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INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF EUR139.1 MILLION

(US$150.0 MILLION EQUIVALENT)

TO

BURKINA FASO

FOR THE

WATER SECURITY PROJECT

MAY 14, 2024

Water Global Practice

Western and Central Africa Region

CURRENCY EQUIVALENTS

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FISCAL YEAR

January 1–December 31

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ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
AEN	Nakanbe water agency – *Agence de l'Eau de Nakanbé*
ANEVE	National Agency for Environmental Assessments - *Agence Nationale d'Evaluation Environnementale*
ARCP	Agriculture Resilience and Competitiveness Project
CCDR	Country Climate and Development Report
CCB	Climate Co-Benefits
CERC	Contingency Emergency Response Component
CISE	Inter-services Water Regional Committees—*Comité Interservices de l'Eau*
CLE	Local Water Commissions - *Comité Local de l'Eau*
CPF	Country Partnership Framework
CSQAP	Construction Supervision and Quality Assurance Plan
DA	Designated Account
DGADI	Irrigation Development and Agropastoral Works General Directorate—*Direction Générale des aménagements Agro-pastoraux et du Développement de l'Irrigation*
DGIH	General Directorate for Hydraulic Infrastructure —*Direction Générale des Infrastructures Hydrauliques*
DGRE	Water Resources General Directorate—*Direction Générale des Ressources en Eau*
DREAs	Regional Directorates for Water and Sanitation—*Direction Régionale de l'Eau et l'Assainissement.*
DSA	Debt Sustainability Analysis
DSEF	Design and Supervision Engineering Firms
E&S	Environmental and Social
ECF	Extended Credit Facility
ECOWAS	Economic Community of West African States
EIRR	Economic Internal Rate of Return
EPP	Emergency Preparedness Plan
ESCP	Environmental and Social Commitment Plan
ESF	World Bank Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESF	World Bank Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESRC	Environmental and Social Risk Classification
EU	European Union
FCV	Fragile, Conflict and Violence
FSRP	Food Security and Resilience Project
FSW	Food Shock Window
GAP	Gender Action Plan
GBV	Gender-Based Violence
GEF	Global Environment Facility
GEMS	Geo-Enabled Initiative for Monitoring and Supervision
GIZ	German Cooperation

GoBF	Government of Burkina Faso
GRID	Green, Resilient, and Inclusive Development
IC	Irrigator Committee
ICOLD	International Commission on Large Dams
IDP	Internally Displaced Persons
IFAD	International Fund for Agricultural Development
IFR	Interim Financial Report
IMF	International Monetary Fund
IPF	Investment Project Finance
IsDB	Islamic Development Bank
IWRM	Integrated Water Resources Management
LASCE-LC	National Authority in charge of Overseeing the State and Fight against Corruption - *Autorité Supérieure de Contrôle d'Etat et de la Lutte contre la Corruption*
LMP	Labor Management Procedures
M&E	Monitoring and Evaluation
MARAH	Ministry of Agriculture, Animal and Halieutic Resources – *Ministère des Resources Animales et Halieutiques*
MEEA	Ministry of Water, Environment and Sanitation - *Ministère de l'Eau, de l'Environnement et de l'Assainissement*
MEFP	Ministry of Economy, Finance and Prospective - *Ministère de l'Economie, des Finances et de la Prospective*
M&E	Monitoring and Evaluation
NAP	National Adaptation Plan
NBS	Nature-Based Solutions
NDC	Nationally Determined Contribution
NPV	Net Present Value
O&M	Operation and maintenance
PAGI	Integrated Watershed Development and Management Plans
PASD	Action Plan for Stabilization and Development – *Plan d'Action pour la Stabilization et le Développement*
PAUR	Emergency Action Plan for the Rehabilitation/Reconstruction of Hydraulic Facilities - *Plan d'Action d'Urgence de Réhabilitation et de Reconstruction des Aménagements Hydrauliques*
PDO	Project Development Objective
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PNAEP	National Program for Water Supply—*Programme National d'Approvisionnement en Eau Potable*
PNAH	National Program for Development of Hydraulic Infrastructure - *Programme National des Aménagements Hydrauliques*
PNDES II	Economic National Development Plan—*Plan National de Développement Economique et Social* II
PPA	Project Preparation Advance
PPP	Public-Private Partnership
PPSD	Project Procurement Strategy for Development

PRA	Prevention and Resilience Allocation
PRAMS	Procurement Risk Assessment and Management System
PRECEL	Burkina Faso Livestock Resilience and Competitiveness Project - *Projet d'appui à la Résilience et à la Compétitivité du sous-secteur de l'Elevage*
RBA	River Basin Agency
RPF	Resettlement Policy Framework
SAGE	Water Development and Management Master Plan – *Schéma d'Aménagement et de Gestion de l'Eau*
SDAGE	River Basin Master Plan for Water Management - *Schéma Directeur d'Aménagement et de Gestion de l'Eau*
SDG	Sustainable Development Goal
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
SIIP	Sahel Irrigation Initiative Support Project
SMP	Security Management Plan
SNDDAI	Program for Sustainable Development of Irrigated Agriculture—*Stratégie Nationale de Développement Durable de l'Agriculture Irriguée*
SNESB	National Strategy for Maintenance and Safety of Dams—*Stratégie Nationale d'Entretien et de Sécurité des Barrages*
SN SOSUCO	New Sugar Company of Comoé — *Nouvelle Société Sucrière de la Comoé*
SOFATO	Faso Tomato Company — *Société Faso Tomate*
STEP	Systematic Tracking of Exchanges in Procurement
RfQ	Request for Quotations
RPF	Resettlement Policy Framework
UNDP	United Nations Development Program
TACF	Technical Assistance Consultancy Firm
TOC	Theory of Change
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
WADB	West African Development Bank
WB	World Bank
WUC	Water User Committee

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DATASHEET

BASIC INFORMATION

Project Beneficiary(ies)	Operation Name		
Burkina Faso	Burkina Faso Water Security Project (BFWSP)		
Operation ID	Financing Instrument	Environmental and Social Risk Classification	
P177094	Investment Project Financing (IPF)	High	

Financing & Implementation Modalities

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

Expected Approval Date	Expected Closing Date
06-Jun-2024	30-Jun-2030
Bank/IFC Collaboration	
No	

Proposed Development Objective(s)

The Project Development Objective (PDO) is to improve the safety of dams, access to associated irrigation and watershed services, and climate resilience for beneficiaries.

Components

Component Name	Cost (US$)
Component 1 - Security and Climate Resilience of Water Storage Infrastructures	92,070,000.00
Component 2 - Development of Climate-smart Hydro-Agricultural Infrastructures	14,720,000.00
Component 3 - Integrated Watershed Protection and Management	10,310,000.00
Component 4 - Climate-smart Sector reforms and Operationalization of the National Strategy for Dams	7,820,000.00
Component 5 - Project Management, Safeguards & Consultancy Services	25,080,000.00
Component 6 - CERC	0.00

Organizations

Borrower:	Burkina Faso
Implementing Agency:	Direction Generale des Infrastructures Hydrauliques

PROJECT FINANCING DATA (US$, Millions)

Maximizing Finance for Development

Is this an MFD-Enabling Project (MFD-EP)? Yes

Is this project Private Capital Enabling (PCE)? No

SUMMARY

Total Operation Cost	**150.00**
Total Financing	**150.00**
of which IBRD/IDA	**150.00**
Financing Gap	**0.00**

DETAILS

World Bank Group Financing

International Development Association (IDA)	150.00
IDA Credit	150.00

IDA Resources (US$, Millions)

	Credit Amount	Grant Amount	SML Amount	Guarantee Amount	Total Amount
National Performance-Based Allocations (PBA)	150.00	0.00	0.00	0.00	150.00
Total	**150.00**	**0.00**	**0.00**	**0.00**	**150.00**

Expected Disbursements (US$, Millions)

WB Fiscal Year	2024	2025	2026	2027	2028	2029	2030
Annual	0.10	6.15	11.55	18.40	36.63	38.17	39.00
Cumulative	0.10	6.25	17.80	36.20	72.83	111.00	150.00

PRACTICE AREA(S)

Practice Area (Lead)

Water

Contributing Practice Areas

Agriculture and Food; Climate Change; Environment, Natural Resources & the Blue Economy; Fragile, Conflict & Violence

CLIMATE

Climate Change and Disaster Screening

Yes, it has been screened and the results are discussed in the Operation Document

SYSTEMATIC OPERATIONS RISK- RATING TOOL (SORT)

Risk Category	Rating

1. Political and Governance	High
2. Macroeconomic	Substantial
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	High
8. Stakeholders	Substantial
9. Other	High
10. Overall	High

POLICY 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

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

E & S Standards	Relevance
ESS 1: Assessment and Management of Environmental and Social Risks and Impacts	Relevant
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant
ESS 2: Labor and Working Conditions	Relevant
ESS 3: Resource Efficiency and Pollution Prevention and Management	Relevant
ESS 4: Community Health and Safety	Relevant
ESS 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
ESS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant

ESS 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
ESS 8: Cultural Heritage	Relevant
ESS 9: 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

Legal Covenants

Sections and Description
Schedule 2. Section I.A.2. Steering Committee. (a) The Recipient shall, no later than three (3) month after the Effective Date, establish and thereafter maintain, throughout the Project implementation period, a committee (the "Steering Committee") with composition, mandate and resources satisfactory to the Association.
Schedule 2. Section I.A.3.Project Implementation Unit. (c) Without limitation to Section I.A.3(a) and (b) of this Schedule, the PIU shall include the following additional key staff: (i) from a date no later than three (3) months after the Effective Date, a SEA/SH consultant, a monitoring and evaluation specialist, two (2) accountants, an internal auditor, and technical specialists respectively for dam safety, the development of hydro-agricultural infrastructures, integrated watershed protection and management, and (ii) other staff as and when may be specified in the ESCP.
Schedule 2. Section I.A.3.Project Implementation Unit. (e) The Recipient shall, no later than three (3) months after the Effective Date, recruit a technical assistance consultancy firm to, inter alia: (i) strengthen the capacities of the PIU, the DGIH and other key stakeholders in the water sector, (ii) support the operationalization of the SNESB and the preparation of related legal texts and procedures, and (iii) ensure quality control and support the contractual management of studies and works; on the basis of terms of reference, qualifications and experience acceptable to the Association.
Schedule 2. Section I.A.3.Project Implementation Unit. (f) The Recipient shall, no later than three (3) months after the Effective Date, recruit a design and supervision engineering firm to, inter alia (i) carry out additional studies for the rehabilitation of dams, and the rehabilitation and development of associated hydraulic infrastructure; (ii) prepare tender documents for works; and (iii) supervise, control and assist the delivery of works; on the basis of terms of reference, qualifications and experience acceptable to the Association.
Schedule 2. Section I.A.4.Dam Safety Experts Panel. (a) The Recipient shall establish a panel of Dam Safety Experts consisting of: (i) two national experts, recruited no later than the Effective Date, and (ii) one international expert, recruited no later than three (3) months after the Effective Date; each selected on the basis of terms of reference, qualifications and experience acceptable to the Association (collectively referred to as the "Dam Safety Experts").
Schedule 2. Section I.A.4.Dam Safety Experts Panel. (b) Without limitation to Section I.A.4(a) of this Schedule, the Dam Safety Experts panel shall inspect and evaluate the safety status of each existing dam to be rehabilitated, upgraded or repaired under the Project, its appurtenances and its performance history; review and evaluate the operation and maintenance procedures; and provide a written report of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam to an acceptable standard of safety. In particular, the Dam Safety Experts panel shall be responsible for the provision of advice on all technical aspects of dam rehabilitation, dam safety, technical design, technical report, implementation of construction details and procedures,

operation/maintenance and the preparation of dam safety plans, supervision of reconstruction/rehabilitation work and quality control, instrumentation, operation and maintenance and emergency preparedness; all in accordance with the ESCP.
Schedule 2. Section I.A.4.Dam Safety Experts Panel. (c) The Recipient shall maintain the Dam Safety Experts panel throughout the period of implementation of the Project, to carry out its mission with the support from ICOLD.
Schedule 2. Section I.A.4.Dam Safety Experts Panel. (d) The Recipient shall provide administrative support to the activities of the Dam Experts throughout the period of implementation of the Project.
Schedule 2. Section I.B.1. For the implementation of the activities in Part 1 of the Project, the Recipient shall carry out an assessment of the dams which were identified in the Recipient's Emergency Action Plan for the Rehabilitation/Reconstruction of Hydraulic Facilities (PAUR/AH) 2021-2025, in order to: (a) develop a program of works sensitive to the impacts of and on climate changes, in each case to improve the sustainability and storage capacity of the dam to expand its ability to respond to drought, and the resilience of its infrastructure to floods, all in accordance with international good practices; and (b) prioritize the dams on the basis of their readiness for rehabilitation or upgrade under the Project, on the basis of: (i) the status of the dam / level of its degradation, (ii) the economic value of water uses in the command area (e.g., for irrigation, livestock, fishery etc.); (iii) the consequences and likelihood of potential dam failures; (iv) the availability of technical and environmental and social studies, and (v) the prevailing local security constraints.
Schedule 2. Section I.B.2. As part of the implementation of Part 1 of the Project, that for each dam rehabilitated, upgraded and repaired under the Project, the Recipient shall ensure compliance with the requirements of the Association's ESS 4-Annex 1 on Dam Safety, available at www.worldbank.org, and in particular that for dams in Risk Categories II and III according to the SNESB: (i) the dam's construction supervision and quality assurance plans (covering the organization, staffing levels, procedures, equipment, and qualifications for supervision of remedial work on existing dams) are prepared by distribution of tender for works and implemented; (ii) operation and maintenance plans (covering the organizational structure, staffing, technical expertise, and training required; instruments, equipment and facilities needed to monitor, operate and maintain the dams in safe condition; operation and maintenance procedures; and arrangements for funding operating and maintenance costs, including long-term maintenance and safety inspections) and an emergency preparedness plan (which specifies the roles of responsible parties when dam failure is considered imminent, or when expected operational flow release threatens downstream life, property, or economic operations that depend on river flow levels) are prepared before starting the rehabilitation works and fully operational by the completion of the works. All these plans should be prepared and implemented in accordance with the SNESB and in a manner acceptable to the Association and the Dam Safety Experts.
Schedule 2. Section I.E.4. Without limitation upon the provisions of Paragraph 2 immediately above, if seven (7) months prior to the Closing Date (or such other date which the Association considers adequate), the Association determines that there are measures and actions specified in the ESCP which will not be completed by the Closing Date, the Recipient shall: (a) not later than six (6) months before the Closing Date (or such other date which the Association considers adequate), prepare and present to the Association, an action plan satisfactory to the Association on the outstanding measures and actions, including a timetable and budget allocation for such measures and actions (which action plan shall be deemed to be considered an annex of the ESCP); and (b) thereafter, carry out said action plan in accordance with its terms and in a manner acceptable to the Association.
Schedule 2. Section I.F. No later than three (3) months after the Effective Date, the Recipient shall establish a grievance mechanism sensitive to GBV/ESA/HS, and thereafter maintain and operate it throughout Project implementation.
Schedule 2. Section I.H. Without limitation to Section 5.03 of the General Conditions, the Recipient shall provide promptly as needed, the funds, facilities, services and other resources: (a) required for the Project; and (b) necessary or appropriate to enable the Recipient to perform its obligations under the Project.

The Recipient shall carry out the Project in accordance with the Implementation Arrangements set out in Section I, Schedule 2 of the Financing Agreement.
ESCP. 4.3. Prepare, disclose, consult upon, adopt the SEA/SH Action Plan no later than three (3) months after the Project effective date.

Conditions

Type	Citation	Description	Financing Source
Effectiveness	Article IV. 4.01.(a)	The Recipient has established the Project Implementation Unit, with key staff, in accordance with Section I.A.3 of Schedule 2 to this Agreement.	IBRD/IDA
Effectiveness	Article IV. 4.01.(b)	The Recipient has recruited the Dam Safety Experts to establish a panel in accordance with Section I.A.4 of Schedule 2 to this Agreement.	IBRD/IDA
Effectiveness	Article IV. 4.01.(c)	The Recipient has prepared, disclosed, consulted upon, and adopted Resettlement Action Plans for the Poedogo and Nambeguian dams' rehabilitation works, consistent with Environmental and Social Standard 5 (ESS 5), in form and substance satisfactory to the Association.	IBRD/IDA
Effectiveness	Article IV. 4.01.(d)	The Recipient has prepared and adopted a Project Implementation Manual, in accordance with Section I.C of Schedule 2 to this Agreement.	IBRD/IDA
Disbursement	Schedule 2.Section III.B.1.(b)	No withdrawal shall be made for Emergency Expenditures under Category (4), unless and until all of the following	IBRD/IDA

		conditions have been met in respect of said expenditures: (i) (A) the Recipient has determined that an Eligible Crisis or Emergency has occurred, and has furnished to the Association a request to withdraw Financing amounts under Category (4); and (B) the Association has agreed with such determination, accepted said request and notified the Recipient thereof; (ii) the Recipient has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Association; and (iii) the Recipient has ensured that all Environmental and Social Standards instruments required for said activities have been prepared and disclosed, and the Recipient has ensured that any actions which are required to be taken under said instruments have been implemented, all in accordance with the provisions of Section I.G of this Schedule.	

I. STRATEGIC CONTEXT

A. Country Context

1. **Burkina Faso is a low-income Sahelian country, with a gross domestic product (GDP) per capita estimated at US$984 in 2023 and an extreme poverty rate of 25.9 percent**.[1] Population growth was 2.67 percent in 2022.[2] With only 19 percent access to electricity and literacy limited to one-third of the adult population, Burkina Faso places 155 out of 174 nations on the World Bank's Human Capital Index (HCI),[3] and was ranked 185 among 193 countries in the 2023–24 Human Development Index report by the United Nations Development Program (UNDP), falling into the category of low human development. [4] Burkina Faso also scores poorly on the Gender Inequality Index (146 out of 166) which evaluates three essential dimensions of human development: reproductive health, empowerment, and economic status. Gender-based violence (GBV) is widespread, with 34 percent of women across the country reporting having endured physical violence at some point in their lives.[5]

2. **The country faces security threats that compound considerable development and humanitarian challenges.** The security situation has deteriorated dramatically since 2016 as the country has suffered increasingly intensive terrorist attacks, resulting in thousands of deaths and massive internal population displacements (2.1 million in March 2023, with women and children accounting for 22.9 percent and 60.4 percent, respectively) and an unprecedented humanitarian crisis.[6] Displacement affects new areas as violent extremism spreads, and internally displaced persons (IDPs) are now hosted in 86 percent of the country's municipalities (303 communes). The continued deterioration of security has made the humanitarian situation increasingly complex, with persistent food insecurity (3.35 million severely food insecure during the 2023 lean season) and no basic public services in several regions. Further, the attacks have negatively impacted the economy by disrupting the labor supply (especially to agriculture) and impeding mining activities (and the vital gold exports). However, the country is engaged in a process of re-conquering and securing the entire territory, which has led to the return of some 250,000 IDPs.

3. **The security crisis continues to impact economic development and political stability, critical to the outlook.** The two successive 2022 regime changes impacted the economy by increasing uncertainty and reducing international financial support. The security situation has led to a drop in mining production and below-average primary sector growth due to restricted access to rural areas. Following a slowdown and high inflation in 2022, GDP growth recovered in 2023, driven by the services sector fueled by an expansion of the public sector. The economy is estimated to have grown by 3.2 percent in 2023, with expected poverty reduction as inflation dropped. Average annual inflation (0.7 percent) decreased significantly from its 2022 regional high, but price levels remain high following the Russian invasion of Ukraine and a bad harvest in 2021/22. The security crisis deepened in 2023 according to the Armed Conflict Location and Event Data Project with a doubling of security-related deaths (8,494). Burkina Faso, Mali, and Niger formed the Alliance of Sahel States and exited Economic Community of African States (ECOWAS). With a stable political situation, the economy may pick up in the medium term, but annual per capita GDP growth would remain below 2 percent. Climate shocks and security issues will continue to affect poor households, while school closures limit human capital accumulation and poverty reduction.

B. Sectoral and Institutional Context

The water security challenge: dams as central assets to build resilience and manage water resources, risks, and services

4. **As water is a driver of Burkina Faso's development, low water security,[7] compounded by vulnerability to climate change, poses a significant challenge for its economy.** Agriculture, which is predominantly rain-fed, still provides most employment in the country, accounts for 71 percent of the income of poor households, and 20 percent of GDP.[8] Water

[1] http://macropovertyoutlook.worldbank.org/mpo_files/mpo/mpo-sm24-bfa-scope.pdf.
[2] https://data.worldbank.org/indicator/SP.POP.GROW?locations=BF.
[3] https://www.worldbank.org/en/publication/human-capital#Briefs.
[4] UNDP, 2021. https://hdr.undp.org/data-center/specific-country-data#/countries/BFA.
[5] https://www.oecd.org/development/development-gender/ETUDE-PAYS-SIGI-BURKINA-FASO.pdf.
[6] Assessed by the National Council for Emergency Relief and Rehabilitation (*Conseil National de Secours d'Urgence et de Réhabilitation,* CONASUR).
[7] Water security consists in managing water resources, delivering water-related services, and mitigating water-related risks to benefit people, the environment and the economy, as defined in the World Bank Water Security Diagnostics initiative .
[8] Source: World Bank (forthcoming). Economic Update. April 2024. Special Chapter: Maintaining Reform Momentum on Social Assistance.

resources play a pivotal role for hydropower generation, domestic water supply, and industry. At 852 m^3 per year per person, Burkina Faso's available renewable water resources per capita fall below the water scarcity threshold of 1,000 m^3 established by the Food and Agriculture Organization (FAO). Whereas the country is crossed by five main cross-border rivers, only two of them are perennial, and climate change projections of decreased rainfall and higher temperatures further threaten availability. As 80 percent of the country is on low-yield, hard-rock aquifers, considered limited and difficult to exploit, surface water represents 80 percent of existing withdrawals. According to the latest estimates, less than 2 percent of rainfall is currently usable (~3.2 billion m^3/year) once environmental needs, evaporation from reservoirs, and downstream needs are deducted.[9] This water scarcity, compounded by climate-induced natural hazards, threatens socioeconomic development.

5. **Climate change is a major threat to water security in Burkina Faso, exacerbating water scarcity and worsening water-related risks.** Average temperatures have been increasing and aggregated accumulated precipitation decreasing except at the peak of the rainy season (June–August) since 1901.[10] Weather station observations show a southward extension of the dry zone over the last century. Temperature extremes are occurring more often, with monthly high temperature averages now regularly exceeding the previous maximum of 35°C, particularly in the north. Average temperature increases are projected to be 0.8°C by 2025 and 1.7°C by 2050, accompanied by a rainfall reduction of 3.4 percent by 2025 and 7.3 percent by 2050, and significant inter-annual and seasonal variations. By 2050, significant reductions in water volumes (30 to 73 percent) are expected in Burkina Faso's major river basins.[11] In the project area (Mouhoun and Nakanbe river basins), declining rainfall is lowering water storage volumes, making droughts more likely, which would impact agricultural production, while increased temperatures could lead to worsening water quality.[12] Despite projected economic growth, economic losses from climate change impacts are projected to increase poverty.[13] Burkina Faso experiences extreme climatic conditions of great variability, with increasingly frequent droughts exacerbated by climate change. Between 1969 and 2014, droughts affected a total of 12.4 million people, resulting in reduction in agricultural and livestock production, famine, and population migration,[14] as well as more intense cultivation of the river plains, particularly for rice. The ecological impact has been particularly severe, with a shrinking of natural vegetation by more than 35 percent (partially due to drought-induced wildfire and agricultural burning) and an increase of 10 percent in bare soil.

