communities will be organized in pastoral water user association as consumers voice and to be part of AUE when in place.

27. **Hydromet investments will be proposed by DGRE/SP-PANGIRE**, reviewed by the PMU and validated by the steering committee. DGRE/SP-PANGIRE, through an implementation support consultancy, will perform the technical preparation. DGRE/SP-PANGIRE will oversee the implementing the selected investments (including contract drilling operators for piezometers and contract operators in charge of the installation of instruments) with the fiduciary support of PMU.

28. **In parallel with WRM investments, the Project will support the operationalization of WRM institutions as defined in the PANGIRE**. The project will build upon the Swiss Cooperation project already supporting the implementation of the PANGIRE institutions in three of the selected sub-basins (Vallée de la Korama, Goulbi'n Maradi et Dallol Maouri). An NGO will be selected to support the establishment (or the formalization) of the IWRM bodies (sub-basin water agencies, local water committees at the commune level and water users' associations at the village level and village groupings). This NGO will also accompany these organizations for two years, including with the implementation of a training and capacity building program for members of these organizations.

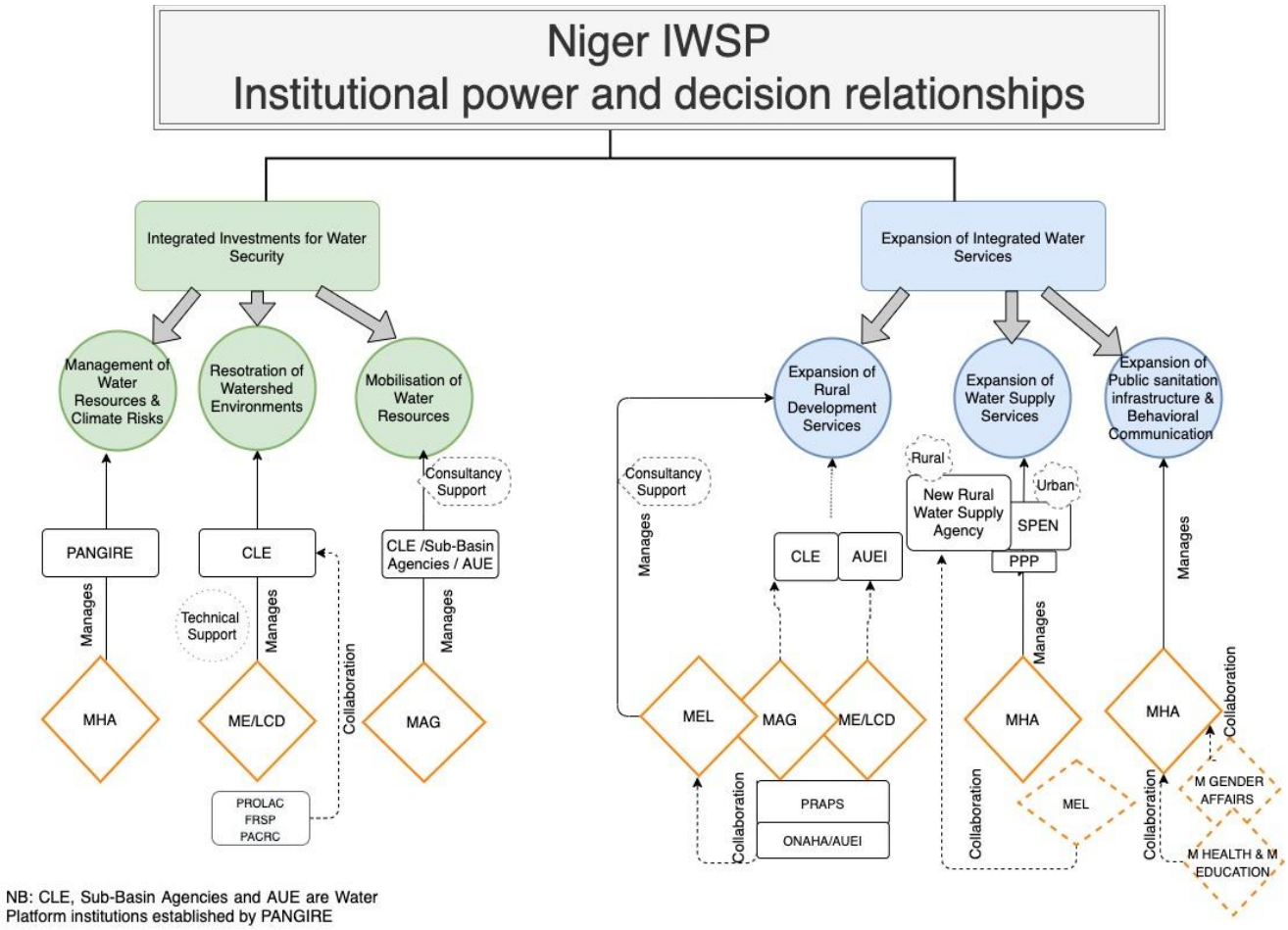
[80] In accordance with the rural public water service guide (reference document that regulate the management of public rural water service).

Figure A2.2: PANGIRE sub-basin organization



29. **Implementation Support Plan:** From project effectiveness to the end an implementation support will be provided by the task team to the implementation agencies and PMU. Every six-month implementation support mission will be conducted to assess and provide guidance on technical, fiduciary, safeguards aspects of project implementation. The citizen engagement will also be assessed and recommendations for the next steps will be provided. During the fourth year of the project implementation, a mid-term review will be conducted to re-adjust if necessary, this will include a technical audit on project activities and an overall assessment of project implementation/arrangement. At the year seven of the project implementation will be closely monitored through close follow-up to end up project implementation and prepare the implementation completion and results report (ICR).

Figure: A2.3: Niger ISWP implementation arrangement



NB: CLE, Sub-Basin Agencies and AUE are Water Platform institutions established by PANGIRE

Annex 3: Procurement and Financial Management

A. Procurement

1. **Guidelines.** Procurement for goods, works, and non-consulting and consulting services will be carried out in accordance with the procedures specified in the World Bank Procurement Regulations, dated July 2016, revised November 2017, August 2018 and November 2020 (Procurement Regulations), and provisions stipulated in the Financing Agreement.

2. **Procurement documents.** For international competitive procurement for goods, non-consulting services, and consulting services, the Borrower shall use the World Bank's Standard Procurement Documents with minimum changes, acceptable to the World Bank, as necessary to address any project specific conditions.

3. **Procurement Capacity Assessment:** A procurement assessment was done for the implementing agency by World Bank procurement specialist during preparation, in accordance with the World Bank Procurement Risk Assessment and Management System (PRAMS). Based on this assessment, the procurement risk factor is Substantial. The residual risk will be Moderate after implementing the agreed mitigation action plan summarized in Table A3.1.

Table A3.1: Procurement Mitigation Measures

Implementing agency	Procurement mitigation measure	By when
PMU	• Recruit a procurement specialist dedicated to the project on a competitive selection basis. • Recruit procurement assistants for each of Regional Antenna.	One month after effectiveness
	• Recruit a Procurement Agent to assist the PMU by carrying out complex and critical procurement activities according to Legal Agreement, the procurement manual and the project procurement plan.	90 days after effectiveness
	• Draft a procurement manual in the PIM to ensure appropriate implementation of activities in line with the WB general framework related to the Project. • The manual should describe procurement rules applicable to the Project and a clear accountability system, as well as responsibilities for decision making, and describe streamlined procurement procedure when applicable.	Before project effectiveness
	• Advertise at the national level even for small works using requests for quotations (open approach of the market). • Set up third-party supervision and monitoring system. • Provide military escorts to supervision missions.	Throughout project implementation
	• Develop contract management plans for prior review contracts.	Throughout project implementation
	• Train project staff on the new framework (online and/or in person) and the STEP, which will be used to manage all contract transactions and related documents.	Throughout project implementation
	• Set up a filing system at the PMU level to ensure compliance with the World Bank procurement filing requirements. • Ensure timely archiving of all procurement documents and complaints in STEP. • Provide a dedicated room for physical archiving.	Throughout project implementation

4. **PPSD and Procurement Plan.** The World Bank has reviewed the PPSD and found it acceptable. The Borrower and the World Bank discussed and agreed on the Procurement Plan for the first 18 months of project implementation on August 30, 2021.

5. **Procurement information, documentation-filing and database.** The project's activities include procurement of

an electronic archiving system (*Acquisition de logiciel d'archivage électronique*) to record procurement information:

(a) Complete procurement documentation for each contract, including bidding documents, advertisements, bids received, bid evaluations, letters of acceptance, contract agreements, securities, and related correspondence will be maintained at the level of respective ministries in an orderly manner, readily available for audit.
(b) Contract award information will be promptly recorded and contract rosters, as agreed, will be maintained.
(c) Comprehensive quarterly reports will be prepared indicating: (a) revised cost estimates, where applicable, for each contract; (b) status of ongoing procurement, including a comparison of originally planned and actual dates of the procurement actions, preparation of bidding documents, advertising, bidding, evaluation, contract award, and completion time for each contract; and (c) updated Procurement Plans, including revised dates, where applicable, for all procurement actions.

6. **General Procurement Notice, Specific Procurement Notices, Requests for Expression of Interest**, **and results of the evaluation and contracts award** should be published in accordance with advertising provisions in the Procurement Regulations. For request for bids and request for proposals that involve international bidders/consultants, the contract awards shall be published in the UN Development Business in line with the provisions of the Procurement Regulations.

7. **Training, workshops, study tours, and conferences.** Trainings (including training materials and support), workshops, and conference attendance (based on individual needs as well as group requirements), and on-the-job training will be carried out based on an approved annual training and workshop/conference plan that will identify the general framework of training activities for the year. A detailed plan and ToR providing the nature of the training/workshop, number of trainees/participants, duration, staff months, timing, and estimated cost will be submitted to IDA for review and approval before initiating the process. The appropriate methods of selection will be derived from the detailed schedule. After the training, each beneficiary will be requested to submit a brief report indicating what skills have been acquired and how these skills will contribute to enhance his/her performance and contribute to the attainment of the PDO. Reports by the trainees, including completion certificate/diploma upon completion of training, shall be provided to the project coordinator, kept as parts of the records, and shared with the World Bank if required.

8. **Procurement Manual.** Procurement arrangements, roles and responsibilities, methods, and requirements for carrying out procurement shall be elaborated in detail in the Procurement Manual, which will be a section of the PIM. The context of fragility and the capacity constraints in Niger will be considered, and simplified procurement arrangements will be designed accordingly.

