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Report No: PAD4802

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US\$86.1 MILLION

TO THE

STATE OF ESPÍRITO SANTO

WITH A GUARANTEE FROM THE FEDERATIVE REPUBLIC OF BRAZIL

FOR THE

ESPÍRITO SANTO WATER SECURITY MANAGEMENT PROJECT

April 18, 2023

Water Global Practice
Latin America and the Caribbean Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective March 17, 2023)

Currency Unit = Brazilian Reais (BRL)

BRL 5.231= US\$ 1.00

US\$ 0.191 = BRL 1.00

FISCAL YEAR

January 1 - December 31

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ABBREVIATIONS AND ACRONYMS

AGERH	State Water Resources Agency (<i>Agência Estadual de Recursos Hídricos</i>)
ANA	National Water and Sanitation Agency (<i>Agência Nacional de Águas e Saneamento Básico</i>)
BANDES	Espírito Santo Development Bank (<i>Banco de Desenvolvimento do Espírito Santo</i>)
CadUnico	Federal Government's Social Programs Registry (<i>Cadastro Único para Programas Sociais do Governo Federal</i>)
CBMES	Military Fire Brigade of Espírito Santo (<i>Corpo de Bombeiros Militar do Espírito Santo</i>)
CEPDEC	State Coordination for Protection and Civil Defense (<i>Coordenadoria Estadual de Proteção e Defesa Civil</i>)
CERC	Contingent Emergency Response Component (<i>Componente Contingencial de Resposta a Emergências</i>)
CERD	Specialized disaster response center (<i>Centro Especializado de Resposta a Desastres</i>)
CERH	State Water Resources Council (<i>Conselho Estadual de Recursos Hídricos</i>)
CESAN	Espírito Santo Water and Sanitation Company (<i>Companhia Espírito Santense de Saneamento</i>)
COMPDEC	Municipal Committees of Civil Defense and Protection (<i>Coordenadoria Municipal de Proteção e Defesa Civil</i>)
CPF	Country Partnership Framework
CRI	Corporate Results Indicator
DA	Designated Account
DER-ES	Buildings and Roads Department of Espírito Santo (<i>Departamento de Edificações e de Rodovias do Estado do Espírito Santo</i>)
DFIL	Disbursement and Financial Information Letter
DRM	Disaster Risk Management
ERR	Economic Rate of Return
ESCP	Environmental and Social Commitment Plan
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plans
ESS	Environmental and Social Standards
FM	Financial Management
FMA	Financial Management Assessment
Fundágua	State Fund for Water and Forest Resources (<i>Fundo Estadual de Recursos Hídricos e Florestais do Espírito Santo</i>)
FY	Fiscal Year
GAP	Gender Action Plan
GCRF	Global Crisis Response Framework
GDP	Gross Domestic Product
GHG	Greenhouse gas
GRM	Grievance Redress Mechanism
IBRD	International Bank for Reconstruction and Development
ICS	Incident Command System
IFRs	Interim Unaudited Financial Reports
IJSN	Jones dos Santos Neves Institute (<i>Instituto Jones do Santos Neves</i>)
IPF	Investment Project Financing

LDO	Budget Guidelines Law (<i>Lei de Diretrizes Orçamentárias</i>)
LOA	Annual Budget Law (<i>Lei Orçamentária Anual</i>)
M&E	Monitoring and Evaluation
NBS	Nature-based solutions
NPV	Net Present Value
NUDEC	Civil Defense Hub (<i>Núcleo de Defesa Civil</i>)
PAD	Project Appraisal Document
PDO	Project Development Objective
PEPDEC	State Protection and Civil Defense Plan (<i>Plano Estadual de Proteção e Defesa Civil</i>)
PERH	State Water Resources Plan (<i>Plano Estadual de Recursos Hídricos</i>)
PES	Payment for Environmental Services
PGE	State Attorney General (<i>Procuradoria Geral do Estado</i>)
PIU	Project Implementation Unit
PMU	Project Management Unit
POM	Project Operations Manual
PPA	Pluriannual Plan (<i>Plano Plurianual</i>)
PPSD	Project Procurement Strategy for Development
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SAFF	Solution for Physical and Financial Project Management system (<i>Sistema de Acompanhamento Físico Financeiro</i>)
SBC	Special Bidding Commission
SEAMA	Secretariat for Environment and Water Resources (<i>Secretaria do Meio Ambiente e Recursos Hídricos</i>)
SECONT	Secretariat of Control and Transparency (<i>Secretaria de Estado de Controle e Transparência</i>)
SEFAZ	State Secretariat of Finance (<i>Secretaria da Fazenda</i>)
SEIRH	State water resources information system (<i>Sistema Estadual de Informações sobre Recursos Hídricos</i>)
SEP	State Secretariat of Economy and Planning (<i>Secretaria de Economia e Planejamento</i>)
SEP	Stakeholder Engagement Plan
SES	State of Espírito Santo
SIEPDEC-ES	The State Civil Defense and Protection System (<i>Sistema Estadual de Proteção e Defesa Civil</i>)
SIGEFES	Integrated System of Public Financial Management of Espírito Santo (<i>Sistema Integrado de Gestão das Finanças Públicas do Espírito Santo</i>)
SIGERH-ES	Espírito Santo State Integrated Water Resources Management System (<i>Sistema Integrado de Gerenciamento de Recursos Hídricos do Estado do Espírito Santo</i>)
SOE	Statement of Expenditures
STEP	Systematic Tracking of Exchanges in Procurement
STN	National Treasury Secretariat (<i>Secretaria do Tesouro Nacional</i>)
SUBCAP/SEP	Sub-secretariat of Fundraising under the State Secretariat of Economy and Planning (<i>Subsecretaria de Captação de Recursos, Secretaria de Economia e Planejamento</i>)
TCE-ES	State Court of Auditors (<i>Tribunal de Contas do Estado do Espírito Santo</i>)
TOR	Terms of Reference
WRM	Water Resources Management



TABLE OF CONTENTS

DATASHEET	1
I. STRATEGIC CONTEXT	8
A. Country Context.....	8
B. Sectoral and Institutional Context	11
C. Relevance to Higher Level Objectives.....	16
II. PROJECT DESCRIPTION.....	18
A. Project Development Objective	18
B. Project Components	18
C. Project Beneficiaries	22
D. Results Chain	23
E. Rationale for Bank Involvement and Role of Partners	24
F. Lessons Learned and Reflected in the Project Design	24
III. IMPLEMENTATION ARRANGEMENTS	26
A. Institutional and Implementation Arrangements	26
B. Results Monitoring and Evaluation Arrangements.....	27
C. Sustainability.....	28
IV. PROJECT APPRAISAL SUMMARY	29
A. Technical, Economic and Financial Analysis	29
B. Fiduciary.....	31
C. Legal Operational Policies.....	33
D. Environmental and Social.....	33
V. GRIEVANCE REDRESS SERVICES	36
VI. KEY RISKS	37
VII. RESULTS FRAMEWORK AND MONITORING	38
ANNEX 1: Implementation Arrangements and Support Plan	61
ANNEX 2: Detailed Project Description	77
ANNEX 3: Economic Analysis.....	89
ANNEX 4: Gender Action Plan	92
ANNEX 5: Map	98



DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Brazil	Brazil: Espirito Santo Water Security Management Project	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P176982	Investment Project Financing	Substantial

Financing & Implementation Modalities

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

Expected Approval Date	Expected Closing Date
09-May-2023	30-Jun-2029

Bank/IFC Collaboration

No

Proposed Development Objective(s)

(i) to strengthen the Borrower's capacity to manage water security risks in a changing climate; (ii) to reduce those risks in selected areas of the Borrower's territory; and (iii) in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

**Components**

Component Name	Cost (US\$, millions)
1) Building the Borrower's capacity for water security in a changing climate	15.52
2) Demonstrating climate-smart integrated water security risk reduction approaches in selected basins	30.18
3) Reducing flood risk in targeted municipalities	60.91
4) Project Management	6.99
5) Contingent Emergency Response Component (CERC)	0.00

Organizations

Borrower:	State of Espírito Santo
Implementing Agency:	AGERH - State Water Resources Agency CEPDEC - State Coordination for Protection and Civil Defense DER-ES - Buildings and Roads Department of Espírito Santo SEAMA - State Secretariat for the Environment and Water Resources

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	113.60
Total Financing	113.60
of which IBRD/IDA	86.10
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	86.10
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Non-World Bank Group Financing

Counterpart Funding	27.50
Borrower/Recipient	27.50

**Expected Disbursements (in US\$, Millions)**

WB Fiscal Year	2023	2024	2025	2026	2027	2028	2029	2030
Annual	0.00	3.00	10.00	15.00	18.00	18.00	17.10	5.00
Cumulative	0.00	3.00	13.00	28.00	46.00	64.00	81.10	86.10

INSTITUTIONAL DATA**Practice Area (Lead)**

Water

Contributing Practice Areas

Environment, Natural Resources & the Blue Economy, Urban, Resilience and Land

Climate Change and Disaster Screening

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

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

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



COMPLIANCE

Policy

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

☐ Yes ☒ No

Does the project require any waivers of Bank policies?

☐ Yes ☒ No

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

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

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

Legal Covenants

Sections and Description



(Schedule 2, Section I.A.1 of the Loan Agreement)

The Borrower shall establish, and thereafter operate and maintain throughout Project implementation, a PMU within SEAMA to implement, coordinate, monitor and report on the execution of the Project, with functions, resources and composition acceptable to the Bank, as further detailed in the Project Operations Manual.

Sections and Description

(Schedule 2, Section I.A.2 of the Loan Agreement)

The Borrower shall establish, and thereafter operate and maintain through Project Implementation, PIUs within AGERH, CEPDEC, SEAMA, respectively, to implement their respective parts of the Project as set forth in Article III, with functions, resources and composition acceptable to the Bank, as further detailed in the Project Operations Manual.

Sections and Description

(Schedule 2, Section I.A.3 of the Loan Agreement)

The Borrower shall establish, and thereafter operate and maintain through Project Implementation, a PIU within DER-ES to implement Part 3 of the Project, with functions, resources and composition acceptable to the Bank, as further detailed in the Project Operations Manual.

Sections and Description

(Schedule 2, Section I.A.4 of the Loan Agreement)

The Borrower shall establish, and thereafter, operate and maintain throughout Project implementation, a steering committee (the "Steering Committee"), responsible for Project oversight, providing strategic direction, ensuring inter-agency collaboration; monitoring progress; with composition, functions and resources acceptable to the Bank and set forth in the Operational Manual.

Sections and Description

(Schedule 2, Section I.A.5 of the Loan Agreement)

No later than three (03) months after the Effective Date, the Borrower shall have the SAFF operating in a manner acceptable to the Bank and thereafter maintain it operational throughout Project implementation.

Sections and Description

(Schedule 2, Section I.A.6 of the Loan Agreement)

No later than nine (09) months after the Effective Date, the Borrower shall hire, and retain throughout Project implementation, a Consulting Firm to support SEAMA throughout Project implementation, with, inter alia: (i) administrative and financial management; (ii) implementation of the ESS and ESCP; (iii) the review and update of the terms of reference for various Project activities and assist in the preparation of documents related to the procurement cycle; and (iv) providing specialized individual consultants with specific technical expertise, as required.



Sections and Description

(Schedule 2, Section I.D.1 of the Loan Agreement)

To facilitate the implementation of Part 2.2 of the Project, the Borrower, through SEAMA, shall enter into an agreement with CEPDEC and AGERH (the “Tripartite Technical Cooperation Agreement”), in terms and conditions acceptable to the Bank, and thereafter maintain said agreement throughout Project implementation.

Sections and Description

(Schedule 2, Section I.C.1 of the Loan Agreement)

To facilitate the implementation of Parts 1.2 and 5 of the Project by CEPDEC, Part 1.1 and 3(ii) of the Project by AGERH and Part 3 (i) and 3 (iii) of the Project by DER-ES the Borrower, through SEAMA, shall enter into separate agreements with each entity (the “CEPDEC Technical Cooperation Agreement”, “AGERH Technical Cooperation Agreement” and “DER-ES Technical Cooperation Agreement”, jointly the “Technical Cooperation Agreements”), in terms and conditions acceptable to the Bank, and thereafter maintain said agreements throughout Project implementation.

Sections and Description

(Schedule 2, Section I.B.1 of the Loan Agreement)

To facilitate the carrying out of Parts 1.1, 2.2 and 3 (ii) of the Project by AGERH, Parts 1.2., 2.2 and 5 of the Project by CEPDEC, and Part 3 (i) and 3(iii) by DER-ES, the Borrower shall make part of the proceeds of the Loan available to AGERH, CEPDEC and DER-ES, respectively, under a separate subsidiary agreement between the Borrower and each entity (“AGERH Subsidiary Agreement”, “CEPDEC Subsidiary Agreement” and “DER-ES Subsidiary Agreement”, jointly the “Subsidiary Agreements”), under terms and conditions acceptable to the Bank, which shall include the following: (i) the roles and responsibilities of AGERH, CEPDEC and DER-ES with regard to the implementation of the Project; and (ii) the obligation of AGERH, CEPDEC and DER-ES to comply with the technical, procurement, fiduciary, environmental and social requirements applicable to the Project, and the Anti-Corruption Guidelines, in accordance with the provisions of this Agreement.

Conditions

Type	Financing source	Description
Effectiveness	IBRD/IDA	(Article V, Paragraph 5.01 of the Loan Agreement) The Additional Conditions of Effectiveness consist of the following: (a) That the Steering Committee referred to in Section I.A.2 of Schedule 2 has been established in a manner acceptable to the Bank. (b) That the PMU referred to in Section I.A.1 of Schedule 2 has been established and staffed in a manner acceptable to the Bank.



		<p>(c) That the PIUs referred to in Section I.A.2 and I.A.3 of Schedule 2 have been established and staffed in a manner acceptable to the Bank.</p> <p>(d) That the Project Operations Manual referred to in Section I.C of Schedule 2 has been approved and adopted in a manner acceptable to the Bank.</p> <p>(e) That the Subsidiary Agreements referred to in Section I.B of Schedule 2 have been entered into in form and substance acceptable to the Bank, and all conditions precedent to their effectiveness have been fulfilled.</p> <p>(f) That the Technical Cooperation Agreements referred to in Section I.C. of Schedule 2 has been entered into in form and substance acceptable to the Bank, and all conditions precedent to its effectiveness have been fulfilled.</p> <p>(g) That the Tripartite Cooperation Agreements referred to in Section I.D. of Schedule 2 has been entered into in form and substance acceptable to the Bank, and all conditions precedent to its effectiveness have been fulfilled.</p>
Type Disbursement	Financing source IBRD/IDA	<p>Description (Schedule 2, Section III.B of the Loan Agreement)</p> <p>No withdrawal shall be made under Category (3) unless and until all funds under Category (5) of Loan No. 8353-BR dated September 28, 2015, entered into between the Borrower and the Bank, for the “Espirito Santo Sustainable Integrated Water Management Project” have been entirely depleted.</p>



I. STRATEGIC CONTEXT

A. Country Context

Brazil Context

- Brazil's economy continues to recover, with gross domestic product (GDP) growing at 2.9 percent in 2022, propelled by a successful COVID-19 vaccination campaign, rising demand for services, and fiscal stimulus.** The labor market improved through 2022, including for women and youth, as unemployment fell to 7.9 percent by December 2022 (down from a peak of 11.1 percent in December 2021). Persistent inflation (5.6 percent as of February 2023) has prompted the tightening of monetary policy rate (13.75 percent as of February 2023) to anchor 2023-24 inflation expectations. Improved revenues, gradual economic recovery and elevated prices of commodities boosted fiscal results in 2022, with the 12-month primary surplus of the public sector reaching 1.2 percent of GDP and public debt declining to 72.9 percent of GDP as of January 2023 (a 5.4 p.p reduction). GDP growth is expected to slow to 0.8 percent in 2023 due to the lagged effects of domestic monetary tightening, persistent inflation, and the deceleration of the global economy, and to mildly accelerate to 2.0 percent in 2024 on the back of a more accommodative monetary policy, easing inflation and higher global growth. Fiscal balance is expected to deteriorate in 2023 as projections indicate a primary deficit of 0.7 percent of GDP, reflecting the higher social expenditures in 2023 and lower economic activity.
- With the economic recovery, poverty is expected to have gone down from 28.4 in 2021 to 25 percent in 2022,¹** responding to increased job opportunities and expansion of the *Bolsa Família* cash transfer program. A real increase in the minimum wages combined with a major overhaul of the *Bolsa Família* and a planned introduction of additional benefits to families with children are expected to drive poverty down to 23.9 percent in 2023. Further reduction may occur as the economy recovers but despite the social gains of earlier decades poverty and disparities remain prominent in the lives of many Brazilians in the absence of stronger investments in human capital among the less well-off. Before the pandemic, one in five Brazilians were chronically poor; the onset of the pandemic widened pre-existing inequalities and today nearly half of Brazil's children – the country's future workforce – are growing up in poor households.
- Water has both supported key drivers of economic growth and been pivotal to reducing poverty and promoting shared prosperity in Brazil;** however, the country is facing more intense and frequent water shortages that are negatively impacting both development and livelihoods. Many important economic sectors in Brazil are highly dependent on water: 50 percent of withdrawals are for irrigated agriculture, 25 percent for human consumption, 9 percent for industry and 8 percent for livestock.² Furthermore, roughly 65 percent of Brazil's electricity is generated from hydropower.³ Future demand for irrigated agriculture and hydroelectricity is likely to result in increasingly competing demands for water considering the climate-driven projected reduction in precipitation, prolonged dry periods, and increasing

¹ Using the recently published US\$6.85 purchasing power parity line for upper-middle-income economies.

² National Water and Sanitation Agency (ANA): Water Resources Situation in Brazil, 2021 (Conjuntura dos Recursos Hídricos no Brasil 2021).

³ Empresa de Pesquisa Energética. <https://www.epe.gov.br/pt/abcdenergia/matriz-energetica-e-eletrica>



water evaporation rates.⁴ If not managed well, water can become a limiting factor to social and economic betterment in the country.⁵

4. **Intensifying climate change impacts expose Brazil's vulnerability and threaten its economic recovery and social development.** With climate change, the water cycle is expected to undergo significant change, which has implications for water security and food production, whereas extreme hydrological events – floods, droughts and landslides – are projected to worsen in frequency and intensity, with disproportionate impacts on poor and vulnerable people, in particular women.⁶ The country's high susceptibility to climate hazards translates into significant economic impacts, with annual losses from natural disasters estimated at US\$3.9 billion. Floods comprise over 65 percent of the natural hazards in Brazil, and intense rainfall events that triggered flash floods and landslides were responsible for 74 percent of the deaths related to natural disasters in the 1991-2010 period.⁷ Addressing the challenges imposed by this context requires resilience from the water sector, as well as investments in better planning and institutional strengthening, increased water storage capacity, improved water reuse systems, and flood and drought infrastructure, including climate-resilient green infrastructure and hybrid green-gray solutions.⁸

State of Espírito Santo Context

5. **The State of Espírito Santo (SES) outpaces Brazil's performance in most socio-economic indicators.** SES spans 0.5 percent of Brazil's territory and is home to 2 percent of its population (4.1 million people in 2021, across 78 municipalities). Most of its population is urban (83 percent) and largely concentrated in the Metropolitan area of the capital Vitória (49 percent in 2021). Despite its small size, SES contributed 1.9 percent of national GDP in 2019 and 3.5 percent of national exports in 2021. Its GDP ranked 14th highest among Brazil's 27 states, while its GDP per capita (US\$ 6,898) ranked 9th in 2019. Contributions to GDP are drawn mainly from services (70 percent), followed by industry (26 percent – of which more than 45 percent from oil and gas, and to a lesser extent, mining, steel and cellulose industries) and agriculture (4 percent). The extractives segment (oil and gas) has grown more than 200 percent in real terms since 2002, generating a massive increase in state revenues. SES' Human Development Index (HDI) of 0.772 was ranked 8th among Brazilian states.⁹

6. **Espírito Santo's poverty and inequality levels are high, albeit lower than the national average.** Per 2021 figures, roughly 26.3 percent of SES' population lives in poverty (c.f. 29.4 percent nationally) and 6.7 percent lives in extreme poverty (c.f. an 8.4 percent national average), while the Gini index was estimated at 0.52, slightly better than the country's 0.54 average, yet higher than most countries in Latin America and the Caribbean. At the end of 2021, 1,219,569 state residents (roughly 30 percent of the

⁴ World Bank Country Climate and Development Report for Brazil (forthcoming).

⁵ World Bank, 2022: Water Matters: Resilient, Inclusive and Green Growth through Water Security in Latin America

⁶ The international literature shows that, during droughts, women and girls eat less, pay more for water, and spend more time to collect water. During floods, women have less access to emergency shelters than men; enjoy less mobility as they often tend to children and the elderly when disaster hits. Women are also more vulnerable to gender-based violence which often increases in disaster situations. Ordinarily, women are also underrepresented in disaster risk management (DRM) institutions and professions, and DRM policies and programs rarely consider women's and men's different concerns and needs.

⁷ World Bank, 2021, Brazil: Climate Risk Country Profile

⁸ World Bank, 2021, World Bank Group Climate Change Action Plan 2021-2025: Supporting Green, Resilient, and Inclusive Development.

⁹ According to UNDP's Human Development Atlas of 2017: <http://www.atlasbrasil.org.br/ranking>.



state's population) were registered in Brazil's *Cadastro Único* social registry,¹⁰ rendering them eligible to receive government assistance.

7. **Raising and sustaining real GDP growth and reducing poverty and inequality levels are overarching State development goals.** Throughout the past decade, both Brazil and SES have posted sluggish economic growth as well as increases in poverty and income inequality rates. Since 2012 the state's average annual real GDP growth rate has been slightly negative. Poverty has increased by 4.9 percentage points and extreme poverty by 5.1 points over the same period. This is in sharp contrast to the 2000-2010 period, when SES's economic growth, poverty levels and income inequalities had improved considerably, outpacing gains made by Brazil as a whole. The State 2030 Strategic Development Plan¹¹ lays out a comprehensive agenda to boost economic growth and reduce poverty and inequalities setting ambitious governance and socio-economic development targets. These would be achieved through a combination of public sector reforms, job creation programs and increased investment in many areas, including climate adaptation through increased water security, which the proposed Project will support. In December 2020, the state government launched an economic recovery plan (*Plano Espírito Santo – Convivência Consciente*) to mitigate the effects from the COVID-19 pandemic, focused on boosting public and private investments, promoting productive inclusion, and creating jobs. Achieving these goals will require particular attention to gender disparities: even before the pandemic, women's participation in the labor market in SES was significantly lower than men's (57.3 percent compared to 77.1 percent).¹²

8. **The State has a history of partnering with the World Bank on water initiatives dating back to the 1990s,** when the focus was primarily on improving water supply and sanitation (WSS) services, coupled with watershed conservation and restoration to reduce water treatment requirements for domestic water supply. More recently, the scope of water operations has evolved to address more complex water security challenges. While the ongoing Bank-financed *Espírito Santo Integrated Sustainable Water Management Project*¹³ has continued investments to improve sanitation services,¹⁴ it has started strengthening the State's capacity to manage water resources in a more sustainable manner and to prepare and respond to water-related disasters. This progressive evolution of the State's priority and the Bank's water agenda from basic WSS services to a more complex water security agenda, related to the sustainable management of water resources for multiple uses and the reduction of hydrological risks is typical in a well performing state, in an upper-middle-income country, whose water security is at risk because of the effects of climate change. This evolution towards a more sophisticated water security agenda focused on reducing expected climate change impacts and strengthening institutional capacity will deepen in the proposed Project.

¹⁰ The *Cadastro Único* (*CadÚnico*) is the country's social registry used to identify individuals and households that are eligible to receive government support. The half a minimum wage per capita income threshold (R\$550 monthly) used by the CadÚnico has been found to be a close representation of the costs of basic needs in Brazil (Lara Ibarra et al. 2021) and helps thus accounting for a broader group of low income-households.

¹¹ The document was published in 2013. Access: <https://planejamento.es.gov.br/Media/sep/Plano%20ES%202030/ES2030.pdf>

¹² According to 2019 data from the Instituto Jones dos Santos Neves. Access:

<http://www.ijsn.es.gov.br/component/attachments/download/7507>

¹³ Espírito Santo Integrated Sustainable Water Management Project (P130682) approved in 2014.

¹⁴ Bank operations have contributed to improved sewerage treatment and collection indicators in Espírito Santo. Between 2010 and 2019, access increased from 39.9 percent to 55.9 percent, with the highest improvement among the urban population, whose access rose from 46.7 percent to 62.8 percent.