6. **Climate change is also causing more frequent and intense floods, which damage water storage infrastructure, interrupting water services.** In recent years, severe flooding periods have occurred repeatedly, especially in the north and center of the country. The flood events of September 2009 affected more than 150,000 people, washed away 22,000 hectares of farmland and damaged 15 dams, resulting in estimated damages and losses of more than US$130 million,[15] while more recent flooding in 2021 affected 4000 hectares in the Boucle du Mouhoun (the national "granary").[16] During the rainy season in 2021, five dams failed due to severe floods, compounding ageing civil works and lack of monitoring and maintenance. Future climate change scenarios predict increased heavy rainfall events and flood magnitudes by 2050 in Burkina Faso compared with the recent past, despite the general drying trend.[17,18] Climate change–exacerbated floods will increase the likelihood of critical water infrastructure failure, putting beneficiaries at physical risk from flood waters, and

[9] World Bank. 2021. Burkina Faso—Water for Development to 2030—Policy Note.
[10] WB Climate Change Knowledge Portal, Country: Burkina Faso. https://climateknowledgeportal.worldbank.org/country/burkina-faso/climate-data-historical.
[11] Comoe (69 percent), Mouhoun (73 percent), Nakanbe (30 percent), and Niger (42 percent).
[12] Sanou, Y., and Pare, S. 2020. "Holistic Approach for an Integrated Management of Mouhoun River in Climate Change Context: Impacts and adaptation measures." J. Mater. *Environ. Sci.,* 2020, Volume 11, Issue 9, Pages 1412–1423.
[13] World Bank Group. 2022. Country Climate and Development Report G5 Sahel. The study estimates by 2050, under the medium-growth and dry and pessimistic climate scenarios, the number of poor will increase relative to the baseline by 2.7 million in Burkina Faso.
[14] Burkina Faso. 2021. Premier Rapport Biennal Actualise (PRBA) Du Burkina Faso Sous La Convention-Cadre Des Nations Unies Sur Les Changements Climatiques (CCNUCC). https://unfccc.int/sites/default/files/resource/Rapport%20BUR1%20-Burkina.pdf.
[15] World Bank. 2011. Climate Risk and Adaptation Country Profile, Burkina Faso. https://climateknowledgeportal.worldbank.org/sites/default/files/2018-10/wb_gfdrr_climate_change_country_profile_for_BFA.pdf
[16] Ouedraogo, K. 2021. Burkina Faso: Farmers grow sesame, watermelon, and other crops to minimize loss from floods. Barza Wire, October 10, 2021. Accessed May 13, 2024 at <https://wire.farmradio.fm/farmer-stories/burkina-faso-farmers-grow-sesame-watermelon-and-other-crops-to-minimize-loss-from-floods/>
[17] Okafor G. C., Larbi I., Chukwuma E. C., Nyamekye C., Limantol A. M., and Dotse S.Q. 2021.) Local climate change signals and changes in climate extremes in a typical Sahel catchment: the case of Dano catchment, Burkina Faso. *Environmental Challenges*: 5(100285).
[18] Aich V., Liersch S., Vetter T., Fournet S., Andersson J. C. M., Calmanti S., van Weert F. H. A., Hattermann F. F., and Paton E.N. 2016. Flood projections within the Niger River Basin under future land use and climate change. *Science of the Total Environment*: 562, 666–677.

economic risk from damaged property as well as decreasing water security through service interruptions and loss of water storage.

7. **To mobilize surface water resources, Burkina relies on large and small dams exposed to climate-exacerbated floods and droughts, many of which are degraded and far from fulfilling their potential.** Water services for irrigated agriculture, livestock, fisheries, and potable supply to many settlements and the capital city, depend on dams, including 20 large dams and over 1,000 small dams (most less than 10 meters high), which are mostly used for agriculture. However, the latest national inventory noted that 88 percent of the dams were in poor or very poor condition.[19] The situation has continued to degrade and, in 2020, it was assessed that 43 percent of dams were not functional,[20] contributing to water-related risk as they do not provide flood protection or water storage for irrigation to help face droughts. Many dams are at risk of failure, threatening downstream regions, including downstream riparian countries, as most rivers in Burkina Faso are transboundary. Several dam failures occur every year across the country, threatening lives and leading to loss of economic assets.[21] More frequent floods—exacerbated by climate change—are a main reason for increased dam failure risks. Other root causes for this vulnerability include ageing infrastructure with poor design and construction (90 percent are over 30 years old), and no or poor maintenance and rehabilitation. Many reservoirs are also full of sediment, polluted, and invaded by vegetation, reducing their storage capacity and usability, further impacting the resilience of the beneficiaries toward rising water scarcity and droughts. In turn, drought impacts on vegetation have led to erosion and sedimentation, reducing the volume stored in reservoirs and to flooding, causing loss of life and economic damage.[10]

8. **Integrated management of water, vegetation, and soil resources could improve reservoir safety and sustainability.** The sedimentation and pollution of reservoirs result from erosion and gullying in their watersheds and is correlated with climatic (increasing intensity of rain episodes), human (agricultural practices and increasing land use, grazing and deforestation), and biophysical (soils, geomorphology, vegetation cover) factors. More than 30 percent of Burkina Faso's land area (9 million hectares) is severely degraded, and that degradation is projected to continue to expand at the rate of 247,145 hectares per year.[22] Integrated watershed management constitutes the most sustainable response to these problems, building on Burkina Faso's experience with related projects.[23]

9. **Water insecurity threatens Burkina Faso's already frail food security, compounded by climate change-exacerbated extreme events.** Some 2.1 million Burkinabe are chronically food insecure despite the small fraction of developed irrigation potential and the poor status of existing irrigation assets. Although estimates vary, the biophysical potential for irrigation is generally considered to be well over 200,000 hectares, of which only 12–14 percent has been developed so far, all from surface water.[24] In the command area of many existing dams, irrigation infrastructures are also underdeveloped. The main constraints to developing irrigation are the lack of water (which impacts crop choice) and poor functionality of infrastructure. Irrigation committees are only formed when water is available for distribution and their operation and maintenance (O&M) capacity is weak. The main irrigated crops are rice, with low water use efficiency, and vegetables. Formal irrigation development has slowed in recent years, and 29 percent of existing assets need rehabilitation. While variable rainfall has been linked to chronic undernutrition in Burkina Faso,[25] drought, lack of water due to dams degraded by climate change and increasing temperatures detrimentally impact fish populations and impede fisheries development, which could represent an important local source of protein to increase food security and improve nutrition.[26]

Policies and institutions establish a sound enabling environment for water security

[19] Forty-one percent in very poor condition and another 47 percent in poor condition.
[20] World Bank. 2020. *Mobilisation des Ressources en Eau pour le Développement au Burkina Faso.*
[21] For example in 2021, 8 dams were reported to have failed
[22] According to the 2019 report on the drivers of deforestation and forest degradation by the Ministry of the Environment, Green Economy and Climate Change.
[23] Including the Sahel Integrated Lowland Ecosystem Management project financed by the Global Environment Facility (GEF) and implemented by the WB (P070871, 2004-2011), as well as projects financed by other partners, including the International Fund for Agricultural Development (IFAD) and the German Cooperation (GIZ).
[24] World Bank (2020). The report *Mobilisation des Ressources en Eau pour le Développement au Burkina Faso* estimates Irrigation potential at 233,000 ha and the current equipped area at just 20,000 ha.
[25] Mank, I., Belesova, K., Bliefernicht, J., Traoré, I., Wilkinson, P., Danquah, I. et al. (2021) The impact of rainfall variability on diets and undernutrition of young children in rural Burkina Faso. *Frontiers in Public Health*, **9**, 693281. Available from: https://doi.org/10.3389/fpubh.2021.693281
[26] Silga R. P., Oueda A., Kpoda W. N., Mano K., Ouedraogo I., Weesie D. M. P., and Kabre B.G. 2021. Fishermen local knowledge and aquatic environmental change: impacts on fishing and adaptation strategies in Volta Basin. *Open Journal of Ecology*: 11(7).

10. **Burkina Faso boasts a comprehensive legal and institutional framework for the water sector**. According to the water management law,[27] the Ministry of Environment, Water and Sanitation (MEEA—*Ministère de l'Environnement, de l'Eau et de l'Assainissement*) determines priorities, sets policies and standards for water development, manages and regulates water resources (including dams), and regulates water and sanitation services. The design and construction of dams are under the responsibility of MEEA's General Directorate for Hydraulic Infrastructure (DGIH—*Direction Générale des Infrastructures Hydrauliques*). For large dams, the MEEA delegates O&M and safety to contracted operators, while small dams are managed by regional and local authorities and operated by Water User Committees (WUCs). The Ministry of Agriculture, Animal and Halieutic Resources (MARAH—*Ministère de l'Agriculture, des Ressources Animales et Halieutiques*) technically oversees the irrigated agriculture sector and is responsible for implementing the agricultural policy. Irrigation committees (IC) and WUCs are the main local water user associations.

11. **Burkina Faso has adopted good practices of integrated water resource management (IWRM), implemented through water policies, strategies, and investment plans set out in national programs.** Governance and oversight are provided by the Inter-ministerial Water Technical Committee and, at the decentralized level, by the inter-services water regional committees (CISE). Since 2007, five national River Basin Agencies (RBA—*Agences de l'Eau*) have been established, two of which have developed a River Basin Master Plan for Water Management (SDAGE—*Schéma Directeur d'Aménagement et de Gestion de l'Eau*). Local Water Commissions (CLE—*Comité Local de l'Eau*) are in charge of coordinating IWRM at the sub-basin level based on sub-basin plans (SAGE—*Schéma d'Aménagement et de Gestion de l'Eau*). A substantial portion of the country's surface water is shared with neighboring countries: the Comoe, Niger, and Volta Rivers are all transboundary, and Burkina Faso is a member of the corresponding transboundary water authorities—the Niger Basin Authority, the Volta Basin Authority, and the recently established Comoe-Bia-Tano Basin Authority.

12. **The National Water Policy for 2016–2030 was translated into sectoral programs in the context of the Sustainable Development Goals (SDGs).** This includes National Programs for Dam Development, Water Supply, IWRM, and Water and Sanitation Governance. The government also prepared and recently adopted the National Strategy for Maintenance and Safety of Dams (SNESB—*Stratégie Nationale pour l'Entretien et la Sécurité des Barrages*) for 2023–2028. The strategic objective of the National Program for Development of Hydraulic Infrastructure (PNAH —*Programme National des Aménagements Hydrauliques*) is to increase water resource availability through infrastructure investment, including by (i) prioritizing infrastructure development and rehabilitation; (ii) protecting the water resource, including through the protection of watersheds and riverbanks; (iii) focusing on pollution, unregulated water use, and reservoir siltation; (iv) promoting regional and international cooperation in management of shared resources; and (v) accounting for climate risks. The PNAH proposes the rehabilitation of 209 dams and a program of 61 new multipurpose dams, including 51 for irrigation and drinking water and 10 for hydropower and irrigation. Based on the latest survey of the state of dams, MEEA initiated an emergency action plan for their rehabilitation. Its first phase (2021–2025) proposes to carry out studies for 235 dams and to rehabilitate 35 of them. The rehabilitation of the remaining ones is part of phase 2, from 2026 to 2030.

13. **Considerable public investment was made in irrigated agriculture, including in a successful small-scale village irrigation program.** In 2004, the Government of Burkina Faso (GoBF) launched a comprehensive irrigation strategy—the first Program for Sustainable Development of Irrigated Agriculture (SNDDAI—*Stratégie Nationale de Développement Durable de l'Agriculture Irriguée*). After an initial focus on large-scale irrigation, the government has increased support to small-scale irrigation schemes, particularly in the lowlands. From 2011 to 2015, the government promoted small-scale irrigation, supporting the development of 15,000 ha of new irrigated area, agricultural production, and the strengthening of ICs. In addition, about 60,000 ha of lowland agriculture have been informally developed by farmers themselves, with some improved water control. The second SNDDAI, from 2021 to 2025, aims to contribute to food security by developing and/or rehabilitating at least 36,520 ha of irrigated perimeters and 30,000 ha of lowlands. As cooperation for irrigation is common, one farmer in two is a member of a cooperative.[28] In recent years, new models are being piloted for both large-scale and small-scale irrigation, including through public-private partnerships (PPPs).

14. **Gender inequality persists in Burkina Faso and in its water sector.** Despite the ratification of all regional and

[27] Loi nº 002-2001/AN portant loi d'orientation relative à la gestion de l'eau. Accessed at: https://faolex.fao.org/docs/pdf/bkf30789.pdf.
[28] World Bank. 2017. Amélioration de la Connaissance et do la Gestion des Eaux au Burkina Faso. Annexe 2: Evaluation des ressources en Eau et des demandes Sectorielles. Bilan Besoins-Ressources. Septembre 2017.

international conventions on gender equality, the adoption of a national gender policy and strategy, the establishment of a dedicated ministry, and the development of a large number of associated actions and programs, social norms, and informal laws challenge the implementation of this progressive framework.[29] Women's participation in paid work is 20 percentage points lower than men, and they are more likely to work as unpaid workers in a family business or farm, widening the earnings gap.[30] Women in rural areas dominate the workforce[31] in non-timber forest product industries, generating less income through more labor-intensive works than men. In agriculture, women's harvest values and crop sales are approximately 60 percent lower than men's. Women are poorly involved in decision-making related to water and agriculture planning and implementation, such as where water points are constructed. Women's low representation and empowerment stems from their low political leadership, as well as low representativity in management, and professional and technical positions.[32] In WUCs, executive boards[33] are in charge of decision-making and elected by the WUC general assembly, and currently have 14.86 percent of women representation against the 30.00 percent national target, despite one of the secretary posts explicitly for "the mobilization of women and vulnerable people." The average participation rate of women in the 18 structures involved in Project implementation is 13.27 percent. Efforts to raise awareness, train and promote gender equality can help improve the representation of women in senior positions within these entities.

In spite of these achievements, challenges remain regarding institutional capacity and performance

15. **Moving laws and strategies into action represents a sector challenge.** For IWRM, despite notable progress made over the past years (including through the Water Supply and Sanitation Program-for-Results [WSS PforR], P164345), improvements remain needed at various levels. This includes improving the transparency and quality of decision-making for infrastructure investments and strengthening institutions to overcome coordination challenges and overlapping responsibilities, both within and among agencies. Challenges include coordinating across sectors and between the national and the decentralized levels, generating internal financing and effecting cost recovery, and implementing and managing infrastructure investments. Burkina Faso has ample legal and regulatory instruments, but implementing decrees and procedures are still lacking, as well as adequate incentives for improved efficiency, productivity, and water savings.

16. **The history of dam development and operation raises questions about planning and management capacity.** Many dams are not fully serving their purpose, have been poorly constructed, or have suffered inadequate O&M and are therefore not functional or at risk of failure. Given concerns around dam safety, there is a need to improve the understanding of the risks and benefits associated with each dam to prioritize rehabilitation works and strengthen capacity. In response to the problems of poor performance and chronic deterioration of public water infrastructure, MEEA has prepared the National Strategy for Maintenance and Safety of Dams (SNESB), proposing detailed approaches to organize O&M of public infrastructure, professionalize O&M, and effect cost recovery. The appointment of a dam safety committee and reinforcement of DGIH as core institution in charge of dam safety will be essential for these tasks.

17. **Building on the World Bank's decades-long engagement as the leading partner in the Burkina Faso water sector, this project complements contributions to the water security agenda.** The World Bank has supported the construction of the Ziga Dam,[34] water supply and sanitation (WSS) services in urban and rural areas,[35] and IWRM activities, including support to hydrometric and water quality networks, operationalization of the National Water Information System, and dam inventory updates. The proposed project leverages existing IWRM engagement while expanding interventions into the dams, watershed protection, and irrigation subsectors, complementing the WSS PforR's focus on secure WSS services. The World Bank conducted a water resources assessment in 2017 and completed a Water for Development to 2030 policy note in 2021 covering IWRM, WSS, and irrigation. Ongoing World Bank operations in irrigation[36] and in the agriculture

[29] OECD. 2018. Maps & Facts, Sahel and West Africa Club, No.63, January 2018.
[30] Donald, A., Islam, T. . T., and Robakowski, A. Explaining Gender Differences in Economic Outcomes in Burkina Faso.
[31] Women in rural areas constitute 80% of the workforce in the NTFP industry: https://rightsandresources.org/our_impact/strengthening-position-women-non-timber-forest-product-industries-burkina-faso-secure-tenure-rights/.
[32] Seventeen percent in parliament, 20 percent in ministerial positions, 11 percent of firms with female top manager, 26 percent of women among professionals and technicians—according to the 2023 WEF Global Gap Gender Report: https://www3.weforum.org/docs/WEF_GGGR_2023.pdf.
[33] Existing executive boards have between 9 and 17 members and all are considered to hold a position of decision-making authority within the WUC.
[34] Ouagadougou Water Supply Project (2001–2007, P000306).
[35] US$160 million Urban Water Sector Project (2008–2018, P106909) and ongoing US$250 million WSS PforR (P164345).
[36] Such as the Sahel Irrigation Initiative Support Project (SIIP) P154482.

sector[37] support the development or rehabilitation irrigation perimeters and provide agriculture advisory services.

18. **Collaboration and complementarity with donor partners.** The water sector has been supported by several development partners, including multilateral partners such as the World Bank, UNICEF, the African Development Bank (AfDB), the West African Development Bank (WADB), and the European Union (EU), as well as bilaterals including France, Denmark, Sweden, and Belgium. Coordination across development partners occurs through regular meetings, with a view to increasing synergies, efficiency, and complementarity. Until recently, few partners had expressed interest in financially supporting the PNAH. However, with the preparation of this project, there is some renewed interest, and the World Bank had discussions with the Netherlands and the AfDB on possible synergies. Should the project be successful, partner involvement could be integrated in potential future additional financing, with a view to scale up project impact.

C. Relevance to Higher-Level Objectives

19. **The Project contributes to the government's medium- and long-term visions for development.** By supporting improved dam safety and irrigation services, the proposed project will contribute to the achievement of higher-level development objectives of GoBF's second Social and Economic National Development Plan's (PNDES II—*Plan National de Développement Economic et Social II*) and of the Action Plan for stabilization and development (PASD—*Plan d'action pour la stabilization et le développement*), through Objective 4.4: "Developing quality and resilient infrastructure to promote the structural transformation of the economy." The project will also support GoBF's objectives outlined in the National Water Strategy to secure water resources (in line with SDGs 6.4 to 6.6[38]) and increase food security (in line with SDG 2.4[39]) in a physical environment increasingly affected by climate change. This will be achieved by financing the necessary infrastructure investments and strengthening sector stakeholders' capacity at the national and local levels to operate and maintain these infrastructures in an effective manner. It aligns with GoBF's policies and strategies for the sector, as outlined in the PNAH and the SNDDAI. Policy objectives include strengthening the capacity of key sector institutions and improving the knowledge and monitoring of water resources and hydraulic infrastructure.

20. **The project design is guided by the principles of water security and aligns with the Water Security and Climate Adaptation Global Challenge Program (GCP).** To support managing water resources, the project will focus on rehabilitation and safety of dams, which contribute to securing storage and water resources, and promote integrated management of associated watersheds to reduce sedimentation and pollution, hence contributing to their safety and sustainability. The emphasis on supporting structures like the WUCs will contribute to improved IWRM. Improved dam safety and management will mitigate water-related risks, as their failures would have devastating impacts. The project will also strengthen resilience of dams and associated infrastructure to climate change–exacerbated floods and local drought impacts. To deliver water-related services, the project will support securing and developing associated irrigation and fisheries services to support food production, jobs, and increase income for the population. By supporting resilience, resource protection, and food security, the project will benefit people, the environment, and the economy.

21. **The proposed project is aligned with Burkina Faso's key strategies on climate change.** Climate resilience is at the heart of the PNDES II goals. The project intends to improve the security of dams and water resources for irrigation and agropastoral services by addressing climate change–exacerbated floods and drought. The National Adaptation Plan (NAP) recognizes the vulnerability of water resources to climate change, which impacts all other key sectors of the economy,[40] and outlines an action plan for water security as a cross-sectoral area for adaptation. Key NAP adaptation measures reflected in project design include monitoring of water storage infrastructure, reduced and efficient water usage, IWRM, and strengthened knowledge of water resources. The Nationally Determined Contribution (NDC) identifies water security,

[37] Agriculture Resilience and Competitiveness Project (ARCP) P167945— 4,500 ha. West Africa Food System Resilience Program (FSRP) P172769—1200 ha.
[38] SDG 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity; SDG 6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate ;SDG 6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers, and lakes.
[39] By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production; help maintain ecosystems; strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters; and progressively improve land & soil quality.
[40] Burkina Faso. 2015. Plan National d'Adaptation aux Changements Climatiques (PNA) du Burkina Faso. Ministère de l'Environnement et des Ressources Halieutiques. Juin 2015.

especially improved water quantity and quality, as one of the key benefits implementing its prioritized actions.[41] The project will support several adaptation measures identified by the NDC, such as: water storage for multipurpose uses, localized irrigation resilience, landscape and forest management, restoration of degraded land, and lake protection.[42] The project will also contribute to mitigation measures identified in the NDC: climate-smart diversification of agriculture by supporting irrigation and sustainable land and forest management. The Long-term Vision to 2050[43] includes a pillar for action on the "Restoration and protection of ecosystems, soils and production systems," which this project is aligned with. Therefore, the operation is consistent with the country's climate commitments. The project also aligns with the World Bank's Country Climate and Development Report (CCDR) for the G5 Sahel region (including Burkina Faso), which calls for assessment and rehabilitation of hydraulic structures including dams, better support for resilient water storage infrastructure, and nature-based solutions (NBS), such as forest and wetland restoration.[44]

22. **The proposed project is aligned with the World Bank Country Partnership Framework (CPF) 2018–2023 (Report No. 123712 – BF).** The project is fully aligned with the 2018–2023 CPF Objectives 1.1 "Improve agriculture, pastoralism and aquaculture (fish) productivity and competitive value chains" and 1.5 "Address management of extractives and sustainability of natural resources" reconfirmed by the latest Performance and Learning Review (Report No: 166080-BF),[45] and with the draft Systematic Country Diagnostic[46] Policy Priorities to Create More Productive Jobs (E - Improve the rural economy to reduce the urban-rural divide and F - Sustainably manage land, natural resources, and climate risks). The project will also contribute to the World Bank mission to end extreme poverty and boost prosperity on a livable planet by enhancing food security, increasing income and livelihoods of farmers and their families, and protecting and regenerating water and natural resources. The project also aligns with the World Bank's Green, Resilient, and Inclusive Development (GRID) approach by addressing sustainability, resilience, and inclusiveness simultaneously. The project is also aligned with the World Bank Next Generation Africa Climate Business Plan, particularly strategic directions related to food security, environmental stability, and climate shocks.

23. **The Project is aligned with the World Bank Strategy for Fragility, Conflict, and Violence (FCV), 2020–2025 (Report No. 146551) and the GoBF Prevention and Resilience Allocation (PRA).** The project is in line with the World Bank approaches of (i) remaining engaged in the most challenging and volatile situations to the extent possible to protect human capital, institutions, and development gains; and (ii) managing the spillover of FCV by addressing the needs of forcibly displaced, and their host populations. It will also support the government PRA's priorities,[47] specifically, (i) "delivering basic services" (by giving access to water resources and irrigation services); (ii) "pastoralism—delineation and marking of grazing and resting" (in Component 3 as part of PAGIs and by developing corridors for livestock to the reservoirs); and (iii) "land—establishment of land management structures at the management structures at the local level" (as part of the support to irrigators' committees in Component 2 but also within PAGIs in Component 3). The Project design and proposed implementation support plan also draw from lessons learned from past and existing World Bank projects in similar FCV environments and consider existing country security and FCV features, including selection of sites in more secured\ and accessible areas (cf. Annex 1).

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

24. **The Project Development Objective (PDO)** is to improve the safety of dams, access to associated irrigation and watershed services, and climate resilience for beneficiaries.