9. **Implementing entity.** The procurement activities for the project will be executed by the PMU supported by the Procurement Agent. The PMU will carry out the fiduciary responsibilities and the following activities:

(a) Monitor and/or manage overall procurement activities and ensure compliance with the procurement process described in the relevant manuals.
(b) Ensure compliance of bidding documents, draft requests for proposals, evaluation reports, and contracts with World Bank procedures.
(c) Coordinate the preparation, consolidation and updating of the Procurement Plan.
(d) Monitor the implementation of procurement activities.
(e) Develop procurement reports.
(f) Seek and obtain approval of internal designated entities and of IDA on procurement documents, as

required.

10. **The PMU will conduct all processes of all procurement activities except those managed by the Procurement Agent and will support the following activities:** (i) preparation of ToRs and the bidding documents; (ii) preparation of evaluation reports and contracts in line with World Bank procedures; and (iii) preparation of procurement commission activities and all related meetings. It will also be responsible for the coordination and quality control of all procurement-related activities funded by the project. Regional branches will consolidate regional work plans, budgets and progress reports for the PMU and will be authorized to carry out procurement of small values' activities for which estimated costs do not exceed the thresholds for quotation for works and goods.

11. **Procurement procedures**. When approaching the national market, the country's own procurement procedures may be used with the requirements set forth or referred to in paragraphs 5.3–5.6 related to National Procurement Procedures and subject to certain requirements for national open competitive procurement. Other national procurement arrangements (other than national open competitive procurement) that may be applied by the Borrower (such as limited/restricted competitive bidding, request for quotations, shopping, local bidding, and direct contracting) shall be consistent with World Bank core procurement principles and ensure that World Bank Anti-corruption Guidelines and Sanctions Framework and contractual remedies set out in the World Bank Legal Agreement apply.

12. **Operating costs** financed by the project are incremental expenses, incurred by the PMU as approved by the World Bank, for project implementation, management, including utilities; office space rental; office supplies; bank charges; vehicle operation, maintenance, and insurance; maintenance of equipment and buildings; communication costs; travel and supervision costs (that is, transport, accommodation, and per diem); and salaries of contracted and temporary staff. These expenses related to operating costs will be procured using the procedures specified in the project manual for administrative, financial, accounting, and procurement procedures, accepted and approved by the World Bank.

13. **Frequency of procurement supervision.** In addition to the prior review supervision which will be carried out by the World Bank, semiannual supervision missions are recommended. Annual World Bank procurement post review will be conducted by the World Bank designated procurement specialist. The sample size will be based on the overall procurement risk rating. The prior review procurements will be reviewed and cleared in STEP by the World Bank procurement specialist.

B. Financial Management

14. **The project's FM functions including the preparation of consolidated financial reports and the withdrawal requests will be provided by a new PMU, which will be established under the office of the Prime Minister.** As part of project preparation, FM assessment was conducted to determine whether the implementing agency has adequate FM arrangements to ensure that: (i) project funds will be used for purposes intended in an efficient and economical way; (ii) the project financial reports will be prepared in an accurate, reliable and timely manner; (iii) the project's assets will be safeguarded; and (iv) it is subjected to a satisfactory auditing process. The review of the FM existing systems included budgeting, staffing, financial accounting, financial reporting, funds flow and disbursements, internal and external auditing arrangements.[81]

[81] FM assessments were carried out in compliance with Directives and Guidance Notes, including **World Bank Directive**: Financial Management Manual for World Bank Investment Project Financing Operations issued February 4, 2015 and effective from March 1, 2010; and the **World Bank Guidance**: Financial Management in World Bank Investment Project Financing Operations Issued and Effective February 24, 2015, last February 28, 2017.

15. **The Office of the Prime Minister is the implementing agency of three ongoing World Bank-financed projects,** namely: PFSA 2 (P166602, IDA 68450: US$50 million, IDA D4200 US$80 million, IDA D7820 US$60 million), PARCA (P164563, IDA 63080: US$40 million, IDA D3690 US$40 million) PROLAC-Niger (P161706, IDA 66440: US$20 million, IDA D6350 US$40 million). The office of the Prime Minister has also been recently assessed to be the implementing agency of the Community-Based Recovery and Stabilization Project for the Sahel (P173830) in Niger.

16. **The assessment revealed that PFSA 2, PARCA and PROLAC have** a good track record in implementing World Bank funded project whose FM performance was rated "moderately satisfactory" following the last FM supervisions. However, given the limited Procurement and FM capacity in the Public Sector in Niger, these projects were implemented through a dedicated PMU with an appropriate risk mitigation mechanism for the fiduciary aspects.

17. **The conclusion of the assessment is that the Office of the Prime minister have in place basic FM arrangements** for the World bank-funded projects. However, the fiduciary risk is assessed to be substantial mainly due to the complex institutional arrangement with five line ministries and the use of PBC mechanism. In order to mitigate the fiduciary risk to ensure adequate FM arrangements through the new PMU which will be created, the following actions need to be completed Table A3.2.

Table A3.2: FM action plan

	Action	Due By	Responsible Entity
1.	Prepare and adopt the PIM including FM procedures and a PBC manual as an annex	Before effectiveness	OPM
2.	Recruit an FM specialist with qualifications and experience satisfactory to the World Bank.	Before effectiveness	MHA
3.	Recruit a senior accountant with qualifications and experience satisfactory to the World Bank.	Before effectiveness	OPM
4.	Recruit one accounting assistant for the PMU and 7 regional accounting assistants with qualifications and experience satisfactory to the World Bank.	Within six months after effectiveness	OPM
5.	Acquire a computerized accounting information system for the management of the proposed project, with specifications acceptable to the World Bank.	Within one month after effectiveness	OPM
6.	Recruit one internal auditor with qualifications and experience satisfactory to the World Bank.	Within three months after effectiveness	OPM
7.	Recruit an external auditor with ToRs acceptable to the World Bank.	Within six months following effectiveness	OPM
8.	Appoint an IVA.	Disbursement condition for PBC	OPM

Planning and Budgeting Arrangements

18. The budgeting process from elaboration to execution and control will be clearly defined in the PIM, including FM arrangements, and the budget will be reviewed and adopted by the Project Steering Committee before the beginning of its execution. The consolidated annual draft budget will be submitted for the World Bank's 'no objection' before adoption and implementation, and no later than November 30 of each year. Periodic monitoring of budget execution and variance analysis will be prepared by the PMU and included in the semiannual unaudited interim financial reports (IFRs). The project does not foresee any counterpart funding. However, prior to the commencement of each year during project implementation, in regard to the implementation of activities related to PBCs, the Borrower shall create, and thereafter maintain throughout each said calendar year of project

implementation, a specific budget line entry in the state budget to keep track of the corresponding expenditures incurred during project implementation.

Accounting Arrangements

19. **FM Manual.** The PIM, including the PBC manual, detailing administrative, procurement, FM, safeguards, and M&E procedures and arrangements for the project will be elaborated and adopted by the Office of the Prime Minister in form and substance satisfactory to the World Bank, before the project effectiveness date.

20. **Accounting staff.** Before the project effectiveness date, one FM specialist and one senior accountant will be recruited at the central level. One accounting assistant will also be recruited at the central level, three months after effectiveness. At the decentralized level, an accounting assistant will be recruited for each of the seven regions, within three months after the project effectiveness date. All those staff will be recruited based on ToRs satisfactory to the World Bank.

21. **Accounting information systems.** A computerized FM system will be acquired and installed within one month after the project effectiveness date. The accounting software to be procured will include the following modules to be integrated: budgeting, general accounting, cost accounting, reporting, M&E, fixed assets management, preparation of withdrawal applications, and tracking of disbursements by donors. The accounting software will be deployed in each of the seven regions, no later than six months after project effectiveness.

22. **Accounting standards.** The PMU will use SYSCOHADA accounting standards which are commonly used among the West African Francophone countries. The chart of accounts should be prepared to reflect various project components to facilitate the preparation of relevant financial statements. The annual financial statements will be prepared in accordance with SYSCOHADA accounting standards and relevant International Public Sector Accounting Standards using a computerized accounting system.

Internal Control and Internal Auditing

23. **Manuals.** Financial procedures will be detailed in the PIM to be elaborated and adopted in form and substance satisfactory to the World Bank before the project effectiveness date. The financial procedures will cover at least the following aspects: institutional arrangements, budget and budgetary control, disbursement procedures and banking arrangements, receipt of goods and payment of invoices, internal control procedures, accounting system and transaction records, reporting requirements, and audit arrangements The financial procedures will also include guidance for handling project funds by any relevant entity involved in the project activities' implementation, as well as annexes with template forms and reports such as asset control form and register; budget formats; monthly, quarterly, and semiannual reports; annual financial statements, etc.

24. The PBC manual will be elaborated and will include the verification protocol of the PBCs and the related disbursement procedures. The PBC manual is an annex to the PIM and must be adopted prior to project effectiveness. In addition, an Internal Audit Manual will be elaborated by the project's internal auditor within six months after the consultant in charge of internal audit functions will be in place.

25. **Internal audit functions.** At the central level, a qualified and experienced internal auditor will be recruited with ToRs acceptable to the World Bank. The internal auditor will provide support to the PMU as well as the seven regions. The internal auditor will be recruited within three months after the project effectiveness date. Regional Internal audit function is not foreseen for the project at this stage. The need to have regional audit function will be reconsidered during implementation, depending on risk levels assessed during review missions. The project internal auditor will advise on the adequacy of project systems of internal controls and will conduct reviews of the implementation of project's activities. The role of project internal auditor will also include following up on

implementation of appropriate actions to improve effectiveness of risk management, control, and governance processes at all levels and training of project's staff. The internal auditors will be trained on risk-based audit. Additional trainings will be recommended as part of continuing professional education. The Project Steering Committee is expected to have a fiduciary oversight function.

Funds Flow and Disbursement Arrangements

26. Disbursements under the project will be carried out in accordance with the provisions of the Disbursement Guidelines for IPF dated February 2017, the Disbursement and Financial Information Letter, and the Financing Agreement. The project will finance 100 percent of eligible expenditures inclusive of taxes.