B. Sectoral and Institutional Context

Sectoral Context

9. **Espírito Santo's abundant water resources mask significant temporal and geographic disparities.** Located under the highly degraded Atlantic Forest biome of Brazil's Southeast Region, the state's territory is divided into eight hydrographic units which correspond to 14 River Basin Committees (RBCs). Precipitation levels range from 900 mm to 1,700 mm, with the lowest incidence in the northern portion of the state and the highest in the southeast, with significant seasonal variability. As a result, the state faces chronic water deficits during the dry season in 3 of the 8 hydrographic units (or the northern half of its territory) and competing demands for water allocation. Approximately 78 percent of withdrawals in SES are for irrigated agriculture, 14 percent for human consumption, 5 percent for industry and 1 percent for livestock. Information on groundwater is uneven and limited by insufficient hydrogeological data on the existing aquifers.

10. **In Espírito Santo, climate change impacts the well-being of its population, economy and environment principally through increased water security risks.** In SES, water security risks relate to water deficits as well as extreme events such as floods, droughts and landslides. Historical records and available climate projections for the state reveal that climate change is playing a pivotal role in the increased frequency and intensity of water-related disasters (floods, landslides and droughts), as well as in the intensity and geographic spread of water deficits. Projections from the climate change institute of the Federal University of Espírito Santo show that extreme water events are expected to increase further throughout SES. Moreover, average temperatures will continue to rise, while average precipitation is expected to decline.¹⁵ The combination of higher temperatures and lower precipitation is expected to progressively increase the number of hydrographic units with water deficits towards the south of the State, as well as the intensity of water deficits in the north. The increases in extreme events and water deficits are expected to adversely affect the state's overall economy, environment, and the well-being of its population.

11. **Water security risks are exerting a heavy and increasing toll in the State of Espírito Santo.** SES is prone to frequent and extreme hydrological events: floods and attendant landslides across the state, but mostly in the south and coastal areas, and droughts mostly in the north. Between 2013 and 2020, 794 disasters were registered throughout SES, more than double the previous decade, of which 27 percent were related to floods, 21 percent to droughts and 7 percent to landslides, leading to an estimated 120 deaths and the displacement of roughly 230,000 people. In 2020 alone, extreme rainfall led to severe flooding that impacted 39 municipalities, resulting in 10 fatalities, the displacement of 14,230 people, leaving another 2,340 homeless, with economic losses estimated at US\$44 million. Floods and landslides have destroyed housing and infrastructure in densely populated areas, often leading to human casualties, while droughts have led to substantial reductions in river flows, conflicts between water users, and reduced agricultural production in rural areas. Floods and droughts have also adversely affected the provision of essential services, including electricity and water supply (with severe rationing in 2014).

12. **In addition to climate change, unregulated human activity continues to undermine water security.** The impacts of floods, landslides, water deficits, and droughts throughout the state are exacerbated by anthropogenic factors such as unplanned and unregulated urban spread into flood plains

¹⁵ Projections of climate change for Espírito Santo using high-resolution regional modeling. Universidade Federal do Espírito Santo, 2019.



and along steep hillside slopes, with often inadequate or poorly maintained urban drainage systems and illegal dumping into drains. Another factor that has contributed to increased water-related risks is the degradation of watersheds resulting from the conversion of the native Atlantic Forest biome – that originally covered the entire State – to pasture and cropland, which now cover approximately 55 percent of SES' territory (compared to 22 percent remaining native forest coverage). This change in land use tends to increase the intensity of runoff, exacerbating floods, while reducing soil water retention and deep percolation to aquifers, thereby increasing water deficits in the dry season and vulnerability to dry spells and droughts. The change in land use also promotes erosion and sedimentation of riverbeds and reservoirs, further increasing the area's vulnerability to flooding, droughts and dry spells. It bears highlighting that the Atlantic Forest biome's exceptional biodiversity and vulnerability to continuous threats ranks it among the world's highest priority areas for conservation.

13. To foster climate adaptation by addressing these water security risks, SES has implemented both green and gray infrastructure:¹⁶

- (a) **As regards green (or nature-based) interventions, Espírito Santo was among the first states to pioneer payments for environmental services (PES)¹⁷** as a means of restoring degraded watersheds and the hydrological services they provide. However, more remains to be done. Brazil's largest state-level restoration program – the Reflorestar Program – was launched in 2011 to promote the restoration of the hydrological cycle and reduce erosion, initially focusing on the river basins that supply water to the Great Vitoria Metropolitan Region. The program protects downstream water uses by offering upstream landholders payments for reforestation and adopting sustainable land use practices in watersheds that could generate substantial environmental services. Since 2011, sustainable land use practices have been adopted throughout 9,000ha under Reflorestar (5,400ha reforested and 3,700ha under productive sustainable uses) and over 10,000ha of standing forest have been conserved. The implementation of such interventions together with the establishment of protected areas, and control of illegal logging has allowed SES to stabilize its forested area over the past 20 years, in stark contrast to Brazil as a whole. In addition to the PES, the state finances complementary structures for soil and water conservation, such as water infiltration ponds, contour ditches and terraces. These practices and structures improve soil retention and water infiltration, thus helping: (i) reduce water treatment costs; (ii) reduce maintenance costs and increase the life of reservoirs and other water infrastructure by decreasing sediment flows; and (iii) reduce flood risks during the wet season and decrease vulnerability to dry spells and droughts by increasing water availability during the dry season by slowing runoff. In addition to these adaptation benefits, they enhance carbon sequestration in soils and aboveground biomass, generating climate mitigation co-benefits. Moreover, most of these land use practices and structures increase participating landholder incomes, rendering them “no regret” options.
- (b) **Traditional gray infrastructure applied to water resources management (WRM) has gained more traction recently.** The SES still has a relatively small stock of gray infrastructure. The few existing water

¹⁶ “Gray” infrastructure generally refers to conventional human-built structures (such as storm drains, pumps, dams, levees, reservoirs, treatment plants, and pipes) while “green” interventions refer to solutions that harness natural systems (such as forests, wetlands, soil or mangroves) to provide water resources management options. Evidence suggests that integrating green and gray infrastructure provide lower-cost and more resilient services, helping fill the need for climate-resilient solutions.

¹⁷ Espírito Santo has received continued World Bank support throughout this process, first under the *Esírito Santo Biodiversity and Watershed Conservation and Restoration Project* (P094233) and subsequently, under the *Esírito Santo Integrated Sustainable Water Management Project* (P130682).



storage structures were constructed over the past 20 years for power generation. It was not until the 2014 drought that the need to build reservoirs to store water and regulate river flows or use hydroelectric reservoirs for emergency water supply was first raised. Recognizing the devastating impacts of drought on agriculture and animal husbandry, in 2017 the State Secretariat for Agriculture, Livestock and Fisheries launched a State Dams Construction Program with the aim of building 60 reservoirs and refurbishing large dams to mitigate the impacts of drought on the sector. The 22 small reservoirs that have been built to date under the program have improved both the reliability and availability of water to rural populations. Additional gray investments, in combination with green infrastructure, will likewise be needed to control or mitigate flooding (storage, dykes, river channeling, among others), in line with the state's plans to continue investing in more integrated green-gray solutions to address water security risks and adapt to climate change.

14. **The State has identified priority river basins and municipalities requiring urgent interventions to increase climate adaptation through increased water security, by reducing hydrological risks and managing water deficits.** The priority *flood* risk areas encompass the Itapemirim basin, as well as the municipalities of Águia Branca, João Neiva, Ibraçu, Iconha and Alfredo Chaves, which are mostly located in the southern half of the state. The priority *drought*-prone risk areas are the four river basins located in the State's Center-North region: Santa Maria do Rio Doce, Santa Joana, Pontões e Lagoas do Rio Doce, and Barra Seca e Foz do Rio Doce. These areas are represented in the map in Annex 5.

Institutional Context

15. **Although Espírito Santo boasts solid institutional and policy frameworks for Water Resources and Disaster Risk Management, their implementation needs strengthening to address water security risks and increase climate adaptation.**

- (a) **Water Resources Management (WRM).** The 2014 State Water Law¹⁸ establishes the State Water Resources Policy with the objective to ensure that water resources are managed in an integrated and sustainable manner to guarantee water security of adequate quantity and quality for current and future generations, as well as the prevention of adverse hydrological events. The Policy defines the seven instruments to achieve these objectives and establishes the State's Integrated Water Resources Management System (*Sistema Integrado de Gerenciamento de Recursos Hídricos do Estado do Espírito Santo* - SIGERH-ES) which serves as the organizational framework governing WRM in Espírito Santo and comprises five entities with key WRM roles. The implementation/modernization of the seven instruments and the strengthening of the key entities is considered pivotal to bolster SIGERH-ES' effectiveness in improving water security and implementing the Water Resources Policy. The description and main challenges of the WRM instruments and SIGERH-ES' organizational structure are summarized, respectively, in tables 1 and 2 below:

Table 1 – WRM policy instruments

Instrument	Status and challenges
1) State Water Resources Plan (<i>Plano Estadual de Recursos Hídricos - PERH</i>)	The 2018-2038 State Water Resources Plan and 10 (of the 14 required) river basin water resources plans were enacted. However, they are not well integrated with other state and municipal plans, and more attention needs to be paid to their implementation, monitoring and evaluation, and consideration of hydrological and climate change risks.
2) River basin plans	

¹⁸ Law No. 10,179/2014, of March 18, 2014.



Instrument	Status and challenges
3) Classification of water bodies	Water quality standards have been defined where basin plans were developed, but they have yet to be operationalized.
4) Water use and discharge permits	The granting of water use rights has been in place since 2005, however most users do not have a water permit and permitted users face low compliance control. The formalization of water use rights is key to increase financial resources for WRM and are also critical to determine water use, control abstractions, and manage water deficits and droughts risks.
5) Water use and discharge fees	Water use fees, a key source of river basin plan and SIGERH-ES financing, have yet to be defined and approved by the river basin committees.
6) Water resources information system, including water users registry	The system needs to be upgraded. Existing WRM information is not organized within a unified system nor readily available to the public. There are significant water availability, quality and demand data gaps that jeopardize both the sustainability of water resources, and protection against extreme hydrological risks.
7) Payment for Environmental Services - PES	Although the PES has been successfully implemented under the Reflorestar Program since 2011, additional efforts could be made to (i) have direct beneficiaries (such as municipalities) share at least part of the costs with the state government, which would require a stronger impact monitoring program; and (ii) bridge gender gaps given the significant underrepresentation of women among the beneficiary landholders of Reflorestar. ¹⁹

Table 2 – SIGERH-ES: WRM organizational framework

Entity	Functions	Status and challenges
1) State Water Resources Council (<i>Conselho Estadual de Recursos Hídricos</i> - CERH)	(i) enact and monitor implementation of the State WRM policies and Plan; (ii) establish water rights, discharge permits and water use and discharge fees criteria and rules; (iii) authorize the creation of basin agencies and committees; (iv) approve water bodies classification; (v) act as court of appeal for water conflicts; and (vi) monitor the use of water use and discharge fees.	The CERH has been established and holds periodic meetings, however its operation would benefit from more proactive discussions and actionable proposals related to conflicts over water resources.
2) State Water Resources Agency (<i>Agência Estadual de Recursos Hídricos</i> - AGERH)	(i) regulate water resources use; (ii) plan and promote actions to reduce droughts and floods risks in conjunction with state civil defense agencies; (iii) oversee the planning and execution of public works for multi-use water storage and supply; and (iv) perform hydrological monitoring.	AGERH lacks sufficient qualified staff, equipment and financial resources to fulfill its mandate.
3) State Secretariat for Environment and Water Resources (<i>Secretaria do Meio Ambiente e Recursos Hídricos</i> - SEAMA)	(i) submit the PERH and any amendments to CERH's appreciation; (ii) raise funds for PERH-related actions; (iii) enable the adequate operation of the CERH through appropriate human and financial resources. It also implements the PES program.	SEAMA's technical advisory role is hindered by limited capacity to coordinate processes and make relevant information available.

¹⁹ Starting in 2021, Reflorestar has set gender as a criterion for prioritization of applications. See Annex 4 for additional references.



Entity	Functions	Status and challenges
4) River Basin Committees (RBCs)	(i) approve the River Basin Plan; (ii) propose water use and discharge fees to CERH; (iii) monitor the implementation of the Basin plans; (iv) submit criteria for the granting of water rights to CERH; (v) approve criteria for the cost allocation of multiple use water works and services; (vi) approve respective Basin Agency annual budget; and (vii) arbitrate water conflicts.	The 14 River Basin Committees that serve SES's entire territory have been created but need additional support to be fully operational. As is the case nationally, RBCs are endowed with strong deliberative powers, but generally have limited implementation capacity and play essentially an advocacy role. Although women currently hold a slight majority of the managerial positions in the agencies involved with Sigerh-ES (AGERH, SEAMA and the CERH), they account for only 22 percent of members of the RBCs (see Annex 4). The decentralized and participatory nature of the WRM framework presents an opportunity to strengthen citizen engagement through the RBCs, resulting in more effective engagement processes and enforcement mechanisms.
5) River Basin Agencies	Function as executive, financial and administrative entity to support the respective RBCs in managing water resources under their mandate, including (i) updates/revisions and implementation of the River Basin Plans, (ii) support to municipal administrations, (iii) maintaining water user registries and balance of water availability in its area of operation.	The agencies are not yet in place and their functions are partly being implemented by AGERH. Its establishment is conditional to evidence of financial sustainability through funds generated by water charges.

- (b) **Disaster Risk Management (DRM).** The Federal and State Civil Defense Laws²⁰ establish the State Civil Defense System (*Sistema Estadual de Proteção e Defesa Civil* - SIEPDEC-ES) which plays a critical role in managing hydrological risks since it is responsible for coordinating disaster prevention, mitigation, preparedness, response, and reconstruction. It is also responsible for carrying out state-level functions and instruments defined in the National Policy for Civil Protection and Defense (*Política Nacional de Proteção e Defesa Civil* - PNPDEC). The SIEPDEC-ES's leading organization is the State Coordination for Protection and Civil Defense (*Coordenadoria Estadual de Proteção e Defesa Civil* - CEPDEC), housed within the Military Fire Brigade of Espírito Santo (*Corpo de Bombeiros Militar do Espírito Santo* – CBMES). Women account for only 1.9 percent of the CBMES contingent and they are a minority of the audience of the training courses offered annually by CEPDEC to municipal committees of civil defense and protection. Table 3 summarizes SIEPDEC-ES's main functions and instruments and their respective challenges.

²⁰ State Law No.694/2013, amended by the State Law No. 767/2014 and Federal Law No. 12,608 of April 10, 2012.



Table 3 – SIEPDEC-ES

Functions and instruments	Status and challenges
Approval and regular updating of the State Protection and Civil Defense Plan (<i>Plano Estadual de Proteção e Defesa Civil</i> - PEPDEC)	The operationalization of the PEPDEC could be improved with each organization involved defining in detail how they would carry out their disaster preparedness and response functions as defined in the plan, ensuring they have the equipment, staff and resources available and protocols in place.
Mapping of risk areas and studies to identify threats and vulnerabilities	Significant progress has been made in rolling out the system, including mapping high and very high-risk areas throughout the state's 78 municipalities.
Hydrometeorological and geological monitoring in risk areas	Information gathered under "Alert!Espírito Santo" system, which integrates different monitoring systems and emits automatic early warnings in case of floods, landslides and dry spells.
Supporting municipalities in surveying of risk areas, preparing Civil Protection and Defense Contingency Plans and disclosing prevention and alert protocols and emergency actions.	Important achievements include support to 17 municipalities in preparing their Municipal Rainwater Master Plans and Disaster Risk Reduction Plans; and the inclusion of 69 municipalities (88 percent of the state's total) in the national disaster monitoring and alert system. However, more is needed to build municipal capacities and community awareness for the effective activation and implementation of contingency plans in urban areas.
CEPDEC's leadership and coordination of the SIEPDEC-ES	Going forward, the disaster response capacity of the CEPDEC begs improvement, notably its response time and the effectiveness of its relief interventions, which are jeopardized by the lack of specialized equipment and staff training.

(c) In addition to the member entities of the WRM and DRM governance frameworks, the Department of Buildings and Roads of Espírito Santo (Departamento de Edificações e de Rodovias do Espírito Santo – DER-ES) has recently taken a more central role in executing civil works and recovering infrastructure related to hydrological disasters.

(d) Overall, there is still a significant need to reduce water-related risks through the preparation and implementation of integrated structural and non-structural measures, identified through rigorous integrated flood and drought planning processes that factor in climate change uncertainties.

16. **Building on the long-term engagement between the State and the Bank, the Government of Espírito Santo has requested the Bank's assistance** to respond to and address the above challenges, encompassing climate adaptation through water security in priority areas by financing drought and flood management plans, implementing a combination of green and gray infrastructure (notably expanding the Reflorestar program), as well as improving State-level WRM and DRM governance and management instruments. This broader initiative seeks to expand and consolidate prior results achieved in these areas and move the needle on reducing the state's water security risks and increasing its capacity to prepare and respond to extreme hydrological events.

C. Relevance to Higher Level Objectives

17. **The proposed operation is fully aligned with the World Bank Group's FY18-FY23 Country Partnership Framework (CPF) for Brazil²¹** and informed by the Bank Group's Climate Change Action Plan

²¹ Report No. 113259-BR, discussed by the Executive Directors on July 13, 2017, and confirmed by the corresponding Performance and Learning Review (PLR).



(CCAP) and the Brazil Country Climate and Development Report (under preparation).²² It fits within the CPF's Focus Area 3, *Inclusive and Sustainable Development* and contributes to Objectives 3.1 (*Support achievement of Brazil's Nationally Determined Contribution (NDC) under the Paris Agreement²³ with a particular focus on land use*) and 3.2 (*Provide more inclusive and sustainable urban services*), by addressing the vulnerability and exposure of people and assets to increased water security risks, which are the main manifestations of climate change impacts in SES, contributing to adaptation objectives, as well as increasing carbon sequestration through increased forested area, thus supporting mitigation targets. In addition, by investing in institutional strengthening and more effective WRM tools, the Project will help enhance the SES water sector's governance, operational efficiency, and sustainability, increasing resilience to flood and drought risk. The Project will also support Brazil's efforts to reach its NDCs, which aim to reduce total net greenhouse gas emissions by 37 percent by 2025 and 50 percent by 2030, relative to 2005, and create climate neutrality (net-zero emissions) in 2050. The national strategy lays out a transition to a cleaner energy mix and an increased use of climate risk management approaches, which is aligned with the Project's objectives. The Project likewise fosters innovation, via the integration of flood risk reduction, green interventions, and water basin revitalization activities, reflecting the Bank's global lessons and prior engagements with the state (see sections E and F).

18. **The Project is aligned with the Bank Group's paper on Global Crisis Response Framework (GCRF), discussed by the Executive Directors on July 12, 2022.**²⁴ The proposed activities under the Project fit into two of the interrelated four pillars that are underpinned by the Green, Resilient and Inclusive Development (GRID) agenda: (Pillar 3) Strengthening Resilience and (Pillar 4) Strengthening Policies, Institutions, and Investments for Rebuilding Better. The operation will (i) help build the state's long-term resilience by strengthening crisis preparedness and disaster risk management to support the SES' capacity to handle hydrological disasters (Pillar 3 contribution through Components 1 and 2), and (ii) advance climate-smart investments and build strong institutions to promote climate adaptation and improve development outcomes (Pillar 4 contribution through Components 1 and 3).

19. **The proposed Project contributes to the SES goals set out in its 2030 Development Plan** aimed at improving the quality of life of its population, economy and the environment, and adapting to a changing climate by reducing water security risks. Support will focus on strategic municipalities and river basins where it will increase water security by improving the State's capacity to manage water deficits, drought, flood and landslide risks, contributing to climate adaptation and mitigation and environmental conservation. It will also support implementation of federal and state water resources and civil defense policies/laws.

²² The Country Climate and Development Report (CCDR) is a new World Bank core diagnostic tool to help countries align climate action and development efforts and absorb new climate-related technologies as they emerge. The CCAP 2021-2025 aims to advance the climate change aspects of the Bank Group's Green, Resilient, and Inclusive Development (GRID) approach, which pursues poverty eradication and shared prosperity with a sustainability lens.

²³ Based on the second cycle of the National Adaptation Plan (NAP), the Project will support three of the four NDC adaptation measures: (i) the strengthening of the management of water resources; (ii) the development of adaptation strategies in the agricultural sector through drought plans and alert systems, as well as nature-based solutions and payments for environmental services; and (iii) adaptation plans for the urban landscape to ensure the resilience of the population and infrastructure (through the reduction of flood and landslide risks). It will also support its mitigation strategies through carbon sequestration in reforested areas.

²⁴ World Bank Group, 2022, Global Crisis Response Framework Paper: Navigating Multiple Crises, Staying the Course on Long-Term Development - The World Bank Group's Response to the Crises Affecting Developing Countries.



II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

20. **The Project Development Objectives (PDO) are:** (i) to strengthen the Borrower's capacity to manage water security risks in a changing climate; (ii) to reduce those risks in selected areas of the Borrower's territory; and (iii) in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

21. **Achievement of the PDO will be measured by specific indicators and targets.** Strengthening the State's capacity to manage water security risks will be measured by the improvement in the application of water resources and disaster management policy instruments (State WRM plan; flood or drought management plans; water rights; water use charges; flood forecast and alert systems), and in the quality and availability of water and climate information for decision making. This increased capacity to manage water security risks will also come from improvement in the State's capacity to use these instruments and information as a result of training, better equipment and other improvements that will be recommended by the AGERH institutional assessment and the WRM system financing assessment. The reduction in water security risks in selected areas will be measured by the number of people, disaggregated by gender, benefitting from reduced water security risks, be it from water deficits, floods or droughts, as well as by the implementation of forecast and early warning systems.

PDO Level Indicators

- PDO 1: Water resources management instruments improved;²⁵
- PDO 2: Digital operations command system implemented;²⁶
- PDO 3: Land area under sustainable landscape management practices (Corporate Results Indicator – CRI);
- PDO 4: Itapemirim river basin forecast and early warning system operational and issuing reports; and
- PDO 5: People benefitting from reduced water security risks, disaggregated by gender.²⁷

B. Project Components

22. **The proposed Project is a US\$113.6 million Investment Project Financing (IPF) operation, financed by a US\$86.1 million IBRD loan and US\$27.5 million in state counterpart funds.** The Project will be implemented over a six-year period. Proposed interventions are grouped around three components focused on the following geographic scales: *statewide* (Component 1), *river basin* (Component 2) and

²⁵ Water resources management instruments improved will be measured by: (i) an increase in water rights decisions, based on revised criteria, improved information and use of a decision support system; (ii) the State Water Resources Plan updated and approved by the State Water Resources Council; and (iii) the State Water Resources Information System modernized and operational.

²⁶ The digital operations command system is the electronic emergency command, control and coordination response system, to operate as a digital and interactive web-based platform for high-complexity events that will allow coordinating efforts to stabilize crisis situations.

²⁷ It refers to the people that will benefit from the implementation of structural and non-structural measures to reduce water security risks in selected areas.



municipal (Component 3) levels as well as support to Project management (Component 4) and a zero-fund Contingent Emergency Response (Component 5 - CERC). Annex 2 presents a detailed Project description and Annex 5 displays a map with the intervention areas.

23. **Component 1 – Building the Borrower’s capacity for water security in a changing climate (US\$15.52 million of which US\$14.05 million IBRD).** This component will strengthen the state’s capacity to manage water security risks by strengthening both SIGERH-ES and CEPDEC water resources and disaster management capacities, respectively, and fostering their better integration. This will contribute to climate adaptation in two ways: firstly, by improving the capacity to manage water security risks, as most climate change impacts people, the economy, and the environment, through increases in those risks (see sectoral context) and, secondly, by designing and implementing policy instruments taking into account climate change uncertainty, improving climate change related information for decision making and providing specialized staff training on this topic. This will be done through two subcomponents:

- (a) **Subcomponent 1.1. Strengthening SIGERH-ES’s water resources management capacity (US\$7.43 million of which US\$7.43 million IBRD).** This subcomponent aims to strengthen SIGERH-ES’ institutional capacity to manage water resources within the context of ever increasing vulnerability to climate change. Activities under this subcomponent will be designed to specifically take into consideration climate change. Financed activities include, *inter alia*: (i) the completion of AGERH’s institutional assessment, the preparation of a state water resources management financial sustainability assessment, and the implementation of their key recommendations; (ii) capacity building activities targeted to SIGERH-ES’ institutions, including hydrological disasters and climate change training; (iii) the strengthening of key WRM tools, including: (a) the strengthening of the criteria underlying the issuance of water rights taking into consideration water related risks, processes, and decision making system; supporting water users to effectively prepare their water rights requests; and upgrading/updating user and water rights digital registries; (b) the development of instruments to finance the state water resources management activities, including the definition and submission for approval of water use charges at the river basin committees level; (c) the modernization and operationalization of the state’s water resources information system (*Sistema Estadual de Informações sobre Recursos Hídricos – SEIRH*) and related hydrological and hydrogeological monitoring networks; and (d) updating of the State Water Resources Plan (PERH) to consolidate other water related sectoral planning and strengthen hydrological extreme events related aspects; (iv) the development of hydrogeological and hydrological studies of selected aquifers and river basins; and (v) the strengthening of a State Water Quality Laboratory, including laboratory and IT equipment, licenses and software necessary for ongoing water quality monitoring and testing. Subcomponent 1.1 supports the implementation of the World Bank’s GCRF, Pillar 4 “Strengthening Policies, Institutions and Investments for Rebuilding Better”.
- (b) **Subcomponent 1.2. Strengthening CEPDEC’s disaster risk management capacity (US\$8.09 million of which US\$6.62 million IBRD).** This subcomponent seeks to strengthen the State Coordination for Protection and Civil Defense’s (CEPDEC) capacity to manage water security risks and respond to disasters by supporting, *inter alia*: (i) the construction and supervision of works of a specialized disaster response center (*Centro Especializado de Resposta a Desastres – CERD*); (ii) the acquisition of specialized equipment, notably fire trucks and emergency kits; (iii) the provision of training, including on gender aspects in DRM; and (iv) the design and implementation of an electronic emergency command, control and coordination response system (Incident Command System software). Subcomponent 1.2 supports the implementation of the World Bank’s GCRF, Pillar 3 “Strengthening



Resilience”.