[41] Burkina Faso. 2021. Contribution Déterminée au Niveau National (CDN) du Burkina Faso 2021–2025. Version Finale. Octobre 2021.
[42] World Bank. 2022. Climate and Economic Analyses for Resilience in Water (CLEAR Water) – NDC Dashboard. Priorities in Adaptation and Mitigation by Country. Water, Economy and Climate Change Global Solutions Group.
[43] Burkina Faso. 2022. Vision 2050 de Développement à Faible Emission de Carbone et Résilient Au Climat Du Burkina Faso.
[44] The World Bank Group. 2022. G5 Sahel Region Country Climate and Development Report.
[45] New Country Engagement Note (CEN) is planned for FY25.
[46] World Bank. 2024. Systematic Country Diagnostic - Burkina Faso. Washington, D.C.: World Bank.
[47] In December 2020, Burkina Faso became the first country to gain access to the PRA financing for a three-year cycle. Continued access to the PRA financing in FY24 is now confirmed.

PDO Level Indicators

25. **The following indicators will track PDO progress:** (i) Dams with improved safety (number); (ii) Operationalization of the National Strategy for Maintenance and Safety of Dams (SNESB) (Yes/No); (iii) Cumulative area of new or rehabilitated irrigated perimeters (ha); (iv) Terrestrial and aquatic areas under enhanced conservation and management (ha); and (v) People with enhanced resilience to climate risks (number).

B. Project Components

26. **The project will improve climate adaptation of water resources in Burkina Faso** and provide several climate mitigation benefits through six interrelated components. The project will particularly foster water storage and hence reduce risks of water scarcity due to a combination of higher temperatures and diminished precipitation. All project dimensions related to climate co-benefits (CCBs) and greenhouse gas (GHG) accounting are included in Annex 4.

Component 1: Security and Climate Resilience of Water Storage Infrastructures (US$92.07 million equivalent)

27. **This component will support the securitization of priority dam infrastructure to ensure continued access to and valorization of the associated water resources, building flood and drought resilience.** Building on the Emergency Action Plan for the Rehabilitation/Reconstruction of Hydraulic Facilities (PAUR – *Plan d'Action d'Urgence de Réhabilitation et de Reconstruction des Aménagements Hydrauliques*) 2021-25, it aims to improve infrastructure that serves, among others, to slow potentially damaging climate change–exacerbated floods and store water during droughts.

Subcomponent 1.1: Strengthening climate resilience through rehabilitation of priority dams (US$78.38 million)

28. **This subcomponent will improve the sustainability and storage capacity of degraded dams to enhance infrastructure resilience to floods while boosting the resilience of beneficiaries to floods and droughts.** Among the 235 priority dams of the PAUR, 35 have been further prioritized using a portfolio risk assessment based on the climate vulnerability/sensitivity of the following processes: (i) dam degradation; (ii) economic value of water uses in the command area; and (iii) consequences and likelihood of potential dam failures.[48] All these dams are earth-filled dams with multipurpose uses, including irrigation, fishery, and water resource supplies for livestock, mines, construction, and household uses. Thirty-three out of the 35 dams are small according to the World Bank (WB) Environmental and Social Framework (ESF) definition[49] (all below 8.4 m high and 2.35 million m^3 in storage capacity; see Annex 2 for details). Only two dams are considered large according to the ESF definition (4.5 m high and 7.00 million m^3 capacity). Among these 35 priority sites, 18 dams for which rehabilitation studies are ready are gathered in block 1, while the remaining 17 for which some complementary studies are needed have been assigned to block 2. Sites of block 1 will be rehabilitated in the first years of the project during which studies for block 2 will be finalized and prepared. Prevailing local security constraints will be monitored and intervention areas amended in the event that security deteriorates.

29. **Works will consist in rehabilitating and, as necessary, upgrading, dam constituent structures** in accordance with good international practices, technical specifications of tender documents, and requirements from safeguard instruments and studies. Based on technical studies, these activities could include reducing sediment load, as required. Several sites will be integrated in tenders, whenever deemed meaningful and feasible. Tenders and works will be carried out on a rolling basis,[50] with an average of seven to eight dams rehabilitated per year. Rehabilitation of each site is expected to last less than a year. To promote flood resilience, instruments will be installed to (i) monitor the status of dams (which can be used for risk analyses and early warning systems); (ii) measure the quantity and quality of water resources (on-site and upstream) for water-level gauging and risk analysis; and (iii) support early warning systems. Water monitoring activities—both systemic and site-specific—will be closely coordinated with the ongoing World Bank–funded Strengthening Climate Resilience Project (P164078), which aims to improve Burkina Faso's hydrometeorological, climate, and early warning services and improve access to such services by targeted sectors and communities during times of floods and drought.

[48] With, as a first priority, the minimization of loss of life.
[49] ESS4-annex 1 defines "Large dams" as dams with a height of 15 meters or dams between 5 meters and 15 meters impounding more than 3 million cubic meters. Within the 35 dams, all are below 15 meters and only 2 are above impounding threshold (respectively, 4.5 m high and 7 million m^3).
[50] Procurement to be grouped in packages of two to four sites based on proximity, readiness and skills, and equipment requirements.

Subcomponent 1.2: Rapid response for securing failing dams and enhanced climate resilience (US$13.69 million)

30. **This subcomponent targets the implementation of reinforcement works on dams outside subcomponent 1.1 at imminent risks of failure,** identified by the national inventory based on vulnerability to floods or to be identified during project implementation as emergencies occur. Emergency works will include sealing of dams' or dikes' breaches, temporary cofferdams or reinforced ripraps to protect weak structural sections, and other interventions deemed required. Such rapid responses will avoid (i) complete dam failure, before full-rehabilitation studies and works can be completed; (ii) associated higher costs for rehabilitation; and (iii) damages to associated economic activities and downstream populations and assets. Lessons learned over the last decade (with around 10 dam failures per year) have shown that such quick interventions can prevent further deterioration, especially during subsequent rainy seasons when climate change–exacerbated floods pose a significant threat. Diagnosis and prioritization of these structures will be carried out with the support of the Technical Assistance Consultancy Firm (TACF) being recruited with Project Preparation Advance (PPA) funds. As recommended by the SNESB, this subcomponent will help establish the national dam emergency response brigade to institutionalize these tasks and will support framework contracts with construction contractors to enable quick mobilization until the brigade is effective.

Component 2: Development of Climate-smart Hydro-Agricultural Infrastructures (US$14.72 million equivalent)

31. **This component will support the improvement and expansion of water-related services and economic benefits from dams in drought-prone areas,** especially from dams rehabilitated under Component 1. It will include (i) rehabilitation and expansion of climate-smart irrigation infrastructure and irrigated perimeters to improve access to water during droughts, (ii) support to improve water use efficiency, reducing GHG emissions and increasing the volume of water available to act as a buffer during periods of drought, and (iii) fish farming in the rehabilitated water reservoirs to improve food security. The design of this component will build on lessons learned under the Sahel Irrigation Initiative Support Project (SIIP-P154482) and the Agriculture Resilience and Competitiveness Project (ARCP -P167945), collaborating closely with existing WB-funded agriculture projects (FSRP-BF-P172769, ARCP, and PRECEL-P178598) to ensure that irrigation development supports agricultural productivity improvement within targeted value chains. This component will emphasize access to irrigated land and the productive use of water for women, especially through local women's organizations. These activities will reduce risks of food insecurity accelerated by increased dry land and diminished precipitation and will consider secondary water quality applications for irrigation and fisheries to promote drought resilience.

Subcomponent 2.1: Development of climate-smart irrigated perimeters (US$13.39 million)

32. **This subcomponent will rehabilitate and develop 788 ha of irrigated perimeters and ensure the efficient development of irrigated land for intensive, environmentally friendly, and climate-smart agriculture.** It will support the development of such land by supplying gravity-fed irrigation water from the reservoirs rehabilitated under Component 1, which will enable offsetting existing diesel pumping for irrigation. The subcomponent will improve access to a drought resilient water supply through (i) the rehabilitation of existing irrigated perimeters (259 ha), and (ii) the development of new irrigation schemes (529 ha). The works for this component will be procured and implemented within the contracts targeting rehabilitation of priority dams under Component 1.

Subcomponent 2.2: Support to agricultural and fish production and to the management of irrigation schemes (US$1.33 million)

33. **This subcomponent will support adequate O&M of irrigation perimeters as well as fish production, benefiting from water resources secured under Components 1.** This subcomponent will ensure community consultation and capacity building toward the sustainable use and management of irrigated perimeters for drought resilient agricultural production. It also will leverage the newly available water supply from rehabilitated dams to increase fish production toward food and nutrition security through a local, climate resilient source of protein, and to fight against malnutrition and stunting.[51] Activities of this subcomponent will include (i) building 10 fishponds and hatcheries to increase fish production and the supply of quality fry and fingerlings; (ii) building 15 modern fish enclosures and floating cages to strengthen the fisheries' halieutic potential; (iii) stocking 15 dams to improve fish production and help maintain the ecosystem balance of water bodies; (iv) supporting fish processing to improve their storage; (v) allocating operational permits to private fisheries and

[51] A. Bennett et al. 2021. Recognize fish as food in policy discourse and development funding – Ambio.

irrigation enterprises, and (vi) building capacity for the management, operation, and maintenance of Project irrigation schemes. Through the establishment of an inter-ministerial committee, the Project will work closely with the General Directorate for Agro-Pastoral and Irrigation Development (DGADI—*Direction Générale des aménagements Agro-pastoraux et du Développement de l'Irrigation*) and with other WB-funded agriculture projects (ARCP, FSRP, and PRECEL) to ensure they boost agricultural and fish production in the project areas. These projects will, among others, support agricultural inputs (improved seeds, fertilizers, and fish feed), small-scale farming equipment, access to commodity drying areas, storage facilities and agroprocessing equipment, and proper valorization of project assets.

Component 3: Integrated Watershed Protection and Management (US$10.31 million equivalent)

34. **An integrated management approach will be implemented in the watersheds of the reservoirs to be rehabilitated by the project,** to protect them from sedimentation, progressive filling, and loss of storage capacity, leading to increased water availability during droughts and reduced climate-exacerbated flood vulnerability. Income-generating activities for the benefit of local populations will be included to ensure their engagement and promote resilience by sustainably increasing the productivity of agro-sylvo-pastoral activities, while also reducing pressure on water bodies and the reservoir catchment area. The approach will consist of (i) carrying out, under the leadership of the relevant RBA, a participatory diagnostic and planning process with local stakeholders (CLE, WUCs, users of natural resources, and local authorities) to identify in a concerted manner the most critical sites requiring intervention and remedial actions to reduce land degradation and erosion; and (ii) elaborating and implementing, in a participatory manner, Integrated Watershed Development and Management Plans (PAGI—*Plans d'Aménagement et de Gestion Intégrée du Bassin Versant*). The project will target up to eight watersheds of dams (given available resources), focusing on those hosting dams with high economic value and showing a high rate of reservoir sediments and watershed erosion, grouping intervention areas for greater impact.[52] Activities aim to reduce conflicts between land users by facilitating consensus-based agreements on land use.

Subcomponent 3.1: Participatory planning for integrated watershed management (US$0.86 million)

35. **The elaboration of PAGI will be carried out according to a participatory and bottom-up process of diagnosis and planning.** This implies the inclusion of all natural resource users of the reservoir's watershed (farmers, sedentary herders, pastoralists, fishermen, hunters, non-timber forest products operators, rural microenterprises, etc.), mostly represented in CLEs. The identified actions will consider the diversity of users and uses of resources in an integrated manner, through an approach that strengthens social cohesion. The first stage in the diagnostic is a deep analysis of spatial data to produce risk maps for climate vulnerability (land degradation, erosion, and siltation), as well as the critical sites for intervention (cross-referencing data on land use, soil types, and topography). The second stage is a participatory and inclusive process of consultation and planning of activities with local stakeholders. This consists in organizing sessions at the local level (village and municipality), where the critical sites are located, to (i) confirm the conclusions of the spatial data analysis; (ii) analyze, with local stakeholders, the occupation, use, and level of land degradation, and understand the main sources of climate vulnerability, erosion, and land degradation; (iii) identify the resource users on the sites at risk; (iv) identify and plan the actions to be implemented to address risks (taking into account previous land use as recorded in planning instruments and its land tenure, and the resilience of the proposed interventions); and (v) agree on the distribution of roles and responsibilities for the implementation and monitoring of identified actions.

36. **To elaborate the PAGI, the identified actions will then be evaluated and prioritized based on the available budget and their impact on addressing sedimentation and pollution**. The PAGI will be validated by the RBA, CLE and WUC, with the relevant municipalities and the decentralized technical services in charge of agriculture, animal resources, environment and water. This subcomponent will support one RBA to elaborate a SAGE supporting the integration of PAGI measures, as well as in the municipal development plans (*Plans Communaux de Développement*) during their renewal. The strengthening of the organizational and technical capacities of the RBA, CLE, and WUC will be financed through Component 4.

Subcomponent: 3.2: Integrated watershed management (US$9.45 million)

37. **The PAGI will be implemented by the RBA, CLE, WUC, and producers of the watershed in collaboration with other local stakeholders.** The PAGIs will determine the activities to be financed according to the specificities of the sites. Categories of possible activities include (i) mechanical and biological anti-erosive water and soil conservation measures to

[52] The watersheds initially targeted are those of the following dams: (i) Lou; (ii) Nambeguian, Kouila, Gaskaye, Nagreongo; (iii) Manga, Gogo; and (iv) Nobili.

reduce surface runoff during flooding events; (ii) vegetation cover restoration measures to fix the soil and reduce erosion; (iii) protection measures for the banks of reservoirs and watercourses;[53] (iv) hydro-agricultural developments to reduce water erosion and improve the livelihoods of local populations; and (v) facilitating consensus-based agreements on land use, including potential development of grazing areas and corridors (including for livestock to the reservoirs).[54]

38. **The PAGI will also include accompanying measures such as communication campaigns** and trainings to raise awareness about pollution (agriculture, mining), climate change–exacerbated floods and droughts, unsustainable practices, and the management of invasive plants. To ensure the sustainability of the implemented activities, the PAGI will also finance the securitization of land and the establishment of management committees for the investments supported.

Component 4: Climate-smart Sector Reforms and Operationalization of the National Strategy for Dams (US$7.82 million equivalent)

39. **This component will support legal and institutional strengthening and capacity building to enhance water security in Burkina Faso.** It will contribute to operationalizing the SNESB in terms of legal and institutional frameworks as well as processes, tools, and financial and human resources. Doing so, this component will expand the benefits of the project to all dams of the country, beyond those considered under Component 1. This component will also help sustain and scale up the systemic (upstream-downstream) sector approach promoted by the project that integrates watershed, storage, and irrigation services to maximize socioeconomic benefits and improve livelihoods in a climate resilient manner. It will also support improving the monitoring, operation and maintenance of dams and irrigation schemes, and support the increased participation of female decision makers and leaders in local community bodies.

Subcomponent 4.1: Supporting climate-smart sector reforms and strengthening the institutional framework (US$5.04 million)

40. **This subcomponent will support preparing the legal and institutional framework for the management of climate-resilient dams and core irrigation infrastructures at the national, regional, and local levels,** within an integrated and systemic approach to the management of dams. Strengthening this sector framework is essential to ensure the sustainability of mobilized water resources in the medium and long run in Burkina Faso, while increasing water availability and reducing flood vulnerability. The project will support the government in operationalizing the SNESB at national (strategic and operational), regional, and local levels.

41. **Consolidating the national vision for the safety, operation, and maintenance of dams, and developing regulatory texts for the SNESB:** based on a review of existing capacities and practices, an action plan for operationalizing the SNESB will be prepared, including (i) the legal and regulatory texts deemed necessary to clarify the roles and responsibilities for dam safety and maintenance; (ii) relevant institutional changes (including creation of emergency/rapid response dam repair brigades and management of early warning systems and disaster risk); (iii) a list of processes and quality control procedures to be improved or developed (including how to finance O&M and safety of dams); (iv) a description of the associated resources to be adapted or mobilized (staff recruitment or reallocation, financing, IT tools, equipment, etc.); and (v) a training and capacity-building plan. The project will support the implementation of the detailed action plan at organizational, institutional, and legal levels, including support to (i) develop the laws, decrees, and orders deemed necessary in these fields and (ii) develop water police and monitoring services to enforce compliance with water regulations. This subcomponent will also strengthen cooperation with hydrometeorological services and IWRM Directorate of the MEEA to further support integrated management of water resources and early warning systems.

42. **Securing land tenure will involve mapping land tenure associated with dams toward their integration into the country's cadastral plan.** Land tenure will be secured at the sites under subcomponents 1.1 and 2.1, with associated perimeters and a map drawn for this purpose. For its operational implementation, a collaboration protocol will be signed between the Project Implementation Unit (PIU) and the Tax General Directorate (*Direction Générale des Impôts*).

[53] In the event some riverbanks are occupied, they could, through consensual agreements among the population, be liberated or the land use changed to ensure their protection. In those cases, the PAGI would include compensatory measures for the producers involved.
[54] Activities to address overgrazing and minimize conflicts between sedentary land users and pastoralists will coordinate closely with the PRAPS (P173197), especially to capitalize on their mapping of the optimal location of pastoralist/livestock water points along migration corridors.

43. **The project will also support developing legal and supportive materials for establishing a water fund dedicated to the O&M of dams,** as recommended by the SNESB. This activity will develop synergies with the next Development Policy Operation (DPO) in Burkina Faso to seek legal approvals of the legal texts that will be prepared by the project and budget support at the national level.[55] This fund will be used to finance the subsector and will secure a budget allocation for dam safety and O&M safety and will be also supported by a share of the water fees collected by River Basin Agencies.

44. **Establishing and strengthening local institutions**: This sub-component will support the establishment and the dynamization of (i) CLEs at the sub-basin level, and (ii) WUCs, with representatives of local water users in the dam's area of influence, and relevant to each rehabilitated dam and to 50 other WUCs. CLEs will help to coordinate watershed and IWRM project activities (including monitoring of water resources), while WUCs will be responsible for day-to-day dam maintenance. This subcomponent will also support setting up (i) Irrigator Committees (ICs) to ensure sustainable use and routine maintenance of the facilities, and (ii) simplified cooperatives to manage fish pens and ponds to ensure the sustainability and profitability of investments in fish production.

Subcomponent 4.2: Capacity building (US$2.78 million)

45. **Capacity building activities will contribute to the operationalization of the existing and reinforced national and regional institutional setup.** With the objective of expanding and sustaining impact on the ground, this subcomponent will include (i) strengthening the technical, financial, and administrative capacities of national and regional actors in adequate monitoring and O&M of hydraulic infrastructure; (ii) providing on-the-job local and regional training in the routine surveillance and maintenance of hydraulic structures; (iii) strengthening academic and vocational training and supporting research programs in dams' design, supervision, and rehabilitation; (iv) strengthening key operators (including dam repair brigades) and institutional entities with equipment and materials deemed required to implement their O&M duties; and (v) facilitating south-south exchanges and partnerships on dam safety. Training may be carried out in partnerships with universities and training centers. This subcomponent will also support (i) the organization of a library of guidelines and manuals on dam safety and O&M, (ii) the reinforcement of central and decentralized services responsible for independent control of dam safety, and (iii) the reinforcement of the national committee of dams to advise the government and the DGIH on dam safety matters (composed of national experts, with support from the International Commission on Large Dams [ICOLD]).

46. **Local institutions (CLEs, WUCs, and ICs) and communities will be trained in dam surveillance and basic maintenance,** which are essential for the long-term safety of water storage assets. Training courses will be deployed to all local entities benefiting from project activities, including training and providing WUCs with basic maintenance and surveillance equipment and climate change considerations. Training kits and communication materials on these topics will also be made available nationally. Trainings in the early stages of Project implementation will also help build a community's ownership of the Project objectives and the shared vision on its benefits.

Component 5: Project Management, Environmental and Social Measures, and Consulting Services (US$25.08 million equivalent)

47. **This component will support additional studies and consultancy services, implementation of project safeguard requirements, and project management.** This will include, but not be limited to (i) the operating cost of the PIU; (ii) TACF; (iii) Design and Supervision Engineering Firms (DSEFs) that will support the preparation of complementary technical studies, tenders, procurement, and supervision of works; (iv) consultancy firms to update and prepare complementary environmental and social (E&S) studies as deemed required; and (v) implementation of project safeguards requirements (including financing any land expenditures and resettlement compensations up to an approved amount of US$ 1.20 million). With the support of the PPA, complementary studies and bidding documents for around seven sites will be prepared by the time the project is submitted to the World Bank Board of Administration. This component will support preparation of studies for the next tender packages (on average around ten sites will be tendered per year). This component is subdivided into three subcomponents: 5.1. Design, control, and supervision of works (US$8.83 million); 5.2.

[55] Note that no International Development Association (IDA) funds will be directly channeled to this Water Fund. The project will prepare legal texts and operational procedures.

Implementation and monitoring of project safeguard requirements (US$5.30 million), and 5.3. Project coordination and management (US$10.95 million).

48. **Project coordination and management include training for personnel in resource management and various aspects** of project execution, such as procurement (equipment, geographic information system, and others), financial management, monitoring and evaluation (M&E), and the use of software systems. Burkina Faso will ensure that other funds, facilities, services, and resources required for the Project, and necessary or appropriate to enable the PIU to fulfill its obligations under the Project, are provided promptly as required. The counterpart funds for the Project are provisionally estimated at US$2.74 million for potential costs related to the field mobilization of other national and regional counterparts.

Component 6: Contingent Emergency Response Component (CERC) (US$0 million)

49. **This component will provide immediate response to an Eligible Crisis or Emergency, as needed.** The component will finance emergency works in the case of a disaster event by including a "zero-dollar" CERC. This will help recover damage to infrastructure, ensure business continuity, and enable early rehabilitation.