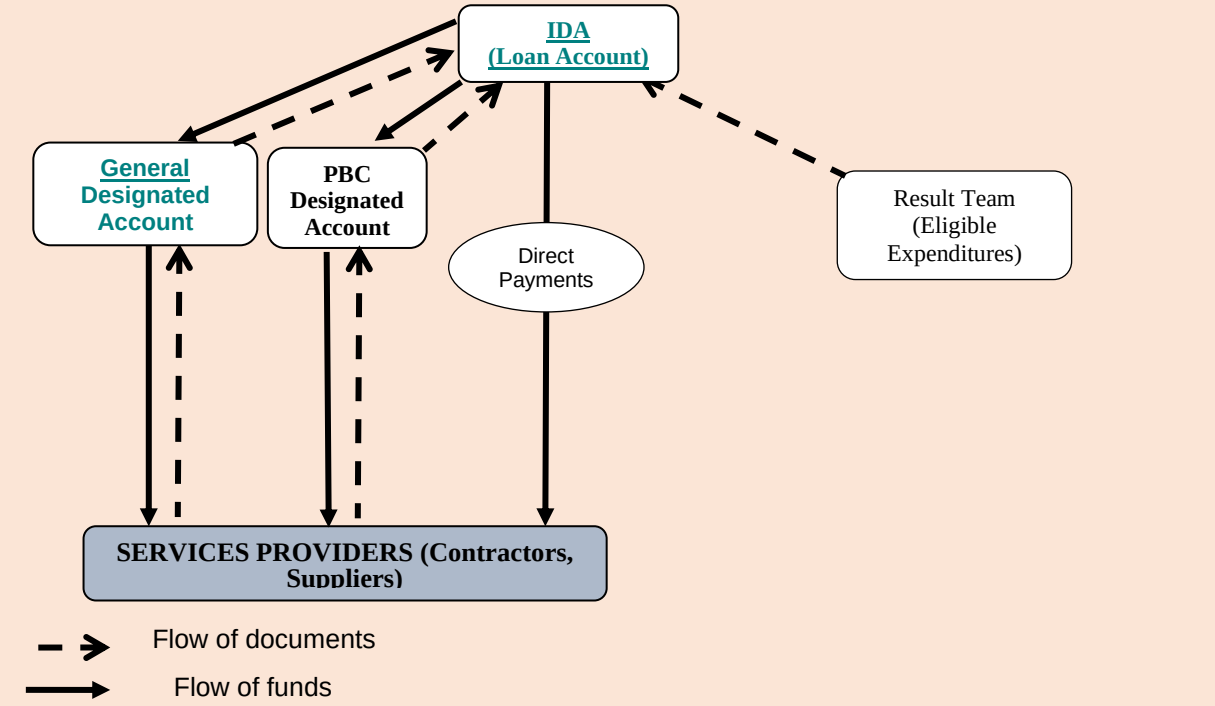
27. Two Designated Accounts (DAs) will be opened in FCFA in a commercial bank under terms and conditions acceptable to IDA: one account for general IPF disbursements and a separate account for the PBC disbursements. The DAs will be managed by the PMU under the co-signature of the Project Coordinator and the FM specialist according to the disbursement procedures described in the FM Manuel. Disbursement will be statement of expenditure (SOE)-based. Replenishment through Reimbursement and Direct Payment methods and special commitments will apply to the project. An initial advance up to the ceiling of the DAs will be made and subsequent disbursements will be made against submission of (SOE) reporting on the use of the initial/previous advance.

28. The disbursements for the PBC payments under Subcomponent 2.2 will be made against achievement of PBCs targets to the DA for PBC disbursements. Advances are allowed against PBC disbursements. A certain amount of credit proceeds will be allocated to each PBC, referred to as the PBC price, which is the amount that the designated beneficiaries' entities contributing to the envisaged reforms can claim as disbursements against eligible expenditures if that PBC has been achieved and verified. These eligible expenditures are a part of the designated beneficiaries' expenditures provided it is productive and required to meet the PBC or the project's development objectives.

29. This mode of disbursement will involve reimbursement of certified eligible expenditures supported with achieved PBCs and other relevant documentation. The disbursements will be made against identified eligible expenditures, and the triggers will be the actual values of predefined PBCs. Decisions over compliance and disbursement against indicators will be made based on periodic reports prepared by PMU and submitted to the IVA with necessary documentation assuring that they have been satisfied. The World Bank will receive the documentation of the eligible expenditures incurred and PBC assessment report and will finally advise on the amount to be reimbursed, which should be consistent with the eligible expenditures and not exceed the actual value of the PBC. Disbursements against eligible expenditures and PBC will be transferred to the government's treasury account managed by the Ministry of Finance (*Ministère des Finances, MF)*.

30. In cases of non-achievement of a PBC, the expenditures associated with that PBC will not be eligible for financing even if they are incurred. In case of a partial achievement of a scalable PBC, expenditures will be eligible, and funds will be disbursed in proportion to the achievement of the PBC.

Figure A3.1: Funds flow – Future financing



Financial Reporting Arrangements

31. **IFRs**. In line with the World Bank's FM guidelines, the PMU will be required to prepare and submit **semi-annual** unaudited IFRs to account for activities funded under this project. The IFRs should provide enough pertinent information for a reader to establish whether (i) funds disbursed to projects are being used for the purpose intended; (ii) project implementation is on track; and (iii) budgeted costs will not be exceeded. The IFRs will include the following (i) an introductory narrative discussion of project developments and progress during the period, to provide context to (or other explanations of) financial information reported; (ii) a sources and uses of funds statement, both cumulatively and for the period covered by the report, showing separately funds provided; (iii) a statement of the use of funds by components, cumulatively and for the period covered by the report; (iv) the designated accounts reconciliation, including bank statements and general ledger of the bank accounts; (v) the disbursement forecasts of the upcoming six months; and (vi) an explanation of variances between the actual and planned. The FM manual will cover the IFR preparation procedure. The formats and contents of the IFRs were agreed on between the World Bank and the implementing agencies at negotiation.

32. **Annual financial reporting.** In compliance with International Accounting Standards and IDA requirements, the PMU will produce annual financial statements. These include (i) a balance sheet that shows assets and liabilities; (ii) a statement of sources and uses of funds showing all the sources of project funds and expenditures analyzed by project component and/or category; (iii) a list of material assets acquired or procured to date with project funds; (iv) notes related to significant accounting policies and accounting standards adopted by management and underlying the preparation of financial statements; and (v) a management assertion that project funds have been disbursed for the intended purposes as specified in the relevant financing agreements.

33. **Eligible expenditures for the PBC disbursements include those expenditures incurred by the Government for semi-urban and rural water investments under Subcomponent 2.2.** These expenditures include infrastructure

investments, as well as those required to establish and operationalize effective rural water supply institutional arrangements such as consultancies and incremental operational costs, including but not limited to: office furniture; transportation equipment; computer hardware and software; studies; trainings; workshops; allowances and per diem; water, electricity, and communications costs; building rents; maintenance costs; office stationary; incremental salaries (100 percent for first year and 60 percent for second year); sector management information systems; and audit costs.

34. **Audit arrangements**. In line with World Bank's policy the PMU is required to submit annual project financial statements audited in accordance with international standards on auditing (ISA), by an independent external auditor appointed based on ToRs acceptable to IDA. The external auditor will express an opinion on the project financial statements in compliance with ISA. In addition to the audit report, the external auditor will prepare a Management Letter containing the auditor's assessment of the internal controls, accounting system and compliance with financial covenants in the financing agreement, suggestions for improvement, and management's response to the auditor's management letter. The audit reports shall be submitted to IDA within six months after the end of each financial year.

Table A3.3: Audit arrangements

Auditing	Deadline	Responsibility
Audited financial statements Including audit report and Management Letter of the project	Six months after the end of the year	**PMU**

35. Verification. All PBC payments will be subject to independent verification in accordance with the verification protocols to be agreed on with the World Bank. The recruitment of the IVA will be a disbursement condition for PBC.

36. **Implementation Support and Supervision Plan:** The World Bank's FM implementation support will be consistent with a risk-based approach and will involve collaboration with the World Bank's task team, Letter of Appointment and procurement. The supervision intensity will be based initially on the Project Appraisal Document (PAD) FM risk rating and subsequently on the updated FM risk rating during implementation. 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 periodic IFRs, quarterly internal audit reports, audited annual financial statements and management letters as well as timely follow up of issues that arise, and updating the FM rating in the Implementation Status Report (ISR) and the FM system. The World Bank task team will provide support in monitoring the timely implementation of the action plan.

Table A3.4: Implementation support plan

FM activity	Frequency
Desk reviews	
IFR review	Semi-annually
Audit report review of the program	Annually
Review of other relevant information such as interim internal control systems reports	Continuous as they become available
On-site visits	
Review of overall operation of the FM system	Semi-annually (implementation support mission)
Monitoring of actions taken on issues highlighted in audit reports, auditors' management letters, internal audit, and other reports	As needed, but at least during each implementation support mission
Transaction reviews (if needed)	As needed
Capacity-building support	
FM training sessions by World Bank FM team	During implementation and as needed

37. **Implementation Support Plan:** Based on the risk rating of the project and the current FM arrangements, it is expected that in the first year of implementation, there will be four quarterly on-site visits to ascertain adequacy of systems and supplemented by desk reviews of IFRs and audit reports. The FM supervision mission's objectives will include ensuring that adequate FM systems are maintained for the project throughout project life. In adopting a risk-based approach to FM supervision, the key risk areas of focus will include assessing the accuracy and reasonableness of budgets, their predictability and budget execution, compliance with payment and fund disbursement arrangements, and the ability of the systems to generate reliable financial reports.

Annex 4: Economic and Financial Analysis

Methodology and parametric assumptions

1. The economic and financial analysis includes an assessment of the project's development impact, the rationale for public sector provision of financing, and the World Bank's value added. The economic analysis also addresses the fiscal and financial sustainability of the proposed investments. A standard CBA was carried out using 30-year projections of incremental costs and benefits for the project's infrastructure investments that have quantifiable benefits and are amenable to CBA, at 2020 constant prices. The life of the infrastructure assets is assumed to be 30 years and the rate of discount 6 percent, as the Project also deals with climate change issues. The exchange rate is 500 FCFA per US$1. The economic and financial analysis follows the World Bank guidelines for economic analysis of investment project financing, carbon accounting and the social value of carbon in project appraisal.