24. **Component 2 – Demonstrating climate-smart integrated water security risk reduction approaches in selected basins (US\$30.18 million of which US\$23.39 million IBRD).** This component will contribute to reduce water security risks by reducing water contamination and sediment loads as well as flood and dry season water deficits, while promoting biodiversity conservation and enhancing existing carbon sinks in soil and aboveground biomass,²⁸ leading to significant climate adaptation and mitigation benefits. Activities are divided into two subcomponents, both of which support the implementation of the World Bank’s GCRF, Pillar 3 “Strengthening Resilience”:

- (a) **Subcomponent 2.1. Expanding the support to the Reflorestar Program in selected river basins (US\$16.06 million of which US\$12.40 million IBRD).** This subcomponent aims to support PES to increase forest cover and implement other climate smart nature-based solutions to reduce water security risks in selected river basin’s priority areas, including Itapemirim, Itabapoana and Benevente, in the South, and Pontões e Lagoas do Rio Doce and Santa Maria do Doce, in the Center-North. It will finance, *inter alia*: (i) the provision of payment for environmental services to land users for the reduction of water security risks through reforestation, improved land use and agricultural practices; (ii) the implementation of physical water and soil conservation structures (such as small/mini water detention ponds or soil built dry boxes); and (iii) the provision of technical assistance to SEAMA to improve the Reflorestar Program’s efficiency and effectiveness, including by, *inter alia*: (a) strengthening the Program’s targeting; (b) developing additional financing sources, such as from the private sector; (c) strengthening its institutional capacity, including through the hiring of a Technical and Operational Firm to provide support to the Program; (d) improving its communication strategy; (e) assessing its effectiveness (in *inter alia*, attracting participants – including vulnerable and marginalized groups, with a specific target to reach 40 percent of women among new Reflorestar participants – targeting payments to priority areas; providing the desired environmental services; and keeping administrative costs low) and using the lessons to improve it; and (f) improving the *Portal Reflorestar*, which participants use to enroll in the Reflorestar PES Program and SEAMA uses to administer it. See Annex 2 for information on Reflorestar’s operation and results.
- (b) **Subcomponent 2.2. Improving flood and drought management in priority river basins (US\$14.12 million of which US\$10.99 million IBRD).** This subcomponent aims to apply an integrated flood risk management approach, with an emphasis on nature-based solutions (NBS), to reduce flood risks in the Itapemirim river basin; and to increase capacity to respond to drought in priority basins located in the State’s Center-North region (tentatively the following four river basins: Santa Maria do Rio Doce, Santa Joana, Pontões e Lagoas do Rio Doce, Barra Seca e Foz do Rio Doce),²⁹ through, *inter alia*: (i) in the Itapemirim basin: (a) the development of an integrated flood risk management plan; and the implementation of nature-based solutions identified in the plan that would complement Reflorestar activities financed under subcomponent 2.1; (b) the strengthening of the flood monitoring, forecasting and alert system; and (c) the implementation of flood risk preparedness communications campaigns for at-risk populations, with a focus on women through targeted awareness raising campaigns; and (ii) in the Center-North region: (a) the development of drought preparedness plans;

²⁸ By promoting conservation of forest cover, restoration of degraded ecosystems and adoption of sustainable land management in upstream watershed areas, Component 2 interventions seek to increase infiltration, reduce runoff, and limit access to rivers by livestock. This results in curbing erosion, and hence sediment loads that tend to affect water quality and damage reservoirs.

²⁹ Including focus on the municipality of São Roque do Canaã, in the Santa Maria do Rio Doce basin.



the preparation and implementation of rational water use plans; and (b) the piloting of issuance of collective water rights to groups of family farmers in micro-basins to facilitate participatory reallocation of water in times of drought.³⁰

25. **Component 3 – Reducing flood risk in targeted municipalities (US\$60.91 million of which US\$41.67 million IBRD).** This component aims to reduce floods risks in targeted municipalities which have faced strong flood episodes over the past few years. It will finance, *inter alia*: (i) Design and Build contracts for the implementation of urgent flood risk reduction investments,³¹ as well as supervision of work services, in three municipalities (Água Branca, João Neiva and Ibirapu) for which technical solutions have been identified, but feasibility studies need revisions; and (ii) the carrying out of studies to identify more innovative integrated structural and non-structural solutions to reduce flood risks in two additional municipalities (Iconha and Alfredo Chaves); and (iii) the implementation of some of the prioritized innovative solutions resulting from these studies. Targeted municipalities have been classified as “high” or “medium” urban flood hazard based on the *ThinkHazard*³² methodology, meaning that potentially damaging and life-threatening urban floods are expected to occur at least once in the next 10 years. Component 3 supports the implementation of the World Bank’s GCRF, Pillar 4 “Strengthening Policies, Institutions and Investments for Rebuilding Better”.

26. **Component 4 – Project Management (US\$6.99 million of which US\$6.99 million IBRD).** This component aims to strengthen the Borrower’s capacity to carry out Project activities, including fiduciary, technical, environmental and social, and monitoring and evaluation (M&E) aspects. To this end, it will finance the provision of technical assistance, consulting and non-consulting services, training, operating costs and goods to key government agencies necessary to effectively carry out activities associated with Project implementation, including the hiring of a consulting firm to provide technical and operational support.

27. **Component 5 – Contingent Emergency Response Component (CERC) (zero budget).** This component will support the State of Espírito Santo, following an Eligible Crisis or Emergency, to respond to emergency situations associated with hydrological events. This disaster recovery contingency zero-fund component could be triggered following the declaration of a disaster or emergency, defined as “an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or man-made crises or disasters.” When triggered, funds may be reallocated to facilitate the rapid financing of goods and services under streamlined procurement and disbursement procedures. Eligible activities may include emergency rehabilitation works, supply of critical equipment, or any other critical inputs to respond to the impacts of floods, landslides, droughts and other hydrological climate-related extreme events. If activated, this component would therefore directly enhance the residents’ resilience to climate change. The CERC supports the implementation of the World Bank’s GCRF, Pillar 3 “Strengthening Resilience”.

³⁰ These are water rights issued to a group of family farmers using water from a defined portion of the river. The water right is issued to the group and they reallocate among themselves as needed. Additional information is presented in Annex 2.

³¹ These no-regret interventions consist of drainage works to increase runoff capacity, including dredging, widening of cross sections and river channeling.

³² *ThinkHazard!* is a web-based tool enabling non-specialists to consider the impacts of disasters on new development projects. The Global Facility for Disaster Reduction and Recovery (GFDRR) supports the tool in partnership with the World Bank Group and other institutions.



C. Project Beneficiaries

28. **The proposed Project is expected to benefit Espírito Santo's 4.1 million residents by enhancing both the State's integrated water resources and disaster risk management capacities (Component 1).** Women will be over-represented among beneficiaries as they represent a larger share among beneficiaries at all activities levels. At the *river basin* level, 2,800 landowner participants will directly benefit from the PES program, whereas an estimated 1.3 million will indirectly benefit from increased water security in the five selected river basins (subcomponent 2.1); the population of the Itapemirim River Basin (523,000 inhabitants) will benefit from integrated flood management interventions (subcomponent 2.2); and residents of the four river basins (538,000 approximately) will benefit from increased capacity to respond to drought (subcomponent 2.2). At the *municipal* level, roughly 39,000 residents of the three targeted municipalities (Águia Branca, Ibirapu, and João Neiva)³³ will benefit from flood risk reduction interventions (Component 3), among which a significant share earn less than half a minimum wage per capita, and thus are either poor or at high risk of becoming poor,³⁴ while 29,000 residents of Alfredo Chaves and Iconha³⁵ will stand to gain from improved designs and innovative studies that will inform future flood risk works in the municipalities.

29. **The proposed Project will likewise provide several institutional benefits.** It will contribute to strengthening the State's capacity to promote improved water resources and land management and nature-based solutions applied to disaster risk management, the adoption of climate-smart and sustainable practices in integrated water management, all of which would eventually be applied in interventions beyond the Project's targeted areas.

30. **Finally, public investments made through the proposed Project will help unlock opportunities for economic development and mobilization of private investments.** Planned interventions for flood risk reduction and disaster risk management are expected to stimulate the local economy through private investments in urban development and expansion of local businesses. The expansion of Reflorestar PES will help leverage additional financing sources, by supporting studies and the development of strategies that could lead to the expansion of funding sources, including the private sector.

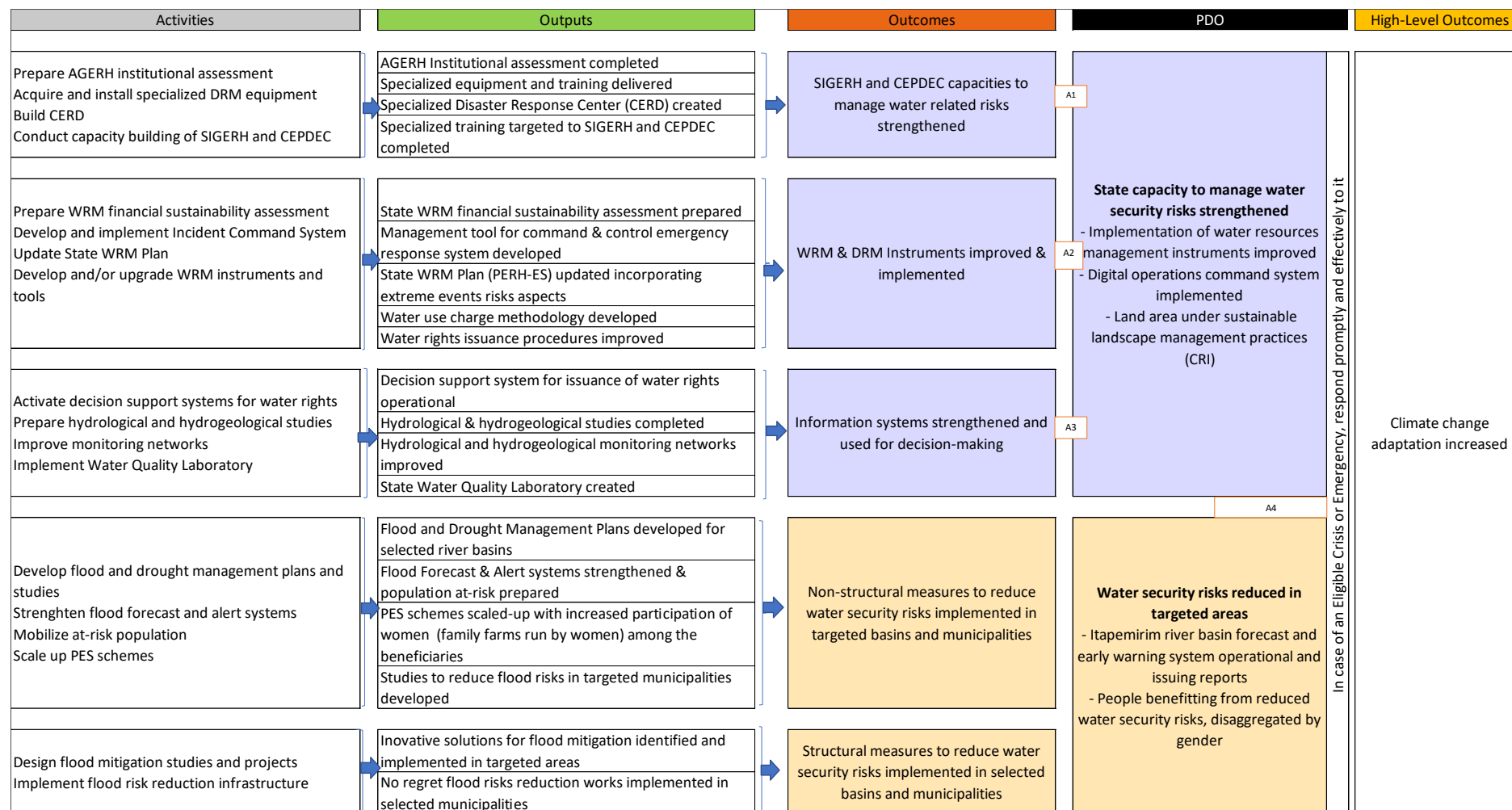
³³ The respective populations are: Águia Branca (9,631); Ibirapu (12,591); and João Neiva (16,722).

³⁴ The percentage of residents that are registered in the Cadastro Único in these municipalities are, respectively: 52 percent, 50 percent, and 34 percent.

³⁵ Iconha (14,083) and Alfredo Chaves (14,670).



D. Results Chain





Critical assumptions include:

- A1. Water use charges are approved by the State Water Resources Council and lead to increased revenues to finance SIGERH-ES institutions and non-structural and structural measures identified in the State and River Basin plans;
- A2. Increased water rights issuance and registration, improved information on water use, allowing better water allocation and control of abstractions, and reducing the risks of water deficits and droughts;
- A3. Information used to help climate change cognizant decision making to reduce water security risks; and
- A4. Reducing water security risks and increasing the State's capacity to manage them increases its adaptation to climate change since climate change principally impacts SES' population, economy and environment through alterations to the hydrological cycle, namely increased water deficits (water demand exceeds availability) and extreme events (floods, landslides and droughts).

E. Rationale for Bank Involvement and Role of Partners

31. **Rationale for Bank Involvement.** Over the past 30 years, the Bank has maintained a successful engagement with the State of Espírito Santo in the water sector, with projects and technical assistance in water supply and sanitation (WSS), coastal pollution management, and watershed conservation and restoration. More recently, through the ongoing Bank-financed *Espírito Santo Integrated Sustainable Water Management Project*,³⁶ the scope of the Bank water engagement has started to evolve to include, in addition to investments in sanitation and watershed restoration,³⁷ some technical assistance to strengthen the State's capacity to manage increasing water security risks, exacerbated by climate change. With its deep level of engagement in the water sector in Espírito Santo and its global experience in WRM and disaster management, the Bank can play a unique role, through the proposed Project, in promoting a paradigm shift in addressing water security risks in the State, building the capacity to further move away from traditional sectoral and reactive approaches, to more integrated, proactive and innovative approaches based on risk management and nature-based solutions (see section F).

32. **Role of Partners.** The World Bank is the only development partner supporting SES in the areas of water security and disaster management, and related climate adaptation. The World Wildlife Fund for Nature (WWF) and the Global Environment Fund (GEF) have been long-time partners to the Reflorestar Program and its PES program.

F. Lessons Learned and Reflected in the Project Design

33. The following lessons learned on technical approaches and implementation arrangements have informed Project design.

34. **Adopting a proactive approach based on flood and drought risk management is critical to achieving technical and economic efficiency.** The traditional approaches to both flood and drought

³⁶ Espírito Santo Integrated Sustainable Water Management Project (P130682) approved in 2014 and scheduled to close in June 2024.

³⁷ Bank operations have contributed to improved sewerage collection and treatment in Espírito Santo. Between 2010 and 2019, access increased from 39.9 to 55.9 percent, with the highest improvement in urban areas, where access rose from 46.7 to 62.8 percent.



management are reactive, based on crisis management, when measures are taken in emergency situations. They are technically and economically inefficient when compared to proactive approaches based on risk management where measures are designed in advance with appropriate planning tools and stakeholder participation and where the question regularly arises as to what safety is available at what price, and how much of the remaining risk has to be accepted by society. Lessons learned and international best practices considered in Project design include the European Union (EU) experience in implementing the EU Flood Directive³⁸ and EU Drought Planning guidelines,³⁹ as well as Brazil's rich drought management experience in the Northeastern region.⁴⁰ Project design also builds on the recommendations of the EPIC Innovative Governance for Flood and Drought Risk Management⁴¹ focusing on an integrated approach, with clear definition of roles and responsibilities of all institutions and sectors as well as their adequate coordination.

35. ***Nature-based solutions and payment for Environmental Services (PES) should incorporate key lessons to improve their cost-effectiveness and sustainability.*** Lessons learned from international experience and the Reflorestar program under the ongoing Espírito Santo Integrated Sustainable Water Management Project (P130682) have shown that PES can provide strong incentives for private land-owners to adopt nature-based solutions, such as reforestation or beneficial agro-environmental solutions that generate ecological services such as reduced water pollution and sediment loads, increased groundwater recharge and water infiltration, and reduced runoff velocity. They also reveal that the following elements are key to ensure PES cost-effectiveness and sustainability: (i) identification of the specific needs of service users in the watersheds (in the ongoing project case, reducing sediment loads in Espírito Santo Water and Sanitation Company-CESAN's water sources), (ii) establishing what land uses in what areas can help generate the specific services needed by the water users, and (iii) ensuring appropriate implementation arrangements. Following considerable experimentation, Reflorestar has settled on an approach in which implementation arrangements are sub-contracted to BANDES, a state public bank with considerable experience in working with landholders through its work with rural credit programs. This arrangement has both reduced implementation costs and allowed Reflorestar to considerably expand the area enrolled and will be continued under the proposed Project.

36. ***Water resources and disaster risk management are multisectoral in nature and require multisectoral implementation arrangements*** ensuring adequate participation of all government institutions involved. Lessons learned show that when project implementation requires the involvement and coordination of multiple institutions it is important to rely, as much as possible, on existing and institutionalized coordination mechanisms and apex agencies, and align implementation arrangements with the actual functions and responsibilities of existing institutions. Moreover, the implementation capacity of the institutions involved should be strengthened based on the recommendations of a thorough and ongoing capacity assessment to be completed during Project implementation, which in this case includes the establishment of a dedicated project management unit within SEAMA, combined with staff training and technical assistance to the various institutions involved, including the support of a project

³⁸ European Union Directive 2007/60/EC on the assessment and management of flood risks, which entered into force on November 26, 2007: https://environment.ec.europa.eu/topics/water/floods_en

³⁹ The EU report on drought management plans was launched in 2007 as part of the Common Implementation Strategy of the Water Framework Directive: https://ec.europa.eu/environment/water/quantity/pdf/dmp_report.pdf

⁴⁰ It includes several knowledge products and tools supported by the World Bank, including the Drought Monitoring instrument (Monitor de Secas): <https://monitordesecas.ana.gov.br/mapa?mes=8&ano=2022>

⁴¹ The EPIC Response is an integrated flood and drought approach to better manage hydro-climatic risks. The World Bank report was launched in 2021: <https://openknowledge.worldbank.org/handle/10986/35754>



management firm (see implementation arrangements). Moreover, a strong operational manual, together with comprehensive project launch training, will be necessary to ensure that Project implementation roles and responsibilities are well understood among participating organizations.

37. ***Design and build (D&B) contracts can also promote timely project implementation.*** Design and build procurement has been used successfully in the execution of civil works under the ongoing operation (P130682) with reduced costs and project delivery time compared to other methods, provided contract management is strong. Indeed, D&B contracts tend to: attract quality firms with proven capacity to tolerate risks; provide an incentive to the firm to resolve issues rapidly, and reduce the number of procurement packages overall, combining design studies and construction into one single contract.

38. ***Participation of citizens in decision making processes related to water resources and disaster risk management is critical to ensure the effective implementation of WRM and DRM instruments.*** The participatory approach is an integral part of SIGERH-ES and SIEPDEC-ES and calls for informed communications strategies to ensure the consultative and decentralized character of both systems. The availability of relevant information in accessible format for stakeholders should be accompanied by targeted campaigns to increase visibility of WRM and DRM processes and encourage participation of a wide segment of the target population – this helps ensure that the participants represent different interest groups and that traditionally excluded groups (including women, people with disabilities and others) have an active role in the process. Local mobilization and outreach will also rely on strengthening the capacity of River Basin Committees, given that working with and strengthening existing institutional bodies has the potential to scale up and ensure sustainability of participatory processes.

39. ***Timely implementation depends on project readiness at the time of approval, which can be facilitated taking advantage of the ongoing project during the preparation phase.*** The ongoing Espírito Santo Integrated Sustainable Water Management Project (P130682) is supporting the preparation of terms of reference (TORs), works feasibility studies and technical requirements; and carrying out an institutional assessment and technical studies, preparing the ground for project implementation. It is also funding additional staffing to improve the capacity of implementing agencies for advancing preparatory activities, with the expectation of an overlap between the two operations. See Table A2.1 (Annex 2) summarizing the status of key preparatory activities and their estimated completion.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

40. **The Secretariat of Environment and Water Resources (SEAMA) will be responsible for the overall Project leadership and coordination through the establishment of the Project Management Unit (PMU).** It will carry out the coordination, supervision and reporting on Project activities and results; perform technical, fiduciary and administrative functions; as well as advise and support the four implementing agencies in fulfilling their Project responsibilities, in compliance with Project regulations and World Bank policies. The PMU will comprise a core team including a Project coordinator, a financial management (FM) specialist, a procurement specialist, a M&E specialist, environment and social specialists, a legal specialist, an operational and administrative specialist, among others. SEAMA will represent the Borrower in any Project-related engagement with the World Bank. The Project's institutional arrangements have been formalized by decree enacted by the Borrower.⁴² See Annex 1 for

⁴² Decree Nº 5344-R, issued on March 16, 2023.



details.

41. **AGERH, SEAMA, CEPDEC and DER-ES⁴³ will be responsible for implementing Project activities under their purview via their specific Project Implementing Units (PIUs),** as follows: i) AGERH for subcomponent 1.1 and component 3(ii);⁴⁴ ii) CEPDEC for subcomponent 1.2; iii) SEAMA for subcomponent 2.1 and component 4; and iv) DER-ES for components 3(i) and 3(iii). AGERH, CEPDEC and SEAMA will share the implementation of subcomponent 2.2,⁴⁵ which is expected to enhance their coordination and improve interinstitutional and cross-sectoral collaboration under the SIGERH-ES, resulting in a positive externality. Component 5 activities will be implemented by SEAMA and CEPDEC, as further detailed in the Project Operations Manual (POM). Procurement of activities under components 1, 2 and 4 will be carried out by a Special Bidding Commission (SBC) established under SEAMA. DER-ES will be responsible for the procurement of activities under component 3. The implementing agencies will sign interagency technical cooperation agreements with SEAMA and will designate a focal point responsible for Project implementation and monitoring of progress. Each PIU includes technical teams from the institutions and will be reinforced with support from a technical and operational consulting firm, as further detailed in the POM. See Annex 1.

42. **An external consulting firm will be contracted to provide support to the PMU and the PIUs in the implementation of the Project.** This firm is expected to provide technical and operational expertise and support in the following areas: (i) administrative and financial management support; (ii) implementation of the environmental and social framework (ESF); (iii) reviewing and updating designs and TORs for various Project activities and assisting in the preparation of documents related to the procurement cycle; and (iv) providing specialized individual consultants with specific technical expertise, as required.

43. **The Steering Committee (*Comitê Gestor do Projeto*) will be established and comprised of high-level representatives from the four Project implementing entities.** It will be chaired by the State Secretariat of Economy and Planning (*Secretaria de Economia e Planejamento* - SEP). The Sub-secretariat of Fundraising under the SEP (*Subsecretaria de Captação de Recursos* – SUBCAP/SEP) will serve as its Executive Secretariat. The Committee will provide strategic direction, guidance, and oversight for implementation; ensure inter-agency collaboration where needed; monitor progress; and recommend and take actions to resolve bottlenecks when necessary.

B. Results Monitoring and Evaluation Arrangements

44. **Progress towards achievement of the Project Development Objective will be assessed based on the PDO-level and intermediate results indicators.** The Results Framework (RF) for this operation is presented in Section VII. The RF includes selected indicators used by the Borrower for the purposes of monitoring Project impacts. Data for most of the indicators can be gathered from existing systems. The PMU will consolidate the relevant data from the four implementing agencies and present the Bank with semi-annual progress reports that include data on Project execution and Project outputs and outcomes.