50. **Summary costs of the components** of the project (US$ million)**:**

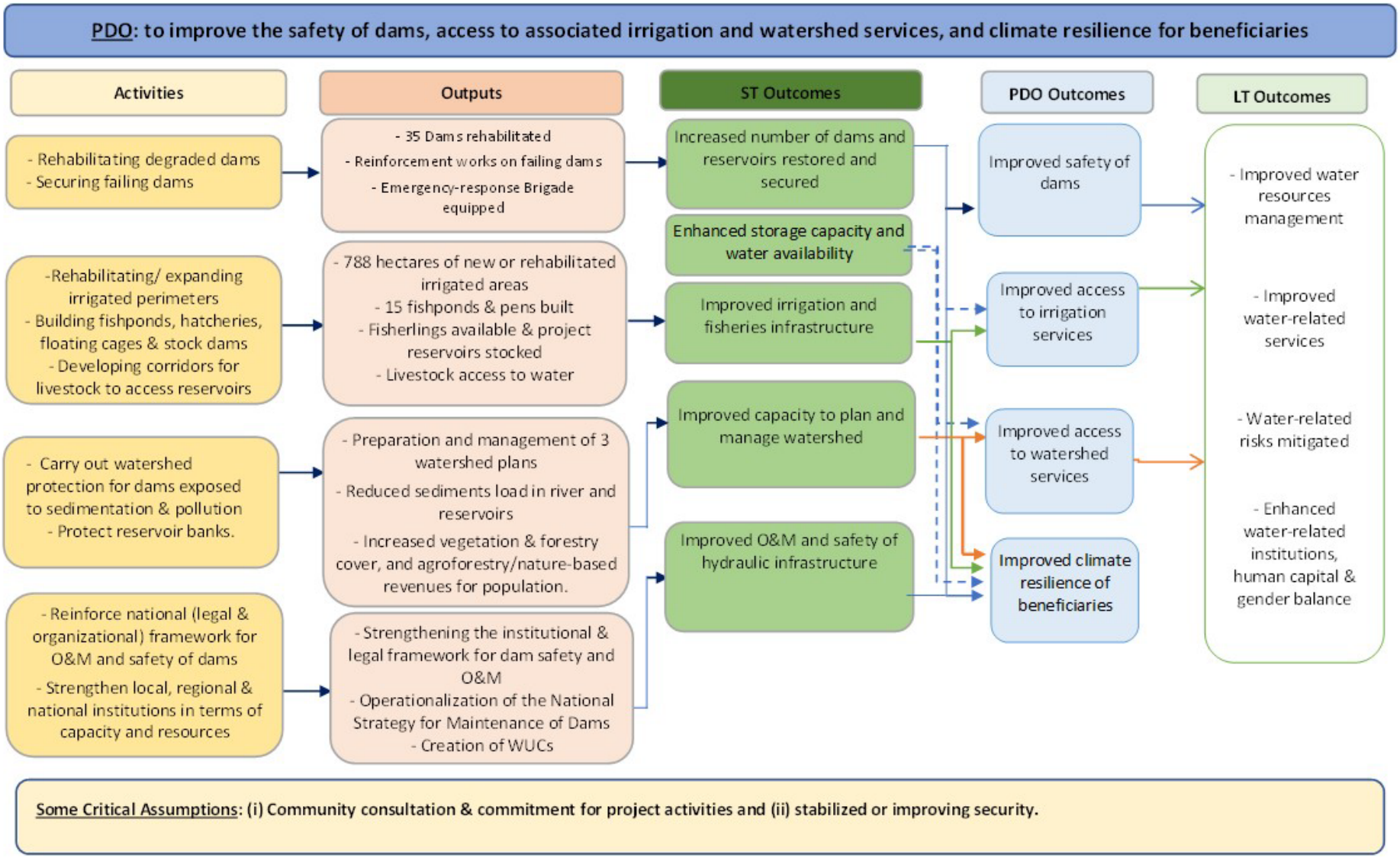
Project Components	Project cost $m
Component 1: Security and Climate Resilience of Water Storage Infrastructures	92.07
Component 2: Development of Climate-smart Hydro-Agricultural Infrastructures	14.72
Component 3: Integrated Watershed Protection and Management	10.31
Component 4: Climate-smart Sector Reforms and Operationalization of the National Strategy for Dams	7.82
Component 5: Project Management, Environmental & Social Measures, and Consult Services	25.08
Component 6: Contingent Emergency Response Component	—
Total	**150.00**

C. Project Beneficiaries

51. **It is estimated that around 1.6 million Burkinabes will benefit from the Project activities, including direct, indirect, and institutional beneficiaries.** Direct beneficiaries (1 million) will include (i) households, Internally Displaced Persons (IDPs), farmers, livestock breeders, fish farmers, and fishermen and women, benefiting from improved water storage, irrigation, and watershed services, and (ii) all institutional staff who will be directly involved in project activities and/or who will be benefit from training. Around 30,000 farmers will have access to new or rehabilitated irrigation and drainage services in the zones of command of rehabilitated dams, and around 1,000 fishermen and 500 livestock breeders will benefit from the project. Indirect beneficiaries will include (i) the population involved in agricultural, fisheries, and pastoral value chains; (ii) personnel of the institutions involved in project activities; and (iii) consultants and employees of the companies involved in project construction and consultancy activities.

52. **Institutional beneficiaries include** (i) MEEA; (ii) the WUCs; (iii) the ICs; (iv) breeders' and fishermen's organizations; (v) CLEs; (vi) municipalities who are responsible for water and land management, including securing land tenure on sites; (vii) Regional Directorates for Water and Sanitation (DREA), who are the project regional partners; (viii) River Basin Agencies for the protection of identified watersheds; (ix) the ministry in charge of agriculture, including the DGADI; (x) regional departments in charge of agriculture, animal resources, and the promotion of women and gender; (xi) the National Agency for Environmental Assessments (ANEVE-*Agence Nationale d'Evaluation Environnementale*); and (xii) nongovernmental organizations (NGOs). As part of project implementation, synergies and coordination will be developed among all stakeholders by the DGIH at the national level, by DREAs at regional levels and by municipalities at local levels.

Figure 1. Theory of Change for the Burkina Faso Water Security Project



D. Results Chain

53. **The Project will secure dams and associated water resources and enhance their benefits through irrigation and agropastoral services, improving the climate resilience of beneficiaries,** by (i) improving the safety, operational performance, and climate resilience of selected dams; (ii) restoring and increasing irrigated agriculture and halieutic resources in the dams' command areas, thus providing access to water in times of drought; (iii) protecting water resources and watersheds upstream of dams, including through sustainable land and water management; and (iv) improving national, regional, and local capacity and strengthening institutions for maintenance and dam safety. The Project will also strengthen the resilience of populations to climate variability and shocks by minimizing the degradation of structures and preserving water resources (see Annex 4). Sustainable access to water for domestic and productive uses will further improve living conditions and mitigate water-related conflicts. Figure 1 depicts the associated Theory of Change (ToC).

E. Rationale for World Bank Involvement and Role of Partners

54. **The value added of World Bank support is manifold, including** (i) the wealth of experience and knowledge gained in dam safety programs worldwide; (ii) global knowledge and technical expertise in dam performance and safety, and the ability to bring best practice and innovative approaches to bear; (iii) operational experience and lessons generated in the sector from Africa and beyond (including in Burkina Faso, India, Niger, Mali, Nigeria, Zimbabwe, Zambia, Ethiopia, Kenya, and Malawi); and (iv) extensive experience in the country's water sector.

55. **Dam safety is a classic public good. Public goods possess two important properties, non-rivalry and non-excludability, that together make their development based on private profitability extremely difficult.** Since the private sector is unlikely to fully provide such public goods, public resources and investment are needed. Furthermore, in the case of Burkina Faso, dam owners who are responsible for dam safety management are largely public, and the quality of dam safety is heavily dependent on the financial capacity of these public agencies. They require sufficient financial resources for regular operations, routine maintenance, continued surveillance, and capital expenditures for more significant maintenance or rehabilitation works.

56. **The project will seek to enable, attract, and capture the participation of the private sector.** The role of the private sector in the water sphere has been reinforced, so far, to mainly delegate water supply services in rural areas. Its role is limited in IWRM and dams, all developed under public financing. A few are valued and operated by private hydro-agricultural operators, such as the company, SN-SOSUCO (*Nouvelle Société Sucrière de la Comoé*), which grows sugarcane at the Comoe dam. Wherever deemed feasible, the project will explore supporting business development from other private agricultural operators (such as SOFATO—Faso Tomato Company) which relies on the Toece dam. Component 2 of the project will mobilize private contributions from beneficiaries for five percent of terminal irrigation canals and help secure land tenure of their plots, which will give them access to credits and private capital. As part of Component 3, elaboration of PAGIs will seek to determine ad-hoc in-kind and/or financial contributions by beneficiaries to ensure ownership (up to 15 percent). The following possible pathways to Maximizing Finance for Development (MFD-EP) were identified: (i) institutional support to facilitate private sector participation through the legal framework, including facilitating private concessions based on dams and support to the WUC status definition so they may engage with the private sector; (ii) working with private operators benefiting from water resources from the rehabilitated dams for the valorization of irrigation products; and (iii) fisheries' development with calls for proposals in collaboration with the WB-funded project PRECEL.

F. Lessons Learned and Reflected in the Project Design

57. **The project builds upon lessons from World Bank-supported operations in Burkina Faso,** including the WSS PforR, which provides valuable lessons in terms of absorption and implementation capacity, including E&S due diligence by firms and contractors. As learned during the implementation of the SIIP, selection of the most cpontext-appropriate crops and irrigation technology, corresponding to a positive internal rate of return, is essential to mitigate high irrigation unit costs in the subregion. The project will also account for lessons from the ARCP and the Regional Sahel Pastoralism Support Project (P147674) to ensure that water points for cattle corridors are sustainable and secured. The proposed holistic approach is informed by background analytical works and lessons learned from the Burkina Faso Water Development to

2030 Sector Note (P174857), and from projects across the region over the past decades. The comprehensive approach is also in line with a recent WB flagship report (a New Paradigm for Water Storage) that calls for "an integrated, systemic approach to planning and managing water storage to achieve sustainable, climate-resilient water storage solutions that sustain generations." Component 3 of the project also draws from lessons from 20 years of global experience in watershed management at the World Bank, including from the WB-funded Sahel Integrated Lowland Ecosystem Management project implemented in Burkina Faso (P070871), which demonstrate the importance of engaging the users of the watershed in design and implementation through a participatory diagnostic and planning process.

58. **The project builds on global approaches as outlined by the Water Security Diagnostics initiative and leverages experiences of other water security projects in West Africa.** The project supports all three building blocks of water security: (i) managing water resources by securing water storage assets and improving IWRM; (ii) delivering water-related services by supporting irrigation and fishery activities; and (iii) mitigating water-related risks through the rehabilitation of at-risk dams, gathering water and climate information, and strengthening the institutional responsibilities to prevent and respond to failure events in the future. The proposed project also aims to address water security challenges in a client-responsive and adaptive way. Where water security engagements in Niger, Togo, and Côte d'Ivoire had a strong focus on WSS services as part of the "service delivery" pillar, in Burkina Faso these services are being provided through the WSS PforR. Therefore, the proposed project will address remaining gaps in bolstering water security through a focus on securing dams and associated water resources, irrigation and agropastoral services. Building on these experiences, activities were prioritized through multi-sectoral dialogue to reflect the different facets and uses of the water resource.

59. **Lessons learned from dam safety projects have emphasized the importance of a robust design, the involvement of qualified engineers and contractors, proper contracts, and effective work supervision.**[56] Implementation of remedial measures will be guided by the principles of proportionality of risks and should therefore be proportionate to the size, complexity, and potential risk of each dam (as recommended by the ESF and good international practice, such as from ICOLD, *Comité Français des Barrages et Réservoirs*, the United States Bureau of Reclamation, and the United States Army Corps of Engineers). A panel of two national dam safety experts will oversee the risky dams to comply with EES4-Annex 1 and associated Good Practice Notes. World Bank products like the "Decision-Support Tool to Inform and Assess Regulatory Frameworks for Dam Safety Assurance"[57] that has been applied in several countries, and the Technical Notes on Small Dams and Stakeholders Engagement under preparation will help inform the preparation and adoption of the new legal and regulatory framework under Component 4. Lessons learned from large national dam safety programs and dam rehabilitation projects have also been integrated (such as from India, Viet Nam, Sri Lanka, and Brazil).

60. **Reasons for frequent past failure of irrigation projects are well known and will be addressed by the project.** Projects in Africa have failed mainly due to (i) insufficient participation of beneficiaries in project design, (ii) poor implementation capacity of the public sector resulting in delays and cost overruns, (iii) poor design and absence of construction oversight, (iv) insufficient attention to operation and maintenance, (v) retention of low valued agricultural production systems even after irrigation is in place, and (vi) inadequate attention to profitability at the scheme and farm levels. In cooperation with other WB-supported agricultural projects, the project will address each of these systematically while also considering potential climate change impacts in irrigated agriculture. Some agronomic improvements can also increase the feasibility and valuation of irrigation. These include, for example, irrigated rice under alternate wetting and drying or by upgrading cropping strategies to foster their climate resilience.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

61. **The Ministry of Water, Environment and Sanitation (MEEA) will be responsible for the technical supervision of the project, through the General Directorate for Hydraulic Infrastructure (DGIH).** An autonomous Project Implementation Unit (PIU) will be established and will manage all aspects of the project (procurement, financial management, safeguards,

[56] With similar features, lessons learned from The Zambia Water Resources Development Project (P114949) have been particularly integrated in this project.
[57] http://hdl.handle.net/10986/38070.

technical, etc.) with the support of decentralized (regional) services and consultants (such as DSEFs and TACF). The project will also support identification and recruitment of complementary and perennial staff as needed.

62. **Project management and implementation will be carried out in close coordination with other ministries and directorates such as** (i) the Ministry of Agriculture, Animal and Halieutic Resources (MARAH), especially the Irrigation Development and Agropastoral Works General Directorate (DGADI) for irrigation and agropastoral activities and the General Directorate for Halieutic Resources for fisheries activities, and (ii) other MEEA directorates such as the Water Resources General Directorate (DGRE). The decentralized agencies of the MEEA such as River Basin Agencies and associated Local Water Commissions (CLE) and Water User Committees (WUC) will also be actively involved. The Ministry in charge of Finance (MEFP – *Ministère de l'Economie, des Finances et de la Prospective*) through the General Directorate of Cooperation, the General Directorate of Economy and Planning, and the General Directorate of Treasury and Public Accounting will also be involved regarding financial aspects. Throughout project implementation, local municipalities will also be actively involved given their local involvement in the water sector (including in WUCs).

63. **A Project Steering Committee (PSC) will be established by MEEA to provide government oversight and strategic guidance to the PIU.** The PSC is chaired by the person responsible for the "Hydraulic development" budget program, and its members will convene twice a year or as needed through an extraordinary session, during project implementation. The PSC will monitor progress, address new difficulties, and suggest mitigation strategies. Additionally, its functioning will be built on existing experiences in the sector for partner-financed projects. Annual work programs and the project budget will be reviewed and approved by the PSC. Annex 1 includes further details on Project Implementation Arrangements.

B. Results Monitoring and Evaluation Arrangements

64. **Overall responsibility for collecting and consolidating monitoring and evaluation (M&E) data will lie with the PIU, DGIH and the structures in charge of planning at MEEA and MEFP,** which will be strengthened to monitor project processes and results. The project results framework will form the basis for tracking progress on project outputs and outcomes. Remote supervision tools through the Geo-Enabled Initiative for Monitoring and Supervision (GEMS) will be embedded in the M&E framework. As part of the overall Project Implementation Manual (PIM), an M&E sub-manual will be prepared before implementation where roles and responsibilities for data collection, aggregation, and reporting will be detailed, as well as the M&E tools. In addition, the PIU will be required to submit progress reports, which will cover the implementation status and challenges, recommended solutions, procurement and disbursements, and implementation of environmental and social safeguards.

65. **The World Bank will provide implementation support and monitor project results and outcomes on a regular basis to evaluate the achievement of the Project Development Objective (PDO).** A midterm assessment will be undertaken to analyze the project performance in reaching its development objective and ensure that lessons learned thus far are considered in implementation over the remaining period. Following the closure, a project completion report will be prepared in accordance with World Bank guidelines.

C. Sustainability

66. **By adopting a systemic and upstream/downstream approach, the Project will promote sustainability in its various dimensions.** The Project will enhance technical and operational sustainability by (i) preparing a legal, regulatory, and monitoring framework for dam safety and building the capacity of institutions; (ii) integrating integrated water resource management (IWRM) and good governance principles; (iii) considering the effects of climate change in project implementation, including for dams' rehabilitation design and flood management; and (iv) developing partnerships and dialogue with stakeholders. The Project will also promote (i) institutional sustainability through the involvement of beneficiaries and local authorities and gender mainstreaming in project implementation, including by creating and operationalizing WUCs and by strengthening Irrigation Committees, Agricultural and Fish Cooperatives; (ii) environmental sustainability, through integrated watershed protection, labor intensive works, and management actions to reduce siltation of dams and reclaim degraded land; and (iii) financial sustainability through the preparation of a water fund to implement the National Strategy for Maintenance and Safety of Dams (SNESB) through improved dam operation and

maintenance. In terms of security, the project prioritized sites in most secured parts of the country, while applying all recommendations of the Security Management Plan (SMP).

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic, and Financial Analyses

Technical Analysis

67. **The Project has been technically designed to address the most pressing challenges in the safety and maintenance of dams in Burkina Faso,** including rehabilitation of priority assets and strengthening operation and maintenance (O&M) and surveillance. Proposed interventions for each dam under Component 1 will be based on the results of a sound and resilient design in line with international good practice, and the execution of works will be supervised by qualified engineers, supported by the TACF. In terms of studies, detailed designs of 32 of the 35 priority dams are available (including review of hydrological studies considering climate change) and have been reviewed by dam safety experts. Their comments are being integrated by DSEFs while preparing tender packages. The DSEFs will be responsible for preparation of the dam safety plans for all dams in Risk Categories II and III according to the National Strategy for Maintenance and Safety of Dams (SNESB). As per World Bank Dam Safety Good Practice Notes guidelines, Construction Supervision and Quality Assurance Plans (CSQAP) will be prepared prior to distributing the Request for Proposals for works. The O&M and Emergency Preparedness Plans (EPPs) will be prepared before starting the rehabilitation works (including a specific section for dam operation and flood management during the works). Instrumentation plans will be integrated into the O&M plan. The standard table of contents for the CSQAP and the EPP, as well as the ToR for the DSEF to integrate these requirements, have been cleared by the World Bank. Downstream risks have been assessed in case of dam breaks to prepare, where deemed required, associated dam safety plans commensurate to the risk and as per World Bank Dam Safety Good Practice Notes and Templates.[58]

68. **To address the institutional aspects, the project will support central structures and decentralized structures of the MEEA (DGIH, DGESS, DGRE DREA, AE), MARAH (DGADI, DGRH), the MEFP (DGCOOP, DGEP, DGTCP), and WUCs in enhancing their managerial and operational skills.** This will be achieved by implementing the well-designed SNESB—horizon 2023–2027. Five maturity matrices that cover different elements of the project in terms of dam safety—governance, training, surveillance, dam maintenance, and emergency preparedness—were prepared for the dam owners and operators with the intent to provide a structured approach to (i) assess the effectiveness of the dam safety project activities against the SNESB and good international industry practice (GIIP), (ii) identify and prioritize areas for improvement in the 2023 dam inventory, (iii) compare the performance of the project activities over time, (iv) contrast project effectiveness across the different regional directorates in charge of water, (iv) inform the prioritization of resources for dam safety improvement, and (v) communicate the effectiveness of the dam safety program to wider audiences.[59] Progress for each dam, depending on its risk category, will be tracked regularly with updated matrices.

69. **The project will strengthen the risk management process for the whole national dam portfolio.** This includes the establishment of necessary regulations, procedures, information systems, capacity-building programs, and tools. The project will also (i) provide guidelines on dam conception, design, surveillance, maintenance, and emergency preparation, and (i) initiate a perennial dam safety program that will assess and prioritize interventions on a rolling basis.

70. **The irrigation infrastructures to be rehabilitated or extended are irrigation perimeters** with total water control, mainly gravity fed. In order to reduce irrigation infrastructure costs, while taking into account the sustainability and adaptation of the technology to smallholder farmers, the project will analyze alternatives as currently promoted in the country, including masonry canals, and semi-Californian irrigation, depending on the topography and the distance from the water source. In all cases, the design firms will be asked to design economically viable options and stakeholders

[58] Two dams listed as large in Annex 2 and seven small ones with downstream risks (categories 2 and 3 from GoBF classification.
[59] The results of applying these maturity matrices to the 35 dams for rehabilitation are available in a separate background document.

(farmers) will choose the option that suits them best. Special care will be given to contract management to meet targeted timelines, while limiting requests for addenda.

71. **The operation is aligned with the goals of the Paris Agreement** on both mitigation and adaptation.

- **Assessment and reduction of adaptation risks:** The main climate risks likely to have a material impact on the operation (including assets and services) and its PDO are extreme heat, droughts, and floods. The project design takes these climate risks into consideration and aims to mitigate them through (i) integration of climate change considerations in technical studies; (ii) rehabilitation of 35 dams, including installing instruments for monitoring the status of dams, measuring the quantity and quality of water resources (on-site and upstream), and/or supporting early warning systems to improve the dam's capacity to mitigate floods and provide water storage during droughts; (iii) reinforcing dams at imminent risk of failure to protect infrastructure and beneficiaries downstream during flood events; and (iv) the rollout of hydromet and early warning systems, and capacity building for climate-informed management and decision-making to improve timely flood and drought management. The project will rehabilitate irrigated perimeters for agriculture to enhance resilience to climate change–exacerbated droughts and floods and support fish and sylvo-pastoral production to improve food security. The participatory development of PAGIs and their implementation will build community and water user resilience by improving flood and drought management. Further, the development of upstream and downstream services around the rehabilitated dams will bolster farmers' and other users' resilience in the face of droughts and floods, improving water availability and promoting efficient water use measures. All infrastructure activities will follow the principles outlined in the Resilient Water Infrastructure Design Brief to ensure the infrastructure itself is able to withstand climate change–exacerbated floods, droughts, and extreme temperatures. With these risk mitigation efforts in place, the residual risk of climate hazards having a material impact on the project is low.

- **Assessment and reduction of mitigation risks**: All Project activities are universally aligned, and the Project is at "Low Risk" of having a negative impact on the country's low greenhouse gas (GHG) emissions development pathways. The Project will support the development of the PAGI and the implementation of PAGI activities targeting sustainable land management and reforestation that will sequester carbon and utilize gravity-fed irrigation, which will replace diesel-pumped irrigation schemes, leading to emissions reductions. No additional water storage will be created as the activities focus on the rehabilitation and restoration of priority dams, along with local ecosystems surrounding the dams, which will limit GHG emissions produced. The rehabilitation of dams will not promote expansion into areas of high carbon stocks or high biodiversity and is universally aligned. Fish production/value chain activities are outside Project scope and rather will be implemented by the PRECEL, so associated mitigation risks have not been included in the project assessment. The World Bank Water Global Practice GHG model and Ex-Ante Carbon-balance Tool (EX-ACT) were used to estimate GHG emissions due to the Project, with a 30-year economic lifetime compared to a scenario without the Project. The net GHG emissions are estimated at -1,017,361 tCO2-eq (tons of carbon dioxide equivalent) over the 30-year life of the Project. Gross emissions are expected to be -909,004 tCO2-eq. Net annual average emissions are estimated at -33,912 tCO2-eq.

Economic and Financial Analyses

72. **Project benefits.** The Project is expected to benefit the population and the economy of Burkina Faso through the following benefits. Component 1 will secure 60 million m^3 of surface water through the rehabilitation of 35 dams, hence avoiding future failures and associated losses including: (i) loss of economic assets and revenues; (ii) damage to public and private properties; and (iii) loss of human life. Rehabilitated dams will also effectively limit future downstream flood damages by capturing runoff water upstream. Component 4, by strengthening the institutional framework and capacities related to dams O&M and safety, will not only consolidate the benefits of Component 1 but expand them nationally. The rehabilitated and expanded services in dam command areas for irrigation (788 ha) and fishery (under Component 2), and the 5,000-ha watershed protection and water pollution measures (under Component 3) will generate significant economic flows that will support rural development, rural incomes, employment, and food security. In addition, vulnerable groups, including women, will benefit from substantial and stable incomes through the creation of market gardens (Component 3). Finally, the benefits of the project lie in the quest for financial autonomy in the sector, notably through the preparation of a water fund under Component 4, as well as strengthening scope and recovery of water levees collected by RBAs.

73. **Methodology and key assumptions.** A cost-benefit analysis was conducted to assess the economic rate of return (EIRR) and net present value (NPV) of all measurable activities carried out under the project. The assumptions and parameters of the economic calculation draw from national planning documents and statistics reports. Under Component 1, rehabilitation will secure additional storage and water volume, which in turn will allow for revenue generation in livestock and fishing. The analysis estimates the losses and damages to the environment and infrastructures avoided due to prevented dam breaks and flooding. To estimate flooding and dam break risks, the analysis draws on existing literature, including the dam classification led by the DGIH on the 35 target dams. Two scenarios are foreseen in case of flooding: either the dam breaks and causes significant damages quantified as part of the analysis, or it is degraded, leading to major increases in O&M costs. For irrigation investments, rehabilitations are assumed to take less than a year during the dry season, allowing farmers to cultivate during the following rainy season, which will improve the efficiency of water use and number of seasons that can be cultivated. Irrigation expansion will help farmers improve crop selection and the number of cultivation seasons with considerations for water and fertilizer use efficiency. For watershed restoration, the analysis used a representative sample of productive activities (3,500 ha of stone barriers, 700 ha of lowlands, and 350 ha of market gardens).

74. **Results of the economic analysis.** The project EIRR is 18.5 percent, with an NPV at discount rate of 10 percent of US$47.9 million and an NPV at 6 percent of US$106.3 million. These economic results are sufficiently satisfactory to fully justify project implementation. The contribution of each component to the overall profitability of the project is substantial. Component 3 has the highest EIRR (25.87 percent), but its NPV remains relatively modest (12.3 percent of total NPV). Components 1 and 4, which account for 60 percent of investments, have an EIRR of 19.8 percent, with an NPV representing 75.9 percent of the total NPV. Finally, Component 2 generates 11.8 percent of total NPV for an EIRR of 12.8 percent.