Development Impacts

2. The project intends to contribute to improving household incomes, food security, and livelihoods of vulnerable groups, especially those dependent on natural resources, by:

a. Improving water resources management through support to the phased establishment of water security platform institutions, improved monitoring systems and capacity building;
b. Restoring select watershed landscapes to improve the resiliency of agricultural and rural livelihoods and to promote land and water conservation;
c. Mobilizing water resources and promoting their sustainable use across sectors, including for small-scale irrigation, fish farming, and livestock;
d. Expanding the use of rainwater harvesting, soil moisture management, and small-scale irrigation; and
e. Improving access to drinking water and sanitation services.

Project Investment Costs

3. To achieve the outlined development impacts, the project investment costs are US$400 million (Table A4.1). Of these costs, about 86 percent have quantifiable benefits and are subject to CBA, including: US$50 million under Subcomponent 1.2 (Restoration of Watershed Environments), US$45.92 million under Subcomponent 1.3 (Mobilization of Water Resources) and US$249.08 million under Component 2 (Expansion Integrated Water Services). Investments under Subcomponent 1.1 (Management of Water Resources and Climate Risks) will mainly produce public goods and externalities that are difficult to quantify and will be subject to verification of project implementation arrangements to achieve minimum cost to implement them.

Table A4.1: Investment costs and preliminary disbursement plan (US$ million)

Component/subcomponent	US$ million	Preliminary disbursement plant (US$ million)						
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Component 1: Integrated Investments for Water Security	**125.92**	**6.10**	**27.17**	**30.42**	**29.16**	**17.26**	**11.61**	**4.21**
Subcomponent 1.1: Management of Water Resources and Climate Risks	30.00	0.60	4.50	7.50	8.40	4.50	3.00	1.50
Subcomponent 1.2: Restoration of Watershed Environments	50.00	3.97	15.27	11.61	8.60	6.12	4.11	0.32
Subcomponent 1.3: Mobilization of Water Resources	45.92	1.53	7.40	11.31	12.16	6.63	4.51	2.38
Component 2: Expansion of Integrated Water Services	**249.08**	**5.13**	**34.46**	**56.75**	**63.51**	**34.26**	**23.15**	**11.83**
Subcomponent 2.1: Expansion of Rural Development Services	**59.08**	**1.73**	**8.96**	**14.25**	**15.91**	**8.76**	**6.15**	**3.33**
Subcomponent 2.1 A. Small Irrigation Schemes	39.08	0.78	5.86	9.77	10.94	5.86	3.91	1.95
Subcomponent 2.1 B. Aquaculture	5.00	0.65	0.85	0.73	0.76	0.65	0.74	0.62
Subcomponent 2.1 C. Supporting the development of livestock	15.00	0.30	2.25	3.75	4.20	2.25	1.50	0.75
Susbcomponent 2.2: Expansion of Water Supply Services	**170.00**	**3.40**	**25.50**	**42.50**	**47.60**	**25.50**	**17.00**	**8.50**
Subcomponent 2.2 A Rural multi-village Climate Resilient	75.83	1.52	11.37	18.96	21.23	11.37	7.58	3.79
Subcomponent 2.2 B Urban Water Supply under SPEN perimeter	94.17	1.88	14.13	23.54	26.37	14.13	9.42	4.71
Subcomponent 2.3 Expansion of Public Sanitation Infrastructure and Behavioral Communication	**20.00**	**0.40**	**3.00**	**5.00**	**5.60**	**3.00**	**2.00**	**1.00**
Project Management	**25.00**	**3.57**	**3.57**	**3.57**	**3.57**	**3.57**	**3.57**	**3.57**
Total project cost	**400.00**	**14.80**	**65.21**	**90.74**	**96.23**	**55.09**	**38.33**	**19.60**

Cost Benefit Analysis

4. For the interventions subject to CBA, two options are considered: (1) a future scenario with project (WP) investment interventions; and (2) a future scenario without project (WOP) interventions.

5. For the WP scenario, a summary of infrastructure investments and a preliminary disbursement plan are presented in Table A4.1, including subcomponents subject to CBA (i.e., Subcomponents 1.2, 1.3, 2.1A, 2.1B, 2.1C, 2.2A, 2.2B and 2.3). Outputs and outcomes for the WP and WOP scenarios, including key parametric assumptions used in the CBA, are described below.

6. **Subcomponent 1.2: Restoration of Watershed Environments (US$50.00 million).** Under the WP scenario, this subcomponent supports watershed restoration activities using an integrated landscape and ecosystems approach in an area covering about 139,000 ha (Table A4.2). The underlying goal is to find and promote synergies between activities that improve production systems and livelihoods, improve the capacity to cope with increasing risks of drought and flood, support biodiversity conservation and ecosystem services, and enhance carbon capture and storage. Preliminary estimated outcomes of Subcomponent 1.2 include: 3,125 ha of regenerated watersheds, availability of water for irrigating about 3,644 ha that will benefit farmers, and avoided deforestation in about 6,950 ha. Also, Subcomponent 1.2 will result in net GHG capture/reduction of about 2.59 million tons of carbon dioxide equivalent (tCO2eq). Under the scenario WOP, deforestation in the intervention area would happen in a more accelerated pace, increasing GHG emissions and depriving farmers from water for irrigation.

Table A4.2: Restoration of watershed environments parametric assumptions (Ha)

	Baseline	WOP	WP	Increment
Regenerated watersheds	0	0	3,125	3,125
Forest covered lands	139,000	69,500	76,450	6,950
Water available irrigated farming	0	0	3,644	3,644

During project implementation, this component is expected to create about 1,248 job opportunities, or one job opportunity for each 2.52 ha of regenerated watershed. In addition, the project will create about 10,021

permanent job opportunities[82]: 8,017 direct jobs in the 3,644 ha of irrigated farming (~2.2 jobs per ha) and 2,004 indirect jobs handling off-farm value chain activities associated to irrigated farming (25 percent spillover effect).

7. **Subcomponent 1.3: Mobilization of Water Resources (US$45.92 million).** Under the scenario WP, this subcomponent supports the construction and rehabilitation of multipurpose water harvesting infrastructure and wells for water mobilization, flood control weirs and riverbank protection infrastructure for protecting agricultural fields. The underlying goal is that farmers will have access to water for irrigation when needed and be more resilient to erratic rainfall patterns: small farmers expected to undertake climate resilient crop production, including crop production during dry season. As a result, crop mix is expected to focus on higher value crops and average yields are expected to grow at 3.5 percent per year during project implementation, starting from their current very low baseline. Beyond project closing, higher yields will remain (Table A4.2). The key outcome under the WP scenario is that the area of irrigated farming will increase from about 18,368 ha to about 26,720 ha, an increase of about 8,352 ha (or 5.5 percent per year). Under the scenario WOP, the irrigated area is assumed to grow (following historical trend) from 18,368 ha to about 21,390 ha (or 2.2 percent per year). Crop mix and crop yield assumptions under the WP and WOP assumption are outlined in Table A4.3. It is important to mention that interventions under Subcomponent 1.3 will result in a net increase of GHG emissions of about 313,632 tCO2eq, mainly because of increased area under irrigation and the use of inputs to improve crop yields.

Table A4.3: Crop mix and yield assumptions, mobilizing water resources for irrigation

	Crop mix (land allocated)			Crop yields (MT/ha)		
	Baseline	WOP	WP	Baseline	WOP	WP
Millet	45.71%	45.71%	29%	0.45	0.45	0.58
Sorghum	19.45%	19.45%	22%	0.30	0.30	0.39
Cowpea	31.13%	31.13%	31%	0.19	0.19	0.24
Maize	0.06%	0.06%	10%	1.00	1.00	1.29
Rice	0.12%	0.12%	0%	2.55	2.55	3.26
Peanut	3.52%	3.52%	8%	0.41	0.41	0.53
Land area under cultivation	18,368	21,390	26,720			

Source: Baseline by A. Alhassane, Description of cropping systems, climate and soils in Niger.

During project implementation, this component is expected to create about 416 job opportunities, including 249 for young people. In addition, the project will create about 10,397 permanent direct job opportunities (1.951 jobs per ha of incremental irrigated farming) and 2,599 indirect job opportunities in irrigated farming (25 percent spillover effect).

Component 2: Expansion of Integrated Water Services (US$249.08 million)

8. **Subcomponent 2.1: Expansion of Rural Development Water Services (US$59.08 million)**

- **Subcomponent 2.1A: Small Irrigation Schemes (US$39.08 million).** Under the WP scenario, a total 5,290 ha of new irrigated farms financed by the project will gradually introduce improved crop production practices, including water feeding as per crop growth demands and use of fertilizers. Also, production during the dry season will gradually be introduced. Both improvements will be facilitated by institutional arrangements

[82] Evidence based data on job creation in irrigated farming in developing countries varies. For example, the National Plan for Economic and Social Development of Burkina Faso (https://www.pndes2020.com/pdf/MAAH/) intends to create 10,000 direct jobs in a project area of 1,812 ha in Sono Kouri (i.e., more than 5 jobs per ha), while a "KfW Position Paper Agriculture and Employment" reports creating about 1 direct job opportunity per ha of irrigated farming for projects in Latin America (Bolivia, Peru and Ecuador) and in Mali (https://www.kfw-entwicklungsbank.de/Download-Center/PDF-Dokumente-Positionspapiere/2012_08_Agriculture_Emploment.pdf). For the IWSP, 1.95 – 2.2 jobs created per ha of irrigated farming was assumed.

established by the project for improved value chain management, including post-harvest. As a result, crop mix is expected to focus on higher value crops and yields are expected to grow at an average 5.5 percent per year during project implementation, starting from the current very low baseline (Table A4.4). Land under cultivation is assumed to double from the current 4,726 ha (taken as reference for the WOP scenario). Beyond project completion, yields will remain at the level achieved by completion. Under the WOP scenario, land under cultivation is expected to grow at 2.2 percent per year, following historical trends (reaching 5,504 ha at the end of project implementation), and crop mixes and very low crop yields are expected to remain the same. It is important to mention that interventions under Subcomponent 2.1A will result in a net increase of GHG emissions of about 309,871 tCO2eq principally because of increased area under irrigation and the use of inputs to improve crop yields.