⁴³ See Table A1.1 in Annex 1 summarizing the agencies' functional roles and responsibilities under each Project component.

⁴⁴ AGERH will also implement the studies to identify more innovative integrated structural and non-structural solutions to reduce flood risks in the municipalities of Iconha and Alfredo Chaves, under Component 3.

⁴⁵ AGERH will be responsible for nearly all activities under subcomponent 2.2, with the exception of (i) activities related to the warning systems, Civil Defense contingency plans, registration of residents in at-risk areas, and production and dissemination of communications materials, to be led by CEPDEC; and (ii) green/gray infrastructure interventions to be implemented under the Itapemirim river basin flood risk management plan, under SEAMA's responsibility.



The World Bank team will conduct at least semi-annual implementation support missions to monitor progress towards achievement of results and agree on adjustments or corrective measures when necessary. Implementation progress will be documented in Aide Memoires and Implementation Status and Results (ISR) Reports. Monitoring and ensuring compliance with the Project's ESF instruments will be performed by the PMU in coordination with the four implementing agencies.

C. Sustainability

45. **Participatory approach and adequate budgeting.** Project objectives are aligned with the state government's strategic priorities, as well as those of the municipalities involved. The sustainability of investments supported by the Project relies on the state institutions' capacity to work closely with the municipalities in preparation and during implementation of works. The responsibility for maintaining infrastructure investments belongs to the municipalities. The State will coordinate with municipalities to ensure that they incorporate it in their overall maintenance functions and budget prior to transferring the completed works.

46. **Resilient integrated structural and non-structural solutions to flood, drought and WRM management.** The Project will promote a risk-based approach to water security and promote NBS, in combination with more traditional gray infrastructure, which tend to provide solutions that are more cost-effective to invest and operate, more robust to uncertainties, more resilient to risks in general and climate change in particular, making them more sustainable measures over time.

47. **PES sustainability.** Most sustainable land management practices and NBS supported by the Reflorestar program are expected to be beneficial for water security, biodiversity, climate adaptation and mitigation, but also in the farmers' interest, so that they are expected to maintain them after the Project closes. To ensure that this is the case, technical assistance will be provided to help farmers adopt practices that are best suited to their conditions and to promote their effective implementation. Moreover, the State Fund for Water Resources (Fundágua) that was created in 2008, provides the State Water Resources Policy an instrument to secure and apply funds to improve management of water resources and the environment (including PES). These funds, which are executed by SEAMA, come from petroleum royalties and contribute to the long-term availability of resources to be applied to the PES programs, including the one to be supported by this Project.

48. **Sustainability of WRM improvements under SIGERH-ES.** The Project will finance several activities that will be key to ensure the sustainability of WRM capacity improvements supported under the Project: the assessments of AGERH's institutional capacity and of the SIGERH-ES financial system and implementation of key recommendations from those assessments. Moreover, as a result of the Project, collection of revenues from water uses charges should start and increase over time, as the Project will support their design at river basin levels and will improve the effectiveness in the issuance of water rights which constitute the revenue base for these charges. The Water use charges is a key financial instrument for the implementation of the WRM plans and the functioning of key SIGERH-ES institutions. These activities, in combination with Fundágua and the state budget, should improve the medium and long-term financial sustainability of the SIGERH-ES and the implementation of its seven policy instruments.

49. **Capacity building of government officials.** The sustainability of Project results beyond its closing will also be ensured through capacity building of government officials and specialists responsible for water resources and disaster risk management, in the innovative approaches that will be included by the Project. This will be done through specialized training, on-the job training as well as study tours, and partnership



building.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

Technical analysis

50. The Project's technical design is in line with international good practices in the sector (see lessons learned). The approaches followed and their justifications are explained below:

51. **Selection of Project areas.** The areas chosen to benefit from on the ground water security risk reduction interventions and piloting of innovative approaches were selected based on the State's prioritization of flood and drought risks. Namely, the priority areas center around five river basins located in the part of the State which have been identified as the most at risk for drought and the Itapemirim basin, and 5 municipalities which have been particularly affected by floods, and in the case of the municipalities, are in urgent need of risk reduction measures.

52. **Technical approach to flood and drought management.** The Project will support the SES in the process of moving from reactive, crisis approaches to flood and drought, to proactive risk management approaches, which requires ex ante design of measures with appropriate planning tools and stakeholder participation (see lessons learned). It will do so by financing within select high risk basins (the Itapemirim and the State's Center-North hydrographic region), the preparation of participatory flood and drought plans that define measures necessary to reduce risks, considering prevention, protection and preparation. It will also strengthen flood monitoring and forecasting systems to allow for timely warning of flood conditions and activation of pre-defined measures.

53. **Basin-scale, participatory and integrated water resources, flood and drought management combining both structural and non-structural measures.** Project design recognizes that, while structural measures, such as flood defense structures and large reservoirs, are important elements to address water-related risks, more emphasis should be given to nature-based solutions, such as watershed, flood plain and wetland restoration, which tend to be more efficient, sustainable and resilient solutions. NBS take advantage of the storage effect of vegetation, soil and wetlands, including their contributions to groundwater recharge and run-off attenuation, which are important mitigating effects for flood and dry-spells. In line with good practices, Project design considers the hydrographic basin (or-sub-basin) as the planning unit for water resources, flood and drought management, where coordinated water, land and related resources management actions should take place. This approach is fundamental to avoid passing water management problems onto other users, municipalities or states located downstream or upstream. As such, flood, drought and water resources management plans should be closely coordinated at the basin level. Finally, public participation and strong inter-institutional coordination mechanisms are critical both to improve the quality and the implementation of decisions. The proposed operation will finance basin-scale, participatory flood, drought and water resources management planning, combining both structural and non-structural measures, with special attention to the introduction of innovative nature-based solutions. It will also strengthen the institutional framework for WRM and disaster risk management fostering strong coordination mechanisms between the two and other relevant institutions, at the municipal, state and federal levels.

54. **Project's contribution to climate change adaptation.** The Project contributes to climate change adaptation in two ways. Firstly, the entire Project, whose objective is to increase the capacity to manage



water security risks and reduce those risks in selected areas, improves climate adaptation. This is because climate change primarily impacts SES' population, economy and environment, through increases in water security risks (see Context section). Secondly, the Project's overall impact on climate adaptation through its objective, is enhanced through the design of many Project's interventions that consider climate change. For example, the State WRM plan, the flood and drought plans, and the design of structural measures to reduce flood risks will be developed factoring in climate change uncertainty, thereby increasing their climate resilience; the water information system will include climate information; staff training of public DRM and WRM institutions will cover climate change.

Economic Analysis

55. **The World Bank has been a long-term partner of Brazil in the water sector.** By addressing preparation to water related extreme events, and improvement of water resources and disaster risk management capacity, the Bank involvement is justified given its vast experience in addressing these water issues that ultimately bolsters water security. The lessons learned from past World Bank's projects in the SES and other Brazilian States has strengthened water institutions and established a long history of engagement in capacity building and water infrastructure development.

56. **The cost-benefit approach was used to compare the economic costs and benefits with and without the Project.** If benefits surpass costs, the Project is economically viable. The present value of expected net benefits was calculated, as well as the economic internal rate of return, and benefit-to-cost ratios. The economic evaluation was completed with greenhouse gas (GHG) emissions estimates, a sensitivity analysis with various scenarios to measure the impact that changes in costs and benefits, and a qualitative description of potential ancillary economic impacts of the Project.

57. **The economic analysis of the Project focused on three subcomponents: the Reflorestar program, the interventions in the Itapemirim basin and the urban and flood risk management interventions in three vulnerable municipalities.** The parameters used in the analysis include an exchange rate of R\$5.15 per US\$1, with a Project lifetime of 30 years, and standard conversion factor of 1.09 to transform financial to economic values.⁴⁶ Finally, a discount rate of 10 percent was considered for estimating Net Present Values (NPVs). GHG net emissions of the Project were estimated and added to the economic analysis using the Shadow Price of Carbon (SPC) to monetize GHG net emissions with a baseline year in 2022 with different SPCs. A sensitivity analysis included the following scenarios that modified direct costs and benefits: (i) increasing Reflorestar direct benefits of reducing sedimentation and increments in avoided damages in Itapemirim's locations, (ii) cost overruns of 50 percent during the lifetime of the Project for all components under economic evaluation, (iii) a decline in both costs and benefits that reduces the NPV to zero (breakeven point), and (iv) delays of Project's implementation up to 10 years. In addition, the sensitivity analysis incorporated a scenario of extra indirect benefits and costs. Indirect benefits included increases in farm income due to better environmental and agricultural practices with higher economic value due to Reflorestar.

58. **The estimation of costs comprised the investment in infrastructure works for the three subcomponents and the recurrent operation and maintenance (O&M) costs from these interventions.** Administrative and transaction costs of interventions were added based on data availability of each component. In the case of Reflorestar, an opportunity cost per hectare annually is proxied at R\$11,879

⁴⁶ The standard conversion factor is the ratio of economic price value of all goods in the economy at their border price equivalent values to their domestic market price value. Usually it is also approximated with the inverse shadow exchange rate factor (SERF) as follows: $1 + (1/\text{exchange rate})/2 \approx 1.09$.



(US\$2,306) spent for alternatives of productive activities and environmental outcomes (see Annex 3 for detailed description).

59. **The economic rate of return of the Project is 14.9 percent for the entire lifetime of the Project.** The Net Present Value (NPV) of all components included in the economic evaluation is US\$75.8 million, with benefits reaching US\$234.3 million, and total costs reaching US\$158.5 million at present values. See Annex 3 for more details.

60. **Climate Co-Benefits.** The Project has significant climate benefits, both on the adaptation and mitigation fronts. By reducing water security risks, the Project is generating significant climate adaptation benefits considering that, climate change predominantly impacts water security risks. These benefits are already accounted for in the Project's economic analysis. In addition to those adaptation benefits, the Project, through its PES program, will provide mitigation co-benefits, by increasing carbon sequestration through increased forested area and farming practices. Expected carbon sequestration is estimated at 8,682 tCO₂-eq, generating economic benefits ranging from US\$4.4 million to US\$9.0 million, depending on the shadow price of carbon considered. This is based on a carbon sequestration rate of 3.45 tCO₂-eq per ha for reforestation program in Brazil as a result of recent research studies, considering that the Project would reforest 2,715 ha (or 70 percent of the project area to be converted into sustainable land management practices).

61. **A climate and disaster risk screening has been undertaken for the Project** that shows that while the exposure of the Project location and impacts on the Project's physical infrastructure and assets are High, the operation has a significant focus on capacity enhancement, basin-wide integrated flood planning and drought preparedness, and disaster risk awareness raising. Combined, these features will reduce the anticipated risk from climate and geophysical hazards, thus leading to a Moderate outcome rating (Risk to the outcome/service delivery of the project). The Project is essentially designed to build the state's resilience and adapt to climate change, with important elements included within the Project scope that will contribute to achieving high climate co-benefits. Further to those adaptation benefits, the Project also includes mitigation measures such as: enhanced carbon sinks from interventions in Component 2; a clear link between addressing flood and drought risks (in Components 1 and 3) and avoiding further soil erosion and carbon loss; and potential displacing of GHG emissions from materials by implementing pilots with a green infrastructure approach.

62. **Project impact on Borrower's fiscal situation.** The impact of Project investments on the Borrower's fiscal situation is expected to be very small, considering the excellent fiscal situation of the SES, which can easily absorb the additional investment and recurrent costs, but also because some of those costs are expected to be recovered through reduced expenses associated to avoided flood and drought damages and compensations, lower potable water treatment costs and increased life of water reservoirs.

B. Fiduciary

Financial Management

63. **A Financial Management Assessment (FMA) was carried out in accordance with the Investment Project Financing and Bank Directive** "Investment Project Financing and the Financial Management in Bank Financed Operations and Other Operational Matters issued and effective on September 7, 2021". It concludes that: (i) the financial management (FM) arrangements for the proposed Project are considered



adequate; (ii) the flow of funds, disbursements, monitoring, auditing, and supervision arrangements have been designed to respond to the Project's implementation arrangements; and (iii) **the residual FM risk associated with the Project is rated Moderate**. There are no FM-related conditions for Effectiveness.

64. **The proposed FM institutional arrangements respond to the Project's multisectoral nature, while taking into consideration lessons learned from the ongoing Espírito Santo Integrated Sustainable Water Management Project (P130682).** The PMU will undertake the primary fiduciary responsibilities for the Project. These responsibilities include: (i) preparing and obtaining approval of Project FM arrangements; (ii) coordinating and supervising Project implementation; (iii) preparing and submitting Project interim unaudited financial reports (IFRs) to the Bank; (iv) preparing and providing all financial documentation and Project reports requested by external auditors and Bank staff; and (v) preparing, updating, and ensuring that the POM is observed.

65. **The FMA identified the following risks to the achievement of the Project Development Objectives:** (i) the Project includes four implementing entities; (ii) the IFRs will run through a different system ("SAFF – Sistema de Acompanhamento Físico Financeiro", or Solution for Physical and Financial Project Management system), since the State FM information system (the Integrated System of Public Financial Management of Espírito Santo – SIGEFES) does not account for cash basis nor allows the transactions to be booked by category, component and subcomponent; and (iii) the current workload posed by the ongoing project.

66. **The above risks' mitigation measures are:** (i) the PMU will need to work closely with the State Secretariat of Finance (*Secretaria da Fazenda* - SEFAZ) and the executing partners to ensure the coordination is working as planned; (ii) the SAFF system will be contracted for this Project, so the Project's transactions can be booked per category, component and subcomponent, and the automated IFRs can be generated through the system; and (iii) the PMU will hire additional professionals, especially the dedicated FM Specialist.

Procurement

67. **Procurement will be conducted per the World Bank's "Procurement Regulations for IPF Borrowers"**, issued in November 2020, for the supply of goods, works, non-consulting and consulting services under the Project. Procurement of activities under components 1, 2, 3(ii) and 4 will be carried out by a Special Bidding Commission (SBC) established under SEAMA. DER-ES will be responsible for the procurement of activities under component 3(i) and component 3(iii). AGERH, CEPDEC, SEAMA and DER-ES are responsible for the technical aspects of their respective activities and for managing the contracts.

68. **A procurement assessment was carried out (May/June 2022)** to appraise the capacity of SEAMA and DER-ES to implement procurement actions and to review the organizational structure underlying Project implementation and the interaction between the PMU and Project benefiting institutions. DER-ES has a well-functioning procurement team, with experience in procuring goods and services, but no previous experience with World Bank regulations. Civil works have been handled by well-qualified procurement staff and technical assistants, however without experience with Bank procedures. SEAMA has an experienced procurement team in terms of Bank Group's procurement rules, since the Secretariat has already implemented components in the ongoing Project (P130682), specially goods and non-consultant services. Project agencies have some experience in selecting consulting services. Mitigation measures to ensure a satisfactory arrangement are provided in table A1.5 under Annex 1.

69. **The Borrower has developed a Project Procurement Strategy for Development (PPSD), and**



based on the PPSD, a Procurement Plan has been prepared by the Borrower and approved by the Bank, covering the first 18 months of Project implementation. The PMU will specify appropriate roles and responsibilities of the technical and procurement specialists. PMU staff will be trained in Bank procurement procedures once they are selected.

70. **The overall conclusions of the procurement assessment are that:** (i) the procurement arrangements for the proposed Project are considered adequate; (ii) the procurement plan has been prepared and approved by the Bank; (iii) the PMU and the SBCs are structured in a way to respond to the Project's implementation arrangements; and (iv) **the residual procurement risk associated with the Project is rated as Moderate.**

71. Additional information on fiduciary risks and mitigation measures is detailed in Annex 1.

C. Legal Operational Policies

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

D. Environmental and Social

Environment

72. **The Environmental risk rating of the Project is *Substantial*.** The Project aims to increase water security and resilience to extreme events, thus significant positive environmental impacts are expected with the recovery of forest cover, the conversion to sustainable land use, the implementation of NBS, and improved water security. The adverse impacts are mainly related to the civil works to minimize floods and landslides, and increase water security to climate-related extreme events in selected basins and municipalities of the State. The environmental risk of Components 1 and 2 is considered moderate. Their interventions will consist of civil works to be carried out on urban land, partially anthropized, and implementation of green infrastructure, and water and sediment retention devices in rural areas, respectively. On the other hand, the interventions planned in urban areas (Component 3) are of substantial risk. Even though to date, the typology of these works is well defined, and their location will majorly consist of urban anthropized areas, modified habitats, which are fragmented and with the presence of nonnative/exotic species, the scale and magnitude of their related impacts still encompass some level of uncertainty. Thus, as a precautionary approach, the environmental risk was considered substantial. Interventions in rural areas will occur in open and degraded farmlands. The impacts foreseen for these works are common to this type of intervention, local, temporary, reversible, site specific, and with low probability of causing significant/permanent negative environmental effects. The measures necessary to mitigate these impacts are widely known and readily available to be carried out by the implementing agencies. There are no significant contextual risks that imply an additional increase or exacerbation of the potential impacts foreseen in the Project.

73. The Project consists of a series of subprojects for which environmental and social risks cannot be specifically determined until their details have been identified. In consequence, **the Borrower has prepared an Environmental and Social Management Framework (ESMF) as the main instrument of Environmental & Social (E&S) assessment of the Project.** The ESMF was publicly disclosed on a dedicated



website.⁴⁷ It was consulted through this online channel from June 15 to July 15, 2022. In addition, a virtual meeting was held on June 29, 2022.

74. **The ESMF defines the principles, rules, guidelines and procedures to assess the E&S risks and impacts of the Program**, considering its components, subcomponents and activities, whether the latter are already well defined in terms of scope and location of intervention or still lacking definitions that will be reached in the future. The ESMF presents measures and plans to reduce, mitigate, and/or neutralize risks and adverse impacts, information on the agencies or entities responsible for managing the program's risks and impacts, including their institutional capacity for such management. As per the ESMF, the Borrower will be required to develop (as necessary) a set of management plans/programs to address the main E&S risks and impacts of the project implementation. The ESMF was disclosed on the Bank's website on April 14, 2023.

75. **In order to address the environmental and social risks of the Project in a manner consistent with the relevant Environmental and Social Standards (ESSs), an Environmental and Social Commitment Plan (ESCP) was developed and agreed** jointly by the Bank's and Borrower's staff, and incorporates several commitments related to the compliance with the relevant ESSs, monitoring and reporting, capacity building and institutional strengthening.⁴⁸

Social

76. **The social risk rating is Moderate.** The main adverse social impacts are related to land acquisition, physical and economic displacement on a temporary or permanent basis for the construction of flood reduction infrastructures in urban areas as well as, at least potentially, for the green and gray interventions envisaged in the context of the flood risk management plan for the Itapemirim river basin. These impacts are expected to be of small magnitude and the Borrower has developed its capacity to carry out involuntary resettlement action plans following the similar requirements of OP 4.12 as part of the ongoing operation in the state. A Resettlement Policy Framework (RPF) has been prepared and consulted. It is being revised to incorporate relevant feedback received during consultations and its final version will be disclosed in the Project's dedicated website within 30 days of the Project's date of effectiveness as stated in the Project's ESCP. Resettlement and land acquisition costs will be financed with counterpart funds.

77. **The ESMF includes an assessment of social risks and impacts of all activities that will be supported by the Project and identifies a few adverse social impacts related to the construction stage of civil works.** They refer to: an increased demand on public services available at the local level and temporary interferences in its provision; increased traffic and road safety risks due to the circulation of heavy machinery; temporary disturbances in the everyday life of neighboring communities (noise, dust, among others); increased exposure to health risks associated with synanthropic fauna; the exposure of workers and pedestrians to accidents and health and safety risks. Since the works for the construction of flood reducing infrastructure will involve excavations and movement of earth, there is also a moderate risk of encountering unknown cultural heritage and a chance finds procedure has been envisaged under the ESMF. These risks and impacts are predictable and expected to be temporary and reversible, low in magnitude, site-specific, with low probability of serious adverse effects to human health (as routine safety precautions are expected to be sufficient to prevent accidents) and can be easily mitigated in a predictable

⁴⁷ <https://agerh.es.gov.br/aguas-e-paisagem-2>

⁴⁸ The ESCP was disclosed on the Bank's website on March 23, 2023.



manner. Although some of the envisaged small civil works would take place in rural areas, they are not expected to increase risks ordinarily related with the influx of workers on rural communities, because high volumes of labor influx are not anticipated, the works would not occur in remote and hard to supervise areas, or in places defined by pre-existing social conflicts or tensions or by the prevalence of gender-based violence, child and/or forced labor, or in a context of weak law enforcement.

78. Indigenous Peoples possessing the four characteristics set in ESS 7 are not present in the areas of physical interventions (Components 2 and 3), which have been selected due to their high exposure and vulnerability to natural disasters (droughts and floods). Nevertheless, the Project supports a technical assistance activity that will be relevant for all State territory: updating of the State Water Resources Plan. In this context, it will be important to ensure that the Terms of Reference of this specific consultancy is drafted so that its final products are consistent with the principles and requirements of ESS 7 as included in the Project's ESCP. Nevertheless, a stand-alone Indigenous Peoples Plan is not deemed to be the appropriate instrument for social risk management. It is worth noting that Indigenous Peoples leaderships and representatives of FUNAI (the National Indian Foundation) have played active roles in the Water Basin Committee since its inception in 2009 as required by State Decree 2376-R/2009 that created the North-Central Coast Water Basin Committee (which encompasses the area of the Aracruz municipality and the basins of the Piraquê-Açu and Piraquê-Mirim rivers). Therefore, Indigenous Peoples participation in water resources management is already embedded in the Borrower's institutional system.

79. The Borrower has prepared a Stakeholder Engagement Plan (SEP), that has been publicly consulted and revised to incorporate relevant feedback received during consultations.⁴⁹ The SEP mapped key stakeholders and identified that Project activities have the potential of benefiting disadvantaged and vulnerable social groups (poor urban dwellers in at-risk areas, quilombola communities,⁵⁰ artisanal fishery communities and small land holders who are more vulnerable to and less able to cope with the adverse impacts of extreme climate events and natural disasters, notably women, children, the elderly and the people with disabilities among them). The SEP establishes approaches and methodologies for disclosing Project information to all key stakeholders – including these vulnerable groups that need to have access to relevant information on the Project, easy access to its mechanism for raising and facilitating resolution of concerns and grievances, and fair access to Project benefits. The SEP also describes the Project specific Grievance Mechanism, whose functionalities address all the requirements set in ESS 10 and will be operated by SEAMA.

80. The ESMF also emphasizes potentially adverse downstream effects of some technical activities envisaged under Subcomponent 1.1 – namely, updating of the State Water Resources Plan (PERH/ES) and the studies aiming at financial sustainability for water resources management – because they may have implications on the collection of water use fees with potentially adverse distributive impacts in detriment of small family farmers. This risk is minimized by the fact that the existing legislation (State Law 10,179/2014) prohibits the collection of these fees from family farmers and traditional communities. Other Technical Assistance activities are not expected to have any adverse social effects downstream and it is worth highlighting that the effects of downstream activities are outside the scope of this Project.

81. Gender. The Project provides a few entry points to promote gender equity. The social impact

⁴⁹ The SEP has been disclosed on the Bank's website on October 20, 2022.

⁵⁰ Quilombola communities are legally defined as ethnic-racial groups (according to self-determination criteria), with their own historical trajectory, endowed with specific territorial relations and a presumption of African ancestry related to the resistance to historical oppression suffered during the times of slavery in Brazil (Decree 4,887/2003, art. 2).



assessment adopted a gender sensitive lens and identified relevant gender gaps still present in the State that can lead to disproportionate impacts of natural disasters on the well-being of women and female-headed households caused by water security risks as well as their negligible participation so far in benefits provided by the Payment for Environmental Services (Reflorestar Program), stemming from imbalances in access to assets, coping and responsive capacities, and voice and representation in decision making arenas. Between 2013-2019, the share of women-headed family farms among Reflorestar beneficiaries accounted for just 0.79 percent. However, there are 13.4 percent of family farms in the state of Espírito Santo that are headed by women. Since 2021, the Program Implementing Unit has made efforts towards increasing women's participation in the program achieving 30 percent of women-headed family farmers beneficiaries. Moreover, under component 2.1, the proposed operation aims to further increase the share of women beneficiaries to 40 percent; this increase will be monitored by an indicator in the Results Framework. To this end, the project will include activities to identify the drivers of exclusion of women family farmers from PES benefits and land tenure, communication strategies and a participatory strategy, among others. (See Annex 4 – Gender Action Plan-GAP, for full details). The GAP focuses on (i) **increasing the participation of women (family farms run by women) among the beneficiaries of the Reflorestar Program to reduce gender gaps in income, voice and agency;** and (ii) **increasing the participation of women in DRM trainings to reduce gender gaps in access to information, participation, voice and agency by preparing women to respond to situations of risks and disasters**, with two corresponding indicators in the Results Framework. Actions will also result in improved information and communication systems aimed at increasing awareness about the gendered nature of these two areas as well as on ecosystem services, and evidence-based decision making processes.