75. **Shadow price of carbon.** The economic analysis incorporated the impact of the Project on GHG emissions. When the shadow price of carbon (lower and upper bounds) is considered to assess the economic viability of the project, the EIRR increases from 18.5 percent to 22.1 percent and the NPV at 6 percent increases from US$106.3 million to US$149.1 million for the low estimate. For the high estimate, the EIRR increases to 25.3 percent and the NPV at 6 percent to US$191.7 million, showing that the project is not only economically viable, but also contributes significantly to the global public good.

76. **Sensitivity analysis.** The project economic indicators are sufficiently robust, as significant variations in the various factors, taken in isolation or in combination, do not challenge the project economic viability. In an unfavorable situation, with a combined variation of investment costs (+20 percent) and decrease in revenues (-20 percent), the EIRR remains at 12.4 percent, which is the lowest value achieved among all scenarios (accounting for increased probability of flooding, dam rupture, increase in investment costs, decrease in revenues).

77. **Financial analysis.** A financial analysis was carried out considering only the cost of physical implementation, that is, the cost of rehabilitating dams and facilities, as well as the cost of the various watershed level developments. For irrigation, economic prices were replaced by financial prices, which are the current prices of fertilizers, pesticides, and produce. Family labor is valued at 1,000 FCFA (*Franc de la Communauté Financière Africaine*) or US$ 1.65/workday, and the hydro-agricultural royalty is a flat rate of 100,000 FCFA or US$ 165/ha. For uses other than breeding and fishing, the profit margins of the production units are used. The financial results obtained show that the project Financial Internal Rate of Return (FIRR) is 9.1 percent, with an NPV at 6 percent of US$26 million.

78. **Readiness.** The Project Preparation Advance (PPA) funds have been leveraged to advance on effectiveness conditions and technical readiness to avoid delays in project start-ups. Key PIU recruitments are finalized or underway: procurement specialist, accountants, FM specialist and internal auditors have been recruited and invitations for application for technical specialists have been published. Detailed designs of 32 of the 35 priority dams are available and have been reviewed by dam safety experts. Template dam safety plans have been prepared and site-specific documents will be prepared by DSEFs before distribution of tenders for works.

B. Fiduciary

(i) Financial Management (FM)

79. **The PIU will have overall project FM responsibility.** The FM arrangements have been designed considering (i) Burkina Faso's recent political situation; (ii) the country's overall Public Finance Management (PFM) performance; and (iii) the minimum requirements under the World Bank Policy and Directive on Investment Project Financing, which describes World Bank policies and procedures for FM. The FM assessment was carried out in accordance with the Financial Management Manual for World Bank-Financed Investment Operations effective on March 1, 2010, and reissued on September 7, 2021. The capacity of MEEA/DGIH was evaluated to determine whether it 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.

80. **The assessment revealed that DGIH is unfamiliar with World Bank-funded projects,** and due to certain public financial management constraints that have yet to be resolved in Burkina Faso, implementing this project will require an autonomous PIU with specific FM arrangements. This will help to proactively address the risks associated with weak internal control mechanisms, hiring unqualified FM staff, and potentially misappropriating project funds. The Financial Management Action Plan in Annex 1 has been developed to mitigate the overall FM risks identified during the assessment. Subject to the implementation of the agreed action plan, **the overall residual FM risk of the project is rated as Substantial.**

(ii) Procurement

81. **Procurement will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers,** dated September 2023; "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants," dated July 1, 2016 (Anti-Corruption Guidelines), and other provisions stipulated in the Financing Agreement. Systematic Tracking of Exchanges in Procurement (STEP) will be used by DGIH for procurement planning, review, and no objection, including prior review procurements, as well as contract management information and complaints handling. All post review procurements will be uploaded in STEP in real time. The procurements not uploaded in STEP or/and not receiving World Bank clearance/No objection will not be eligible for project financing.

82. **Procurement arrangements, capacity assessment, risks, and risk mitigation for borrower/recipient are detailed in Annex 1.** The summary of the capacity assessment of the DGIH indicated that DGIH has experience implementing projects funded by financial partners, such as AfDB, WADB, the Islamic Development Bank (IsDB) or the Kuwaiti and Saudi Funds for Development, but has no experience implementing World Bank-financed projects. The overall procurement residual risk rating after implementing the mitigation measures is Moderate. Assessment will be continuous throughout the Project cycle and ratings will reflect the periodic assessments outcomes. The World Bank will provide continuous support to the PIU to ensure effective and efficient procurement implementation. Procurement arrangements for Component 3 are detailed in Annex 1 based on a capacity assessment of the Nakanbé River Basin Agency (*Agence de l'Eau de Nakanbé*).

C. Legal Operational Policies

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

83. **The project triggers OP 7.50 because some of the proposed investments will take place in the Nakanbé and Mouhoun river basins, which are part of the Volta River basin.** Project activities are limited to the rehabilitation of existing dams and development of 420 ha of new irrigated perimeters. The cumulative impact assessment demonstrated that the project will not affect the quantity and quality of water flows to other riparians and will not be affected by other riparians' water use. A notification was sent to the Volta Basin Authority on February 13, 2024, and the corresponding

Memo to West and Central Africa Regional Vice President was cleared on April 3, 2024. OP 7.60 is not applicable to this Project given the Project intervention area as defined in the PAD does not include any disputed areas.

D. Environmental and Social

84. **Although activities to be supported by the project are expected to have positive impacts, some are associated with potential environmental and social risks and adverse impacts that should be mitigated.** Potential risks and impacts are mainly related to (i) the safety of populated areas downstream of a few sites (number of sites under estimation) in the event of dam failure, and (ii) potential impacts of construction works for Components 1 and 2. For the latter, these may include (i) alteration of air quality by dust rising during rehabilitation of dams, and rehabilitation and construction of irrigation facilities; (ii) degradation of the sound climate due to excavation work, noise and vibration from moving of work vehicles and machinery; (iii) contamination of surface water and groundwater by residues of hydrocarbons, lubricants, oils and suspended solids, and agrochemicals (pesticides and fertilizers); (iv) risk of accidents and incidents (including injury and drowning) due to construction materials supply, the transport of equipment, and worker transportation; (v) exposure to hazardous waste; (vi) economic/physical displacement due to rehabilitation/construction activities and the establishment of buffer zone for dams sites; (vii) temporary or permanent disturbances to sources of income and livelihoods of communities in project areas; (viii) risks associated with labor use and labor influx; (ix) security risk in the northern part of the country; (x) risks of sexual exploitation and abuse and sexual harassment (SEA/SH); and (xi) potential transmission of infectious diseases, including COVID-19 and HIV/AIDS.

85. **The aggregated environmental and social risk classification (ESRC) is *High*** given the nature of activities that will be financed by the project and the high environmental and social risks and impacts that may result. The project will comply with the World Bank's ESF. The relevant standards are ESS1 to 6, ESS8, and ESS10. The government of Burkina Faso through DGIH, and with key stakeholders, has undertaken the preparation of environmental and social documents in a participatory manner. These are an Environmental and Social Management Framework (ESMF), a Resettlement Policy Framework (RPF), an Environmental and Social Commitment Plan (ESCP), a Stakeholder Engagement Plan (SEP), Labor Management Procedures (LMP), a Security Risk Assessment (SRA) and Security Management Plan (SMP), Environmental and Social Impact Assessments (ESIAs) for two dams (Nambeguian and Poedogo), and a preliminary ESIA for a large dam (Tangare). All these instruments were disclosed in-country by the Government of Burkina Faso (GoBF) and by the World Bank, respectively, on March 29 and April 3, 2024. [60]

86. **Site-specific ESIAs will be prepared for all project sites** and will be approved and disclosed as per World Bank requirements prior to the start of civil works. Finally, the SEA/SH action plan will be prepared, reviewed, disclosed and cleared at the latest three months after project effectiveness.

87. **Proposed security mitigation measures recommended by the SMP include** (i) regular information sharing and coordination with security actors; (ii) regular coordination and communication between the PIU, local authorities, and traditional community leaders; (iii) protocols for missions and incident response and regular training; (iv) securitization of worksites; (v) third-party supervision by a nongovernmental organization (NGO), if necessary; (vi) remote supervision through the Geo-Enabled Initiative for Monitoring and Supervision (GEMS), including a community monitoring mechanism; and (vii) temporary or partial suspension of project activities where the security situation deteriorates, with an openness to re-engage if conditions improve. In addition, site selection considered sites that are more secure and accessible. The project participatory approach is expected to build a safe operating environment through the consent, approval, and cooperation of local communities, especially the most vulnerable. Direct supervision by the PIU is possible in these areas; however, it may need to rely on supervision by its regional branches, as necessary. A security specialist embedded within the PIU will enable the constant update of security risk information and the application of risk mitigation measures.

88. **For the management of environmental and social risks of project activities,** the following qualified staff is required to be hired prior to effectiveness: (i) an environmental specialist; (ii) a social development specialist; and (iii) a security specialist, charged with all security monitoring/management aspects. The following staff is required to be hired at latest

[60] https://www.environnement.gov.bf

three months after effectiveness: (i) an occupational health and safety specialist; (ii) a technical manager for dam safety; and (iii) a part-time gender-based violence specialist who will address SEA/SH. Finally, four environmental and social (E&S) assistants will be hired to support the regional branches covering all the regions concerned by the project, at the latest, six months after effectiveness.

89. **The PIU will also employ a dam safety panel of independent experts** (with at least two high-level national experts and one international expert) who will advise on all technical aspects of dam rehabilitation, dam safety, technical design, technical report, and procurement document (bidding and contracts) reviews, construction details and procedures, operation/maintenance and dam safety plans as per ESF requirements, and development and implementation of reservoir sediment control strategies. The panel of experts will be appointed by the PIU by negotiations, in accordance with terms of reference acceptable to the World Bank.

90. **Citizen engagement** (CE) is integrated in the project design through consultations with project beneficiaries and an effective grievance redress mechanism (GRM). The consultations will inform the project implementation to ensure high participation and build beneficiaries' ownership. Beneficiaries' feedback through both the consultation and the GRM will ensure transparency and accountability and will be used throughout project implementation to allow for any needed course correction and to close the feedback loop with project stakeholders. CE will be primarily anchored around WUCs, as a platform to enhance water users' participation. Guides and materials for WUCs have been developed and describe clear mechanisms for beneficiaries' engagement (including dedicated secretary and deputy of the executive committee of WUC dedicated to women and the vulnerable population). General assemblies of project-supported WUCs will be held at least twice a year, with decisions documented and monitored by members. Besides WUCs, communities and municipalities in the project areas will be involved in their respective areas through project-related public consultations and meetings (including during update of ESIAs and Resettlement Action Plans [RAPs]). Female beneficiaries and vulnerable population (including Internally Displaced Persons [IDPs]) will be actively engaged with tailored consultations to ensure that their priority needs and identified actions and investments are taken into account. The preparation of PAGI under Component 3 will embody citizen engagement through a participatory and feedback-based process. The training activities organized under Component 4 will, where relevant, be tailored to ensure the inclusion of women and excluded and vulnerable groups. Planned community consultations are further detailed in the SEP.

91. **The Project Gender Action Plan (GAP)** is based on identified gender inequalities and is aligned with the MEEA's 2023–2025 Gender Action Plan. The project GAP focuses on increasing female decision-makers and leaders to improve water security in the project areas. Progress will be measured through the indicator: number of executive boards of project-supported water user committees, where at least 30 percent of members are women. The project will also work with the national civil and rural engineering association (*l'Ordre des ingénieurs de génie* Civil/Rural (OIGC), in which there are 6.5 percent of women) to increase female professional representation in the project subsectors (hydraulic and civil works). Access to childcare will be explored to strengthen women's participation in the workforce. To achieve these goals, GAP follows a three-step approach: (i) development of skills, capacity, and knowledge; (ii) application of gained skills, capacity, and knowledge; and (iii) sustaining and expanding empowerment. The steps will be supported through (i) constant assessment, consultations, and communications in safe and comfortable settings; (ii) a series of trainings and trainings for trainers (in management and technical capacities); (iii) involvement of men as important partners; (iv) well planned and designed awareness campaigns; (v) easy and safe access to a hands-on support system, monitoring, and feedback; and (vi) cooperation with universities, research institutions and civil-engineer professional associations. The full project GAP will be included in the Project Implementation Manual (PIM), and the PIU gender specialist will monitor its progress. The provision of improved water storage through dam rehabilitation will increase access to water and reduce the time spent fetching water, which disproportionately affects women, thus reducing gender-based violence (GBV) risks.

V. GRIEVANCE REDRESS SERVICES

92. **The project will develop and implement a comprehensive Grievance Redress Mechanism (GRM) to allow affected beneficiaries and stakeholders to submit grievances and seek redress when they perceive that a negative impact has resulted from the project interventions.** The GRM will be designed in consultation with relevant government and nongovernment stakeholders and will establish accessible processes to submit complaints and clear procedures from

investigation to resolution, as well as the timeline and feedback. The GRM will include the provision for appeal if aggrieved parties are dissatisfied with the resolution. Communities and individuals who believe that they are adversely affected by a project supported by the World Bank may submit complaints to existing project-level grievance mechanisms or the 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 Bank's independent Accountability Mechanism (AM). The AM houses the Inspection Panel, which determines whether harm occurred, or could occur, as a result of Bank noncompliance with its policies and procedures, and the Dispute Resolution Service, which provides communities and borrowers with the opportunity to address complaints through dispute resolution. Complaints may be submitted to the AM at any time after concerns have been brought directly to the attention of Bank management and after management has been given an opportunity to respond. For information on how to submit complaints to the World Bank GRS, visit http://www.worldbank.org/GRS. For information on how to submit complaints to the Bank's Accountability Mechanism, visit https://accountability.worldbank.org.

VI. KEY RISKS

93. **The Project overall risk rating is *High* due to** (i) high political and governance, security, and E&S risks; and (ii) substantial macroeconomic, fiduciary, institutional capacity and stakeholder risks.

94. **Political and governance risks are rated *High,*** due to political and institutional instability, recent military regime changes, and chronic security challenges in a significant part of the country, including areas which may be selected for project activities. To help mitigate the risks, the Project will support the PIU to raise awareness among regional directorates involved locally in the project, to build their ownership and capacity. Furthermore, by adopting a people-centered approach with inclusive and transparent dialogue and by improving access to water for agropastoral production while strengthening the institutions where concertation occurs (WUCs), the project will address the drivers of fragility and increase food security.

95. **The macroeconomic risk is rated *Substantial*.** The heightened uncertainty following the coups d'états has raised the country's risk premium and delayed potential private investment, including foreign direct investment, thereby negatively affecting growth and fiscal accounts. The pressure on fiscal accounts is further exacerbated by Russia's invasion of Ukraine which is driving up prices of the main subsidized goods (food, fertilizer, and fuel), and impeding public investment and consumption. To mitigate the risks, the Project budget includes 23 percent contingencies, while 20 percent technical contingencies have been integrated in Component 1. The Project will closely monitor the macroeconomic risks and take appropriate measures, for instance, by monitoring market prices (especially for construction materials) and calibrating project implementation accordingly.

96. **Institutional capacity for implementation and sustainability is rated as *Substantial*.** During project preparation, the DGIH has demonstrated outstanding reactivity and high technical and management skills. Project activities will further strengthen DGIH and other institutions involved in and created during project implementation. The hiring of the TACF, which has strong experience in dam infrastructure management and World Bank projects, will support the PIU and DGIH in training, technical reviews of documents, and project management. The implementation arrangements are designed to ensure coordination across various agencies involved in implementing the project, to be reinforced through the Steering Committee. The residual risk rating is *substantial* due to national sector challenges in institutional capacity and performance (see section I.B. above), which the project will help address.

97. **The residual fiduciary risk is rated as *Substantial,*** considering the country context, project design, and ratings provided in the procurement and FM assessments (cf. section IV B.).

98. **E&S risk is rated as *High*.** The project environmental risk is rated as *High* due to the range of activities to be financed by the project and the high environmental risks and impacts that may result. The proposed activities, during construction and operation, may generate high environmental risks and impacts that will need to be carefully managed at all project

sites to comply with the ESF: dam safety and health risks on communities, risks of construction site accidents and traffic accidents, risk of drowning in dams, risk of water and soil pollution by solid and liquid waste from living bases and construction sites, risk of disturbance runoff, risk of poaching by site workers, groundwater and surface water pollution during construction, risk of loss of natural habitats, risk related to insecurity in the project area, and so forth. The Project will also involve implementing agencies with limited experience with ESF instruments. The project social risk is rated *High* as the implementation of proposed activities may be associated with potential social risks and impacts related to labor and working conditions (including child and forced labor, SEA/SH, health, and safety of populations during civil works, incidents and accidents during civil works both for workers and communities), social conflicts due to the lack of communication on project benefits, and so forth. Limited understanding/awareness of the project by various stakeholders could lead to social conflict. In addition, the planned investments of the proposed project (rehabilitation and expansion of irrigated perimeters, halieutic production infrastructure development, integrated watershed management, etc.) could lead to potential land acquisition, land use, or involuntary resettlement issues and could exacerbate the risks of SEA/SH against (female) community members and workers. The context of insecurity in the country is also a risk that may negatively impact the overall implementation of project activities, mainly in terms of the consultation with key stakeholders, social inclusion, and vulnerable groups' involvement. Environmental and social clauses in tender documents will include clearly defined mitigation measures during the construction phase to enable contractors to follow up on E&S due diligence, and to mitigate the anticipated negative risks and impacts. In addition, a Dam Safety Panel will be recruited to advise the government of dam safety matters. Dam safety plans will be prepared accordingly. The Environmental and Social Management Framework (ESMF) and the Stakeholder Engagement Plan (SEP) include measures related to social inclusion (including for vulnerable groups) and participatory approaches during consultation processes. Mitigation measures within the SEP will provide safe and confidential grievance mechanism channels to report SEA/SH-related complaints and cross referenced in the Environmental and Social Management Plans (ESMPs). On resettlement, the mitigation hierarchy will be applied, and involuntary resettlement or land acquisition will be avoided if possible. If it cannot be avoided, efforts will be made to avoid and/or minimize any impacts. Resettlement Action Plans (RAPs) will be developed to propose mitigation measures to be implemented before the start of civil works, including potential losses of production during works.

99. **The stakeholder risk is rated as *Substantial*,** due to potential limited understanding and awareness of the Project by various stakeholders. Although no new dams will be constructed, there could be sub-projects (such as expansion of irrigated perimeters and development of agropastoral infrastructure development) with potential adverse impacts on communities. The Project is designed to mitigate risks through comprehensive stakeholder engagement during preparation and implementation, the development and implementation of a communications and outreach strategy, and the operation of a comprehensive GRM. A SEP has also been prepared at the project level to lay down the principles, processes and protocols to be followed for consultations, identification and engagement of stakeholders, and so forth. The design of activities expected to generate alternative revenues, for example, agriculture, fisheries, will be developed and implemented with stakeholder input. One of the key nonstructural interventions under the project is the preparation of the Emergency Preparedness Plans (EPPs) for dams with significant downstream risk—a document that is required to be disseminated and consulted upon to elicit feedback from communities and all key stakeholders involved in EPP implementation. Citizen engagement will be built into the project through a combination of actions, such as disclosure of general information as mandated by law and project-level communications, consultations, and information disclosure.

100. **Security risk (other risk) is rated High** due to the existing security situation in certain regions of the country, which could affect future access to some project sites. To mitigate the risk, an SRA was carried out during preparation and an SMP has been prepared, both to be updated throughout implementation. In addition, a SRA of the Burkina Faso World Bank portfolio is currently under preparation to guide the strategic consideration of security threats in the development and implementation of operations. The assessment will suggest adaptative measures and mutualization efforts at the country portfolio-level to further support project design and implementation. Findings will further inform the project risk mitigation approach. Remote monitoring (information and communication technology [ICT], GEMS) will allow the World Bank team and central government entities to follow Project implementation in areas that become inaccessible due to conflict. The situation will be regularly reviewed, and maps updated accordingly. A security specialist will be recruited at the PIU level to update and implement the SRA and SMP during implementation.

VII. RESULTS FRAMEWORK AND MONITORING

PDO Indicators by PDO Outcomes

Baseline	Period 1	Period 2	Period 3	Closing Period
To improve the safety of dams.				
Dams with improved safety (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	8	25	40	47
National Strategy for Maintenance of Dams (SNESB) operationalized (Yes/No)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
No	No	Yes	Yes	Yes
To improve associated irrigation and watershed services.				
Cumulative area of new or rehabilitated irrigated perimeters (Hectare(Ha))				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	300	650	788
Terrestrial and aquatic areas under enhanced conservation and management (Hectare(Ha)) CRI				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0	0	4000	8000	10000
To improve the climate resilience of beneficiaries.				
People with enhanced resilience to climate risks (Number of people) CRI				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0	100000	500000	800000	1000000
➢People with enhanced resilience to climate risks – Youth (Number of people) CRI				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0	30000	150000	240000	300,000
➢People with enhanced resilience to climate risks – Female (Number of people) CRI				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0	50000	250000	400000	300,000

Intermediate Indicators by Components

Baseline	Period 1	Period 2	Period 3	Closing Period
Component 1 - Security and Climate Resilience of Water Storage Infrastructures				
Dams rehabilitated (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	15	30	35
Failing dams stabilized through emergency operations (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	8	12	12
Dams achieving targeted dam safety maturity level (Number)				
Feb/2024	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	8	20	30	35
Cumulative surface water capacity secured to improve drought and/or flood management (Cubic Meter(m3))				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	5000000	20000000	35000000	43,000,000
Component 2 - Development of Climate-smart Hydro-Agricultural Infrastructures				
Fish ponds and hatcheries developed (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	5	10	10
Reservoirs stocked for local fish production under the project (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	6	12	15
Permits or licenses allocated to private fishery or irrigating operators (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	3	6	10
Component 3 - Integrated Watershed Protection and Management				
Reservoirs rehabilitated with delimitation and protection of reservoir banks (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	1	3	4
Area of land reforested or benefiting from assisted natural regeneration (Hectare(Ha))				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	350	700	1000
Implementation rate of integrated development and management plans (PAGI) for watersheds (Percentage)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	10	50	80	95

Component 4 - Climate-smart Sector reforms and Operationalization of the National Strategy for Dams				
Roadmap for operationalizing the SNESB approved (Yes/No)				
Oct/2023	Jun/2026	Jun/2026	Jun/2029	Jun/2030
No	No	Yes	Yes	Yes
Emergency response brigade in place and operational (Yes/No)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
No	No	Yes	Yes	Yes
Legal texts & supportive materials ready for adoption to establish a fund dedicated to O&M of dams (Yes/No)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
No	No	Yes	Yes	Yes
Laws and decrees to operationalize the National Strategy for Maintenance of Dams ready for adoption by the Government (Yes/No)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
No	No	No	Yes	Yes
New dam surveillance and O&M framework and procedures ready for implementation. (Yes/No)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
No	No	Yes	Yes	Yes
Additional dam safety human resources mobilized within national and regional directorates as per staffing plan for operationalizing the SNESB (Percentage)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0	0	20	50	65
Water User Committees established and operational (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	25	42	47
Executive boards of project-supported water user committees where at least 30% of members are women (Number)				
Feb/2024	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	15	25	35
Irrigation Committees established and trained in effective O&M of irrigation assets (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0.00	0	15	25	25
Rate of grievances registered and addressed within the project GRM timeline (Percentage)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0	20	50	80	80
Component 5 - Project Management, Safeguards & Consultancy Services				
Technical Assistance Consultancy Firm and 3 Design & Supervision Engineering Firms recruited and mobilized (Yes/No)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030

No	Yes	Yes	Yes	Yes
Sites for which the construction tenders are ready (Number)				
Oct/2023	Jun/2026	Jun/2027	Jun/2029	Jun/2030
0	30	40	45	45
Component 6 - CERC				