Table A4.4: Crop mix and crop yields assumptions for small irrigation schemes

	Crop mix (land allocated)			Crop yields (MT/ha)		
	Baseline	WOP	WP	Baseline	WOP	WP
Millet	45.71%	45.71%	28%	0.45	0.45	0.68
Sorghum	19.45%	19.45%	24%	0.30	0.30	0.46
Cowpea	31.13%	31.13%	30%	0.19	0.19	0.28
Maize	0.06%	0.06%	10%	1.00	1.00	1.51
Rice	0.12%	0.12%	0.10%	2.55	2.55	3.83
Peanut	3.52%	3.52%	8%	0.41	0.41	0.62
Land area under cultivation	4,726	5,504	9,452			

Source: Baseline by A. Alhassane, Description of cropping systems, climate and soils in Niger.

During project implementation, this subcomponent is expected to create about 832 job opportunities. When fully operational, the irrigation schemes will generate about 8,523 permanent direct job opportunities (2.159 jobs per ha of irrigated farming) and 2,131 indirect job opportunities (25 percent spillover effect).

- **Subcomponent 2.1B: Aquaculture (US$5.00 million).** Under the WP scenario, the Aquaculture subcomponent intends to introduce four technologies for fish production, including 200 m2 earth ponds, 100 m2 plasticized ponds, 50 m2 concrete basins, and 15 m3 above ground basins. Production protocols will consist of putting 1,000 “fingerlings” (i.e., baby fish) in the ponds, and feeding them with fish-feed. Key assumptions regarding fish production under each technology are summarized in Table A4.5. For example, the survival rate of fingerlings in the case of 15 m3 above ground basins is assumed to go from 80 percent in year 1 to 96 percent at the time of project completion (year 7). For the same technology of production, the feed conversion factor (which indicates the feed weight needed for each kg of fish produced) is assumed to go from 1.4 in year 1 to 1.2 by year 7. It is also assumed that the project will use appropriate institutional arrangements for managing aquaculture production value chains. In the WOP scenario, no aquaculture activities will be carried out. Using these assumptions, benefits and recurrent costs are estimated and used as a basis for the CBA. Aquaculture activities under the project will increase GHG emissions by about 25,397 tCO2eq.

Table A4.*5*: Key assumption for the aquaculture production subcomponent

	# production facilities	Technology mix	Fish survival rate		Feed conversion factor	
			Year 1	Year 7	Year1	Year 7
Earth ponds of 200 m2	24	17%	80%	90%	1.50	1.30
Plasticized 100 m2 ponds with geomembrane	6	4%	85%	93%	1.40	1.25
Concrete basins (50 m2)	42	29%	88%	95%	1.45	1.20
Above ground basins 15 m3	72	50%	90%	96%	1.40	1.10
Total	144	100%	-	-	-	-

When fully operation, aquaculture project interventions will create about 360 permanent job opportunities, or an average 2.5 laborers per each aquaculture production facility. During project implementation, 200 job opportunities will be created in the design and construction of aquaculture production facilities.

- **Subcomponent 2.1C: Supporting development of livestock (US$15.00 million).** Under the WP scenario, the sector will receive support to improve water availability and forage for livestock. The project intends to enhance forage productive capacity in the pastoral routes (in about 8,777 ha) and to promote fodder production (3,771 ha). Forage yields assumptions for the WP scenario are included in Table A4.6. It is also assumed that the daily forage intake per head of livestock is 4 percent of their body weight (400 kg average) and that each head has a three-year average life before being sold in the market. For the WOP scenario no improvements in the pastoral routes and no promotion of fodder crops are assumed. Using these assumptions, year by year benefits and recurrent costs are estimated and used as a basis for the CBA. Supporting livestock corridor activities will reduce GHG emissions by about 577,711 tCO2eq.

Table A4.6: Development of pastoral routes and promotion of fodder crops – assumptions

	Units	Area ha	Forage yields mt/ha-year	Recurrent cost US$/ha-year
Development of pastorral routes	ha	35,000	5	250
Promotion of fodder crops	ha	15,000	10	280

This subcomponent is expected to create about 400 job opportunities during implementation, and an additional 450 permanent job opportunities, or one person aided by machinery to cut and store fodder in each 33-ha area.

9. **Component 2.2: Expansion of WSS services and behavior change (US$199.50 million).**

- **Subcomponent 2.2A: Expansion of Rural Multi-village Climate Resilient Water Supply (US$75.83 million).** The subcomponent includes two main interventions: (i) increasing semi-urban and rural access to water services (basic and on located on premises) through the construction of primarily multi-village trunk-based infrastructure; and (ii) enhancing related service delivery management capacity. Key parametric assumptions for the WP and WOP scenarios are shown in Table A4.7, including willingness to pay for water of about 0.3 FCFA/liter (equivalent US$0.52/m3) and an assumed 30 lpcd water consumption in the WP scenario compared with 5 lpcd in the WOP scenarios. O&M expenses of the intervillage systems are assumed to be 200 FCFA/m3 with physical distribution losses of 10 percent. In the WOP scenario, rural villages currently consume about 5 lpcd and are assumed to face a cost due to lack of service equivalent to 1 FCFA per liter of water. It is also assumed that populations in rural areas served by the project will continue to grow at 3 percent per year in both the WP and WOP scenarios. Expansion of multi-village water services will contribute to the reduction of GHG emissions by about 553,767 tCO2eq mainly because of energy savings from people no longer boiling water for consumption.

Table A4.7: Rural multi-village climate resilient water supply – parametric assumptions

WTP for water		Water consumption (lpcd)		O&M cost (F CFA/m3)		Physical losses	
F CFA/m3	US$/m3	WP	WOP	WP	WOP	WP	WOP
300	0.60	30	5	200	N/A	10%	N/A

This subcomponent is expected to create 370 job opportunities during project implementation and 150 permanent jobs for handling water plants and trunk conveyance systems when fully operational.

- **Subcomponent 2.2B: Urban Water Supply (US$94.17 million).** The WP scenario includes expansion of water supply services provided by the Niamey water utility (SEEN/SPEN) by expanding both distribution networks along the right bank (Lots 6) and the left bank of the Niger river (Lot 7) in metropolitan Niamey. The population of each distribution area is about 225,000 people, resulting in a total of 450,000 people that will benefit from water services, primarily through household connections. This subcomponent will also deploy the Multi-village Gotheye-Tera water supply system, including a water treatment plant (WTP) with a 35,000 m3/day production design capacity, five water reservoirs, and a 60 km distribution network. People in Niamey are assumed to consume 67 lpcd and those in Gotheye-Tera 28 lcpd in the WP scenario (Table A4.8). In the WOP scenario, urban populations in Niamey and Gotheye-Tera are assumed to consume 10 lpcd supplied by private vendors at high rationing prices (at 28 FCFA per "jerrycan", equivalent to 1,400 FCFA /m3). It is also assumed that populations in both service areas will continue to grow at 3.5 percent per year in both the WP and WOP scenarios. Jobs for local populations will be created during construction: 350 (including 210 for young people) in Niamey and 360 (including 216 for young people) in Gotheye-Tera. Expansion of multi-village water services will contribute to the reduction of GHG emissions by about 499,054 tCO2eq mainly because of energy savings from people no longer boiling water for consumption.

Table A4.8: Urban water supply, Niamey and Gotheye-Tera Systems – parametric assumptions

	WTP for water		Water consumption (lpcd)		O&M cost (F CFA/m3)		Physical losses	
	F CFA/m3	US$/m3	WP	WOP	WP	WOP	WP	WOP
Niamey	550	0.96	67	10	250	N/A	10%	N/A
Gotheye and Tera	470	0.82	28	10	250	N/A	10%	N/A

This subcomponent is expected to create 400 job opportunities during project implementation and 160 permanent jobs when fully operational (which is equivalent to 2.29 workers per 1,000 connections, assuming ten persons per connection[83]).

- **Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Change (US$20.00 million).** This subcomponent will improve sanitation and hygiene services and practices in both urban and rural Niger, prioritizing support for women and girls. To improve sanitation practices, the project is expected to finance construction of about 220 three-block latrines in school and health centers (serving about 6,600 people), 100 three-block latrines in public buildings (serving about 6,000 people), and two fully equipped fecal sludge treatment plants serving 800,000 people. Also, a population of about 4,312,600 in the seven regions supported by the project will receive sanitation behavioral change campaigns during project implementation. In the WOP scenario, people are assumed to continue: (i) facing frequent diarrhea events spending US$0.96 per event; (ii) spending an average 1.5 person-days per year looking for safe spots to defecate in the open; and (iii) experiencing 0.06 percent death rate due to diarrhea (Table A4.9). Expansion of public sanitation will increase Niger's GHG emissions by about 136,704 tCO2eq, mainly from gas methane emissions as technology to treat sludge is anaerobic.

Table A4.9: Sanitation key parametric assumptions

Water use for WWTP lpcd	Average cost to treat diarrhea US$/event	Person-days/year looking for spot to open defecation	Percent of pop. deaths due to diarrhea	Population growth	O&M WWTP F CFA/m3
35	0.96	1.5	0.06%	3.50%	150

[83] SPEN Sector Performance Indicators Report (Indicateurs De Performance Du Secteur De L'hydraulique Urbaine, 2020) shows a declining trend of number of workers per 1,000 connections, with 2.6 workers per 1,000 connections for year 2020.

This subcomponent is expected to create 710 job opportunities during project implementation and 207 permanent jobs when fully operational (which is equivalent to about 2.6 workers for each 1,000 households served[84]).

Cost Benefit Analysis (CBA)

10. Table A4.10 shows the preliminary results obtained for the CBA indicators for the project and for each individual component/subcomponent appraised, including the EIRR and the ENPV.

Table A4.10: CBA indicators for the project and per component/subcomponent

Project Investments Subject to Cost/Benefit Analysis	Investment US$ million	Economic Internal Rate of Retun	Economic Net Present Value, US$ million	Direct Benficiaries	Jobs attributed to project
Subcomponent 1.2: Restoration of Watershed Environments	50.00	11.3%	44.50	11,269	11,269
Subcomponent 1.3: Mobilization of Water Resources	45.92	11.8%	39.76	13,412	13,412
Subcomponent 2.1 A. Small Irrigation Schemes	39.08	10.9%	23.88	11,485	11,485
Subcomponent 2.1 B. Aquaculture	5.00	7.3%	0.53	560	560
Subcomponent 2.1 C. Supporting the development of livestock	15.00	10.2%	6.33	750	750
Subcomponent 2.2 A Rural multi-village Climate Resilient Water Supply	75.83	11.4%	34.69	1,402,500	520
Subcomponent 2.2 B Urban Water Supply under SPEN perimeter	94.17	11.9%	52.95	700,000	935
Subcomponent 2.3 Expansion of Public Sanitation Infrastructure and Behavioral Communication	20.00	8.3%	13.56	812,000	918
Total	345.00	11.0%	216.21	2,940,708	39,849

11. The project as a whole is found to be economically viable, with an 11 percent EIRR that is well above the 6 percent economic discount rate that is assumed for alternative projects. Also, the project has a US$216.21 million estimated ENPV, which indicates that the project will generate an excess of US$216.21 million compared with alternative projects, had those projects utilized the same US$345 million financing. These positive indicators are also reflected in the project's 2.9 million direct beneficiaries and the 39,849 direct and indirect jobs created by the project, including 4,875 jobs during project implementation, 27,615 permanent jobs (mostly in irrigated agriculture) and 7,359 indirect jobs (also referred as spillover effect) in activities related to the irrigated agriculture value chain.