82. **Citizen engagement.** The Project will also aim to enhance citizen engagement in decision making processes related to water resources and disaster risk management. Stakeholder engagement is a core element in water resources, engaging various entities in the forums provided for in the Policy: the State Council of Water Resources (CERH), the River Basin Committees (RBCs) and the Forum of River Basin Councils (FCCBH). Stakeholder engagement is also a cornerstone of the State's disaster risk management regulatory framework, which relies on Municipal Committees of Civil Defense and Protection (COMPDEC) and Community Civil Defense Nuclei (NUDEC) – both instances comprise representatives of governmental agencies at the state and municipal level as well as civil society organizations and volunteer citizens. Project activities (particularly under Component 1) will contribute to the institutional strengthening of these existing instances of citizen engagement in the implementation of public policies, paying particular attention to improvements in social communication, transparency and civil society engagement, with an emphasis on increasing opportunities for female representation and ensuring the participation of disadvantaged and vulnerable groups that may be more likely to be adversely affected by water security and disaster risks and Project impacts and/or more limited than others in their ability to take advantage of Project benefits. Citizen/stakeholder engagement will be monitored through three indicators included in the Results Framework.

V. GRIEVANCE REDRESS SERVICES

83. **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 non-compliance 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 Bank's Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the Bank's Accountability Mechanism, please visit <https://accountability.worldbank.org>.

VI. KEY RISKS

84. The **overall risk** to achieving Project Development Objectives is assessed as **Moderate**.

85. The Environmental and Social risk rating is Substantial considering the substantial Environmental risk due to potential adverse effects from the civil works under Component 3 – such as increase in traffic volume, interference in the local road system, generation of solid waste and wastewater, loss of vegetation cover, and increase in noise and dust levels – whose scale and magnitude still encompass some level of uncertainty. However, as explained in Section D, the measures necessary to mitigate the impacts are widely known and readily available to be carried out by the implementing agencies. They will include, among others, solid waste and wastewater management, dust and noise control and monitoring, erosion control, emergency preparedness and response, forest clearing procedures, inclusion of Environmental & Social requirements within bidding documents and contracts, capacity building and institutional strengthening. There are no significant contextual risks that imply an additional increase or exacerbation of the potential impacts foreseen in the Project.

86. Considering the residual risks after the application of mitigation measures, all other individual risks are **Moderate**.



VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Brazil

Brazil: Espirito Santo Water Security Management Project

Project Development Objectives(s)

(i) to strengthen the Borrower's capacity to manage water security risks in a changing climate; (ii) to reduce those risks in selected areas of the Borrower's territory; and (iii) in case of an Eligible Crisis or Emergency, respond promptly and effectively to it.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
Strengthen the Borrower's capacity to manage water security risks in a changing climate				
PDO 1: Water resources management instruments improved (Text)		a) 1,500 decisions on water permits assessed per year based on few criteria and information; b) PERH not fully operational and lacking focus on extreme events related aspects; c) Information system with low availability to the public and not used to support water rights decision-making.	a) 50% increase in water rights decisions per year. b) Updated PERH submitted to the CERH-ES. c) 1,000 accesses to the system, including 50% of water rights analyses.	a) 100% increase in water rights decisions per year. b) Updated PERH approved by the CERH-ES. c) 2,000 accesses to the system, including 100% of water rights analyses.
PDO 2: Digital operations command system implemented (Text)		No system	System developed	System implemented
Land area under sustainable landscape		0.00	2,100.00	3,000.00



Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
management practices (CRI, Hectare(Ha))				
Reduce water security risks in selected areas of the Borrower's territory				
PDO 4: Itapemirim river basin forecast and early warning system operational and issuing reports (Text)		Simplified system in operation, with few information and not issuing reports.	System in operation and issuing monthly reports.	System in operation and issuing weekly reports.
PDO 5: People benefitting from reduced water security risks (Number)		0.00		100,000.00
People benefitting from reduced water security risks, of which female (Number)		0.00	0.00	48,000.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
1-Building the Borrower’s Capacity for Water Security in a Changing Climate				
1.1) Reduction in the average time for issuing water rights for irrigation using surface water (Text)		60 days	15% reduction	25% reduction
1.2) Water use charges proposals submitted to the River Basin Committees (Number)		0.00	1.00	13.00
1.3) Commitment agreements signed between socioeconomic sectors and SIGERH-ES institutions to implement actions/programs agreed on the PERH-ES (Number)		0.00	3.00	5.00
1.4) Technical staff and key SIGERH-ES and Civil Defense system stakeholders trained in water resources and disaster risk management and		0.00	169.00	350.00



Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
disaster response (Number)				
1.5) Increase in the participation of women in the annual training courses offered by CEPDEC to municipal civil defense and protection committees (COMPDEC) and Community Civil Defense Centers (NUDEC) (Percentage)		29.00	35.00	40.00
2-Demonstrating Climate-Smart Integrated Water Security Risk Reduction Approaches in Selected Basins				
2.1) Water retention structures installed through the Reflorestar Program (Number)		0.00	840.00	1,680.00
2.2) Properties supported with projects for soil and water conservation practices (Number)		0.00	2,100.00	2,800.00
2.3) Priority land area reforested and/or implementing sustainable land use practices through Reflorestar Program (Hectare(Ha))		0.00	630.00	900.00
2.4) Beneficiaries satisfied with the Reflorestar Program (Percentage)		0.00	70.00	90.00
2.5) Increase in the participation of women (women-headed family farms) among the beneficiaries of the Reflorestar PES Program (Percentage)		30.00	35.00	40.00
2.6) People benefitting from measures to mitigate the impacts of floods (Text)		0.00	79,524 as the population living in at-risk areas in the Itapemirim river basin.	522,932 as the total population living in the Itapemirim river basin according to the PERH-ES.
2.7) People benefitting from drought preparedness measures identified in the drought preparedness plans (Number)		0.00	0.00	591,807.00
3-Reducing Flood Risk in Targeted Municipalities				
3.1) Area under reduced flooding risk (Hectare(Ha))		0.00		654.32
3.2) Area mapped for flood risk reduction		0.00	0.00	320.75



Indicator Name	PBC	Baseline	Intermediate Targets	End Target
			1	
(Hectare(Ha))				
4- Project Management				
4.1) Participants satisfied with the events organized by the Project in which they take part (Percentage)		0.00	70.00	70.00
4.2) GRM: the rate of complaints related with the Project that are properly and timely responded (Percentage)		0.00	70.00	90.00

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
PDO 1: Water resources management instruments improved	a) The baseline considers the online application system for irrigation processes between 2020 and 2022. The indicator measures the increase in the number of water rights decisions, considering the revised analysis criteria, improved information and the use of a decision support system, comparing the amount of processes	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	AGERH (Subcomponent 1.1)



	<p>analyzed in June 2022 (baseline), during Project implementation and at the end of the Project.</p> <p>b) State Water Resources Plan (PERH-ES) updated, incorporating aspects related to extreme events risks, submitted by AGERH and approved by CERH-ES, aiming at making it more operational: well-identified water resource management problems, measures to address problems identified and implemented. Together with the Plan, AGERH will also forward to the CERH-ES the signed commitment agreements between the socioeconomic user sectors and SIGERH/ES institutions, aiming to improve the Plan's implementation capacity. Throughout the process, AGERH will coordinate with the Council to facilitate the approval process.</p> <p>c) Water Resources</p>				
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	Information System operational, including improved and publicly available information used for decision-making in the face of different climate scenarios.				
PDO 2: Digital operations command system implemented	<p>Baseline: no system in place results in the information being transmitted via Whatsapp or in physical format; less agility and difficulty in effectively documenting incidents.</p> <p>The indicator measures the use of the system, operating in digital format and interacting on a web-based platform in the case of highly complex events. It allows integration of efforts and better coordination of agencies working towards the common goal of stabilizing critical situations and protecting lives, property and the environment. More effective response, greater control over the execution of tasks, better</p>	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	CEPDEC (subcomponent 1.2)



	<p>management, also providing greater effectiveness in documenting disasters.</p> <p>Implemented system means tests carried out, knowledge transferred to future users (training) and system established by means of an internal ordinance (portaria).</p>				
Land area under sustainable landscape management practices	<p>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; Sustainable landscape management (SLM) practices refers to a combination of at least two technologies and</p>	Bi-annual.	Six-monthly progress reports	<p>Definition: Areas in ha reforested and/or implementing sustainable land use practices through the Reforestar Program. The indicator demonstrates the amount of degraded hectares that can be converted into sustainable practices and that present conditions to be demonstrated within the Project's timeline. Key premises: the PES contracts initiated in years 1 and 2 of the Project are able to be</p>	SEAMA (Subcomponent 2.1)



	approaches to increase land quality and restore degraded lands for example, agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land, rangeland, and agriculture land.			fully concluded within the Project implementation period, whereas contracts started in years 3 and, mainly, in year 4, will hardly have enough time for the forest restoration process to be considered successful, since this can take 3 to 5 years on average. Although the Project is expected to support overall the restoration of approximately 5,600 hectares, it is expected that at least 3,000 ha will be demonstrable within the Project period. The detailed methodology is presented in the Project Operations Manual.	
PDO 4: Itapemirim river basin forecast and early warning system operational and issuing reports	The indicator measures the strengthening of disaster risk management capacities, including the forecast and information of the following	Bi-annual	Six-monthly reports	Six-monthly progress reports.	AGERH (Subcomponent 2.2)



	parameters: level and discharge rate (outflow) of rivers (current, forecast and discharge rate/permanence curve), flood maps, and population affected by the observed level at that point in time, meteorological data (current and projection of climatological scenarios), with information periodically published to the public.				
PDO 5: People benefitting from reduced water security risks	The indicator measures the population benefited by the implementation of structural and non-structural measures to reduce the risk to water security in the selected areas. The inhabitants of the municipalities of João Neiva (16,774 in total, of which 8,486 are women); Ibiraçú (12,705, of which 6,413 women); and Aguia Branca (9,621, of which 4,667 are women) will benefit from already identified works to reduce the risk of flooding.	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	DER-ES (Component 3)



	The inhabitants of the municipalities of Iconha (14,083, of which 6,876 women) and Alfredo Chaves (14,670, of which 7,203 women) will benefit from the mapping of flood risk areas and the implementation of structural and non-structural measures to be prioritized for implementation. Finally, inhabitants of at least two basins that will have drought preparedness actions planned (subcomponent 2.2) will benefit from the planning and implementation of selected activities.				
People benefitting from reduced water security risks, of which female	The indicator measures the population benefited by the implementation of structural and non-structural measures to reduce the risk to water security in the selected areas. The inhabitants of the municipalities of João Neiva (16,774 in total, of which 8,486 are women); Ibiraçú	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	DER-ES (Component 3)



	<p>(12,705, of which 6,413 women); and Aguia Branca (9,621, of which 4,667 are women) will benefit from already identified works to reduce the risk of flooding. The inhabitants of the municipalities of Iconha (14,083, of which 6,876 women) and Alfredo Chaves (14,670, of which 7,203 women) will benefit from the mapping of flood risk areas and the implementation of structural and non-structural measures to be prioritized and implemented according to the available time and resources. Finally, inhabitants of at least two basins that are the focus of the planning and implementation of preparedness actions for droughts (subcomponent 2.2) will benefit from the selected plans and actions.</p> <p>Estimated population in the River Basins of Santa Maria do Rio Doce (34,600), Santa</p>				
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	Joana (32,866), Pontões e Lagoas do Rio Doce (396,324), Barra Seca e Foz do Rio Doce (74,515) and the municipality of Sao Roque do Canaa (12,510). Sources: www.agerh.es.gov.br , www.gov.br/ana/pt-br/assuntos/gestao-das-aguas/fortalecimento-dos-entes-do-singreh/comites-de-bacia-hidrografica/comites-estaduais/es .				
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Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
1.1) Reduction in the average time for issuing water rights for irrigation using surface water	Measurement of the reduction in the average total time for issuing water rights for irrigation with surface abstraction (counting from the request to the decision on the right). The percentage will be calculated in relation to the average time for issuance on June/15/2022,	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	AGERH (Subcomponent 1.1)



	considering the results of the water rights improvement study and the use of a decision support system.				
1.2) Water use charges proposals submitted to the River Basin Committees	AGERH will submit proposals for water use charges to the River Basin Committees, following coordination and discussions with water user sectors, civil society and public authorities on the financial sustainability of the water resources management and applicable parameters, as well as on the importance of the water use charges for improving WRM in the State.	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	AGERH (Subcomponent 1.1)
1.3) Commitment agreements signed between socioeconomic sectors and SIGERH-ES institutions to implement actions/programs agreed on the PERH-ES	Commitment agreements signed during and after the update of the State Water Resources Plan (PERH-ES) to implement action(s) under the responsibility/interest of the socioeconomic sectors and the SIGERH-ES institutions.	Bi-annual	Six-monthly reports	Six-monthly reports	AGERH (Subcomponent 1.1)
1.4) Technical staff and key SIGERH-ES and Civil Defense system stakeholders	Technical staff and other key actors trained through	Bi-annual	Six-monthly progress	Six-monthly progress reports	AGERH and CEPDEC (Subcomponents 1.1 and



trained in water resources and disaster risk management and disaster response	(among others) participation in the preparation of Drought and Flood Risk Plans; technical courses in areas related to water resource, disaster risk management and disaster response, systems training, participation in workshops, and technical visits. The intermediate target considers the training of 50% of AGERH employees, members of River Basin Committees and CERH; and the final target corresponds to 80% of them. The total staff of AGERH is 44, the total staff of Committees is 289 and the total staff of CERH is 60. In addition, it also includes 20 staff of SEAMA and SEAG; and 20 CEPDEC civil servants.		reports		1.2)
1.5) Increase in the participation of women in the annual training courses offered by CEPDEC to municipal civil defense and protection committees (COMPDEC) and Community Civil Defense Centers (NUDEC)	The indicator will measure the share of women participating in the annual training courses offered by CEPDEC to municipal civil defense and protection committees (COMPDEC) and Community Civil Defense	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	CEPDEC (Subcomponent 1.2)



	Centers (NUDEC) with a target to increase at least 10% the participation of women in the total number of course participants. Of the 10 DRM courses offered by CEPDEC in 2021 to municipalities across the State, female participation accounted for only 29 percent of the 1,399 participants.				
2.1) Water retention structures installed through the Reflorestar Program	The indicator measures the number of water retention structures that will be installed in the rural properties. It has been calculated taking into account the universe of rural properties that joined Reflorestar in the previous year, of which at least 60% will receive support to implement at least one physical intervention in the soil, which may be mini water detention ponds, soil built dry boxes or similar (barraginha, couxinho or caixa seca). This final determination on the type and number of interventions	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	SEAMA-Reflorestar (Subcomponent 2.1)



	to be implemented in each property will rely on knowledge of the characteristics of each rural property, technical viability and the expression of interest by the property's owner.				
2.2) Properties supported with projects for soil and water conservation practices	This indicator measures the number of PES contracts signed. It allows assessing whether the implementation of the component is creating the necessary conditions for the other indicators to be achieved. Although the establishment of new PES contracts does not mean that they will be successful, it is essential that there are active contracts for the restoration objectives to be achieved.	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	SEAMA (Subcomponent 2.1)
2.3) Priority land area reforested and/or implementing sustainable land use practices through Reflorestar Program	This indicator is linked to the PDO indicator 3 and therefore considers the same assumptions. It reflects the Reflorestar Program's evolution towards measuring priority areas within the restored	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	SEAMA/Reflorestar (Subcomponent 2.1)



	areas. The relationship between areas under restoration/priority areas was measured empirically and considering as a baseline the correlation verified in the PES contracts that went into effect from the 2021 call for proposals, which has revealed a ratio of 1 ha in priority areas for each 5 ha allocated for restoration (or 20%). Priority areas are those that have been identified through the Invest model that, if restored, deliver the best sediment retention results. The monitoring methodology is detailed in the Projects Operation Manual.				
2.4) Beneficiaries satisfied with the Reflorestar Program	Citizen engagement indicator. It measures the share of beneficiaries (Program participants) satisfied with the Reflorestar Program, to be measured through specific surveys at baseline, during and at the end of the Project. The baseline will be	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	SEAMA-Reflorestar (Subcomponent 2.1)



	defined before the implementation starts.				
2.5) Increase in the participation of women (women-headed family farms) among the beneficiaries of the Reforestar PES Program	<p>The indicator refers to an increase of 10 percentage points in the participation of women (women-headed family farmers) among Reforestar beneficiaries. Participatory monitoring should be established to assess the effects on income as a result of expanding the number of women in the Program. *There are 33,093 family farms in the state and 13.4% (4,345 family farms) are headed by women in the state of Espírito Santo. Between 2013 and 2019, Reforestar has financed 3,795 landholdings in the State, of which women-headed family farms accounted for just 0.79% (and comprised 0.68% of the total women-headed family farmers in the state). In 2020, a new call for expression of interest supported by the World Bank was launched and 30%</p>	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	SEAMA (Subcomponent 2.1)



	of the total of 300 contracts signed by Reflorestar benefit women-headed family farmers.				
2.6) People benefitting from measures to mitigate the impacts of floods	About 14% of the population of the Itapemirim river basin (79,524) lives in at-risk areas. The target includes the total number of the population mapped by the Itapemirim river basin flood risk integrated management plan and benefited from green and/or gray infrastructure measures.	Bi-annual	Six-monthly progress reports.	Six-monthly progress reports.	AGERH and SEAMA (subcomponent 2.2)
2.7) People benefitting from drought preparedness measures identified in the drought preparedness plans	Total number of inhabitants of river basins benefiting from Drought Preparation Plans and implementing measures provided for in the Plans. It reflects the need to implement preparedness and response actions in the basins, including in the normal scenario (without identified drought), seeking to increase the adaptive capacity and reduce and mitigate negative impacts,	Bi-annual	Six-monthly progress reports	Six-monthly progress reports	AGERH (Subcomponent 2.2)



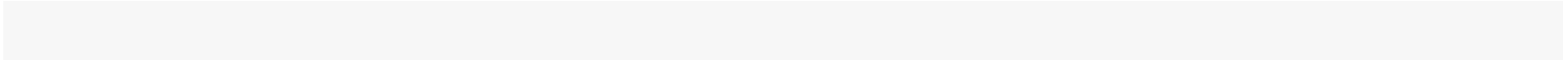
	considering the severity of the drought. Population of municipalities covered by the plans (IBGE Census 2010, estimate 2021), namely: Águia Branca - 9,519, São Domingos do Norte - 8,001, Alto Rio Novo - 7,317, Colatina - 111,788, Governador Lindenberg - 10,869, Itaguaçu - 14,134, Itarana - 10,881, Jaguaré - 24,678, Linhares - 141,306, Mantenópolis - 13,612, Marilândia - 11,107, Pancas - 21,548, Rio Bananal - 17,530, Santa Teresa - 21,823, São Gabriel da Palha - 31,859, São Roque do Canaã - 11,273, Sooretama ⁸⁴ - 23,843 and Vila Valério - 13,830)				
3.1) Area under reduced flooding risk	Urban areas in the municipalities of Ibiraçu, João Neiva and Águia Branca that will have reduced flooding risk due to the infrastructure works.	Bi-annually	Six-monthly progress reports	Six-monthly progress reports Sources: Population, Total risk areas, Total properties at risk, Total people at risk, Percentage of population in risk areas - CPRM - SECTORIZATION OF	DER-ES (Component 3)



				<p>GEOLOGICAL RISK AREAS Urbanized Area - IJSN/Geobases</p> <p>- Mapping Project of Periurban Areas of ES</p> <p>Percentage of Risk Areas in the Urbanized Area (ha) - Agerh/C</p> <p>ohip. Respective urban areas: Águia Branca 42,48 ha; Joao Neiva 364,57 ha; Ibiraçu 247,27 ha.</p>	
3.2) Area mapped for flood risk reduction	<p>Urban areas in the municipalities of Iconha and Alfredo Chaves that will be mapped through hydrological modelling for flood risk reduction.</p>	Bi-annual	Six-monthly progress reports	<p>Six-monthly progress reports</p> <p>Sources: Population, Total risk areas, Total properties at risk, Total people at risk, Percentage of population in risk areas</p> <p>- CPRM</p> <p>- SECTORIZATION OF GEOLOGICAL RISK AREAS Urbanized Area - IJSN/Geobases</p> <p>- Mapping Project of Periurban Areas of ES</p> <p>Percentage of Risk Areas in the Urbanized Area (ha) - Agerh/C</p>	AGERH (Component 3)



				ohip. Urban areas: Iconha 198.58 ha and Alfredo Chaves 122.27 ha.	
4.1) Participants satisfied with the events organized by the Project in which they take part	Citizen engagement indicator. Measures the percentage of satisfaction of participants in Project events, including, among others, satisfaction with disaster preparedness training, use of systems open to the public, and procedures for requesting water rights.	Bi-annual	Six-monthly progress reports.	Six-monthly progress reports.	AGERH, CEPDEC, SEAMA, DER-ES (Components 1, 2 and 3)
4.2) GRM: the rate of complaints related with the Project that are properly and timely responded	Citizen engagement indicator. It measures the rate of Project-related complaints responded to appropriately (ie dissatisfied people having access to complain and appeal to higher levels if necessary); and within an appropriate period (maximum of 30 days, as established in the SEP).	Bi-annual	Six-monthly progress reports.	Six-monthly progress reports.	AGERH, CEPDEC, SEAMA, DER-ES (Components 1, 2 and 3)





ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: Brazil

Brazil: Espírito Santo Water Security Management

Project Implementation Arrangements

- 1. The Implementation Arrangements and Support Plan considers a multi-sectoral approach and is based on the Project's scope and risk profile, as well as on the lessons learned from the implementation of the ongoing Espírito Santo Integrated Sustainable Water Management Project (P130682).** It relies on: (i) a Project Steering Committee (SC) with strategic and consultative functions; (ii) SEAMA, responsible for overall Project coordination/leadership and for housing the PMU; (iii) four State entities responsible for the implementation of Project activities: AGERH, CEPDEC, SEAMA, and DER-ES through their respective PIUs; and (iv) a consulting firm to provide technical and operational support to the PMU and the PIUs. These arrangements are shown in Figure A1.1 and detailed in Table A1.1.
- 2. The Project Steering Committee** will be chaired by the State Secretariat of Economy and Planning (SEP) and is comprised of high-level representatives from the four implementing entities and the PMU's general coordinator. The SC operates at a strategic, consultative level, and ensures the Project's alignment with government policy and directives. The SC will hold quarterly meetings to fulfil its responsibilities, including: tracking Project's activities; monitoring and assessing progress to ensure that targets, disbursements and expected results are reached as agreed; providing institutional support to the PMU and PIUs, including to ensure that appropriate human resources are in place; monitoring compliance with World Bank policies and guidelines; reviewing and approving key Project documents, such as the POM and annual budget; recommending strategies to resolve bottlenecks during Project implementation; documenting decisions made; and referring issues, as necessary, for deliberation by higher instances. In fulfilling its functions, the SC will be supported by an Executive Secretariat led by the *Subsecretaria de Captação de Recursos, Secretaria de Economia e Planejamento* (SUBCAP/SEP), whose responsibilities will include coordinating and undertaking tasks assigned to the SC. The SUBCAP/SEP has extensive experience in managing externally financed operations, and the proposed SC model reflects a similar arrangement to the one in place for the Espírito Santo Integrated Sustainable Water Management Project (P130682).
- 3. SEAMA will house the PMU to carry out its overall Project coordination/leadership functions,** including to coordinate, supervise and report on Project activities and results; perform technical, fiduciary and administrative functions; as well as advise and support the four implementing agencies in fulfilling their Project responsibilities, in compliance with Project regulations and World Bank policies. The PMU will comprise a Project coordinator, a financial management specialist, a procurement specialist, a monitoring and evaluation specialist, an environmental specialist, a social specialist, a legal specialist, an operational and administrative specialist, and a communications specialist, as further detailed in the POM. It will be staffed by full-time, tenured personnel drawn from the State government in addition to external consultants hired through the PMU to support the planning, coordination, implementation, and monitoring of Project performance. The state government has selected SEAMA as implementing agency given its legal mandate to formulate the State Water Resources and Environment Policies, however despite having prior experience with World Bank-financed operations, it has not performed roles of leadership or coordination. To mitigate associated risks, Project design includes specific measures to strengthen implementation capacity and effective coordination of the different entities involved, including a management firm, an SC, staff training and both comprehensive Project launch workshops and POM.