Monitoring & Evaluation Plan: PDO Indicators by PDO Outcomes

To improve the safety of dams.	
Dams with improved safety (Number)	
Description	This indicator measures the cumulative number of dams with improved levels of safety. Improved safety in this context means (i) that the taking-over certificate for rehabilitation/stabilization works of dams is issued, and (ii) WUC is in place or dam safety maturity level deemed satisfactory.
Frequency	Annually
Data source	Project database
Methodology for Data Collection	DGIH reports based on area of influence of project's activities and based on sampling.
Responsibility for Data Collection	Project Implementation Unit
National Strategy for Maintenance and Safety of Dams (SNESB) operationalized (Yes/No)	
Description	This indicator measures the outcome of the procedures and resources necessary at the national and regional levels to support the implementation and effectiveness of the SNESB.
Frequency	Annually
Data source	Project database
Methodology for Data Collection	This indicator will be deemed satisfactory if and when 6 of the 9 intermediate indicators of component 4 will have met their objectives.
Responsibility for Data Collection	Project Implementation Unit
To enhance associated irrigation and watershed services.	
Terrestrial and aquatic areas under enhanced conservation and management (Hectare (ha)) CRI	
Description	The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes; adoption refers to change of practice or change in the use of a technology promoted or introduced by the project.
Frequency	Annually
Data source	Project implementation report
Methodology for Data Collection	Manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Cumulative area of new or rehabilitated irrigated perimeters (Hectare (ha))	
Description	This indicator measures the total irrigated land area that has been rehabilitated or newly developed throughout the project.
Frequency	Annually
Data source	Project implementation report
Methodology for Data Collection	Manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
To improve the climate resilience of beneficiaries	
People with enhanced resilience to climate risks (Number of people) CRI	
Description	This indicator counts the number of people in the command areas of dams benefiting from enhanced resilience to floods from rehabilitated dam infrastructure and to droughts from more secured water supply.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of people living in the command areas of dams receiving project intervention; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit

Monitoring & Evaluation Plan: Intermediate Results Indicators by Components

Component 1 – Security and Climate Resilience of Water Storage Infrastructures	
Dams rehabilitated (Number)	
Description	This indicator captures the number of identified dams rehabilitated during the project.
Frequency	Semiannual
Data source	Progress Reports
Methodology for Data Collection	Aggregate number of rehabilitated dams under the project; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Failing dams stabilized through emergency operations (Number)	
Description	This indicator measures the number of dams about to fail, stabilized through emergency operations.
Frequency	Semi-annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of dams secured under emergency operations; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Dams achieving targeted dam safety maturity level (Number)	
Description	This indicator monitors the count of dams that have attained a targeted safety threshold as determined by the dam safety maturity level (as per maturity matrices developed for the project).
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of dams that meet the set safety maturity level; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Cumulative surface water capacity secured to improve drought and/or flood management (Cubic Meter(m3)) CC tag	
Description	This indicator captures the cumulative volume of water in rehabilitated dams, which will contribute to adapting to climate shocks through flood-resilient infrastructure and increased beneficiary resilience to drought periods.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate water surface secured throughout the project; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Component 2 – Development of Climate-smart Hydro-Agricultural Infrastructures	
Fish ponds and hatcheries developed (Number)	
Description	This indicator measures the number of fishponds built for fishery production or hatcheries during the project to enhance local fish production.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of fishponds and enclosures built; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Reservoirs stocked for local fish production under the project (Number)	
Description	This indicator reflects the count of reservoirs that have been stocked with fisherlings thanks to the project.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of reservoirs managed for local fish production; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit

Permits or licenses allocated to private fishery or irrigating operators (Number)	
Description	This indicator measures the number of official authorizations (permits or licenses) granted to private entities, allowing them to engage in businesses related to the project (such as fish production or food market production from irrigation).
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of official authorizations granted to private operators; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Component 3 - Integrated Watershed Protection and Management	
Reservoirs rehabilitated with delimitation and protection of reservoir banks (Number)	
Description	This indicator captures the number of pilot reservoirs rehabilitated with delimitation and protection of reservoir banks.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of reservoirs with delimitation and protection of reservoir banks; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Area of land reforested or benefiting from assisted natural regeneration (Hectare (ha))	
Description	This indicator that measures the extent of land area that has been subject to reforestation efforts or has undergone assisted natural regeneration.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of hectares reforested or managed through natural regeneration; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Implementation rate of integrated development and management plans (PAGI) for watersheds (Percentage)	
Description	This indicator measures the level of implementation of integrated development and management plans (PAGI) prepared under the project.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate implementation rate of watersheds plans; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Component 4 - Climate-smart Sector Reforms and Operationalization of the National Strategy for Dams	
Roadmap for operationalizing the SNESB ready (Yes/No)	
Description	This indicator supports effective implementation of the national strategy for dam maintenance and safety (SNESB). It is considered achieved upon the approval by the government of the roadmap for its operationalization.
Frequency	Semi-annual
Data source	Progress Report
Methodology for Data Collection	Effectiveness of the activities supported by the SNESB; manual counting
Responsibility for Data Collection	Project Implementation Unit
Emergency response brigade in place and operational (Yes/No)	
Description	This indicator measures the creation and effectiveness of a rapid intervention brigade to stabilize dams about to fail. It is considered achieved once the brigade has been established and with adequate resources as defined in the roadmap for operationalizing the SNESB.
Frequency	Semiannual
Data source	Progress Report

Methodology for Data Collection	Assessment of emergency brigade established and effective during the project; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Legal texts & supportive materials ready for aoption to establish a fund dedicated to O&M of dams (Yes/No)	
Description	This indicator captures the preparation of legal texts and supportive materials (including associated procedures, and estimation of human and financial resources) for creating a fund to support and sustain O&M of dams. The texts are considered ready to be adopted when a version has been validated by the body in charge and submitted to a competent authority for signature.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Record of final version of documents in project's database; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Laws and decrees to operationalize the SNESB ready for adoption (Yes/No)	
Description	This indicator measures whether the set of legal and regulatory frameworks and tools have been put into effect as recommended by the SNESB and its operationalizing roadmap. It is considered achieved once the documents are ready to enter the government approval circuit. The texts are considered ready to be adopted when a version has been validated by the body in charge and submitted to a competent authority for signature.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
New dam surveillance and O&M framework, and procedures ready, including manuals on design standards of earth-filled dams, construction and supervision standards for dams, dam surveillance, O&M of dams. (Yes/No)	
Description	This indicator refers to the comprehensive set of guidelines and protocols needed to ensure the safety and efficiency of dam operations being developed and ready for implementation. It is considered achieved upon approval and resourcing of manuals on design standards of earth filled dams, construction and supervision standards for dams, dam surveillance, and O&M of dams.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Readiness of framework and procedures to safeguard against risks and ensure the long-term sustainability of dam infrastructure; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Additional dam safety human resources mobilized within national and regional directorates as per staffing plan for operationalizing the SNESB (Percentage)	
Description	This indicator measures the extent to which additional human resources dedicated to dam safety have been recruited or allocated in accordance with a staffing plan defined within the SNESB operationalization roadmap.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate percentage of personnel exclusively dedicated to dam safety; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Water User Committees established and operational. (Number)	
Description	This indicator captures the number of water user committees established and trained under the project, meeting the requirements of the existing guide and of the complementary manuals to be prepared under the project.
Frequency	Annual
Data source	Progress Report

Methodology for Data Collection	Aggregate number of water user committees created during the project; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Executive boards of project water user committees where at least 30% of members are women (Number) Gender Tag	
Description	This indicator measures gender representation within the leadership of water user committees involved in the project. The executive board is responsible for decision-making within the water user committee and is elected by the general assembly. All executive board members are considered to be in a position of decision-making authority.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate count of women serving on the executive boards of water user committees; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Irrigation Committees established and trained in effective O&M of irrigation assets (Number)	
Description	This indicator assesses the number of operational committees (created, staff trained with refresher after one-year) to support the operation and maintenance of irrigation equipment.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of irrigation committees established during the project; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Rate of grievances registered and addressed within the project GRM timeline (Percentage) CE tag	
Description	This indicator measures the percentage of complaints addressed in a timely fashion after being received in the project GRM.
Frequency	Annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of irrigation committees established during the project; manual counting; analysis of project report data
Responsibility for Data Collection	Project Implementation Unit
Component 5 - Project Management, Environmental and Social Measures, and Consulting Services	
Technical Assistance Consultancy Firm and 3 Design & Supervision Engineering Firms recruited and mobilized (Yes/No)	
Description	This indicator captures the hiring and deployment of professional services to support the project.
Frequency	Semiannual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of entities mobilized
Responsibility for Data Collection	Project Implementation Unit
Sites for which the construction tenders are ready (Number)	
Description	This indicator highlights the number of identified sites for which construction bids have been prepared.
Frequency	Semi-annual
Data source	Progress Report
Methodology for Data Collection	Aggregate number of sites with construction tenders prepared through the project.
Responsibility for Data Collection	Project Implementation Unit

ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: Burkina Faso
Burkina Faso Water Security Project (BFWSP)

Introduction

1. **The Ministry of the Environment, Water and Sanitation (MEEA) is responsible for the technical supervision of the Project** through the General Directorate for Hydraulic Infrastructure (DGIH—*Direction Générale des Infrastructures Hydrauliques*), which is responsible for implementing water resource mobilization policies and strategies. The Project will be attached to Budget Program 109 *"Aménagements Hydrauliques"* and is classified Category 2 in accordance with the decree on the general regulations governing development projects and programs in Burkina Faso (decree no. 2021-1383/PRES/PM/MEFP of December 31, 2021), meaning that a dedicated Project Implementation Unit (PIU) will be set up. The Ministry of the Economy, Finance and Prospective (MEFP) is responsible for the financial supervision of the project.

2. **The institutional structure includes** (i) an inter-ministerial steering committee; (ii) a Project Implementation Unit (PIU); (iii) local stakeholders (WUC, CLE, CI, water agencies, and decentralized technical services); and (iv) cross-functional support from a Technical Assistance Consultancy Firm (TACF). Their roles and responsibilities will be detailed in the Project Implementation Manual (PIM).

3. **Steering Committee.** In accordance with Article 17 of the abovementioned decree, a steering body called the Steering Committee (CoPil) will be set up for the Project. Its powers, composition, and operation will be specified by a ministerial order issued by the MEEA in accordance with current regulations. It will be chaired by the head of the 109 "Hydraulic developments" budget program.

4. **Project Implementation Unit (PIU).** Since the government has classified the Project as Category 2 in accordance with the decree on the general regulations governing development projects and programs in Burkina Faso (decree no. 2021-1383/PRES/PM/MEFP of December 31, 2021), an autonomous PIU will be set up to cover core needs of the Project, while promoting coordination with and training of DGIH and other Directions and Regional Directorates. During implementation, the TACF will identify any needs for capacity strengthening when detailing the roadmap for operationalizing the SNESB.

5. **The PIU,** under the responsibility of a coordinator, will comprise (* indicates key staff):

- A coordinator *,
- A technical manager for dam safety and an assigned deputy,
- A technical manager for the development of agropastoral and fisheries infrastructures,
- A technical manager in integrated watershed protection and management,
- A specialist for institutional and capacity building,
- An administrative and financial manager*,
- A procurement specialist* and a deputy,
- A monitoring and evaluation specialist,
- An environmental safeguards specialist*,
- A social development specialist*, with expertise in inclusion,
- Four (4) assistants in environmental and social safeguards,
- A security expert*,
- A specialist in occupational health and safety,
- An expert in GIS - geographic information system,
- A communications specialist,

- Two accountants,
- An internal auditor, and
- Support staff (3 secretaries, 5 drivers, 1 liaison officer).

6. In addition to these staff, an individual SEA/SH consultant will be mobilized on a part-time basis. Given the lack of expertise in this field, the project could pool this recruitment with another project financed by the World Bank.

7. **Ten regional branches within the DREAs,** covering all project implementation regions, will support the central coordination unit implement project activities, in close collaboration with public entities at regional, provincial, and municipal levels and other local stakeholders. The four safeguards and social development assistants will be recruited and assigned to these DREAs for project implementation.

8. **PIU staff will be selected on a competitive basis following a recruitment notice.** Managers and specialists will have the rank of department head. They may be supported by deputies depending on needs. Recruitment of managers and specialists will be carried out by the MEEA. Each stage of the recruitment process will require the World Bank's Notice of No Objection.

9. **The Technical Assistance Consultancy Firm (TACF) will support the PIU and DGIH** in the efficient implementation of project activities. It will provide technical assistance for all technical Components (1, 2, 3, and 4) and support project management and supervision within Component 5. It will be responsible for reviewing the quality of studies and reports, supporting the preparation of tender documents for works, and supporting the awarding and monitoring of contracts (including management of any claims). It will support operationalizing the SNESB, with the main aim of improving dam safety and operational reliability for priority dams, systematically at national, regional, and local levels. TCAF will also (i) strengthen the capacities of the PIU, the DGIH, and other key players (DGADI, Regional Directorates, AE, WUC, etc.) including training of trainers and operationalizing partnerships with universities (such as 2iE); (ii) support the improvement of irrigation services in selected areas; and (iii) support the DGIH in implementing a methodology for monitoring dam sedimentation and pollution. TACF (as well as DSEFs) will also provide and integrate decentralized staff.

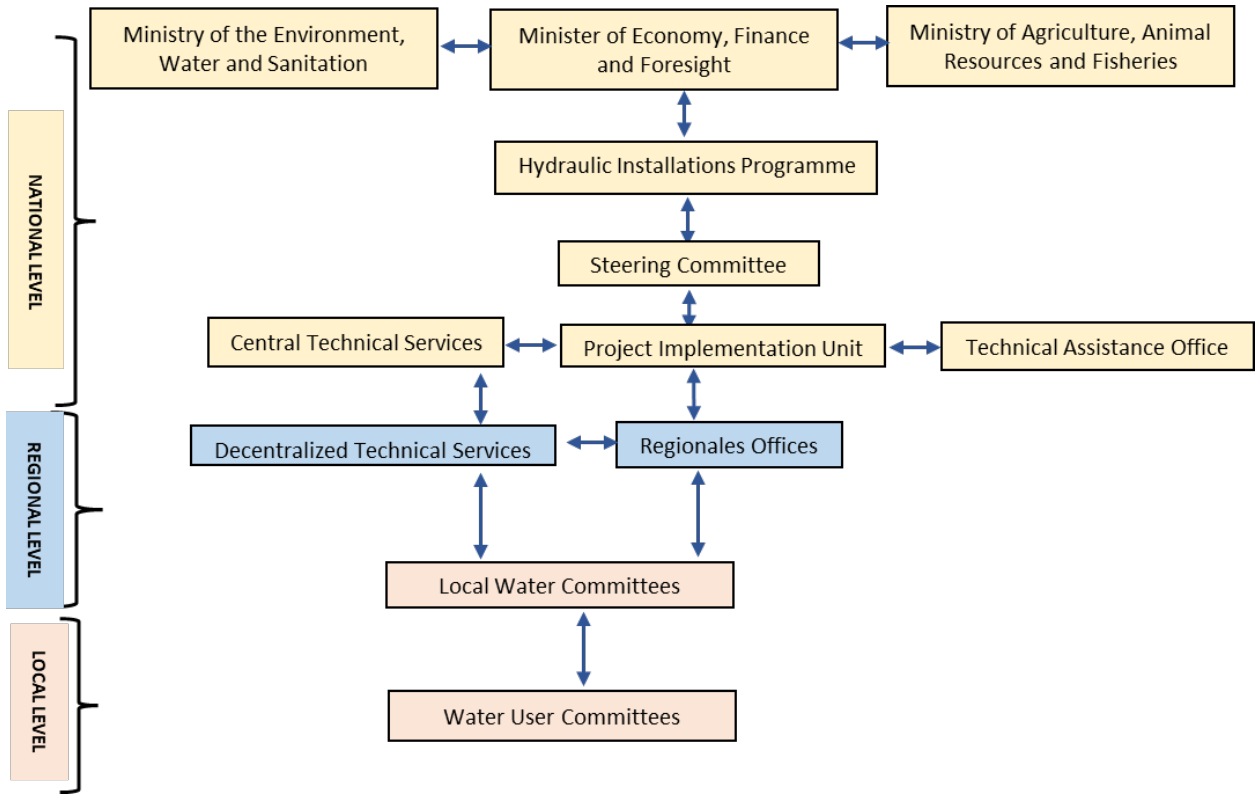
10. **Central technical departments (DGIH, DGADI, DGRE, ANEVE),** will support the implementation of the project as formalized through protocols signed with the project. As part of a pooling of interventions from projects financed by the World Bank, an interministerial committee (MEEA and MARAH) will be created to coordinate project activities for BFWSP, PRECEL, and FSRP. A matrix with distribution of responsibilities between the three projects/directions has been prepared and will inform the inter-ministerial committee. The PIU technical specialists will lead coordination and technical discussions with these departments. All decentralized technical services (DRE, AE, DRARAH, etc.) will work in synergy with the project DREA's regional branches. Protocols for the implementation of activities will be signed with the structures concerned and the Project.

11. **Nakanbe Water Agency (*Agence de l'Eau du Nakanbé*) of the MEEA** ensures the actual management of water resources at the level of the river basin. It is supported at the sub-basin level by Local Water Committees (CLE—*Comités Locaux de l'Eau*), which will contribute to the integrated watershed management activities (Component 3). Seven CLEs will be set up under the project to complete the coverage of project intervention areas.

12. **Water Users' Committees** (WUC—*Comité des Usagers de l'Eau*) will be set up systematically where the project implements rehabilitation of dams as well as for 40 other priority dams, with representatives of water users, as per the existing national guidebook for WUCs. They are responsible for monitoring and routine maintenance of dams. With the support of MARAH, the project will also support creation and training of the Irrigators' Committees.

13. Figure A1.1 below presents the above-mentioned project organization at different levels.

Figure A1.1: Project Organization at National, Regional, and Local Levels



Integration of Fragility Aspects in Project design and implementation arrangements

14. **The Project design draws from lessons learned from past and existing World Bank projects and international best practices in similar FCV environments.** Research shows that water in the Sahel can be both an integrator and connector, and a source of conflict. For instance, evidence indicates that irrigation projects may become magnets of conflict, particularly in fragile, resource-scarce settings, with a higher incidence of conflict in irrigated areas, as compared to non-irrigated areas amid increased fragility in the broader West African region.[61] Successful water platforms in the region have also shown that leveraging a problem-shed approach by convening water users at the scale of a water security hotspot (such as a water reservoir) or around specific uses can facilitate solution seeking and consultative decision-making with satisfactory outcomes for all users.[62] Learning from other projects in Burkina Faso and the region, IDPs will be considered as a vulnerable population targeted by the Project and will be fully integrated as Project beneficiaries. IDPs will be active members of the WUCs, will receive irrigated land, and be consulted as part of all Project activities throughout the life cycle of dams (including awareness raising activities around Emergency Preparedness Plans [EPPs]). The Project approach to work at the level of WUCs and irrigation committees will build on these findings to promote local development and coordination in view of conflict prevention. Flexible design and implementation lessons, like working with local organizations and maximizing beneficiary participation, among others, will also be applied from relevant projects.

15. **The proposed implementation support plan also leverages knowledge from the current World Bank portfolio and FCV expertise.** Its core principles are (i) the need for intensive, risk-based implementation support, and (ii) maximizing the use of national staff, international staff, and consultants, as needed. A security risk management plan has been developed for the Project and will be reviewed regularly and revised as required. The World Bank team comprises

[61] Khan, and Rodella. 2021. A Hard Rain's a-Gonna Fall? New Insights on Water Security and Fragility in the Sahel.
[62] World Bank. 2021. Strengthening Regional Water Security for Greater Resilience in the G5 Sahel. © World Bank, Washington, DC. http://hdl.handle.net/10986/35994. License: CC BY 3.0 IGO.

specialists in the areas of dams, water and natural resources management, irrigation, watershed protection, FCV, agriculture, financial management, procurement, social and environmental safeguards, and administration support. Core World Bank operational and fiduciary staff based in the Country Office will facilitate implementation support and ad hoc problem solving as needed.

16. **The project has been designed considering existing country security and FCV features.** The 35 priority dams (blocks 1 and 2) have been selected in lower-security risk and more accessible areas. The project participatory approach is expected to build a safe operating environment through the consent, approval, and cooperation of local communities, especially the most vulnerable (the "acceptance approach"). Direct supervision by the PIU is possible in these areas; however, it may need to rely on supervision by its regional branches, as necessary. In the event of a security incident impacting accessibility to one of the selected sites, a list of alternative intervention sites meeting the same selection criteria has been developed to maximize flexibility. A security specialist embedded within the PIU will enable the constant update of security risk information and the application of risk mitigation measures.

17. **Additional support and flexibility.** Project design inherently builds in flexibility to manage security risks and will make use of relevant World Bank tools and local expertise as needed to address risks as they arise. For example, as in other projects in Burkina Faso, interventions could be delayed or relocated depending on worsening security situations. The use of hands-on expanded implementation support (HEIS) will be considered during implementation if needed.

Project Monitoring & Evaluation

18. **The Project Implementation Manual (PIM) will specify the information needs of the various project actors and stakeholders,** the project monitoring and evaluation procedures, and the system and tools for collecting, processing/validating, transmitting, storing, producing, and disseminating information on the project.

19. **The Project will be subject to evaluations (including midterm and final evaluations) and audits**. The midterm evaluation will aim to analyze and assess relevance, efficiency, and progress toward expected results, and to make any strategic adjustments deemed necessary. Audits will enable the Project to continuously improve its performance in terms of financial management. Internal and external audits will be carried out annually throughout the Project implementation period (audit of accounts). Audit reports for calendar year $n - 1$ will be submitted to the supervisory authorities by June 30 of year n at the latest. The Project may also be audited by government auditors such as by The National Authority in charge of overseeing the State and Fight against Corruption (LASCE-LC).

Project communication and visibility

20. **External and internal communication actions will be undertaken** to (i) give visibility to the Project; (ii) enable messages to be transmitted or exchanged with target groups; and (iii) create synergies of action between the various stakeholders. The overall aim of communication will be to inform, raise awareness, and engage direct beneficiaries and other target groups in the Project (vision, approaches, steering, achievements, etc.). Specifically, communication will help to (i) prepare the ground for project implementation; (ii) engage project beneficiaries; (iii) improve stakeholders' knowledge of the project content and progress; (iv) facilitate team management; (v) clarify objectives for all stakeholders; (vi) alert problems or difficulties related to the project, so that they can be managed and avoided; and (vii) facilitate relations with stakeholders.

21. **The project communication target groups** include beneficiaries, landowners, local authorities, customary and religious leaders, decentralized government technical services, NGOs, technical and financial partners, and local and national media. Appropriate communication tools and actions will be developed to tailor to the diversity and specificity of each target group, as well as any barriers or constraints (tone, language, etc.). This requires two forms of communication: (i) institutional communication, and (ii) communication for social change.

Financial Management

22. **The FM risk assessment and mitigation measures** are summarized in the Table A1.1. The Financial Management Action Plan in Table A1.2 has been developed to mitigate the overall financial management risks identified during the assessment.