12. Component by component results:

Subcomponent 1.2 Restoration of Watershed Environments (US$50.00 million). Its CBA results in an 11.3 percent EIRR and a US$44.5 million ENPV. These positive results are expected mainly because the project interventions are expected to produce significant economic benefits for the populations living in the 139,000-ha intervention area beyond the public benefits expected from watershed restoration and reforestation. This subcomponent is also expected to generate about 11,269 jobs including 1,248 during construction, 8017 direct permanent jobs and 2,004 indirect permanent jobs.

Subcomponent 1.3 Mobilization of Water Resources (US$45.92 million). Its CBA results in an 11.8 percent

[84] Taking as reference water supply indicators in Niger as reported by SPEN in "*Indicateurs De Performance Du Secteur De L'hydraulique Urbaine*" (2020).

EIRR and a US$39.8 million ENPV. These positive results are expected mainly because the project interventions (construction of small reservoirs, infiltration thresholds, dikes, and development of wellfields) intend to reach existing farmers across 18,386 ha, which are expected to increase their land under cultivation to about 26,720 ha due to enhanced water availability. Such increase is assumed viable given that land under cultivation has been historically growing at 2.2 percent per year. Also, to achieve the estimated EIRR, it is assumed that crop yield will grow at 3.5 percent per year, thanks to the availability of water for irrigation, the introduction of crops during dry season, and the improved use of fertilizer. If such assumptions are not accurate and increase in yields are not achieved, the EIRR will be lower. For example, a 10 percent reduction in crop yield growth rate translates into a reduction of one percent in the EIRR; i.e., the EIRR goes from 11.8 percent down to 10.7 percent. The component is also expected to generate 13,412 job opportunities, including 10,397 direct and 2,599 indirect permanent jobs, in addition to 416 jobs during construction.

Subcomponent 2.1A Small irrigation schemes (US$39.08 million). Its CBA results in a 10.9 percent EIRR and a US$23.88 million ENPV. These positive results are expected mainly from a 5.5 percent increase in crop yields per year thanks to irrigated agriculture and the cultivation of crops during dry season, both as a result of year-round water availability made possible by the project. It is also assumed that the project will introduce institutional arrangements for improved management of value chains, including post-harvest handling of produce. Achieving a high growth rate in crop yields is deemed feasible as current crop yields are among the lowest in Western Africa. Achieving such high improvement in crop yields is also necessary to ensure recuperation of Niger's ability to feed its people: note that a 5 percent crop yield growth is only 1.5 percent above its population growth rate (3.5 percent). If the project does not achieve the high crop yield growth rate, the EIRR and the ENPV will be lower; e.g., a 10 percent reduction in growth of crop yields results in a 1 percentage point lower EIRR. The component is also expected to create 11,485 job opportunities, including 8,523 in crop production and 2,131 in indirect jobs; additionally, during construction the project will create 832 jobs.

Subcomponent 2.1B. Aquaculture (US$5.00 million). Its CBA results in a 7.3 percent EIRR and a US$0.53 million ENPV. The results are positive given the pilot nature of this component: the level of investment is modest as aquaculture productive activities are new to most of the targeted regions. To achieve the estimated EIRR, it is assumed that the project will ensure appropriate institutional arrangements to introduce aquaculture activities in the various regions in Niger. For example, partnerships will be established between small aquaculture pond owners and more experienced aquaculture "entrepreneurs" in Niger. If successful, this subcomponent is expected to create 360 permanent jobs in addition to 200 jobs during project implementation.

Subcomponent 2.1C Supporting Development of Livestock (US$15.00 million). Its CBA results in a 10.2 percent EIRR and a US$6.33 million ENPV. These positive results are expected mainly because of the extensive experience of targeted populations in raising livestock and results of project activities, including: enhanced pasture productive capacity of 8,777 ha along pastoral routes, and increased fodder production 3,761 ha. Also, enhanced water availability for livestock is assumed. If any of these assumptions do not materialize, the EIRR of this subcomponent will decrease. This subcomponent is expected to create 400 jobs during project implementation and 350 permanent jobs.

Subcomponent 2.2A Expansion of Rural Multi-village Climate Resilient Water Supply (US$75.63 million). Its CBA results in a 11.4 percent EIRR and a US$34.69 million ENPV. These positive results are expected mainly because multi-village water supply systems are expected to gain from economies of scale, which lowers unit production costs. Also, it is assumed that with the project, the served population will stop experiencing water

scarcity and being forced to pay significant amounts of money to water vendors. Moreover, most water supply systems are assumed to be powered by solar energy, which is a considerable advancement given the size of systems proposed by the project. This economic assessment also assumes that the project will explore appropriate institutional arrangements for the implementation of the project and for the operations and maintenance of water supply infrastructure. The subcomponent is expected to have 1.4 million direct beneficiaries. During project implementation, it is expected to generate 370 jobs and thereafter 150 permanent jobs handling water supply services.

Subcomponent 2.2B Urban Water Supply (US$94.17 million). Its CBA results in an 11.9 percent EIRR and a US$52.95 million ENPV. These positive results are expected mainly because implementation is led by a well-established agency (SPEN) and O&M will by a well-experienced operator (SEEN), both of which are expected to ensure manageable costs. Also, prospective customers in the project service areas (in Niamey and in Gotheye-Tera) currently experience water scarcity and are forced to pay private vendors high prices for water; such high payments will stop and become project benefits accruing to customers. The project is expected to benefit about 700,000 people: 450,000 in Niamey and 250,000 in Gotheye-Tera. Also, the project is expected to generate 700 job opportunities during project implementation, of which 426 are expected to be provided to young people.

Subcomponent 2.3 Expansion of Public Sanitation Infrastructure and Behavioral Change (US$20.00 million). Its CBA results in an 8.3 percent EIRR and a US$13.56 million ENPV. Using a six percent discount rate, the positive results are explained mainly by the current adverse impact of a lack of access to sanitation, including lost time looking for a safe place to defecate in the open, cost of treating diarrheal diseases due to lack of proper sanitation, and the “value” of lives lost to diarrheal diseases. Thanks to the project, such adverse impacts (with tangible monetized value) on the populations to be served will not be realized and the avoided costs will count as benefits. The subcomponent will have 812,600 direct beneficiaries and more than 3 million people will benefit from sanitation behavioral campaigns. During project implementation, the project is expected to generate 918 job opportunities, of which 207 will become permanent jobs associated with the O&M of school and public latrines and two WWTs financed by the project.

Sensitivity Analysis

13. In addition to the sensitivity analysis above regarding crop yield improvements, a sensitivity analysis was carried out for the base case scenario to assess the impact of changes in key parameters on the Project’s economic viability. Taking all components together, a 10 percent investment cost overrun results in the EIRR falling from 11 to 10.1 percent. As the base case scenario includes farming during wet and dry seasons, a failure to achieve two harvests per year reduces the EIRR of the Project by 1.5 percent, from 11 percent to 9.5 percent, rendering the project still viable. However, not achieving two crops per year makes small irrigation scheme investments not economically viable, with an EIRR of only 4.8 percent – below the 6 percent discount rate. As a whole, the project is therefore resilient to cost overruns and to not achieving two harvests per year. It is also important to note that achieving the promising EIRR results will depend on the efficacy of project institutional arrangements handling project management in general and value chains in particular, including those of high crop yield irrigation practices.

Assessment of Impact of Project Activities on GHG Emissions

14. Based on the preliminary estimates of project activities’ impacts on GHG emissions, the project as a whole contributes to GHG net emission reductions of 3,430,921 tons of Carbon Dioxide equivalent (tCO2eq) during the economic lifetime of the project, or a 114,364 tCO2eq annual average; gross emissions during the economic life

of the project are estimated at 21,219,596 tCO2eq. When shadow prices of carbon (SPC, lower and upper limits) are considered to assess economic viability of the project, the EIRR rises from 11 percent to between 12.2 and 13.4 percent (see Table A4.11), which indicates that the project is not only economically viable, but it also contributes to the global public good. From a subcomponent-by-subcomponent perspective, the major contributions to GHG emission reductions are the Restoration of Watershed Environments subcomponent (with -2.59 million tCO2eq and whose EIRR rises from 11.3 percent to between 16.3 and 20.8 percent) and the Development of Livestock activities (with 0.58 million tCO2eq and whose EIRR rises from 10.2 percent to between 15.8 and 20.6 percent). The Rural and Urban Water Supply subcomponent also contributes to emission reductions with -0.55 million tCO2eq and -0.499 million tCO2eq respectively. Mobilization of water resources, small irrigation schemes, aquaculture and public sanitation activities contribute an increase in GHG emissions, which is reflected in the reduction in their estimated EIRR by more than one percentage point.