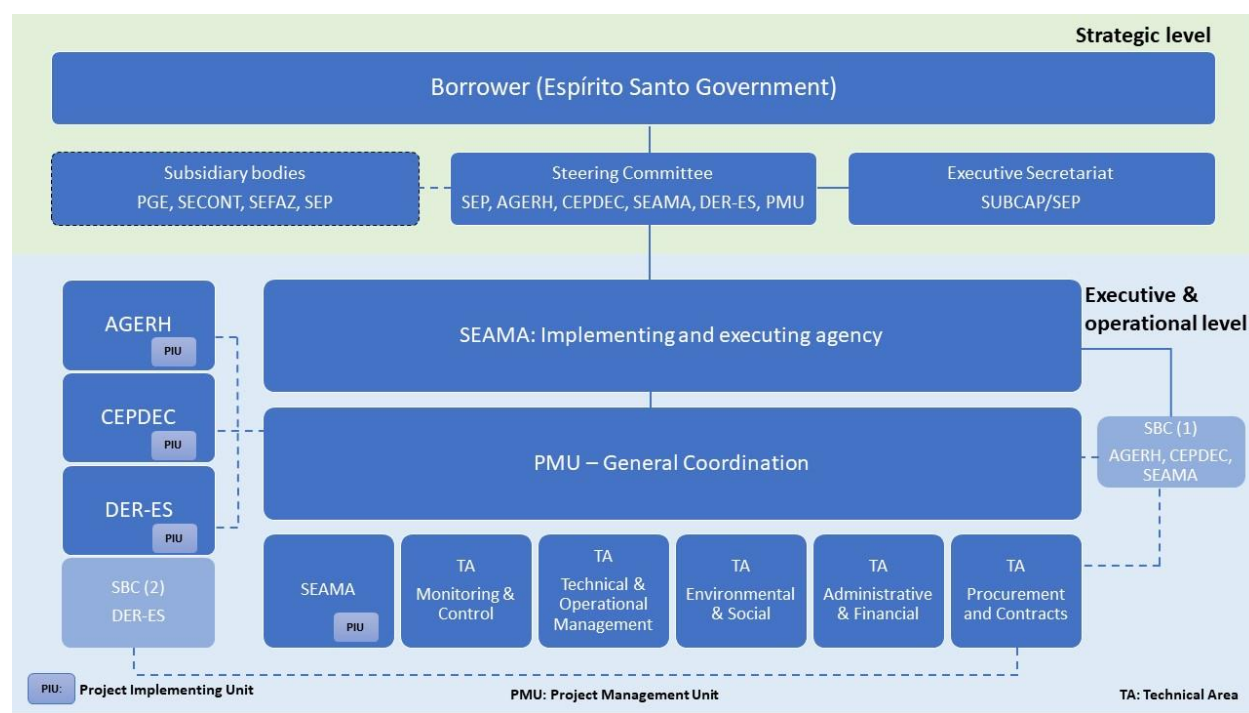


4. **The PMU will serve the following key functions:** (i) ensuring proper and timely implementation of Project activities; (ii) monitoring and supporting proper implementation of the Project's ESF; (iii) assisting in the preparation of TORs; (iv) ensuring that procurement is carried out in the most expeditious manner, with technical input provided by relevant departments and/or expertise in the relevant area being financed, following World Bank rules; (v) monitoring contracts under the Project; (vi) presenting Project progress and financial reports on a timely basis as required by the World Bank; (vii) disseminating results in such a manner as to strengthen stakeholders' feedback; and (viii) hosting and facilitating World Bank support missions and working to optimize the operation's results and impact.

5. **The four implementing agencies, AGERH, SEAMA, CEPDEC and DER-ES,** are responsible for the implementation of Project activities that fall under their respective mandates, relying on their organizational structure and staff to do so. Each has already established a team responsible for Project implementation headed by a Project manager focal point. More specifically, these teams will be responsible for the preparation of TORs and bidding documents, participation in the bid evaluation commissions, contract management and supervision, monitoring Project indicators, implementation of environmental and social standards, payments and budgeting. The teams' composition and responsibilities are detailed in the POM. The PIUs will implement those activities in close coordination with the PMU to ensure implementation quality and timeliness. With the exception of AGERH, the other three implementing agencies have experience working with the Bank and are currently implementing activities under the ongoing Espírito Santo operation (P130682).

6. **Two Special Bidding Commissions (SBC) will be created.** An SBC under SEAMA will be responsible for carrying out procurement processes for Components 1, 2, 3 (ii) and 4; while an SBC under DER-ES will be responsible for carrying out procurement processes for Component 3(i) and Component 3(iii).

Figure A1.1 – Project Implementation Arrangements





7. **Component 4 (US\$6.85 million) will strengthen the State's capacity to carry out Project activities.** To this end, it will finance the provision of technical assistance, consulting and non-consulting services, training and goods to the four implementing agencies necessary for the effective implementation of the respective activities under their mandate. This Component will likewise support training aimed at qualifying professionals directly or indirectly involved in World Bank procurement policies, in the development of TORs, budget and costs, contract management, supervision, Project monitoring & evaluation, disbursement, and controls, as well as implementation of the environmental and social standards.

8. Table A1.1 sets out the corresponding functional roles and responsibilities under each Project component.

Table A1.1 - Implementation Arrangements

Component	Technical Implementation	M&E	Social/ Env. Standards	Procurement	Contract Mgmt.	FM
Component 1	AGERH, CEPDEC	AGERH, CEPDEC and PMU	AGERH, CEPDEC and PMU	SEAMA (PMU)	AGERH, CEPDEC	SEAMA (PMU)
Component 2	SEAMA, AGERH, CEPDEC	SEAMA, AGERH, CEPDEC and PMU	SEAMA, AGERH, CEPDEC and PMU	SEAMA (PMU)	SEAMA, AGERH, CEPDEC	SEAMA (PMU)
Component 3	DER-ES and AGERH ⁵¹	DER-ES, AGERH and PMU	DER-ES, AGERH and PMU	DER-ES SEAMA (PMU)	DER-ES AGERH	SEAMA (PMU)
Component 4	SEAMA (PMU)	SEAMA (PMU)	SEAMA (PMU)	SEAMA (PMU)	SEAMA (PMU)	SEAMA (PMU)

Implementation Support Plan and Resources Required

9. **The Implementation Support Plan** is based on the Project's risk profile, the lessons learned of previous operations with the State of Espírito Santo, and water sector projects of similar scope.

10. **Biannual World Bank implementation support missions will be complemented by continuous dialogue on Project progress and challenges.** This interaction will cover technical and nontechnical aspects of implementation, including FM, procurement, and ESF. Implementation Status and Results Reports (ISR) will be filed after every mission. The World Bank will continue to provide fiduciary, ESF and other Project-related training as needed.

11. **The Implementation Support Plan will be reviewed annually to ensure that it continues to meet the implementation support needs of the Project.** At the halfway point of Project implementation, a midterm review will be undertaken with a view to making any changes to the design and implementation arrangements, including any changes to the Loan Agreement that would require a restructuring. The Bank will work with the PMU and designated officials to clarify the requirements necessary to effect any changes. It is understood that any changes to the Project that require amendments to the Loan Agreement

⁵¹ AGERH will also implement the studies to identify more innovative integrated structural and non-structural solutions to reduce flood risks in the municipalities of Iconha and Alfredo Chaves, under Component 3.



will require a formal request from the government's signatory.

12. **Six months before the Closing Date of the operation, the government will commence preparation of its Implementation Completion and Results Report (ICR).** An ICR author from the World Bank will participate in the final implementation support mission and gather the necessary information to prepare the World Bank ICR.

13. Tables A1.2 and A1.3 estimate the level of inputs and staffing that will be needed from the World Bank to provide implementation support to the proposed Project. These estimates will be reviewed and revised as needed throughout implementation.

Table A1.2 - Resource Requirements

Focus	Skills Needed
Project management and Project implementation support coordination	Team Leaders
Compliance with E&S standards and management of E&S risks	Environmental and Social Development Specialists
Technical, oversight of civil works, and quality review of Terms of Reference, technical reports and bidding documents	Task Team Leaders, Technical Specialists (Water Resources Management, Land Management, Flood and Drought Risk Management, DRM, Engineering, Gender, Climate Change), Externally hired consultants (as needed)
Procurement review of bidding documents/implementation support	Procurement Specialist
FM supervision / implementation support	FM Specialist

Table A1.3 - Implementation Support Plan

Skills Needed	Number of Staff Weeks per Year	Number of Trips per Year
Task Team Leaders	20	2
WRM Specialist	6	2
Flood Risk Reduction and DRM	6	1
Gender Specialist	1	0
Climate Change Specialist	1	0
FM Specialist	3	2
Procurement Specialist	3	2
Environmental Specialist	3	3
Social Specialist	6	3
Operations support	3	2
STC Consultants (support to project management; oversight of civil works; technical expertise on drainage, DRM, flood and drought risk reduction, reforestation; support to procurement and contract management)	6	0

Financial Management

14. **The Bank performed a FMA of the FM arrangements for the Brazil Espírito Santo Water Security Management Project (P176982).** The FMA was carried out in accordance with *Bank Policy: Investment Project Financing* and *Bank Directive: Investment Project Financing* and the Financial Management in Bank Financed Operations and Other Operational Matters issued and effective on September 7, 2021.



15. **The scope of the FMA included:** (i) an evaluation of existing FM systems to be used for Project monitoring, accounting, and reporting; (ii) a review of staffing arrangements; (iii) a review of the flow of funds arrangements; (iv) a review of internal control mechanisms in place, including internal audit; (v) a discussion with regards to reporting requirements; and (vi) a confirmation of the external audit arrangements. FM arrangements should place emphasis on governance controls applicable to Project components.

16. **The conclusion of the FMA is that:** (i) the FM arrangements for the proposed Project are considered adequate; (ii) the funds flow, disbursements, monitoring, auditing, and supervision arrangements have been designed in a way to respond to the Project's implementation arrangements; and (iii) the residual **FM risk associated with the Project is rated as Moderate**. There are no FM-related conditions for effectiveness.

17. **The FMA identified the following risks to the achievement of the Project Development Objectives:** (i) the Project has four implementing entities/partners; (ii) the IFRs will run through a different system, ("SAFF – Sistema de Acompanhamento Físico Financeiro"), since the state's FM information system (*Sistema Integrado de Gestão das Finanças Públicas do Espírito Santo – SIGEFES*) does not account for cash basis nor allow the transactions to be booked by category, component and subcomponent, and (iii) the current workload posed by the ongoing project.

18. **The above risks' mitigation measures are:** (i) the PMU will need to work closely with SEFAZ and the implementing partners to ensure the coordination is working as planned, (ii) the SAFF system will be contracted for this Project, so the Project's transactions can be booked per category, component, and subcomponent and the automated IFRs can be generated through the system and (iii) to hire additional professionals, especially the dedicated FM Specialist.

19. **Implementing Entity:** SEAMA is a body directly administered by the State Government and manager of public policies for the Environment and Water Resources, responsible for managing the tools that help improve environmental conditions and promote sustainable development in Espírito Santo. It was created by Law No. 4,126 of 1988 as the State Secretariat for Environmental Affairs. In 2002 it was renamed the State Secretariat for the Environment and Water Resources through Complementary Law No. 248 of 2002. Among its attributions are supporting the development of research, scientific studies, and projects for the definition of standards for the release of liquid effluents, solid waste, water resources, pollution, soil, among other parameters for the control of potentially polluting and degrading activities. SEAMA is also responsible for coordinating the actions of the State Council for the Environment (CONSEMA), the Regional Councils for the Environment (CONREMAs) and the State Water Resources Council (CERH).

20. **Staffing:** SEAMA's financial department (GFS)⁵² in conjunction with the Planning and Budget area (GPO)⁵³ are responsible for the management of processes, projects, and routines related to the preparation, execution, and monitoring of the budget, financial, and accounting procedures. Currently, SEAMA's team comprises 1-Undersecretary for Administrative and Financial Affairs; 1-Head of the Planning and Budget Group (GPO) with 1-Assistant and 1-Head of the Sector Finance Group (GFS). In addition to having adequate knowledge of the state budget, accounting, administrative rules and procedures, the current Head of GFS/SEAMA has extensive experience with various Bank policies and procedures participating in both the implementation of the ongoing Project and other previous projects

⁵² GFS – Gerência Financeira

⁵³ GPO – Gerência de Planejamento e Orçamento



financed by the Bank. Currently, SEAMA has a small number of staff, but an administrative restructuring is planned with the creation of new positions and salaries with a bill to be sent to the Legislative Assembly. As to ensure appropriate financial staffing arrangements, by loan effectiveness, SEAMA should nominate two FM Specialists, and respective tasks and duties will be detailed under the POM. In addition, each implementing agency (CEPDEC, DER-ES and AGERH) should appoint and/or hire at least one staff, specifically for this Project, to undertake all FM related tasks and to assure segregation of functions, which will be detailed in the POM. It is expected that the financial management team (from all the implementing agencies) will participate in all Bank's fiduciary and disbursement trainings throughout the Project life.

21. **Planning and Budgeting:** The State's budget process is clearly defined, follows Law 4,320/64, and is in line with IPSAS standards. The budget cycle includes the planning and implementation of all government activities, which are to be reflected in the Multiyear Plan (*Plano Plurianual* – PPA), Budget Guidelines Law (*Lei de Diretrizes Orçamentárias* – LDO), and Annual Budget Law (*Lei Orçamentária Anual* – LOA).⁵⁴ The entire process of elaboration of the LOA, PPA, and LDO is carried out by the SEP, with the participation of all state agencies. The current PPA has been prepared for 2020-2023. The next one will be prepared in 2023 for the period 2024-2027. SEFAZ will include the Project in the next PPA, by December 31, 2023. Normally, the pre-approval budget request process or PLOA⁵⁵ initiates in the month of July of the previous year. Overall, the preparation of the budget will be carried out by SEAMA and submitted to SEP which will prepare the final state budget proposal to be approved by the State Legislative Assembly. The current procedures to plan Project activities, prepare related budgets, and collect information from the other Project executors in charge of the different components were considered satisfactory. The Project will be executed under the “*Programa de Gestão Integrada dos Recursos Hídricos e Revitalização de Bacias Hidrográficas do Espírito Santo – Águas e Paisagem II*”. The State budget has been timely approved and available at the beginning of each year.

22. **The Project's budgeting, accounting, and financial transactions will be processed through the integrated SIGEFES that is used by all state institutions that receive/transfer government funds.** A specific ledger of accounts is created in the SIGEFES system under each of the executors for budget and financial reasons to identify the source of funds. All payments will follow the official commitment (*empenho*), verification (*liquidação*), and payment (*pagamento*) routines.⁵⁶ The budget preparation and expenses are fixed based on the revenue forecast and the monitoring of budget execution is carried out by the Planning, Budget, and Finance Management. All executing agencies will execute their budget by observing the monthly fiscal budget limits determined by the SEP. No payments shall happen outside the Finance and Budget System – SIGEFES. In parallel, the SAFF,⁵⁷ a license owned by the State of Espírito Santo utilized to monitor the state's projects, will consolidate the Project's accounting entries, for

⁵⁴ PPA, LDO, and LOA include the government's goals and programs that are approved by Congress every five years, 18 months, and 12 months, respectively.

⁵⁵ Projeto de Lei Orçamentária Anual (PLOA), a bill initiated by the Head of the Executive that estimates revenues and fixes expenses for the following financial year, with a structure and level of detail defined by the LDO for the year. According to Article 57 of Law no. 11,354/2021, all entities of the Executive Power must provide budget, financial and asset management sent by the State Secretariat of Economy and Planning within the deadlines stipulated in the aforementioned requests.

⁵⁶ At the commitment stage (*empenho*) proposed expenditure is verified to ensure that spending proposals have been approved by an authorized official, that funds have been appropriated in the budget, that sufficient funds remain available in the proper category of expenditure, and that the expenditure is proposed under the correct category. At the verification stage (*liquidação*) the documentary evidence that the goods have been received or that the service has been performed is verified. Before the payment stage (*pagamento*) confirmation is needed that a valid obligation exists, that the competent person has signed that the goods or services have been received as expected, that the invoice and other documents requesting payment are correct and suitable for payment, and that the contractor is correctly identified. These controls are built into SIGEFES.

⁵⁷ Solution for Physical and Financial Project Management system (*Sistema de Acompanhamento Físico Financeiro*).



monitoring and reporting purposes. The SAFF system is a secure, efficient, and transparent environment tool used to plan, implement, and monitor the annual budget exercise. It also allows for monitoring the POA and the main bidding data. The reports are generated using the Business Intelligence (BI) tool which is built in the SAFF system. The new web-based version of the SAFF system allows the online consultation of the information and access will be made available to all Project executors.

23. **Actual expenditures are compared to budgeted expenditures, monthly, and justifications are provided for variations relevant to the budget.** If there are significant variations to the budget, justifications are presented to the Secretariat of Economy and Planning to promote readjustment. Any relevant variations to the originally planned budget need to be submitted and reviewed by SEP. For Project purposes, SEAMA will be responsible to undertake monthly budget variations reviews and request any increase of the approved budget, that requires pre-approval, which is sought through a budget supplemental process. Each executor will only have access to its budget and financial transactions per its own “UG – Unidade Gestora” or Management Unit. However, SEAMA, as the PMU, will have full access to the Project’s executors’ entity budget and financial transactions through the “read-only” access of the SIGEFES system. As to better monitor the project, the PMU will request to SEFAZ, within one month after loan effectiveness, system access as “read-only”, for the Project’s executing agencies or the “Management Unit” participating in the Project.

24. **Accounting:** The state of Espírito Santo follows: (i) the Brazilian Accounting Standards Applicable to the Public Sector (*Normas Brasileiras de Contabilidade Aplicadas ao Setor Público-NBCASP*); (ii) Law 4,320/64, that establishes certain high-level accounting principles (*Normas Brasileiras de Contabilidade Técnica Aplicada ao Setor Público-NBCT SP*); and (iii) the Accounting Manual Applicable to the Public Sector (*Manual de Contabilidade Aplicada ao Setor Público-MCASP*) issued under Law 10,180 of February 6, 2001, and Decree 3,589 of September 6, 2000. Both the NBCASP and MCASP were revised via Portaria STN 467 of August 6, 2009, and updated in 2013 to incorporate the text of the International Public Sector Accounting Standards (IPSAS), with adaptations for the Brazilian reality. There is a work plan to implement the IPSAS – PIPCP, issued through the National Treasury Secretariat’s (STN) Ordinance Implementation Plan N° 548/2015, in progress, that will culminate in the convergence of 35 IPSAS currently in force by 2023; with the STN subsequently verifying the data of the respective entities of the Federation, by the year 2024. The state is following the STN NBCASP implementation schedule. Based on a total of 21 IPSAS applicable to the state of Espírito Santo, a total of 17 have been fully implemented, or 81%. Transactions under the Project will be accounted for on a cash basis, for disbursements, reporting and auditing purposes. Although the Bank is not financing any PIPCP activity, it will follow up on it throughout the Project’s life as it is directly related to the achievement and sustainability of the Project Development Objectives.

25. **The state of Espírito Santo has satisfactory accounting arrangements, controlled through the integrated Budget, Accounting, and Financial system called SIGEFES, in line with the STN rules.** SIGEFES is managed by the SEFAZ Information Technology department. The SIGEFES system was implemented in 2014, which was the result of the consolidation and integration of three technologically outdated systems, such as: i) SIAFEM - “Sistema Integrado de Administração Financeira dos Estados e Municípios do Espírito Santo” or the integrated financial administration system for the states and municipalities, ii) SIPLAN - “Sistema Integrado de Planejamento” or the integrated financial planning, and iii) SISPPA (“Sistema do Plano Plurianual”), the Pluriannual Plan System. The SIGEFES is a modern solution developed in state-of-the-art language and aimed at web environments, allowing a high degree of process automation and ease of generating management reports. The system guarantees the state government’s compliance with the accounting standards required by the STN for convergence with the international standards (IPSAS) and



provides more transparency to the financial and budget management in the executive and legislative branches by converging all information on expenditures and investments directly to the Court of Auditors (TCE-ES), Public Prosecution (MP-ES) and court of Justice (TJ-ES).

26. **The Bank evaluated the robustness of the SIGEFES system** and although it follows the current national accounting procedures, it does not allow the monitoring of the Project's transactions per category, component, and subcomponent. Since any customization will not be finalized in time for the Project's launch, the operation will follow the accounting arrangements established for the current project (P130682), which is made through the financial management system called SAFF. The SAFF system should be fully operating within ninety days after loan effectiveness. All Project transactions will be booked in the SIFEGES state system, and the SAFF system. The Project's accounting records from SIGEFES and SAFF systems will be reconciled monthly by the PMU.

27. **Internal Controls:** Although SEAMA will hold the primary fiduciary responsibilities for the Project and PMU staffing is appropriate to assure segregation of functions and reconciliations of accounts, all executing agencies will also need to ensure a proper FM and control environment.

28. **The State Secretariat of Control and Transparency - SECONT is the unit responsible to support the State's direct and indirect agencies**, on legal procedural compliance for contracting public expenditures and complying with the public information access law. Therefore, for Project purposes, SECONT will be responsible for the internal audit compliance-related functions and certain aspects of internal control. SECONT is responsible to carry out the internal audit of SEAMA, and during the last three years, issued an unmodified opinion over SEAMA financial statement. The Project will be included in the Annual Audit Plan and the PAINT system within one month after loan effectiveness.

29. **For Project purposes, all payments will follow acquisition, verification of invoices, and payment routines.** The transaction processing (recording annual budgets, budget commitments, and payables; authorizing payments and internal control reviews) will be carried out by each executing agency. SEAMA, in conjunction with SEFAZ, will manage the two Project's bank accounts (Brazilian reais and US dollars). Other internal control mechanisms include the review and the reconciliation of payments, proper access to systems, segregation of functions and observation of internal administrative codes and procedures. The Project's bank accounts for all the executing agencies should be reconciled daily. A staff, who does not process or approve payments, will review all unusual items, and refer them to the responsible official for approval.

30. **In addition, the PMU will ensure that all the Projects' assets that are being acquired with the loan's funds will be accounted for.** The PMU will ensure (for the whole time of Project implementation) that there is a control in place that guarantees that all purchased assets, by each implementing agency are: 1) used only for the Project's activities; 2) listed in an inventory record; 3) each asset is given an individual master record and number (that is, recorded as an individual asset and depreciated according to its individual useful life); 4) physical inventory control is performed annually for these assets and reconciled with the respective control accounts; and 5) the asset is maintained in good condition. The Project's assets will be accounted for through the SIGEFES, SIGA/Asset System, and SAFF systems. Since these systems are not integrated, the PMU will ensure that all records within the three systems are reconciled every month.

31. **Anti-corruption Arrangements:** The Brazilian Anti-corruption Law (Federal Law 12,846) establishes civil and administrative liability for legal entities in relation to acts of corruption. The Law implements the OECD Anti-Bribery Convention, strengthens anti-corruption enforcement and is broadly



in line with (and, in some respects, even stricter than) similar legislation found in other jurisdictions—such as the U.S. Foreign Corrupt Practices Act and the U.K. Bribery Act. Brazil’s Law represents a significant step, exposing companies—not just individuals—to liability and fines for the first time.

32. **SEAMA and all implementing state agencies shall also observe the Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants** (dated as of October 2006; revised as of July 1, 2016), that set the general principles, requirements, and sanctions applicable to persons and entities which receive, are responsible for the deposit or transfer of, or take or influence decisions regarding the use of the loan proceeds.

33. **SEAMA and state agency staff involved in project implementation must observe the highest standard of ethics and take all appropriate measures to prevent and refrain from engaging in sanctionable practices.** SEAMA and state agency staff must report allegations of fraud and corruption in connection with the use of the loan proceeds, maintain appropriate fiduciary and administrative arrangements, cooperate with Bank investigations, take timely and appropriate action to address the problem, and follow other applicable government related rules and guidelines.

34. **Based on the current Ombudsman’s structure in the state’s bodies, the Project will also establish a Grievance Redress Mechanism - GRM,** to further strengthen the relationship between the beneficiaries and those responsible for the project. These channels must be publicized in all means of communication used to publish the works carried out by the Project. The executing agencies (AGERH, DER-ES, CEPDEC and SEAMA) and SEP have designated and trained ombudsmen, with access to operationalize the Ombudsman system of the Executive Power of the State of Espírito Santo – e-OUV and duly accompanied by the monitoring and support team of the General Ombudsman’s Office.

35. **The Project’s internal control system will be documented in the POM,** which will reflect the detailed staff duties, procedures, and guidelines for disbursements, payments, approvals, commitments, and reporting, whose draft was approved by the Bank before Negotiations. The POM should be prepared by the PMU, approved by the Bank and maintained/updated throughout the Projects’ life.

36. **Funds Flow and Disbursement Arrangements:** The disbursement of Project funds will be processed following Bank procedures as stipulated in the Legal Agreement and in the Disbursement and Financial Information Letter (DFIL). Funds will be disbursed in respect of eligible expenditures incurred or to be incurred under the Project and will be disbursed following agreed financing percentages. The proposed funds flow and disbursement arrangements were considered satisfactory and will be streamlined within the project to facilitate execution, avoid unnecessary incremental operational arrangements, and rely as much as possible on Public Financial Management (PFM) country systems.