Table A1.1: Fiduciary Risks and Mitigation Measures

Risk	Risk rating	Risk mitigation measures	Conditionality	Residual risk rating
Inherent Risks:	***S***			***S***
Country: • Regarding the political and security context, the country risk is unpredictable, which increases the level of the country risk	H	• Continue to monitor and report any issue to the authorities.		S
Entity level • This new PIU is unfamiliar with the IDA finance procedures. The PIU may be experiencing many challenges at the start of the project, which can hinder good monitoring of FM activities.	S	• Qualified and experienced FM staff should be recruited. The staff to be recruited should be familiar with the World Bank procedures. The recruitment should be under terms of references acceptable to the World Bank.		M
Project level • This Project involves cash transfers to the regional directors leading to a risk of misuse of the funds and challenges of reporting to the central level.	S	• Ensure that appropriate procedures have been set up in the manual of procedures to reinforce the internal control of the operations. The LASCE-LC may be requested to conduct annual verification.		M
Control Risks:	***S***			***M***
Budgeting				
• Budget preparation process may be delayed or an overoptimistic forecast or activities missing in the annual workplan, as the PIU will be new. • Limited quality of budget monitoring so lack of good information for decision-making	H	• The annual workplans and the budget preparation should start early, and the final document be submitted to the World Bank for no-objection after approval of the Steering Committee not later than November 30th of each year preceding the year the work plan should be implemented. • Once the budget is approved, it will be integrated in the accounting software to serve as a basis for a budget execution monthly follow-up, based on variance analysis. • Appropriate accounting software should be acquired to facilitate monitoring of the budget execution		S
Accounting				
• Lack of reliable and up-to-date accounting information	S	• Configure multi-project and multi-sites accounting software. • Ensure that appropriate accounting procedures have been set up in the manual of procedures. • Qualified and experienced accounting staffs are recruited.		M

Risk	Risk rating	Risk mitigation measures	Conditionality	Residual risk rating
Internal Audit				
Weak internal control environment. By-passing the procedures.	H	• Regular internal audit missions covering all the risky operations of the project (technical and financial) to be conducted during the project period with a focus on fraud and corruption risk. • Annual risk-based internal audit plan should submit to the World Bank for no-objection. • Internal auditor reports should be submitted to the World Bank with the interim unaudited financial reports (IFRs).		S
Funds Flow				
• Funds might be diverted, used for non-project eligible purposes, or not properly justified. • Funds disbursed to the regional directors may be misused or not properly reported. • Funds may be transferred to the regional directors, and due to security context, the activities could not be implemented.	H	• Having a separate transactions account. • Use mobile money as payment mechanism when making payments for many beneficiaries. • Prepare monthly bank reconciliations approved by appropriate authorities within the PIU. • Set up clear procedures related to the funds to be transferred to the regional directors and train the people in charge of the management of the funds.		S
Reporting				
Delay and difficulties in the preparation of acceptable IFRs or other financial reports.	S	• Agree on the format and content of the IFRs in Project's Implementation Manual. • Configure the accounting software to be able to automatically generate the reports. • Qualified and experienced FM staffs should be recruited. The staff should be familiarized with the World Bank financial management procedures.		M
External Audit				
• Delay in the submission of the audit reports or qualified audit opinion.	S	• The external auditor should be recruited no later than six months after effectiveness. • The external audit of the project financial statements will be done by a qualified independent audit firm acceptable to the World Bank. • Qualified and experienced FM staffs are recruited to ensure that good Project financial statements will be prepared.		S
Overall Risk	**H**	• Overall, the residual financial management (FM) risk of the project is rated as Substantial due country political and security ongoing challenges and the limited experience of the new PIU to be set up.		**S**

Table A1.2: FM Action Plan (own elaboration)

#	Actions	Due date	Responsible
1	Elaborate financial management, accounting, and auditing procedures in the project implementation manual.	Before effectiveness	MEEA/DGIH
2	Recruit a financial management specialist (RAF) with qualifications and experience satisfactory to the World Bank.		
3	Recruit two accountants with qualifications and experience satisfactory to the World Bank.	No later than three months after the effectiveness	
4	Set up adequate accounting and reporting software.		
5	Recruit one internal auditor under terms of references acceptable to the World Bank.		
6	Recruit external auditor.	No later than six months after the effectiveness	

23. **Subject to the implementation of the agreed action plan,** the overall residual FM risk of the project is rated as *Substantial*.

Financial Management Arrangements

24. **Planning and budgeting:** The MEEA PIU will prepare a consolidated annual budget based on the agreed annual work program cleared by the WB. The budgets, which should be adopted before the beginning of the year, will be prepared in enough detail by disbursement categories, activities, and account codes broken down by quarters.

25. **Accounting and records:** The SYSCOHADA current accounting standards for ongoing World Bank-financed projects will be applied.

26. **Project financial reports:** MEEA will be responsible for submitting the project IFRs. The reports will include Statement of Sources and Uses of Funds by disbursement categories, Uses of Funds by Project activities, project Balance Sheet, and Statements of Designated Accounts (DA). The report will be submitted to the World Bank within 45 days of the end of each quarter.

27. **Internal control and external audits:** The Project Implementation Manual will describe detailed internal control procedures. The project will be subject to an annual audit by an independent auditor. The annual audit reports will be submitted to the World Bank within six months of the end of each fiscal year.

28. **Disbursement arrangements:** Project proceeds will finance 100 percent of eligible expenditures of the Project. A designated account (DA) in XOF will be opened at the Central Bank of West African States, (*Banque Centrale des Etats de l'Afrique de l'Ouest*—BCEAO), for the PIU. Upon effectiveness, an initial advance of an amount equivalent of the cash forecast for one (1) semester, will be released by IDA to the DA at the request of the PIU. The PIU will open a Project Account (PA) in a commercial bank, managed by the FM unit, with signatories of the Project Coordinator and the Project FMs. The details of the fund's transfers and management to the "*directions régionales*" will be addressed in the project manual. Specific section will be dedicated to these key points.

29. **Disbursements will be made using report-based disbursement procedures:** The DA will be set up to fund eligible expenditures based on the approved annual activity plans. The ceiling of the designated account would be the equivalent of the cash forecast for one (1) semester as provided for in the semiannual Interim Financial Report. The PIU should retain all other supporting documentation evidencing eligible expenditures and must be made available for review by World Bank missions, external auditors, and other controllers, if any. Disbursement methods and formats for withdrawal applications and disbursement documentation will be stated in the DFIL.

30. **Governance and anti-corruption:** Transparency and accountability are highly encouraged, and the PIU will put in place measures to avoid fraud and corruption in accordance with the World Bank Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (revised as of July 1, 2016) referred to in the Financing Agreement. Support to the implementation plan: FM supervision mission will be conducted over the

project lifetime. The Project will be supervised on a risk-based approach. The objective of the implementation support plan is to ensure the project maintains a satisfactory FM system throughout its lifetime. Based on the current risk assessment, which is *Substantial,* we envisage at least two implementation support missions per year. The supervision will include an FM rating of the Project. An implementation support mission will be carried out before effectiveness to ensure the project readiness. The supervision intensity will be adjusted over time, considering the project FM performance and FM risk level.

Procurement

31. **Procurement Implementation Arrangement:** Procurement will be carried out by the PIU in accordance with the World Bank Procurement Regulations for IPF Borrowers, 5th edition, dated September 2023; "Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants" dated July 1, 2016 (Anti-Corruption Guidelines), and other provisions stipulated in the Financing Agreement. Systematic Tracking of Exchanges in Procurement (STEP) will be the World Bank system to be used by the DGIH for procurement planning, review and no objection, including prior review procurements, as well as contract management information and complaints handling. All post review procurements will also be uploaded in STEP in real time. The procurements not uploaded in STEP and/or not receiving World Bank clearance/No objection will not be eligible for project financing. The latest World Bank published Standard Procurement Documents will be used for an international approach to the market. When approaching the national market in Burkina Faso, as agreed in the Procurement Plan, the country's own procurement procedures may be used with the requirements set forth or referred to in Regulations' paragraphs 5.3 to 5.6 related to the National Procurement Procedures. However, the Burkina Faso standard bidding documents are not found acceptable to be used for national competitive bidding provided; the requirements to make them in compliance with clauses 5.3 to 5.6 of the procurement regulations and other statements have been notified to the Government. Procurement procedures will be reflected in the procurement section of the PIM. High Value and/or Complex Procurements and Contracts will be given maximum attention by the PIU.

32. **Procurement capacity assessments:** Consistent with the above procurement arrangements, procurement capacity and risk assessments have been carried out for the DGIH by the World Bank in accordance with the World Bank Procurement Risk Assessment and Management System (PRAMS). The assessment found that the DGIH has experience implementing projects funded by donors such as AfDB, WADB, the Islamic Development Bank (IsDB), or the Kuwaiti and Saudi Funds for Development, but has no experience implementing WB-financed projects, though risks were observed and mitigations recommended. The main risks identified are (i) the lack of familiarity with World Bank procurement regulations; (ii) the lack of delegation of contract approval to the coordinator in line with the GoBF decree (whereby only contracts of 10 million FCFA or less could be approved by the coordinator; other contracts are approved by the minister with delay). For this reason, it is recommended to competitively recruit a procurement specialist who will be dedicated to the Project. In respect of the new institutional arrangement for projects implementation in Burkina Faso, this procurement specialist will work with the Directorate of Public Procurement (DMP) comprised of 16 staff who are not familiar with World Bank procurement regulations; (iii) the DMP staff have limited qualifications, insufficient procurement skills, and inadequate experience in World Bank procurement procedures; (iv) tender committee members are not trained in the World Bank's new procurement procedures; and (v) there are significant time delays in the procurement process.

33. **Procurement arrangements for Component 3:** Procurement capacity and risk assessments have been carried out for the *Agence de l'Eau de Nakanbé* (AEN) in accordance with the World Bank Procurement Risk Assessment and Management System (PRAMS). The assessment found that the AEN has experience implementing projects funded by donors such as ASDI (Sweden), the Austrian Cooperation, DANIDA (Denmark), ENABEL (Belgium), the European Union, and the West African Development Bank. However, it does not have direct experience in implementing projects financed by the World Bank. Nevertheless, the AEN benefited from an executive convention from the World Bank–financed regional Sahel Irrigation Initiative Support Project (PARIIS-BF, P154482) for the establishment of two local water committees (CLE), where two small contracts were concluded. The AEN has a procedures manual, including for the purchasing of goods and services. It also has a qualified Procurement Specialist but has no experience in World Bank procurement regulations. Based on this assessment, procurement of project activities can be delegated to the AEN within the limits of the amounts to which it is accustomed (20 million FCFA). Contracts above this amount will be managed

directly by the PIU. It is recommended to revise the AEN's procedure manual by integrating World Bank procurement procedures.

34. **The other identified risks at the country level are** (i) the high insecurity of the areas in which project activities will be conducted; and (ii) the country's political situation. The assessment has rated the procurement risk as *Substantial*. The overall procurement residual risk rating after implementing the mitigation measures will be Moderate. The PIM will define the required project internal organization (including staffing arrangements) and implementation procedures for procurement activities. It will include, inter alia, all the relevant procedures for calling for bids, selecting consultants, and awarding contracts. The project monitoring arrangements for procurement will be specified.

Table A1.3: Procurement Risks and Mitigation Measures

Risks that have been identified	Procurement mitigation measures	Responsibility	By when
Absence of procurement specialist familiar with WB procurement regulations	Recruit competitively a procurement specialist who will be devoted to the Project	DGIH/MEEA	Before effectiveness
Limited qualification and experience of the staff in the National Procurement Framework (NPF)	Reinforce the procurement capacity by training the DMP, DGCMEF, PIU, and the tender committee in Bank procurement procedures with external training courses	Project coordinator/DGIH/MEEA	During project life
Delays in reviewing procurement documents and decision by DCMP	Design a focal point for the project at DMP	DMP/MEEA	Before effectiveness
Delays in contract approval by the ministry	Delegate the contract approval to the coordinator of the project in line with the GoBF decree	MEEA	3 months after effectiveness
Internal organization and implementation procedures for procurement activities	Elaborate the procurement section of the manual to ensure appropriate implementation of activities in line with the World Bank's 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 describing streamlined procurement procedures when applicable	PIU/MEEA	Before effectiveness

35. **Summary of the Project Procurement Strategy for Development (PPSD):** The Project Procurement Strategy for Development (PPSD) and the Procurement Plan detailing the first 18 months of implementation have been prepared by the Borrower and approved by the World Bank. The most important procurement of the Project is related to works that will be the rehabilitation of degraded dams, irrigated areas and construction of fishponds and hatcheries for about 66 percent of the project cost. Consultant services include monitoring and control of work activities. The different approaches, selection methods, need for prequalification, estimated costs, prior review requirements, and timeframe have been agreed between the recipient and the World Bank in the Procurement Plans. During implementation, the Procurement Plans will be updated as required and at least annually, to reflect actual program implementation needs and improvements in institutional capacity implementation needs. While open national competition is generally the preferred method, in some areas the market and security situation might lead to other options.

36. **Special considerations.** As a large part of the Project is affected by an insecurity and fragility situation, the Project will apply flexibilities and simplification to facilitate procurement implementation. These procurement arrangements would draw on the World Bank Guidance on Procurement Procedures in Situations of Urgent Need of Assistance or Capacity Constraints issued on July 1, 2016. These measures include the use of the Borrower's national procurement, provided the arrangements are consistent with the World Bank's Core Procurement Principles. Key measures to fast-track procurement include the use of UN agencies, NGOs, Direct Contracting/or Limited Competition, and Request for Quotations with identified manufacturers and suppliers for other urgent items; and increased threshold for Request for Quotations (RfQ) to US$500,000 for goods and US$1 million for works. A Bid Securing Declaration may be used instead of

bid security. Advance payment may be increased to 40 percent, while secured with the advance payment guarantee. The time for submission of bids/proposals can be shortened to 15 days in competitive national and international procedures, and to 3 days for the RfQ; however, if bidders request an extension, it should be granted. The simplified procurement arrangements will be detailed in the procurement section of the PIM.

37. **Procurement documents.** For international competitive procurement of works, goods, non-consulting services, and consulting services, the Borrower shall use the World Bank Standard Procurement Documents with minimum changes, acceptable to the World Bank as necessary, to address any Project-specific conditions.

38. **Procurement information and documentation**—filing and database. Procurement information will be recorded and reported as follows:

39. **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 project level in an orderly manner, readily available for audit. Contract award information will be promptly recorded and contract rosters, as agreed, will be maintained.

40. **Comprehensive quarterly reports will be prepared indicating** (i) revised cost estimates, where applicable, for each contract; (ii) 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 (iii) updated procurement plans, including revised dates, where applicable, for all procurement actions.

41. **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 United Nations Development Business in line with the provisions of the Procurement Regulation.

42. **Training, workshops, study tours, and conferences.** Training (including training materials and support), workshops, 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 plans that will identify the general framework of training activities for the year. A detailed plan and ToR providing the nature of training/workshops, number of trainees/participants, duration, staff months, timing, and estimated cost will be submitted to the 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 a completion certificate/diploma upon completion of training, shall be provided to the Project Coordinator, will be kept as part of the records, and will be shared with the World Bank if required.

43. **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 will be considered, and simplified procurement arrangements will be designed accordingly. The PIM shall be prepared by the Recipient and agreed with by the World Bank before effectiveness.

44. **Operating costs.** Operating costs financed by the Project are incremental expenses, incurred by the PIU as approved by the World Bank, for Project implementation, management, and M&E, 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. They will be procured using the procedures specified in the Project Implementation Manual of administrative, financial, accounting, and procurement procedures, accepted and approved by the World Bank.

45. **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 Recipients (such as Limited/Restricted Competitive Bidding, (RFQ), Shopping, Local Bidding, and Direct Contracting) shall be consistent with World Bank core procurement principles and ensure that the World Bank Anticorruption Guidelines and Sanctions Framework and contractual remedies set out in the World Bank Legal Agreement apply.

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

47. **Procurement prior review**. The procurement risk is rated *Substantial*. Table A1.4 summarizes the procurement prior review for Substantial risk. These prior review thresholds can evolve according to the variation in procurement risk during the life of the Project.

Table A1.4: Procurement Prior Review Thresholds (US$ millions) Based on the Procurement Risk Assessment

Contract category	Risk level			
	High	Substantial	Moderate	Low
Works, turnkey contracts, and PPPs	5,000,000	10,000,000	15,000,000	20,000,000
Goods inc. information systems & non-consulting services	1,500,000	2,000,000	4,000,000	6,000,000
Consulting services (firms)	500,000	1,000,000	2,000,000	4,000,000
Individual consultants	200,000	300,000	400,000	500,000

48. **Contract management and administration**. For all prior review contracts, contract management plans (in line with provisions of Regulations Annex XI) will be developed during contract creation and completed by contracts' signature.

Support Plan

49. **Implementation support missions will be carried out twice a year.** A midterm review will be carried out to assess project progress, achievement of the key indicators, risks and mitigation measures, and relevance of activities. The MEEA will undertake an independent evaluation at the midterm and at closing. The main areas of focus and skills requirements for implementation support to be provided by or through the World Bank are as summarized below:

Table A1.5: Main Areas of Focus and Skills Requirements for Implementation Support

Timeline	Focus
First 12 months	• Initiating critical procurements • Strengthening M&E and reporting systems • Strengthening FM systems • Integrated watershed management • Livelihood and community development • Spatial planning and coordination with stakeholders • Gender mainstreaming • Communication and outreach • Citizen engagement and GRM setup • Mobilization of the panel of experts for dam safety • Implementing complementary studies where deemed required toward finalization of first batch of tender (targeting around 7 sites)

Timeline	Focus
From 13 to 72 months	• Continuing critical procurements • On a rolling basis, implementing complementary technical and E&S studies where deemed required toward continuing various batches of tenders (targeting around 10 sites per year in average during first 4–5 years). • Maintaining M&E and reporting systems • Continuing coordination with stakeholders • Gender activities implementation • FM, procurement • Safeguards and GRM • Systematic training programs • Communication, knowledge generation, and dissemination • Project reporting

ANNEX 2: Key Features of Priority Dams for Intervention

#	Region	Province	Municipality	Name reservoir	Height (m)	Reservoir capacity (m3)	Block	WB classification	Risk category BF*	Main Uses	Secondary uses
1	Nord	Yatenga	Ouahigouya	Gondolgo	2.21	98,575	1	Small	nd	Irrigation	Pastoral, Household & Construction Fishery
2	Nord	Zandoma	Gourcy	Guelba	3.75	629,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
3b	Centre	Kadiogo	Komsilga	Boulbi	5	2,350,000	2	Small	3	Irrigation	Pastoral, Household & Construction, Fishery
4	Nord	Passoré	Arbolé	Ramessoum / Arbolé	4.07	2,046,000	1	Small	1	Pastoral	Household** & Construction Fishery
5b	Centre-Ouest	Boulkiemdé	Thiou	Soula	4.01	360,000	2	Small	2	Irrigation	Household & Construction, Fishery
6	Plateau Central	Kourwéogo	Toéghin	Nahartenga	3.9	600,000	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery, mines
7	Plateau Central	Kourwéogo	Boussé	Niogo	2.73	770,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery, mines
8	Plateau Central	Oubritenga	Zitenga	Nambéguian	3.69	212,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
9	Plateau Central	Oubritenga	Ziniaré	Kuila	2.8	107,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
10	Plateau Central	Oubritenga	Ziniaré	Gaskaye	2	1,200,000	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
11	Plateau Central	Oubritenga	Absouya	Biligotenga / Sogodin	3.65	580,000	1	Small	3	Irrigation	Pastoral, Household & Construction, Fishery
12	Plateau Central	Oubritenga	Nagreongo	Nagreongo	4	1,350,000	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery

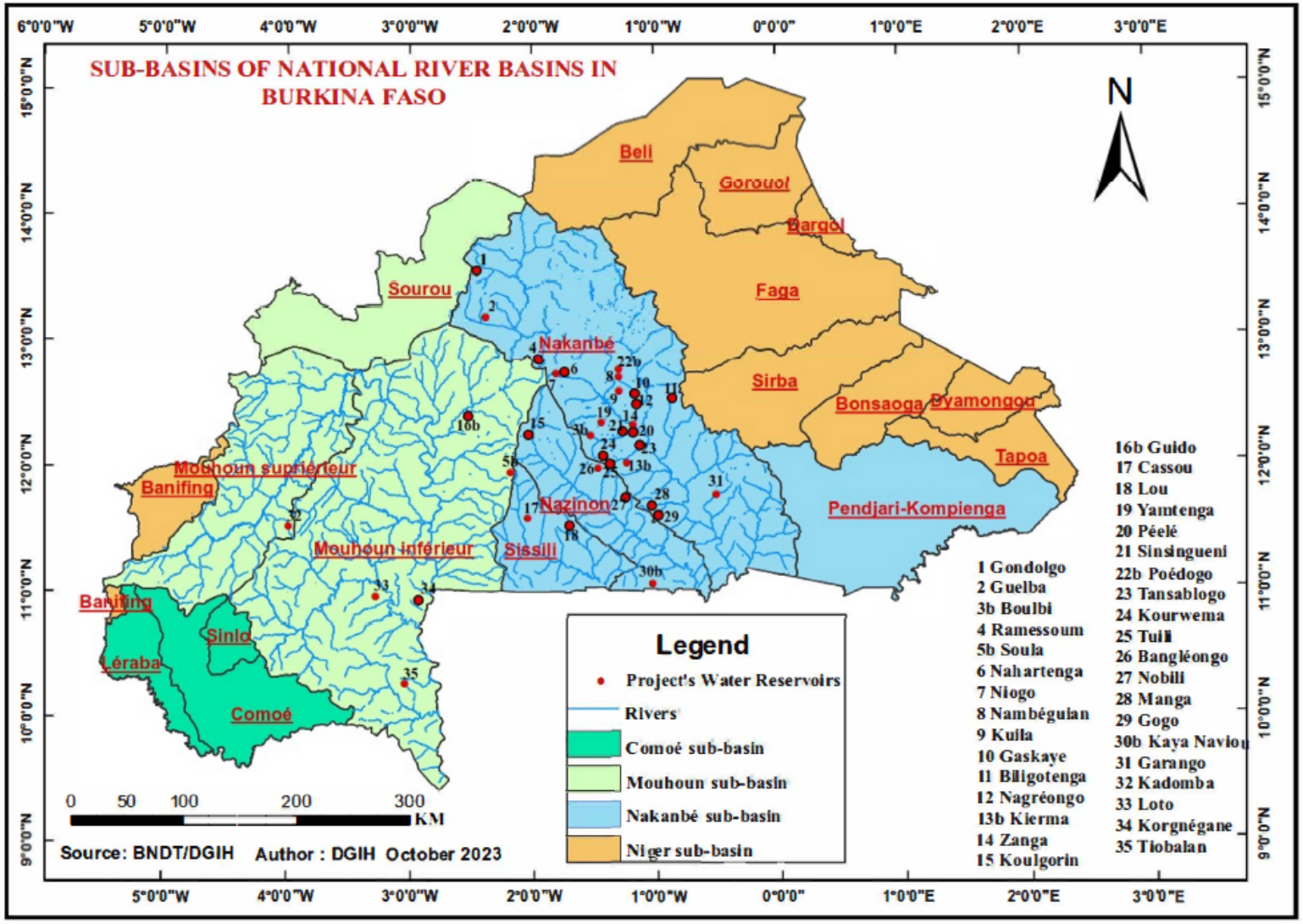
#	Region	Province	Municipality	Name reservoir	Height (m)	Reservoir capacity (m3)	Block	WB classification	Risk category BF*	Main Uses	Secondary uses
13b	Centre-Sud	Bazèga	Kombissiri	Kierma	nd	615,570	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
14	Plateau Central	Oubritenga	Nagreongo	Zanga	3	820,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
15	Centre-Ouest	Boulkiemdé	Bingo	Koulgorin	3.32	536,000	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
16b	Centre-Ouest	Sanguié	Réo	Guido	3.3	460,000	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
17	Centre-Ouest	Ziro	Cassou	Cassou	2	300,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
18	Centre-Ouest	Ziro	Sapouy	Lou	4.2	854,786	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
19	Centre	Kadiogo	Saaba	Yamtenga	5	841,912	2	Small	3	Récréatif	Pastoral, Household & Construction, Fishery
20	Centre	Kadiogo	Koubri	Péélé	6.44	7,000,000	1	Large	3	Irrigation	Pastoral, Household & Construction, Fishery
21	Centre	Kadiogo	Koubri	Sinsingueni	8.37	589,347	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
22b	Plateau Central	Oubritenga	Zitenga	Poedogo	3.5	160,000	2	Small	3	Irrigation	Pastoral, Household & Construction
23	Centre	Kadiogo	Koubri	Tansablogo	5.75	1,344,000	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
24	Centre-Sud	Bazèga	Saponé	Kourwema	5.16	632,287	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
25	Centre-Sud	Bazèga	Kombissiri	Tuili	2.25	40,000	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
26	Centre-Sud	Bazèga	Doulougou	Bangléongo	4.8	638,000	2	Small	3	Irrigation	Pastoral, Household & Construction, Fishery