Table A4.11: CBA indicators including impact of GHG emission on economic viability

	All project interventions taken together	Integrated Inv. for Water Security		Expansion of Integrated Water Services					
		Restoration of Watersheds	Mob. of water Resources	Small Irrigation Schemes	Aquaculture Interventions	Development of Livestock	Rural water Supply	Urban Wate Supply	Public Sanitation
EIRR	11.0%	11.3%	11.8%	10.9%	7.3%	10.2%	11.4%	11.9%	8.3%
Lower limit, SPC	12.2%	16.3%	10.6%	9.4%	5.8%	15.8%	13.1%	12.9%	7.9%
Upper limit, SPC	13.4%	20.8%	9.5%	7.8%	4.2%	20.6%	14.8%	13.8%	7.4%
ENPV, US$ million	216.21	44.50	39.76	23.88	0.53	6.33	34.69	52.95	13.56
Funding, US$ million	345.00	50.00	45.92	39.08	5.00	15.00	75.83	94.17	20.00
GHG emissions									
Gross Eco lifetime, million tCO2eq	20.772	19.696	0.491	0.356	0.025	(0.322)	0.156	0.209	0.161
Net Eco lifetime, million tCO2eq	(3.431)	(2.586)	0.314	0.310	0.025	(0.578)	(0.554)	(0.499)	0.137
Net annual average, tCO2eq	(114,364)	(86,200)	10,454	10,329	847	(19,257)	(18,459)	(16,635)	4,557

15. A summary of GHG emissions impacts of project activities grouped by components is presented in Table A4.12.

Table A4.12: Project GHG emission impact by subcomponent

	Gross Emissions Economic Lifetime tCO2eq	Net Emissions Economic Lifetime tCO2eq	Net Emissions Annual Average tCO2eq
Subcomponent 1.2: Restoration of Watershed Environments	19,696,204	(2,585,994)	(86,200)
Subcomponent 1.3: Mobilization of Water Resources	491,455	313,632	10,454
Subcomponent 2.1: Expansion of Rural Development Services	58,962	(242,442)	(8,081)
Subcomponent 2.2: Expansion of Water Supply Services	364,857	(1,052,820)	(35,094)
Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication	160,704	136,704	4,557
Total	20,772,181	(3,430,921)	(114,364)

Financial Analysis

16. Financial sustainability is assessed using simple cash-flow models for project activities involving entities that operate on commercial basis.

a. **Urban water supply services.** Under a Lease Contract with SPEN/SEEN provision of urban water supply in Niger is found to be financially sustainable. According to their financial statements and periodic performance reports assessed during appraisal, SPEN/SEEN achieved remarkable

financial and operating performance while delivering water supply services in all urban areas under their Lease Contract renewed every ten years during the last 20 years. SPEN/SEEN have generally, over the past ten years, covered operational and maintenance costs plus renewables as defined in a financial equilibrium criterium. Water supply infrastructure to be financed by the proposed project will also be financially sustainable achieving a 10 percent FIRR, estimated using a cash flow model that includes revenues of the incremental water supply at current tariffs (US$0.61/m3) and assuming 100 percent investment subsidy.

b. **Rural water supply services.** Operations and maintenance of water supply infrastructure financed under the proposed project is expected to be conducted through institutional arrangements defined through PBCs, likely to involve delegated management arrangements and/or PPP contracts. Financial sustainability of rural water supply infrastructure to be financed by the project might be achieved if operational and financial performance of the selected institutional arrangement is similar to those achieved by SPEN/SEEN. If so, a 9 percent FIRR could be achieved assuming an 85 percent investment subsidy and a US$0.5/m3 rural water supply tariff.
c. **Livestock development.** Assessment of financial sustainability is based on a cash flow model for a prototype production and processing of fodder plant to increase meat production without increasing the number of livestock heads. With a 50 percent investment subsidy, an 8.5 percent FIRR is obtained. To achieve this FIRR and financial sustainability, an evidence-based business model to promote increased weight of livestock will be needed during project implementation.
d. **Small Irrigation Schemes.** An 80 percent investment subsidy for small farmers is assumed to finance proposals (i.e., business plans) of farmers that include implementation of high value crops with two harvests per year.[85] Under such assumptions, the average irrigation scheme will be financially sustainable with a 9.5 percent FIRR, provided that business plans are screened based on evidence-based business models.
e. **Aquaculture.** A 50 percent investment subsidy is assumed to finance business plans of aquaculture small entrepreneurs. Aquaculture entrepreneurs are expected to benefit from extensive value chain support (inputs, production know-how and commercialization) from the project, based on an evidence-based business model adapted to Niger's socioeconomic conditions. Under such assumptions, the average aquaculture entrepreneur will achieve a 9.3 FIRR.

Fiscal Impact

17. During implementation, the fiscal impact of the project will be positive, as financing will enter the treasury account as project finance revenue. As productive activities are established and enhanced thanks to the project investments, the GoN will collect taxes that will be treasury recurrent revenue during project implementation. Upon project completion, the GoN will have to repay the IDA credit, which will be an expense of the Treasury.

Rationale for Public Sector Financing

18. Public sector financing is justified by the public good nature of multipurpose infrastructure, including reservoirs, infiltration thresholds, dikes, and wellfields under Subcomponent 1.3. Public sector financing in irrigation schemes is justified provided such schemes will contribute to poverty alleviation through substantial improvements in crop yields that support Niger in feeding its own people, as is the case of Subcomponent 2.1. Public financing for expanding access to water supply and sanitation services is justified by the public health

[85] As per SPIN, financing to small irrigators (0.2 to 3.0 ha) will be done based on motivated requests that include financial contributions from farmers.

benefits accruing to society at large. Also, at Niger's current stage of development, it is unlikely that tariffs for WSS services can be raised to a level that would generate the funds required to repay finance and operate in commercial terms.

World Bank Value Added

19. The World Bank is well placed to provide value-added support to the GoN through its global experience with infrastructure projects, WRM, and climate adaptation and mitigation, as well as its experience in applying and adapting evidence-based technical knowledge at scale. The proposed project, based on a multisectoral approach, will require close collaboration across various World Bank units, including the Water, Agriculture and Food, WSS, Environment, Natural Resources and the Blue Economy global practices and the Climate Change unit.

Annex 5: Subcomponent Linkages

Table A5.1. Subcomponent Linkages (*A directly impacts B through…*)

		A					
		Subcomponent 1.1: Management of Water Resources and Climate Risks	Subcomponent 1.2: Restoration of Watershed Environments	Subcomponent 1.3: Mobilization of Water Resources	Subcomponent 2.1: Expansion of Rural Development Services	Subcomponent 2.2: Expansion of Water Supply Services	Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication
B	Subcomponent 1.1: Management of Water Resources and Climate Risks		Watershed restoration activities improve quantity and quality of water resources. Implementation of activities to involve communities through water platform.	Water mobilization activities increase water availability and therefore improve feasibility of development plans.	The expansion of development services contributes directly to the management of climate risks as elaborated within the development plans.	Water supply services will be included in the WRM monitoring system to ensure sustainability.	Pollution control is among elements of IWRM. Safely managed sanitation improves the quality of water resources.
B	Subcomponent 1.2: Restoration of Watershed Environments	Resulting development plans inform selection of activities. Improved WRM monitoring identifies critical watershed environments to be protected/restored.		Watershed protection/restoration activities will be selected that best facilitate mobilization of water resources under the Project.	The planning of development services will take into consideration their appropriateness with respect to the natural environment.	Water safety plans will be developed at the community level to ensure that watersheds and natural resources are protected.	Improved sanitation infrastructure and practices reduce untreated fecal sludge in the environment, therefore contributing to the protection of watersheds.
B	Subcomponent 1.3: Mobilization of Water Resources	Resulting development plans inform selection of activities. Improved WRM monitoring informs water mobilization needs.	Water mobilization activities can be rendered more efficient and less costly by leveraging improvements in the upstream watershed.		The planning of development services will take into consideration their appropriateness with respect to the natural environment.	The planning of water supply services will take into consideration their appropriateness with respect to the natural environment.	Improved sanitation infrastructure and practices reduce untreated fecal sludge in the environment, improving water quality and the potential to safely mobilize resources.
B	Subcomponent 2.1: Expansion of Rural Development Services	Resulting development plans inform selection of activities. Improved WRM monitoring mitigates risk of unsustainable water abstraction for productive purposes.	Watershed restoration activities improve the quantity and quality of water resources, which can then be mobilized for productive	Water mobilization activities will improve the availability of water resources that can be leveraged for productive uses.		The expansion of water supply services will be conducted as part of the water platform, ensuring that development services and natural	Improved sanitation infrastructure and practices render agriculture and aquaculture safer, as the risk of contaminated waters, and thus

		A					
		Subcomponent 1.1: Management of Water Resources and Climate Risks	Subcomponent 1.2: Restoration of Watershed Environments	Subcomponent 1.3: Mobilization of Water Resources	Subcomponent 2.1: Expansion of Rural Development Services	Subcomponent 2.2: Expansion of Water Supply Services	Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication
			uses.			resources are not threatened.	waterborne diseases for users, is reduced. Fecal sludge can be used as fertilizer for agricultural land if properly treated to avoid harm.
	Subcomponent 2.2: Expansion of Water Supply Services	Resulting development plans inform selection of activities. Improved WRM monitoring mitigates risk of unsustainable water abstraction for water supply.	Watershed restoration activities improve the quantity and quality of water resources, which can then be mobilized for domestic use.	Water mobilization activities will improve the availability of water resources that can be leveraged for domestic uses.	The expansion of development services will be conducted as part of the water platform, ensuring that domestic supply and natural resources are not threatened.		Improved sanitation infrastructure and practices, together with improved water supply, have a multiplicative effect on improved health and wellbeing.
	Subcomponent 2.3: Expansion of Public Sanitation Infrastructure and Behavioral Communication	Resulting development plans inform selection of activities.	Watershed restoration activities can improve the natural environment's ability to contribute to fecal waste treatment.	Improved mobilization of water resources facilitates increased access to water supply, which is prerequisite to proper sanitation and hygiene practices.	The expansion of rural development services will impact the selection of sanitation and behavior change activities to safeguard the health of service beneficiaries.	Improved water supply service is an essential prerequisite to proper sanitation and hygiene practices.	

Annex 6: Performance-based Conditions

Rural drinking water institutional arrangement:

1. The rural water sector has undergone important reform since 2010, at which time the rural water service guide that regulates the management of rural drinking water services was established. However, insufficient implementation has prevented it from responding to existing needs and growing demand. This reform has sought to move away from community-based management to promote delegated management and PPP through the establishment of three primary actors: (i) Communes that are responsible for public water supply services and own the water supply assets built by the MHA ; (ii) Private operators that operate and manage water supply systems under a lease (affermage) management contract with the commune; and (iii) ARSEau that is responsible for regulation. Although this reform has resulted in the private management of rural water supply systems (1,589 out of 2,329 as of December 2019), improvements in sector performance have been limited. The municipalities lack appropriate capacities to manage PPP contracts with private operators, while the private operators have limited technical, financial, and managerial capacities to address all challenges related to quality and sustainable drinking water services in rural communities.