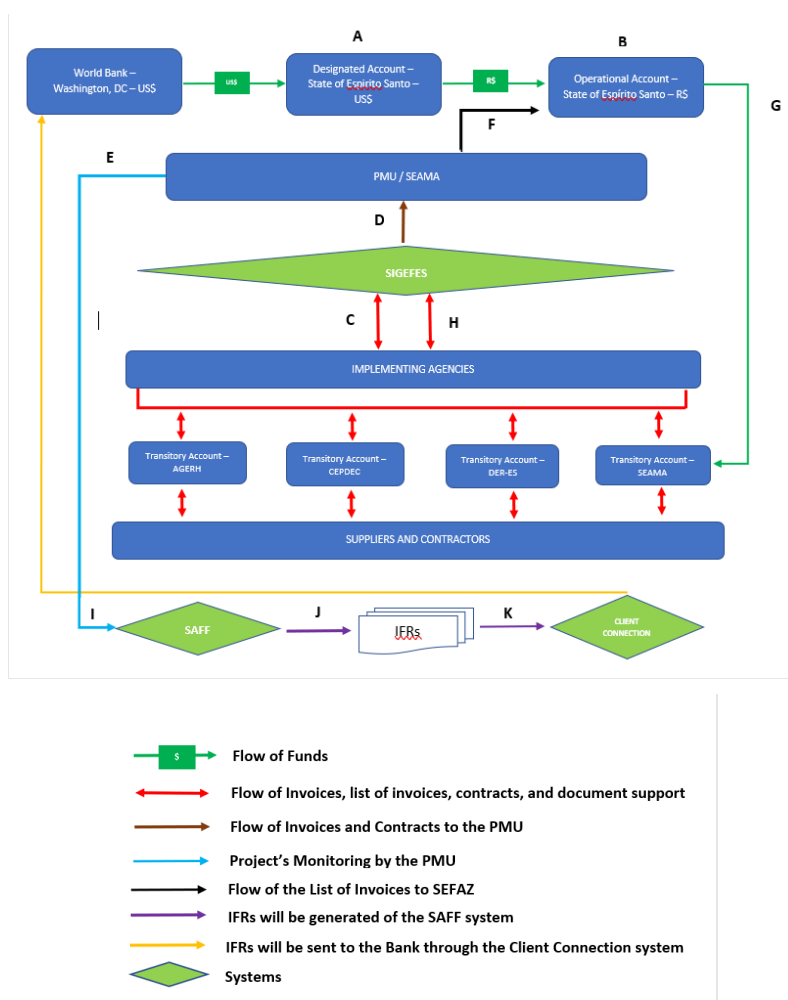
37. **The following disbursement methods will be available: Reimbursement, Direct Payment, and Advances.** The Advance method will be the primary disbursement method. For Advances disbursements will be documented based on statement of expenditures (SOEs) and customized SOEs for PES following the prescribed agreed format. The Designated Account (DA) will have a fixed ceiling of US\$ 16,000,000. Reimbursements will also be documented by the regular and customized SOEs. Direct Payments will be documented by records (copy of the invoices). The frequency for reporting eligible expenditures paid from the DA is quarterly.

38. **SEFAZ will open a segregated DA, in “Banco do Brasil”, in Brasília, in the name of the State of Espírito Santo to receive loan funds in US dollars.** An operational account, exclusive for the Project, will also be opened in Banco do Brasil, in Brazil in local currency (Reais) to receive and transfer resources to the implementing agencies’ transitory accounts, which will be opened by each project executor to receive



the transfers from SEFAZ and pay suppliers, contractors, and PES (Payment for Environmental Services) in local currency. There will be a total of five transitory accounts (to account for the cash inflows from SEFAZ and the cash outflows to the suppliers and PES): two in SEAMA (one of which in FUNDÁGUA), one in AGERH, one in DER-ES and one in CEPDEC. Since all transfers from SEFAZ will be made against the list of invoices and PES submitted, the transitory account will serve mainly as a registering and controlling process and they will always be kept zeroed. The Designated Account, the Operational Account and the transitory accounts should be opened, exclusive for the Project, within one month after loan signing. SEFAZ will be responsible for managing the Designated Account and SEAMA will be responsible for managing the Operational Account. The below flow of funds and internal processes will be included in the POM.

Figure A1.2 – Flow of funds



39. Based on the bank statements and the electronic payment notification received from each implementing agency's financial focal point, (who will function as a liaison between the PMU and the implementing agency's financial department - per the current Project design), all Project financial information from the SIGEFES, SIGA/Asset System and SAFF systems, will be reconciled by the PMU, monthly.



40. **The *pari-passus* counterpart will be executed by SEFAZ and monitored by SEAMA.** The PMU will include in the POM the process to monitor the counterpart funds.

41. **Retroactive financing will be allowed for this Project up to an aggregate amount not to exceed US\$17,220,000 to be made for payments up to twelve months before the signing date of the Loan Agreement for eligible expenditures.** The ESCP includes provisions to carry out an environmental and social audit – according to a methodology agreed upon between the Bank and the Borrower – to ensure the consistency of the Environmental, Social, Health and Safety management procedures adopted during the implementation of the activities proposed for retroactive financing with the principles and requirements of the relevant ESSs and to submit to the Bank an Evaluation Report and establish (as required) a Plan of Corrective Actions that is satisfactory to the Bank as conditions to obtain the Bank's no objection for retroactive financing.

42. **The loan will also have a four-month grace period after the closing date, during which the World Bank will accept withdrawal applications relating to project transactions incurred before the closing date.** The Minimum Application Size for Direct Payments will be US\$ 1,000,000 equivalent. All disbursement details will be reflected in the DFIL. The table below specifies the categories of eligible expenditures that may be financed out of the proceeds of the Loan. The information required for the compilation of Statements of Expenditure and Summary Sheets will be maintained by the Financial Management sub-unit in the PMU.

Table A1.4 - Disbursement Categories

Category	Amount of the Loan allocated (US\$)	Percentage of Expenditures to be Financed (Inclusive of Taxes)
(1) Goods, consulting services, non-consulting services and Training under the Project	29,451,417	100%
(2) Works under Components 1.2, 2 and 3	48,394,100	67%
(3) PES under Component 2.1	7,439,233	67%
(4) Operational Costs under Component 4 of the Project	600,000	100%
(5) Emergency Expenditures	0	100%
(6) Front-end fee	215,250	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions
TOTAL	86,100,000	

43. **Payment for Environmental Services:** Considering that the Bank is currently supporting the Payment for Environmental Services under the Espirito Santo Integrated Sustainable Water Management Project (P130682), Loan No. 8353 and that the proposed Project areas may overlap in some few cases with the areas under the ongoing Project, and to avoid supporting twice the same areas, a disbursement condition will restrict the disbursement of PES funds under the new loan before the complete use of PES allocated funds under the ongoing Project.



44. **Contingent Emergency Response Component (CERC):** The objective of this zero-fund component (financed under category 2) is to support the State of Espírito Santo in eventual emergencies associated with natural disasters that affect water systems. During project preparation, the definition of the key aspects of the CERC has been detailed as an Annex to the POM. The same flow of funds, accounting, financial reporting, disbursement methods and corresponding supporting documentation requirements, will apply to disbursements under the CERC, that will be described in the initial DFIL, as the CERC will also be implemented by the same implementing agencies.⁵⁸

45. **The Bank will revise the ceiling or limit of the DA and the MAS,** taking into consideration the planned emergency program expenditures, potential delays or difficulties in banking transfers in emergency situations, communication difficulties in working in remote or inaccessible areas and other factors to ensure that sufficient liquidity is secured always to enable smooth Project implementation.

46. **Financial Reporting:** The SAFF system will control, account for, report on, and manage the proposed Project. The system can provide the necessary data to prepare the respective reports in local currency (Brazilian reais) and US dollars, for monitoring purposes on a cash-basis (although the State also follows accrual accounting). As a result, the PMU will ensure the timely production of semiannual Interim Financial Reports (IFRs) for further submission to the Bank, within 60 days after the end of each semester. The IFRs will be generated from the SAFF system. SEAMA should submit for Bank's validation the IFRs (the automated format and content) no later than sixty days after loan effectiveness.

47. Accordingly, the format and content of the IFRs will cover the following items:

- IFR 1 - Sources and Uses of Funds by disbursement category, with evidence of the World Bank's share in the financing of expenditures, cumulative (project-to-date, year-to-date, and for the period) versus actual expenditures, including a variance analysis
- IFR 2 - Uses of Funds by Project Activity or Component and subcomponent, cumulative (project-to-date, year-to-date, and for the period) versus actual expenditures, including a variance analysis
- IFR 3 - Designated Account bank reconciliation and Bank statements
- IFR 4 - Disbursement Forecast

48. **External Auditing:** The Court of Auditors of the State of Espírito Santo (TCE-ES) is the public body that conducts the accounting, financial, budgetary, operational, and patrimonial inspection of the state, municipalities, and entities of the direct and indirect administration, regarding aspects of legality, legitimacy, and economy.

49. **Specifically for this Project, annual financial statements will be audited by independent auditors, satisfactory to the World Bank, in accordance with acceptable auditing standards.**⁵⁹ The external audit will be conducted according to the TOR acceptable to the World Bank (prepared by the PMU and approved by the Bank) and in accordance with International Standards on Auditing (ISAs) issued by The International Auditing and Assurance Standards Board (IAASB) of the International Federation of Accountants (IFAC) or national auditing standards if, as determined by the Bank, these do not significantly depart from international standards. The audited financial statements will be prepared in accordance with

⁵⁸ If another entity, other than the ones stated under the Project will be responsible for the CERC, a new FMA will need to be performed of that entity.

⁵⁹ The government communicated to the Bank that the TCE-ES does not have an interest to audit the Bank's Project and has declined a similar request made by the Inter-American Development Bank – IADB. However, the Bank will seek opportunities to enhance the dialogue with TCE-ES for future operations.



accounting standards acceptable to the Bank (that is, IPSAS or national accounting standards where, as determined by the Bank, they do not significantly depart from international standards).

50. **According to the World Bank's guidelines, the auditors will also have to prepare a Management Letter, where any internal control weaknesses will be identified, which will contribute to the strengthening of the control environment.** The auditor's report will be submitted to the World Bank no later than six months after the closing of the fiscal year, and the annual audit may be financed out of the loan proceeds. Specific audit TORs will be prepared by SEAMA and submitted to the Bank's No Objection within sixty days of the signature of the Legal Agreement.

51. **The General Conditions require the Borrower/Recipient to retain all records (contracts, orders, invoices, bills, receipts, and other documents) evidencing eligible expenditures and to enable the Bank's representative to examine such records.** They also require the records to be retained for at least one year following receipt by the Bank of the final Audited Financial Statement required in accordance with the Legal Agreement or two years after the Closing Date, whichever is later. Borrowers/Recipients are responsible for ensuring that document retention beyond the period required by the Legal Agreement complies with their government's regulations.

52. **Conditions or Nonstandard/Significant Financial Covenants (Relevant issues to be included in the Legal Documents):** Except for the first disbursement condition, there are no other FM-related conditions for Board and/or Effectiveness.

Procurement

53. **Procurement under the proposed Project will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers dated November 2020 and the provisions stipulated in the Legal Agreement.** The various items under different expenditure categories are described in general terms below. For each contract to be financed by the Loan, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame will be agreed between the Borrower and the Bank in the Procurement Plan. The World Bank's Standard Procurement Documents will govern international competitive procurement. For national procurement processes, the Borrower will use Standard Procurement Documents acceptable to the World Bank that will be included in the POM.

54. **Procurement of Civil Works.** Civil works procured under the Project will include, among others, civil work for installations under a Design and Build approach, for example, CERD and civil works to mitigate flooding risks in areas as defined in the Project.

55. **Procurement of goods.** Goods procured under the Project will include, among others: pipes and hydraulic equipment, software packages, communications services, educational materials, vehicles, IT equipment and other tools required to put in place an integrated client system control. Such procurement may be carried out in accordance with the method known as "Pregão Eletrônico", provided (i) documents are acceptable to the Bank and in accordance with the Procurement Regulations; (ii) documents include anti-corruption clauses; and (iii) the process is carried out under an e-procurement system previously approved by the Bank.

56. **Procurement of non-consulting services.** Non-consulting services under the Project will include, among others: capacity building support to the implementation and beneficiaries' agencies; monitoring, reporting and evaluation-related services; events of various natures, including training, workshops and seminars; logistics, such as hotel services, catering and travel services; printing services,



videoconferencing materials, brochures, magazines, intranet, and videos; communication and education campaigns and events. It may be carried out in accordance with the method known as “Pregão Eletrônico”, provided (i) documents are acceptable to the Bank and in accordance with the Procurement Regulations; (ii) documents include anti-corruption clauses; and (iii) the process is carried out under an e-procurement system previously approved by the Bank.

57. **Selection of consultants.** Consulting services under the Project will include technical assistance and advisory services of various natures and purposes, including: engineering services; water resources and environmental studies, feasibility and pre-feasibility studies, diagnostics and impact assessments; software and system development-related services; among others. The following methods will be used for selecting consulting firms depending on the nature and complexity of assignments, attractiveness to foreign firms and need for international expertise, estimated budget of the services: Quality and Cost Based Selection (QCBS), Least Cost Selection (LCS), Selection under a Fixed Budget (SFB), Selection Based on Consultant’s Qualification (SBCQ), Single-Source Selection (SSS) both for consulting firms and individual consultants, and Selection of Individual Consultants (IC). Contracts estimated to cost US\$ 300,000 equivalent and more will be advertised internationally.

58. **Operational costs** refer to office supplies, per diem, staff related expenses, sundries, incidentals, and other project implementation related expenses which would be financed by the Project and will be procured using any implementing agency’s administrative procedures acceptable to the Bank and outlined in the POM. However, they should be described in the procurement plan accordingly.

59. **Others.** The procurement procedures and standard bidding documents to be used for each procurement method, as well as model contracts for works and goods to be procured, are presented in the POM.

60. The assessment determined that the procurement staff to be designated for the Special Bidding Commissions be, ideally, kept exclusively to assist Project implementation.

61. **Procurement assessment.** The Bank team performed a Procurement Assessment to evaluate the capacity of the agencies involved to implement procurement actions for the Project. Procurement activities will be carried out by SEAMA and DER-ES – SEAMA is the PMU’s central unit for the execution, coordination and monitoring of procurement processes and for overall Project implementation and monitoring. The agencies’ responsibilities will include, among others: procurement planning, implementation and monitoring, ensuring quality of bidding documents, and participating in bid evaluations. The Bank reviewed the organizational structure for Project implementation and the interaction between Project staff responsible for technical aspects and PMU staff skills, quality and adequacy of supporting and control systems, and suitability of applicable laws, rules and regulations. The assessment determined that the procurement staff designated to the Project should be, ideally, kept exclusively within the implementation agencies to assist Project implementation, especially in PMU. In addition, a procurement consultant with experience in Bank procedures should be hired on an *ad hoc* basis to assist during critical stages of the procurement processes. **Based on the information provided at preparation, the procurement risk is *Moderate*.**

62. The following action plan was proposed to address and/or mitigate risks during Project implementation:



Table A1.5 - Procurement Action Plan

Action	Description	Action	Time frame
1	SEAMA must complete the Procurement Team responsible	Create an SBC and hire and/or designate staff for the SEAMA's SBC	By Effectiveness
2	Little experience of SEAMA and lack of experience of DER-ES in implementing World Bank-financed projects	Hiring of an <i>ad hoc</i> procurement specialist to support Agencies' staff; Strengthening the capacity of Agencies, through ongoing Bank support and specific procurement training	By Effectiveness
3	Lack of Interest of companies to participate in the tendering procedures	Use of: (i) national media to increase interest for works, goods and non-consulting services, (ii) international media to increase interest in the selections of consultancy of higher complexity, and (iii) direct contact with the market	As defined in the POM
4	Inadequate quality of TORs and Technical Specifications (TEs)	Obtain expert advice to inform the definitions of the TORs and TEs Technical no objections to technical documents to be issued by the World Bank	Prior to Effectiveness, as the TORs and TEs are prepared, and throughout implementation Prior to launch of each Project procurement process
5	Weak and imprecise cost estimates	Look for budgeting based on data that reflects the market and not just on official tables issued by various spheres of government	Prior to Effectiveness, as cost estimates are prepared, and throughout implementation
6	Companies involved in fraud and corruption issues	Maintain strict control over the companies and individuals present in the different control lists in Federal, State, and Municipal scope, and even in lists of international financing institutions	Before signing the first contract using Loan funds, and throughout implementation
7	Contract management	Members of the team with responsibility for the formal control of the execution of contracts, controlling and monitoring the progress of the contracts, also the milestones for their development, such as deadlines, readjustments (when applicable).	Before signing the first contract using Loan funds, and throughout implementation.

63. **Capacity building.** It was agreed that an approximate amount of US\$ 200,000 will be made available under Project proceeds to finance procurement capacity deemed appropriate and previously approved by the Bank.

64. **Procurement arrangements for the Project were established taking into consideration SEAMA and DER-ES's existing systems.** The technical agencies (AGERH, DER-ES, SEAMA and CEPDEC) are responsible for elaborating the Terms of Reference and Technical Specifications. The SBCs are responsible for elaborating the bidding documents and Requests for Proposals and conducting the



procurement/selection processes. The Project team will count on a focal point in each SBC responsible for developing the Project's procurement packages, including among other activities: (i) consolidating the procurement packages for consulting services; (ii) issuing requests for expressions of interest, requests for proposals and procurement notices; (iii) conducting opening and negotiations sessions, when applicable; and (iv) consolidating evaluations and inputs from the technical evaluations.

65. **Anti-corruption.** All bidding documents and respective contracts regardless of the procurement method are required to have the anti-corruption (A/C) clause as a condition for eligibility of expenditures.

66. **Procurement Plan.** The Borrower has prepared a Procurement Plan for the first eighteen months of Project implementation, which provides the basis for the procurement processes. The use of the Systematic Tracking of Exchanges in Procurement (STEP) is mandatory to manage the Procurement Plan. This Plan was agreed upon between the Borrower and the Bank during the appraisal and was approved before the end of Negotiations. The Procurement Plan will be updated in agreement with the Bank on an annual basis or as required to reflect actual Project implementation needs and improvements in institutional capacity.

67. **Summary of PPSD.** Based on the strategy developed and low-risk and low-value activities planned so far, it is expected that the activities will be carried out with the following arrangements: (i) Works: carried out through RFB and RFC - National approach; (ii) Goods and non-consulting services: the Project plans to finance the procurement of goods to be acquired through SDO, SDC - National Approach and e-reverse auction, with bidding documents acceptable to the Bank; (iii) Consulting Services: the Project will finance, *inter alia*: consulting activities, mainly for planning, construction projects, auditing, monitoring, supervision and data collection. QCBS, LCS, QCS are the most appropriate selection methods, but this approach can be reviewed in the face of the finalized TORs. It should be noted that any change in the conditions described in this strategy must necessarily be reflected in this document and in the Procurement Plan.

68. **Procurement Supervision during Implementation.** In addition to the prior review supervision to be carried out from Bank offices, the Bank will undertake at least one early supervision mission to visit the field and carry out post review of procurement actions. It is estimated that twelve staff weeks for procurement supervision will be required during the life of the Project.



ANNEX 2: Detailed Project Description

COUNTRY: Brazil

Espírito Santo Water Security Management

1. The proposed Project is a US\$113.6 million Investment Project Financing (IPF) operation, financed by a US\$86.1 million IBRD loan and US\$27.5 million in state counterpart funds. The Project will be implemented over a six-year period. Proposed interventions are grouped around three components focused on the following geographic scales and objectives: *statewide* institutional strengthening (Component 1), *river basin* level approaches to build water security (Component 2) and *municipal* no-regret interventions to reduce flood risks (Component 3), as well as support to Project management (Component 4) and a zero-fund Contingent Emergency Response (Component 5 - CERC).

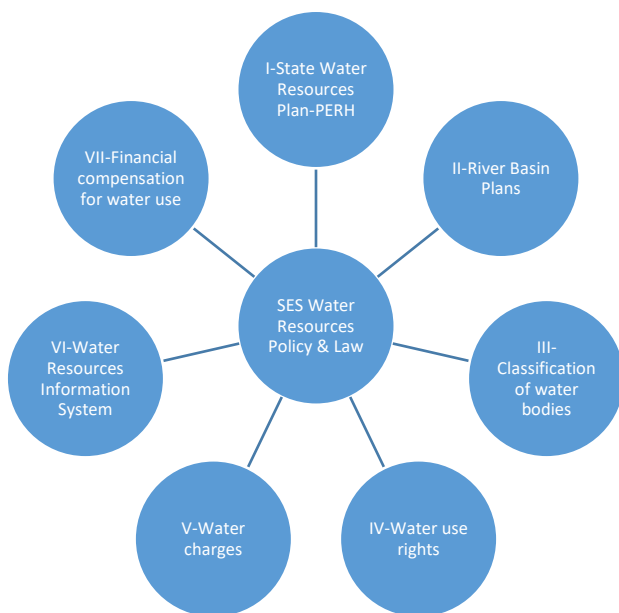
Component 1 – Building the Borrower’s capacity for water security in a changing climate (US\$15.52 million of which US\$14.05 million IBRD)

2. This component will build the state’s capacity to manage water security risks by strengthening both SIGERH-ES and CEPDEC water resources and disaster management capacities, respectively, and fostering their better integration. This will be done through two subcomponents:

Subcomponent 1.1. Strengthening SIGERH’s water resources management capacity (US\$7.43 million of which US\$7.43 million IBRD). Implementing agency: AGERH

3. The subcomponent is underpinned by the principles set out in the *WRM policy instruments* established by the State Water Law, whose implementation/modernization is considered pivotal to bolster SIGERH-ES’s effectiveness in improving water security in the state (see Figure A2.1) The proposed activities reflect the key recommendations presented in the State’s Water Resources Plan (PERH) and related Action Plan as selected by AGERH for priority implementation under the Project.

Figure A2.1 – WRM policy instruments in SES



4. The Water Law suffers from a number of implementation problems due to overlapping responsibilities and weak coordination between federal, state and basin level authorities, as well as an insufficient use of economic instruments to regulate water demand and poor capacity to enforce more efficient water allocation. The use of water rights and charges for agricultural producers are still in their infancy, while water tariffs for households are rarely sufficient to cover the investments needed to ensure universal access and reduce network losses. Some positive experiences exist in managing water conflicts at the basin level, but water basin management plans rarely serve their purpose to anticipate and mediate potential conflicts among users. Activities under this subcomponent are summarized as follows:



AGERH's institutional assessment, including WRM financial sustainability in the state:

5. As the agency responsible for implementing the State's Water Resources Policy, AGERH's strong capacity is a crucial element to fulfilling the Policy's objectives. The agency was created in 2013 and sits under SEAMA, however it suffers from insufficient human and financial resources and lacks a robust structure and system to perform its functions. The AGERH institutional assessment will consist of specialized consulting services to deliver a study to: (i) assess AGERH's attributions and functions; (ii) assess the current stage of implementation of the WRM Policy and its instruments by AGERH; (iii) conduct a gap analysis of AGERH's structure, functions and performance; (iv) identify, map and rate the WRM services, activities, measures and instruments developed and implemented by AGERH; (v) conduct a financial sustainability assessment to determine financing needs, assess water use charges and identify alternative financing sources for AGERH's operation; and (vi) develop a restructuring proposal for strengthening AGERH's performance in fulfilling its attributions, including the appropriate structure (technical, administrative and logistical) and staffing. The study will include as final deliverable a draft of a legal or regulatory provision to change AGERH's current structure.

The development, improvements to, and/or implementation of key WRM tools:

(a) water rights:

6. AGERH currently holds a backlog of over 15,000 water rights requests under review, most of them paper-based and some date back to as far as 2007, in addition to the average 100 requests logged each week. It will be necessary to digitalize these requests, strengthen the agency's human resources and establish effective systems to not only reduce the current backlog but also set appropriate time and quality standards to issue water rights.

7. The improvement of the water rights system includes the revision of methodology and criteria, the establishing of process flows to ensure that water uses are allocated effectively, producing draft legal instruments and effective mechanisms to monitor the implementation of water rights grants in the state. The activity will include strengthening the criteria taking into consideration water related risks, processes, and decision making system underlying the issuance of water rights; supporting water users to effectively prepare their water rights requests and promote training and capacity building of stakeholders, including a water users support network; and upgrading/updating user and water rights digital registries.