#	Region	Province	Municipality	Name reservoir	Height (m)	Reservoir capacity (m3)	Block	WB classification	Risk category BF*	Main Uses	Secondary uses
27	Centre-Sud	Zoundwéogo	Nobéré	Nobili	5.43	712,500	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
28	Centre-Sud	Zoundwéogo	Manga	Manga	3.96	1,079,865	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
29	Centre-Sud	Zoundwéogo	Gogo	Gogo	4.84	492,500	1	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
30b	Centre-Sud	Nahouri	Tiébélé	Kaya Naviou	5.5	257,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery
31	Centre-Est	Boulgou	Garango	Garango / Tangaré	5.8	4,500,000	2	Large	3	Irrigation	Pastoral, Household & Construction, Fishery
32	Hauts Bassins	Houet	Satiri	Kadomba	4	1,025,000	2	Small	nd	Irrigation	Pastoral, Household & Construction, Fishery
33	Sud-Ouest	Bougouriba	Diébougou	Loto	5	386,500	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery, mines
34	Sud-Ouest	Ioba	Dissihn	Korgnégane or Tolégane	4.43	503,000	1	Small	3	Irrigation	Pastoral, Household & Construction, Fishery
35	Sud-Ouest	Poni	Gbomblora	Tiobalandi	5	168,000	2	Small	1	Irrigation	Pastoral, Household & Construction, Fishery, mines

** Risk category for BF enables among others evaluation of downstream risks in case of evaluation of adverse impacts due to potential failure of the dam structure.*

***Household uses includes house cleaning as well as washing of clothes and dishes.*

ANNEX 3: Distribution of Priority Dams in Sub-basins



Map cleared by GCS on March 24, 2024

ANNEX 4: Summary of Adaptation and Mitigation Activities under the Project

Subcomponents and activities	Climate adaptation activities/investments	Climate mitigation activities/investments
COMPONENT 1: SECURITY AND CLIMATE RESILIENCE OF WATER STORAGE INFRASTRUCTURES (US$92.07 MILLION)		
Subcomponent 1.1: Strengthening climate resilience through rehabilitation of priority dams (US$78.38 million) The activities to be funded will include: (i) **Climate-resilient rehabilitation and upgrading of priority dams:** to replace and strengthen climate change–damaged structures to be flood resilient, have sufficient water level and pressure to provide gravity-fed water to beneficiaries, and improve flood and drought resilience of beneficiaries in the command area **(90%F)** (ii) **Installation of early warning systems and disaster risk monitoring and management:** for equipment of dams with data monitoring systems in view of better anticipation and planning against climate change–exacerbated floods and droughts **(10%F)**	This subcomponent will improve the sustainability and storage capacity of degraded dams to enhance infrastructure resilience to floods, while boosting the resilience of beneficiaries to floods and droughts. Among the 235 priority dams of the PAUR, 35 have been further prioritized using a portfolio risk assessment based on the vulnerability to climate change–exacerbated natural hazards of the following dimensions: (i) dam degradation (including due to flood and extreme temperature damage), (ii) economic value of water uses in the command area (e.g., for irrigation, livestock, fishery etc.), and (iii) consequences and likelihood of potential dam failures due to floods, including communities' exposure. As all dams have been damaged by climate change–exacerbated high-flow events and temperatures, all rehabilitations include climate change considerations and build back better principles like right-sizing dams to protect against predicted floods and meet future water needs, integrating technology for monitoring and early-warning systems, and strengthening the governance for disaster risk management and response through the brigade. Planning and implementation will follow the principles outlined in the Resilient Water Infrastructure Design Brief[63] to ensure infrastructure is resilient to climate change–exacerbated floods and droughts, such as ensuring rehabilitated dams' spillways are designed to face more severe floods and better protect people and services in their command area. Assessments will also make use of the HydroClimatic Stress Test Toolbox to better quantify the magnitudes of future floods that the dams are likely to face. Additionally, the installation of instruments for (i) monitoring the status of dams (and that can be used for risk analysis & early warning systems), (ii) measuring the quantity and quality of water resources (on-site and upstream) for water-level gauging & risk analysis, and/or (iii) supporting early warning systems that will identify maintenance issues and flood events early, improving resilience. More flood resilient dams will also benefit drought resilience of people in the command area, as their	The mobilization of water through reduction of sedimentation and enhancements to the dams' spillways and other components will create the opportunity to utilize a gravity-fed water supply in the command area, thus replacing diesel-run pumping conveyance systems, leading to GHG emissions reductions. This change in pumping practices around existing reservoirs from diesel fuel pumping to gravity-fed water conveyance—made possible by the water access created following dam rehabilitations—is expected to reduce GHG emissions by 12,476 tCO2-eq annually, representing a 100% reduction compared to the baseline.

[63] World Bank. 2020. Resilient Water Infrastructure Design Brief. © World Bank, Washington, DC. http://hdl.handle.net/10986/34448. License: CC BY 3.0 IGO.

Subcomponents and activities	Climate adaptation activities/investments	Climate mitigation activities/investments
	water storage will be increased and become more reliable during dry periods.	
Subcomponent 1.2: Rapid response for securing failing dams and enhanced climate resilience (US$13.69 million) Activities to be financed under this subcomponent include: (i) **Diagnosis and prioritization:** technical assistance (feasibility studies, climate-informed emergency works identification, etc.) and support to works implementation **(15%F)** (ii) **Emergency works:** to strengthen the climate resilience of failing dams to exacerbated floods and droughts **(65%F)** (iii) **Emergency-response brigade:** establishment of a team equipped to respond to dam emergencies in the face of climate-exacerbated extreme events **(20%F)**	This subcomponent targets the implementation of reinforcement works on dams outside subcomponent 1.1 at imminent risks of failure, identified by the national inventory or to be identified during project implementation, during extreme events such as floods or other natural hazards exacerbated by climate change. The diagnosis and prioritization of these structures to be carried out with the support of the Technical Assistance Consultancy Firm (TACF) will consider current vulnerability to floods and droughts, especially impacts in terms of water storage reduction, sedimentation, and land degradation. Similarly to subcomponent 1.1, identified intervention measures for emergency works will follow the principles outlined in the Resilient Water Infrastructure Design Brief[64] to ensure infrastructure is resilient to climate change–exacerbated floods and droughts after repairs. They will also integrate build back better principles (see 1.1 above). This subcomponent will help establish the national dam emergency-response brigade to institutionalize these tasks in the future, thus equipping the government in the early identification and quick response to dam emergencies, reducing the likelihood of failure brought on by climate-exacerbated extreme events like floods and droughts and contributing to building back better.	The reinforcement works will support GHG mitigation through the use of low-emission materials, energy efficient equipment and nature-based solutions (NBS), including bunds, sand dams and local infiltration, and flood protection through wetlands restoration. Improved water mobilization and availability is expected to have benefits similar to subcomponent 1.1 in terms of displacing energy-intensive water transportation techniques and reducing associated GHG emissions. The establishment of the national dam emergency-response brigade will institutionalize climate-informed practices in responding to such emergencies, normalizing the use of low emissions materials, NBS, and energy-efficient equipment in the face of all future dam failures, thus reducing GHG emissions.
COMPONENT 2: DEVELOPMENT OF CLIMATE-SMART HYDRO-AGRICULTURAL INFRASTRUCTURES (US$14.72 MILLION)		
Subcomponent 2.1: Development of Climate-smart irrigated perimeters (US$13.39 million) This subcomponent will finance: (i) **Rehabilitation of existing irrigated perimeters:** to apply climate-smart irrigation equipment and practices and develop drought-resilience **(30%F)** (ii) **Development of new irrigated perimeters:** to provide climate-smart irrigation equipment and boost drought resilience for farmers **(70%F)**	This subcomponent will rehabilitate and develop 788 ha of irrigated perimeters in drought vulnerable areas and ensure the efficient development of irrigated land for intensive, environmentally friendly, and climate-smart agriculture. These investments will leverage the availability of water mobilized through the rehabilitation of dams under Component 1 to provide farmers in the intervention area with drought-resilient water supply for irrigation, thus allowing them to multiply the productivity of their land, boost food security, and enhance their resilience and that of their livelihood in the face of extreme temperatures and drought. The subcomponent will (i) rehabilitate existing irrigated perimeters (259 ha) by supplying gravity-	Irrigated land will be developed based on the availability of gravity-fed irrigation water from the reservoirs rehabilitated under Component 1. Measures that will be taken to encourage lower carbon development include gravity-fed and precision irrigation, using organic compost, agroforestry, cover crops or mulch, and limiting chemical fertilizers. For the new irrigation developments, the conversion of degraded land to annual cropland (tomato and onion cultivation) yields GHG emissions reductions of 634 tCO2-eq per year (100% reduction compared to baseline) while the conversion of degraded land to flooded rice irrigation (with multiple drainage periods during the dry season to reduce water

[64] World Bank. 202). Resilient Water Infrastructure Design Brief. © World Bank, Washington, DC. http://hdl.handle.net/10986/34448. License: CC BY 3.0 IGO.

Subcomponents and activities	Climate adaptation activities/investments	Climate mitigation activities/investments
	fed water to equip farmers to face the variability of rainfall and associated drought, which they cannot do today due to lack of water in reservoirs, and (ii) develop new irrigation schemes (529 ha) improving access to drought resilient water supply. Small-scale irrigation will contribute to reducing crop failure due to droughts, increasing crop and rice productivity, and enhancing food availability and access for people living in the dams command areas, including internally displaced people, thus strengthening local food security in the face of extreme events. Sustainable soil management and proper use of drought resistant crop seeds will increase the adaptive capacity of communities and reduce the risk posed by projected increasing temperatures and reduction in rainfall in the project locations.	use) yields GHG emissions reductions of 301 tCO2-eq per year (100% reduction compared to baseline). The emissions associated with the rehabilitation of irrigated areas toward the cultivation of tomato and onion (one-half of the rehabilitations) yield annual emissions reductions of 121 tCO2-eq (80 percent reduction compared to baseline), while the rehabilitation of irrigated areas toward rice (with multiple drainage period during the dry season to reduce water use) yield annual emissions of 1520 tCO2-eq, a 60 percent increase compared to the baseline. The supply of inputs in the operation of the new and rehabilitated irrigation schemes (organic compost and urea) will be supported by World Bank–financed agriculture projects active in the area and therefore was omitted from this analysis.
Subcomponent 2.2: Support to agricultural and fish production and to the management of irrigation schemes (US$1.33 million) Activities to be financed under this subcomponent include: (i) **Fishery equipment, infrastructure and stocking:** to build the value chain for the production of a local climate-resilient source of protein **(60%F)** (ii) **Support to fish processing:** to strengthen the value chain resilience to extreme events **(20%F)** (iii) **Operational permits allocation:** to strengthen the participation of the private sector in fishery and irrigation activities **(5%F)** (iv) **Capacity building:** for the climate-resilient management, operation, and maintenance of irrigation schemes **(15%F)**	This subcomponent will leverage the newly available water supply from rehabilitated dams to increase fish production, which would improve food and nutrition security through a local, drought resilient source of protein, and fight against malnutrition and stunting. The fishery equipment, infrastructure, and stocking will leverage newly available water storage from rehabilitated dams to boost the local fishery economy through drought-resilient water supply from the newly rehabilitated dams, protecting the production from higher temperatures and eutrophication associated with extreme heat and drought through a sustained water source. Location of the supportive infrastructure will account for flood vulnerability and use raised floors as needed if located in a flood zone. Support to fish processing will enhance the value chain to improve the extreme temperature resilience of storage for fish produced by beneficiaries from the project through better ventilation and cooling of storage facilities, including by appropriately using shade, local materials, energy efficient cooling equipment and facilities design (thickness of walls, location of openings and windows, depth of storage). Capacity building activities will equip beneficiary farmers with the skills for the management, operation, and maintenance of project irrigation schemes with a focus on climate-smart irrigation practices (gravity-fed, precision irrigation), water	Support to fish processing will promote the use of low emissions materials and equipment in view of reducing the GHG emissions associated with the fish processing value chain. It will also help avoid early spoiling and food waste, thus reducing associated GHG emissions. Capacity building activities will promote climate-smart irrigation practices such as efficient water use in the operation and maintenance of irrigation schemes developed under the project, as well as the use of climate-resilient seeds, thus aiming to reduce the GHG emissions associated with the operation, maintenance, and cultivation of these irrigated perimeters.

Subcomponents and activities	Climate adaptation activities/investments	Climate mitigation activities/investments
	use efficiency, and use of climate-resilient seeds. For fisheries, capacity building will also focus on sustainable fisheries operation, to ensure regular stocking and care combined with measured extraction and regulation avoid impacts on the fish population.	
COMPONENT 3: INTEGRATED WATERSHED PROTECTION AND MANAGEMENT (US$10.31 MILLION)		
Subcomponent 3.1: Participatory planning for integrated watershed management (US$0.86 million) Activities to be financed under this subcomponent include: (i) **Participatory diagnostic and elaboration of the PAGI:** develop risk maps for climate vulnerability; identify, with local stakeholders, the priority actions to address climate change–exacerbated land degradation and sedimentation **(100%F)**	This subcomponent will finance the development of Integrated Watershed Development and Management Plans (PAGI—*Plans d'Aménagement et de Gestion Intégrée du Bassin Versant*) in the watersheds associated with the dams to be rehabilitated under subcomponent 1.1 (and therefore selected due to their vulnerability to floods and droughts) through a participatory and bottom-up process of diagnosis and planning. The main objective of the PAGI is to protect the target watersheds from sedimentation, progressive filling, and loss of storage capacity due to drought, increased erosion, and land degradation exacerbated by climate change. PAGIs will encourage climate change–informed planning and investments such as forest conservation and reforestation, soil erosion prevention, and water resource conservation to reduce climate-exacerbated flood vulnerability by reducing erosion due to runoff and through increasing storage capacity, which will also increase drought resilience. The diagnostic starts with a deep analysis of spatial data to produce risk maps for vulnerability to flood and drought–exacerbated land degradation, erosion, and siltation, as well as thematic maps of the critical sites for intervention (cross-referencing data on land use, soil types, and topography). The second stage is a participatory and inclusive process of consultation and planning of activities with local stakeholders to (i) confirm the conclusions of the spatial data analysis, (ii) analyze, with local stakeholders, the occupation, use, and level of land degradation, and understand the main sources of climate vulnerability, erosion, and land degradation in the selected watersheds, (iii) identify the resource users on the sites at risk, (iv) identify and plan the actions to be implemented to reduce vulnerability (taking into account previous land use as recorded in planning instruments and its land tenure, and the climate resilience of the proposed interventions), and (v) agree on the distribution of roles and responsibilities for implementating and monitoring identified actions. This participatory process will align with robust decision-making (RDM) and dynamic adaptation pathways (DAP)	The development of the PAGI supports the implementation of subcomponent 3.2, which will implement the measures identified and prioritized during this phase.

Subcomponents and activities	Climate adaptation activities/investments	Climate mitigation activities/investments
	methodologies. To elaborate the PAGI, the identified actions will then be evaluated and prioritized based on the available budget and their impact on addressing the priority climate change–exacerbated impacts like land degradation, sedimentation, and pollution.	
Subcomponent 3.2: Integrated watershed management (US$9.45 million) Activities to be financed under this subcomponent include: (i) **Implementation of PAGI activities:** address climate vulnerability, land degradation and erosion, restoring degraded areas and creating a carbon sink **(95%F)** (ii) **Communication campaigns:** including climate sensitization **(5%F)**	This subcomponent focuses on the implementation of activities identified under the PAGI developed in subcomponent 3.1, all of which will be selected based on their potential to address climate vulnerability in the watershed, land degradation, and erosion. Categories of possible activities include (i) mechanical and biological anti-erosive water and soil conservation measures to reduce surface runoff during flooding events aggravated by climate change, (ii) vegetation cover restoration measures to fix the soil and reduce erosion (thereby providing flood resilience and maintaining soil moisture during droughts), (iii) protection measures for the banks of reservoirs and watercourses, including measures to reduce vulnerability to drought or flood through restoration of vegetation and wetlands and green-grey infrastructure, (iv) hydro-agricultural developments to reduce water erosion during floods and improve the livelihoods of local populations through climate-smart agriculture practices that will build the local population's resilience to droughts, and (v) facilitating consensus-based agreements on land use to reduce land degradation and erosion exacerbated by floods and droughts, including potential development of grazing areas and corridors (including for livestock to the reservoirs). Communication campaigns will raise awareness about climate change–exacerbated floods and droughts and how to manage the associated impacts on land and water resources. These activities aim to improve flood and drought resilience and will contribute to the protection and resilience of water resources (reducing sediment load and flood peaks).	The watershed management improvements under this subcomponent are expected to contribute to the mitigation potential, with 38,036 tCO2-eq reduction annually in GHG emissions through land use change from degraded land to reforestation and grass-covered land without the use of fertilizer or pesticides, managed by communities. This subcomponent will contribute to regenerative activities such as reforestation, agroforestry, and land protection that will increase carbon sequestration. The anti-erosive soil and water conservation measures and the protection measures for the banks of reservoirs and watercourses will involve the use of NBS and vegetation cover restoration measures to fix the soil and reduce erosion, thus increasing vegetative and soil carbon stock. Hydro-agricultural development will focus on climate-smart agriculture practices such as gravity-fed, organic irrigation and the use of climate-resilient seeds, converting degraded land to sustainably productive areas with higher carbon stocks and no emissive chemical fertilizers. These activities aim to offer sustainable production opportunities to producers, including those committed to freeing up some land for natural forest regeneration, in the context of compensating and improving the livelihoods of populations. Consensus-based agreements on land use will establish mechanisms to avoid the further degradation and erosion of land in the target watersheds, thus preserving the carbon stock and biodiversity in those areas. The communication campaigns will raise awareness about sustainable land management practices and change behaviors to ensure local stakeholders continue to be stewards of the land and promote carbon sequestering activities.
COMPONENT 4: CLIMATE-SMART SECTOR REFORMS AND OPERATIONALIZATION OF THE NATIONAL STRATEGY FOR DAMS (US$7.82 MILLION)		
Subcomponent 4.1: Supporting climate-smart sector reforms and strengthening the institutional framework (US$5.04 million)	The consolidation of a national vision for the safety, operation, and maintenance of dams will be carried out through the implementation of the SNESB action plan and will include relevant institutional changes (including creation of emergency/rapid response dam repair brigades and management of	Land tenure will be secured at the sites under subcomponents 1.1 and 2.1, which have been prioritized due to their vulnerability to climate change–exacerbated floods and droughts, to facilitate the implementation of associated

Subcomponents and activities	Climate adaptation activities/investments	Climate mitigation activities/investments
Activities to be financed under this subcomponent include: (i) **Consolidating the national vision for the safety, operation, and maintenance of dams:** support institutional changes necessary for climate-informed planning and disaster-risk management (DRM); capacity building on early warning systems and DRM **(35%F)** (ii) **Securing land tenure:** for the climate change vulnerable dams identified under Component 1 **(10%F)** (iii) **Supporting the setup and operationalization of a water fund:** for O&M and dam safety budgeting accounting for climate impacts **(20%F)** (iv) **Establishing and strengthening local institutions:** for improved management of climate risks at local levels **(35%F)**	early warning systems and the climate change–exacerbated flood and drought risk), a list of processes and quality control procedures to be improved or developed (including climate change exacerbated flood and drought risk response), a description of the associated resources to be adapted or mobilized (including expertise and required software/tools on climate resilience, early warning systems, and DRM), and a training and capacity-building plan on the abovementioned topics, including early warning systems and DRM. This subcomponent will also strengthen cooperation with hydrometeorological services and the IWRM Directorate of MEEA to further support integrated management of water resources as well as early warnings for droughts and floods, hence also improving resilience of dams to climate change. Land tenure will be secured at the sites under subcomponents 1.1 and 2.1, which have been prioritized due to their vulnerability to climate change–exacerbated floods and droughts, to facilitate the implementation of associated rehabilitation and water mobilization activities. The development of legal and supportive materials for establishing a water fund will explicitly set out how budgeting is to consider the operation and maintenance and dam safety of dams in a context of climate change and based on the climate impacts faced by the dams. Sensitivity to climate change will be one of the key criteria for allocating resources for the water fund. All local water management institutions established by the project, including Local Water Committees (CLEs) at the sub-basin level and Water User Committees (WUCs), will receive capacity building regarding the climate vulnerabilities and risks faced by the watersheds and reservoirs on which they operate, including climate-conscious water management, resilience to floods and droughts, and climate-smart management practices in their field of interest.	rehabilitation and water mobilization activities.
Subcomponent 4.2: Capacity building (US$2.78 million) Activities to be financed under this subcomponent include: (i) **Capacity building of regional and national actors:** equip actors for climate-informed operation and maintenance of dams **(35%F)** (ii) **Support to dam safety:** establish mechanisms for improved dam	This subcomponent will strengthen the national framework and institutions to foster climate resilient design and O&M of dams and scale up project climate benefits. It will also support improving the monitoring, operation, and maintenance of dams and irrigation schemes, thus ensuring the rehabilitated climate-resilient infrastructure provides sustainable and optimized protection against floods and water supply during droughts.	Capacity building activities will promote resource efficient operation and maintenance to reduce GHG emissions associated with these tasks.

Subcomponents and activities	Climate adaptation activities/investments	Climate mitigation activities/investments
safety in the face of climate impacts **(35%F)** (iii) **Training to local institutions:** equip local institutions for climate- informed operation and maintenance of dams **(30%F)**	Capacity building activities will include climate change considerations, namely: strengthening the capacities of national and regional actors in adequate monitoring and O&M of hydraulic infrastructure, including in the face of climate risks and extreme events; on-the-job local and regional training in the routine surveillance and maintenance of hydraulic structures, including climate resilient operation of dams and flood management; support to academic and vocational training and research programs in dams' designs, supervision, and rehabilitation to take into account ways to increase climate resilience; and strengthening of key operators (including dam repair brigades) and institutional entities tol include training to face climate extremes and their impacts on dam operation and maintenance. Activities supporting improved dam safety will better equip dam operators and relevant stakeholders to face the impacts of climate-exacerbated floods and droughts in the operation, maintenance, and rehabilitation of dams going forward, therefore reinforcing their and the sector's climate resilience. Training to local institutions will similarly equip them to carry out surveillance and maintenance while considering climate change risks and impacts, improving the local resilience to climate change exacerbated floods and droughts.	
COMPONENT 5: PROJECT MANAGEMENT, ENVIRONMENTAL AND SOCIAL ISSUES, AND CONSULTANT SERVICES (US$25.08 MILLION)		
Subcomponent 5.1: Design, control, and supervision of works (US$8.83 million) Activities to be financed under this subcomponent include: (i) **Resilient design of interventions and supervision:** technical studies (feasibility, bidding documents) and supervision will take into account all best practices for climate resilient design **(100%F)**	Planning and development of technical studies will follow the principles outlined in the Resilient Water Infrastructure Design Brief to ensure infrastructure is resilient to climate change–exacerbated floods and droughts, such as ensuring rehabilitated dams' spillways are designed to face more severe floods exacerbated by climate change and better protect people and services in their command area. Assessments will also make use of the HydroClimatic Stress Test Toolbox as relevant.	Design and supervision will promote climate resilient infrastructure components and practices to encourage the reduction of GHG emissions through project implementation and coordination.
Subcomponent 5.2: Implementation and monitoring of project safeguard requirements (US$5.30 million): climate risks taken into account in ESS4 Annex 1 **(100%F)**	Pro-rated from other components' CCBs.	Pro-rated from other components' CCBs.
Subcomponent 5.3: Project coordination and management (US$10.95 million): supervision of the implementation of climate change–related project features **(100%F)**	Pro-rated from other components' CCBs.	Pro-rated from other components' CCBs.