2. Through various studies, the Government has identified promising approaches to address these challenges. The first approach was to transfer these growing centers to the "well performing"[86] urban assets holding company SPEN. The conducted studies in 2014 have shown that the impact of this transfer on the already fragile financial sustainability of SPEN may require important tariff adjustment or operational subsidies and significant capital investment by the Government. In 2015, an assessment was conducted on the performance of the management of rural assets. As a result, a roadmap to address the identified gaps was proposed in 2016. However, for various reasons, this was not implemented. In 2019, another assessment was conducted to prospect the best institutional options to address both the investment and management gaps of rural drinking water supply. The findings of this assessment identified two options: (i) establishment of a new rural assets holding company (rural drinking water agency); or (ii) expanding the scope of SPEN to rural areas. During the water sector policy dialogue with development partners in August 2020, the Minister formally requested that donors support the MHA in further exploring these options to fill the rural water gaps.

3. The Niger IWSP Project plans to support rural water supply in accordance with PROSEHA,[87] the Government's 15-year program for the sector. IWSP will also support the institutions required to ensure proper operations and maintenance, and therefore the sustainability of assets. The project's approach is to support investments that respond to critical needs of the population, while helping the Government in establishing and operationalizing appropriate institutional arrangements. The project will incentivize the development of an up-to-date assessment, based upon the previously-conducted studies, to inform this process to include: (i) a diagnostic of the rural water subsector that includes the identification and assessment of existing rural assets that would be under the jurisdiction of the rural drinking water lead institution; and (ii) an institutional assessment that identifies gaps in the existing institutional structure. The Government will then be supported to conduct consultations across levels and with key stakeholders to reach consensus on required policy and institutional reforms and prepare a roadmap for their implementation. This process will lead to the establishment and operationalization of effective institutional arrangements to deliver quality and sustainable water services to the rural population. With respect to regulation, ARSEau already has the remit for rural areas, in addition to urban. Therefore, the establishment of

[86] The urban utilities (SPEN and SEEN) are technically performing well. However, the lack of on-time tariff adjustment to balance inflation and a continuous investment program for service expansion is jeopardizing the financial sustainability of the urban water sector.
[87] PROSEHA: *Programme Sectoriel Eau Hygiène Assainissement* (2016 – 2030).

a rural lead institution will facilitate the task of the regulator to cover rural areas, expand access, and improve service quality and sustainability.

4. In order to navigate the vested interests and account for the capacity gaps of the sector, the IWSP Project will take a consultative and gradual approach to reform. The project will provide technical assistance and incentives through PBCs to support further assessment of the sector, the collaborative determination of improved rural water sector institutional arrangements for quality and sustainable rural water systems, the detailed design of relevant institutions, and the establishment of the improved institutional arrangements. Niger's urban water supply sector, which has employed an affermage model to great success over the past 20 years, can provide inspiration for the rural sector.

5. PBCs will also be used to support the operationalization of relevant rural water supply sector strategies. This will both be done by incentivizing: (1) the lead rural agency's annual reporting to the Board of Directors and ARSEau and (2) the performance of a technical assistance provider, to be hired under the project, in supporting the capacity reinforcement of private operators. This technical assistance provider will have substantial experience as a private operator managing small water supply systems in similar contexts, allowing them to impart critical and relevant capacities and lessons learned to their Nigerien counterparts. The PBCs represent, in aggregate, US$12 million of project financing and are associated with project expenditures for institutional capacity strengthening and infrastructure investment activities under Subcomponent 2.2.

6. The PBCs, included under Subcomponent 2.2, encourage a focus on results for the achievement of key targets as follows:

a. **PBC 1:** Establishment of improved, financially sustainable, and functioning rural water supply institutional arrangements in accordance with the PIM. (Planned for Year 4; US$4 million)
b. **PBC 2:** Submission of rural water supply annual report to the Board of Directors and the Regulatory Authority ARSEau following approved template defined in agency operations manual (Planned for Years 5-6 for reports in two Project implementation years; US$4 million total; scalable 50 percent, or US$2 million, per year)
c. **PBC 3:** Technical assistance provider supported at least 60 percent of private operators managing rural water systems constructed/rehabilitated under the project to operationalize accounting and asset management systems (Planned for Year 6; US$4 million).

7. PBC 1 is intended to incentivize the design and establishment of effective and financially sustainable rural water supply institutional arrangements. Both the rural water supply institutional arrangements and the sector sustainability strategy fully address critical elements as described in the PIM, including but not limited to the following: (i) roles and responsibilities for capital and operational expenditure financing (including tariff and subsidy policies), asset management, construction quality assurance, water quality, monitoring, and regulation; (ii) institutional capacity requirements and detailed roadmap to address any existing gaps; (iii) strategies to support development of private operators and actors across the value chain; (iv) strategies for citizen engagement and participative planning; and (v) strategies for ensuring that women and marginalized communities are represented in sector decision-making. To facilitate the verification process and a more responsive flow of funds to support associated activities, PBC 1 is disaggregated into PBRs as follows:

a. PBR 1.1 disburses against the delivery of a desk review of the rural water supply institutional arrangements drawing from the previously conducted assessments, which proposes two options for the institutional arrangements to improve service quality and sustainability and respective roles and responsibilities of the sector (e.g., overall responsibility by an independent rural water agency or the expansion of SPEN's mandate) in accordance with the PIM (Planned for Year 1; US$0.8 million)

b. PBR 1.2 disburses against the acceptance of the desk review, the completion of stakeholder consultation (workshops), and the endorsement of improved, financially sustainable, and functioning rural water supply institutional arrangements by the MHA, MF, MP, and the Niger commune association (Planned for Year 2; US$1 million).
c. PBR 1.3 disburses against the preparation of the required documentation to operationalize the endorsed institutional arrangements in accordance with the PIM, which includes organizational structure, mandate, legal framework, operations manual, and draft legislation, and their endorsement by the MHA, the MF, and the Niger commune association; (Planned for Year 3; US$1.2 million)
d. PBR 1.4 disburses against the submission of the government decree and related package to establish the endorsed rural water supply institutional arrangements and the participation of the MHA representative in the quality control committee to be set up by the Prime Minister's cabinet (Planned for Year 4; US$1 million)

8. Upon establishment of the rural water supply institutional arrangements, PBC 2 is intended to facilitate its operationalization by incentivizing the submission of an annual report to Board of Directors and ARSEau for two project implementation years following establishment. The report is to follow an approved template defined in the PIM, but shall include, at a minimum, details on the registry of public and private service providers, female representation within staff and in leadership positions, and status of critical support activities. These activities include supervision of water providers, water quality monitoring, IEC/BCC, and a pro-poor financing policy (including a combination of tariffs and subsidy) (US$2 million each year).

9. To best foster the establishment of functioning and sustainable rural water supply systems private operators, PBC 3 incentivizes a technical assistance provider, to be hired under the project, to support these nascent operators in developing required skills, competencies, and management systems. PBC 3 will disburse against verification that at least 60 percent of private operators managing rural water systems constructed/rehabilitated under the project have benefited from such support, such that they have operationalized accounting and asset management systems in accordance with the PIM (US$4 million).

Annex 7: Digital and Disruptive Technologies for Niger Water Platform

1. **In Niger's water-scarce environment, digital and disruptive technologies provide valuable solutions for IWRM to improve decision making, involve citizens and increase resilience.** The strategy for implementation of digital and disruptive technologies is to drive value in incremental steps designed for sustainability. Implementation should start with a pilot in one basin, then expand to others using lean-agile methodologies, ensuring that end users are involved from the start. It is crucial to look at systems and data with a strong emphasis on organizational capacity and processes to successfully drive adoption in Niger.

2. **Data Value Chain. Exploiting data to realize greater value using trusted data value chains provides the foundation for a new water platform in Niger**. The operationalization of data value chains with reliable information in a sustainable manner is crucial to improve decision making on investment prioritization and services. A study will be conducted to inform the institutional ownership of each of the data value chains, to what extent current systems and designs can be re-used and the best way forward.

Activity: 1	**Operationalization of a WSS Management Information System**
Description: Implement a functional and locally adapted WSS Management Information System. The baseline values for this component are estimated at 50000 questionnaires, further assessment and discussion is needed.	
Outcome: Data driven decision making through a national information system for WSS	

Activity: 2	**Operationalization of WRM Information System**
Description: Implement an IWRM system and approach including groundwater, surface water, irrigation and integration of hydromet and irrigation data with modern backup and security.	
Outcome: Data driven decision making through a national information system for WRM.	

Activity: 3	**Advanced Ecosystem and Resilience Integrated Information System(s)**
Description: Review and implement monitoring of ecosystem and resilience value chains – which may include fisheries, watersheds, forests, droughts, etc. – in an integrated manner using satellite, drones and/or other technologies in a coherent manner. Further assessment and discussion needed to clarify activities and boundaries with other information systems.	
Outcome: Data driven decision making for improved resilience and management of natural resources.	

3. **Citizen Engagement. A digital citizen engagement platform will allow citizens to interact in an easy and intuitive manner.** This platform will be piloted in one basin, evaluated and further scaled up in collaboration with relevant stakeholders and taking into account appropriate management models, sustainability and data privacy.

Activity: 4	**Implement Citizen Engagement Digital Platform**
Description: A citizen engagement platform to inform, consult and co-create with citizens in WRM in Niger. Inclusive access to this platform will be considered and reviewed including synergies with Smart Villages	
Outcome: A digital Citizen Engagement platform pilot is operational and can be accessed in one sub-basin.	

4. **Improved Services and Resilience.**

Activity: 5	**Operationalize Smart Irrigation**
Description: Specific activities may include tele-irrigation, mobile climate stations and smart sensor technology for effective irrigation scheduling practices with improved agricultural water productivity.	
Outcome: Optimized water usage through improved irrigation scheduling and crop pattern planning.	

Activity: 6	**Support Implementation of Smart Water Disruptive Technologies in Relevant Areas**
Description: Specific activities may include asset management, leak detection, smart meters, scenario planning, consumer pattern prediction, and intelligent automatic water monitoring	
Outcome: Faster detection of problems and improved forecasting and planning of water flow and use.	

Activity: 7	**Operationalization of Drought Monitor**
Description: Multi-sectorial, evidence-based drought monitor for early warning, preparedness, and response.	
Outcome: Improved drought management and enhanced citizen resilience to drought in Niger.	

Annex 8: Map of Project Priority Sub-basins