(b) Modernization and operationalization of the state's water information system (SEIRH/ES) and related hydrological and hydrogeological monitoring networks:

8. The SEIRH is established in state legislation for the purpose of collecting, storing, treating and retrieving information. This system has not yet been implemented in Espírito Santo; therefore, it constitutes a significant gap for implementing the WRM Policy in the state. Although Espírito Santo has a wealth of information related to the management of water resources, these are not organized in the same system and do not provide easy access to the public to properly grasp the situation or for use in technical studies. The effective operation of the system is expected to produce technical information related to water availability and monitoring, qualitative-quantitative analysis of water, in addition to presenting aspects related to governance, legislation, as well as the level of implementation of WRM instruments and their results. The implementation of the SEIRH would include a decision-supporting system to issue water rights and would be completed sequentially to other studies that would serve as inputs to upgrading and modernizing the SEIRH.



(c) Updating of the State Water Resources Plan (PERH):

9. The State Water Resources Plan (PERH) provides an overall diagnostic of water resources issues (including lower resolution flood and drought mapping) and climate, an analysis of the institutional capacity for WRM management and degree of implementation of the legal framework, an action plan to address WRM issues at the strategic level, and detailed actions to strengthen institutional capacity and to better implement the instruments and rules detailed in the State Water Law. The river basin-level plans are complementary to the PERH, providing a more detailed diagnostic of WRM issues at the basin level (including higher resolution flood and drought mapping), and detailed action plans including structural and non-structural measures to address them. Both are prepared involving key water stakeholders at the state and/or basin level. Both levels of planning (state and basin) are coordinated amongst themselves. The PERH is used to support and guide the implementation of programs, projects and actions for corresponding river basin or hydrographic regions in the state, however once approved, its implementation and monitoring begs improvements, including those related to the role of the RBCs and AGERH in monitoring and discussing the achievement of proposed goals.

10. The updating of the PERH (PERH-ES 2018) will include a preliminary risk analysis of floods and droughts, considering the various River Basin Plans carried out after its approval, in addition to strongly incorporating a strategic dimension and involvement of different actors with greater focus on the operationalization and implementation of the Plan. The key guiding principle for this activity is on the governance of the implementation, with the definition of actors, indicators and goals, while also reinforcing the need to incorporate absent elements in the previous PERH, such as hydrological extreme events and climate analysis. The revision of the PERH will enable a more risk-based approach of integrated drought and flood management (thus incorporating lessons from the EU Directive) and will consolidate the Plan with other sectoral planning. By completing the activity, the state will also comply with the requirement to produce a revised PERH and submit it to the CERH every five years.

Development of hydrogeological and hydrological studies of selected aquifers and river basins:

11. The current information gap on groundwater persists, in particular in regions of intense use, and requires an in-depth analysis and technical knowledge to improve the process of issuing water rights. The study will undertake a hydrogeological mapping of aquifers in the Metropolitan Region of the capital Vitoria and other water use conflict areas to be defined. It will produce proposals for a monitoring network and integrated management of superficial and ground waters, which is expected to enhance groundwater allocation and security.

Strengthening of a State Water Quality Laboratory, including laboratory and IT equipment, licenses and software necessary for ongoing water quality monitoring and testing:

12. This activity will contribute to improving and expanding the state network for quantitative hydrological monitoring and will include the procurement of hydrological stations, flow meters, and other equipment to structure the support labs (LACAR/CPID) dedicated to water quality analysis.

Subcomponent 1.2. Strengthening CEPDEC's disaster risk management capacity (US\$8.09 million of which US\$6.62 million IBRD). Implementing agency: CEPDEC

13. This subcomponent seeks to strengthen the State Coordination for Protection and Civil Defense's (CEPDEC) capacity to manage water security risks and respond to disasters. The proposed activities are underpinned by the CEPDEC and have been selected as priority actions to enhance the state's DRM in response to hydrological events and introduce a more integrated risk-based approach. Activities are



summarized as follows:

Construction of the Specialized Disaster Response Center (CERD):

14. Currently CBMES lacks a dedicated area for practical training on search and rescue operations in response to disasters as well as a storage area for maintaining vehicles, boats and specialized equipment. The stockpile of materials and equipment are dispersed across various CBMES units and the lack of a dedicated space prevents the large-scale mobilization for specific events that require qualified professionals and surge response.

15. The construction of the CERD will enable the SES to become better prepared to operate in the response to extreme hydrological events across four pillars: training, mobilization, logistics and operations. It is expected that the CERD will comprise the following units:

- Humanitarian assistance shed to store first aid kits and material to assist people in the event of emergencies;
- Operations and logistics shed for prompt deployment and maintenance of vehicles, boats, tractors, buses and trucks, operational equipment and personal protective equipment;
- Mobilization and training shed to house classrooms, apartments, lodges, restaurant and laundry room;
- Instructional runway to perform disaster simulations;
- K9 kennels for treating, feeding and providing veterinary service to animals conducting search operations; and
- Helicopter pad for transporting personnel and specialized equipment, and humanitarian assistance material.

16. The CERD will be constructed through the D&B modality, in which the contractor will prepare the designs and build the Center in an area located in Carapebus (land donated by the Arcelor Mittal Tubarão company), in the municipality of Serra (north of the capital Vitoria), with the full infrastructure, including civil works, electric, electronic, fire alarm and security systems, fencing, water supply, furniture, information technology, radio communications; thereby providing, installing and testing systems, as well as performing technical and operational training, corrective and preventative maintenance. The activity will also include a technical visit to similar centers abroad to incorporate innovations and best practices. When finalized, the CERD will house skilled CBMES personnel holding specialized training and equipment to remain available on a 24-hour regime. This will significantly address the current gaps in the existing response capacity and ensure clarity on first responders in the case of future complex disasters, applying global lessons on DRM.

Provision of specialized equipment, notably fire trucks and emergency kits:

17. The procurement of equipment seeks to complement goods acquired under the scope of the current operation in SES to contemplate additional areas and fill gaps that emerged during the COVID-19 pandemic as specific goods became unavailable in the market. The goods to be acquired include specialized rescue vehicles that are expected to strengthen the response capacity of CBMES/CEPDEC and expand its service delivery in response to extreme hydrological disasters.

Training, with a particular focus on including gender aspects in DRM:

18. The increasing occurrence of extreme events in the state have exposed the need to strengthen the response capacity of CBMES fire brigade, with corresponding gaps in preparation, organization and knowledge in specialized technical areas. The corporation has identified specific competences, abilities



and skills needed to improve the human resources capacity to respond: (i) Confined Space Rescue, (ii) Rope Rescue, (iii) Trench Rescue, and (iv) Incident Command System (ICS) 300/400 – General Complex Incidents. The activity will include training, technical visits to excellence centers and other practical courses, with a focus on building capacity of instructors to replicate knowledge. The training will include gender-sensitive aspects and will target women participants.

Design and implementation of an electronic emergency command, control and coordination response system (Incident Command System software):

19. CBMES currently lacks a computer-based tool to support resource command, control and management actions. The activity will apply the ICS software to operate as a digital and interactive web-based platform for high-complexity events that will allow integrating and coordinating efforts from individual agencies working around a joint objective to stabilize critical situations and protect lives, property and the environment. CBMES and CEPDEC personnel have extensive expertise in the theoretical and practical use of the ICS, which will enable the improvement of information flow, data registering and report generation to be incorporated in the ICS.

Component 2 – Demonstrating climate-smart integrated water security risk reduction approaches in selected basins (US\$30.18 million of which US\$23.39 million IBRD)

20. This component will contribute to reduce water security risks by reducing water contamination and sediment loads as well as flood and dry season water deficits, while promoting biodiversity conservation and enhancing existing carbon sinks in soil and aboveground biomass, leading to significant climate adaptation and mitigation benefits. Activities are divided into two subcomponents:

Subcomponent 2.1. Expanding the support to the Reflorestar Program in selected river basins (US\$16.06 million of which US\$12.40 million IBRD). Implementing agency: SEAMA

21. This subcomponent aims to support PES to increase forest cover and implement other climate smart nature-based solutions to reduce water security risks in selected river basin's priority areas, including Itapemirim, Itabapoana and Benevente, in the South, and Pontões e Lagoas do Rio Doce and Santa Maria do Doce, in the Center-North.

22. Brazilian states and municipalities have experimented with alternative approaches to tackle inappropriate land use, chief among which has been that of Payments for Environmental Services (PES), in which landholders are paid to maintain or adopt appropriate land use practices.⁶⁰ Espírito Santo was a pioneer in this effort.⁶¹ The state's Reflorestar PES Program, Brazil's largest state-level restoration program, was launched in 2011 (Law 9,864, of June 26, 2012) to promote restoration of the hydrological cycle through the conservation and recovery of forest cover and the improvement of farming practices. The program, which consolidates and builds on the lessons of two earlier PES programs,⁶² encourages the adoption of land uses that protect downstream water uses by offering landholders payments for reforestation or adopting sustainable land uses in hydrologically important sub-watersheds. Since 2011, over 9,000ha have been put under sustainable uses by Reflorestar (5,400ha reforested and 3,700ha under

⁶⁰ See *Experiências de pagamentos por serviços ambientais no Brasil*, São Paulo: Secretaria do Meio Ambiente (2013).

⁶¹ Espírito Santo has received continued World Bank support throughout this process, first under the *Espírito Santo Biodiversity and Watershed Conservation and Restoration Project* (P094233) and then under the *Espírito Santo Integrated Sustainable Water Management Project* (P130682).

⁶² The *ProdutorES de Água* program, which had been Brazil's first state-wide PES program, and the *Florestas para Vida* program, which had been developed with GEF support under the *Espírito Santo Biodiversity and Watershed Conservation and Restoration Project* (P094233).



productive sustainable uses) and over 10,000ha of standing forest have been conserved. See Box A2.1 for additional information on the PES Program in Espírito Santo.

23. An important lesson learned from the implementation of Reflorestar to date, and other PES programs around the world, is that the hydrological benefits vary substantially depending on the land uses being implemented, its location within a watershed, and the nature and magnitude of downstream water uses. From this lesson, Reflorestar began to implement rules to better direct its activities. Thanks to these efforts, the proportion of land enrolled in the program located in the most valuable hydrological areas has increased from 1 ha in 12 to 1 ha in 5. This is a huge progress, but there is still much room for improvement. Reflorestar data also show (consistent with results from other regions) that the hydrological benefits of forests are greater than those of agro-forestry, which in turn are greater than those of silvopastoral practices.

24. As currently designed, Reflorestar is narrowly targeted to areas that protect domestic water users. Under the proposed Project, the Reflorestar program will be expanded in two ways: (i) by adding areas that contribute to other hydrological benefits, including reducing flood risk and dry season water shortages,⁶³ and (ii) by incorporating additional contract options (including physical conservation structures – such as small/mini water ponds or soil built dry boxes). The Project will also finance studies and provide technical assistance (TA) to SEAMA to help continuously improve the Reflorestar program's efficiency and effectiveness, including by, *inter alia* (a) strengthening Program targeting; (b) developing additional financing sources, such as from the private sector; (c) strengthening its institutional capacity; (d) improving its communication strategy; (e) assessing its effectiveness (in *inter alia*, attracting participants - including vulnerable and marginalized groups, with a specific target to reach 40 percent of women among new Reflorestar participants; targeting payments to priority areas; providing the desired environmental services; and keeping administrative costs low); and using the lessons to improve it; and (f) improving the *Portal Reflorestar*, which participants use to enroll in the Reflorestar PES Program and SEAMA uses to administer it.

25. The subcomponent will support the continuous improvement of (a) the identification of priority areas for land use change and establishment of soil conservation measures, using hydrological models such as INVEST; and (b) the program's operating rules with the objective of increasing the allocation of registered lands to these priority areas. Based on these lessons, the subcomponent will also no longer simply count the registered hectares, but will use a weighted indicator that takes into account whether a given hectare is located in a priority area or not and the nature of the land use. Co-financing of project payments to farmers will also be proportionate to this weighted indicator. It is anticipated that these land use practices will also generate important benefits in terms of carbon sequestration and biodiversity conservation.

26. The Bank is currently supporting the Reflorestar PES Program under the Espírito Santo Integrated Sustainable Water Management Project (P130682). Considering that the proposed Project areas may overlap in a few cases with the areas under the ongoing Project, and to avoid supporting twice the same areas, a disbursement condition will restrict the disbursement of PES funds under the new loan before the complete use of PES allocated funds under the ongoing Project. In addition, the Bank will receive for approval the list of geo-referenced proposed PES contracts, before the Project submit the correspondent request for disbursement (all areas enrolled under the PES program are geo-referenced, not only to

⁶³ Studies being undertaken under the current Project will help identify the new priority areas, which may be different from current areas, or may overlap with them, in which case they will receive a higher priority.



ascertain that they are indeed located in the priority areas, but also to avoid double-dipping). It is important to note however, that landholders that have already participated in Reflorestar can apply to the program to support conversion of additional areas to sustainable practices, if they have successfully completed earlier land use changes. This is not double-dipping; on any given eligible hectare, landholders can only receive support once.

27. The mechanism for payment and eligibility are described in detail in the Reflorestar Annex to the POM.

Box A2.1 PES in Espírito Santo

Coordinated by the State Secretariat for the Environment and Water Resources – SEAMA, Espírito Santo's Reflorestar PES Program was established in 2012 under Law No. 8,960, building on the earlier *ProdutorES de Água* program. *ProdutorES de Água* was created under Law No. 8,995 of 1998, and was the first state-wide PES program in Brazil. It supported forest conservation in hydrologically important areas, paying participating landholders to preserve existing forests, using funding from Fundágua, which was also established in 2012, under Law No. 8,960. Fundágua receives 2.5 percent of oil and natural gas royalties paid to the state and must devote at least 80 percent of its resources to PES; as an example, annual transfer to the PES program has already reached around US\$5.6 million in the past and, in recent years, it has been varying between US\$1.9 and US\$2.8 million per year.

Among the innovations in the Espírito Santo PES mechanism implemented by Law 9,864, of 06/26/2012, the possibility of substantially higher payments stands out, with emphasis on those that aim to support the costs involved in forest restoration. To exemplify, considering costs with the acquisition of inputs and labor, 1 hectare of restoration is hardly feasible with costs below R\$ 20,000, which is higher than the average annual income of most rural producers in Espírito Santo. The legal framework for PES established by the 2012 Law allows rural producers to receive support in the restoration of 1 hectare of forest of up to R\$ 12,912, destined to the acquisition of inputs necessary for the restoration, leaving the rural producer in charge of providing the workforce for the preparation, implementation and maintenance of the plantations. The amounts to be paid as a form of support for the restoration of each hectare, the Short Term PES, vary according to the forest arrangement to be supported, and can reach R\$ 3,954 if the restoration is carried out by conducting natural regeneration; R\$ 5,447, if the restoration is carried out after the implementation of a silvopastoral system; R\$ 8,554, if the restoration is carried out after the implementation of managed forest; R\$ 12,226 if the restoration is carried out using sole native species, and R\$ 12,912, if the restoration is carried out based on the implementation of an agroforestry system.

A management plan is developed for every participant, which shows existing forest areas and areas to be restored. As of November 2016, through a technical and financial cooperation agreement, the PES mechanism implemented by Reflorestar began to be operated by the Development Bank of ES – BANDES, which also made its network of independent consultants available to Reflorestar, who started to take over the entire technical assistance part of the Program and taking over the development of management plans, and monitoring of compliance.

Participants are not obligated to bring their entire property under compliance with environmental laws, but receive lower payments if they do not; conversely, they receive higher payments if they exceed requirements. This approach avoids the all-or-nothing approach that has proven a major obstacle to participation in similar programs in other states and creates an on-going incentive to meet or exceed conservation requirements.

Reflorestar was initially implemented throughout the state. More recently, it has been increasingly targeted: first at priority watersheds, and now also at priority areas within each watershed. The criteria is published annually detailing eligible areas and payment rates.

28. In addition to the Reflorestar PES, the Project will finance physical water and soil conservation structures. Farm ponds (or *barraginhas*) are small basins dug into the ground with a diameter between



16 and 20 meters, and gentle ramps, a depth of at most 1.8 m and the average volume of stored water is around 100 m³ (see picture below). They are built scattered around the properties with the function of catching runoff, controlling erosion, and allowing rainwater to infiltrate into the ground and aquifers.

29. The construction of *barraginhas* occurs with the involvement of rural producers, who participate in mobilizing meetings, notably to agree on their location. Their construction according to the approved technical criteria) cannot occur in perennial watercourses, in permanent protection areas (APPs), inside gullies, in "V" grottos with deep ravines, nor on slopes with a gradient of more than 12 percent. The construction of each *barraginha* takes, on average, one hour on soft and humid soil, and one hour and a half on firm and dry soil. According to the legislation of the SES, which deals with the environmental licensing process, the implementation of *barraginhas* belongs to the list of activities that have low/negligible environmental impact and, therefore, do not require any type of licensing or specific authorization. The implementation of these structures is part of several municipal programs to improve water quality and increase water availability during the dry season in rural watersheds, with over 600,000 *barraginhas* built in the country between 2008 and 2019.



Picture of a barraginha in the state of Espírito Santo (Source: www.es.gov.br)

Subcomponent 2.2. Improving flood and drought management in priority river basins (US\$14.12 million of which US\$10.99 million IBRD). Implementing agencies: AGERH, CEPDEC and SEAMA

30. This subcomponent aims to apply an integrated flood risk management approach, with an emphasis on NBS, to reduce flood risks in the Itapemirim basin; and to increase capacity to respond to drought in priority basins located in the State's Center-North region (tentatively the following four river basins: Santa Maria do Rio Doce, Santa Joana, Pontões e Lagoas do Rio Doce, Barra Seca e Foz do Rio Doce).

(a) In the Itapemirim river basin:

Development of an integrated flood risk management plan (AGERH) and the implementation of nature-based solutions identified in the plan (SEAMA):

31. This activity will include the preparation of a basin-scale integrated flood risk management plan, following the EU experience on integrated flood risk management.⁶⁴ Structural and non-structural measures recommended under the plan will be prioritized for implementation. If gray infrastructure is

⁶⁴ The EU Floods Directive available at https://ec.europa.eu/environment/water/flood_risk/implem.htm



identified and prioritized, implementation will be carried out under Component 3 of the Project.

Strengthening of the flood monitoring, forecasting and alert system (AGERH):

32. It includes the development of a systematic hydrometeorological monitoring process for the Itapemirim river basin, implementation of technology and installation of equipment for data generation and transmission and data and information management. It will also involve (i) the preparation of an action plan for alerts emission including data flow and procedures, protocols and standardization of informative pieces; (ii) development of an IT platform (computer and cell phone) for management and disclosure of data and information to different audiences (technical staff, decision makers) and the general public; and (iii) development of mechanisms for monitoring the system use including its access by users.

Implementation of flood risk preparedness communications campaigns for at-risk people, with a focus on women through targeted awareness raising campaigns (CEPDEC):

33. This activity seeks to improve the risk perception of people affected by extreme hydrological events and improve the warning systems and response procedures in case of emergency situations. It will be carried out as a priority with the public in the Itapemirim River Basin, with the possibility of expansion to other areas in the state. A more proactive preparation approach will be applied, including the identification and cadaster of affected people residing in mapped at-risk areas, with a special focus on women; outreach campaigns with the full participation of municipal civil defense entities; dialogue with affected communities using specialized communications materials (both paper-based and digital for targeted social media); support to municipal civil defense agencies in the preparation or upgrading of local contingency plans; developing a warning system via SMS to issue targeted alerts to the mapped population; undertaking of evacuation simulations in at-risk areas to strengthen community resilience and response (in principle the following municipalities in the Itapemirim river basin: Jerônimo Monteiro, Cachoeiro do Itapemirim and Itapemirim).

(b) In the Center-North region:

Development of drought preparedness plans (AGERH):

34. Drought preparedness plans will focus on the operational dimension in the following four river basins: Santa Maria do Rio Doce, Santa Joana, Pontões e Lagoas do Rio Doce, Barra Seca e Foz do Rio Doce. The plans will be prepared following the methodology developed under the Bank-supported NLTA on Drought Preparedness and Climate Change Resilience⁶⁵ based on the Drought Monitor⁶⁶ information in the State of Espírito Santo. The plan will include both preventive measures to reduce drought risks as well as preparedness measures to know in advance what measures would be taken once drought is coming and declared.

Preparation and implementation of rational water use plans (AGERH):

35. The activity includes the preparation of rational water use plans in the same river basins and implementation of select actions proposed by such plans. It involves the diagnosis of water use for irrigation, human and industrial water supply; implementation of targets for rational use upon participatory negotiation; and monitoring of results in a pilot selected area.

⁶⁵ Brazil Water Series 10 (<https://documents1.worldbank.org/curated/en/607701468197373119/pdf/106302-PORTUGUESE-PUB-P146301-ADD-SERIES-AND-ISBN-PUBLIC-Aguas-Brasil-no-10.pdf>)

⁶⁶ <https://monitordesecas.ana.gov.br/mapa?mes=2&ano=2022>



Piloting of the issuance of collective water rights to family farmed micro-basins to facilitate participatory reallocation of water in times of drought (AGERH):

36. The activity seeks to develop a methodology and testing it through a pilot, for the issuance of collective water rights to family farmers in rural micro-watersheds with a focus on developing and implementing community self-management. This will include the revision of good practices and local legal and regulatory context, the development of a methodology based on this review, the testing of the methodology in a micro-watershed, the evaluation of the pilot and the strengthening of the methodology, the preparation of manuals for AGERH civil servants to replicate the methodology in other areas, communication campaigns guiding the implementation of self-management activities in smallholder microbasins, and provision of technical assistance to landowners for the application of the methodology and tools. According to an OECD study,⁶⁷ collective entitlements depend on devolving responsibility for management to local users, either through a water users' association or some other entity. The resource manager (AGERH) is then only concerned with ensuring compliance with collective entitlement, and not the water use of individual water users. A few advantages of this approach include: (i) reducing the number of compliance points and hence the time and cost to government involved in monitoring; (ii) fostering a culture of compliance among users, as it increases recognition that the water allocation process is a zero-sum game; and (iii) potentially providing water users with greater flexibility in how they use the resource. Key factors for the success of collective water rights include: (i) providing sufficient incentives for water users to take on the management responsibility and move away from the existing arrangements; (ii) ensure water user support; and (iii) support the capacity of the water management agency to monitor and enforce compliance with the entitlement.

Component 3 – Reducing flood risk in targeted municipalities (US\$60.91 million of which US\$41.67 million IBRD). Implementing agency: DER-ES⁶⁸

37. Component 3 aims to reduce floods risks in targeted municipalities, which are divided in two groups of critical flood occurrence:

- (a) The first group includes the municipalities of Águia Branca, João Neiva e Ibirapu, for which technical solutions have been identified, but feasibility studies need revisions. Solutions include dredging to increase flow capacity, widening of the cross section of canals, and internal coating of canals. These studies will be revisited, reviewed, and eventually adapted depending on results from the hydrological-hydrodynamic modeling and dimensioning of the interventions to be carried out. DER-ES and AGERH are responsible for monitoring the revision and completion of studies. After studies are ready, DER-ES will be responsible for the implementation of the Design and Build contracts for each municipality and for contracting the supervision of work services.
- (b) The second group of municipalities include Alfredo Chaves and Iconha, where studies are needed to identify innovative integrated structural and non-structural solutions to reduce flood risks. Potential innovative solutions include practices that use natural systems to manage stormwater runoff, such as rain gardens, and infiltration basins. Studies will focus on the municipalities, but with a broader look at the basins considering nature-based solutions. AGERH is responsible for the studies, while DER-ES will implement the works.

⁶⁷ OECD (2015), Water Resources Governance in Brazil, OECD Studies on Water, OECD Publishing, Paris, <https://doi.org/10.1787/9789264238121-en>.

⁶⁸ In addition to AGERH, to a smaller extent, as AGERH will implement the studies to identify more innovative integrated structural and non-structural solutions to reduce flood risks in the municipalities of Iconha and Alfredo Chaves.



38. **The State Government has designated the selected municipalities impacted by increasing flooding events as high priority areas requiring urgent attention.** Recent recurrences throughout municipalities in the upper part of the state – Águia Branca, João Neiva and Ibirapu – prompted the SES Government to single them out for priority infrastructure investments aimed at mitigating the impacts of floods in their respective urban areas. Flooding events in Águia Branca (2013, 2018, 2020), resulted in the displacement of 80 people, leaving another 15 homeless, with total financial costs estimated at R\$67 million (US\$13 million). Floods in João Neiva (2016, 2020), resulted in the displacement of 97 residents, rendering 2 homeless with costs estimated at roughly R\$5,544,649 (US\$1.1 million); while flooding in Ibirapu (2009, 2018, 2020) came at a cost of approximately R\$6,128,818 (US\$1.2 million). Similarly, since 2003 municipalities along the Benevente River Basin, south of the state, have been impacted by extreme flood events, the most devastating of which took place in January 2020 including in Iconha and Alfredo Chaves, leaving in their wake several fatalities, homeless and displaced people, and significant infrastructure damages to industries, businesses, roads, bridges and culverts. Flooding in Iconha resulted in 4 fatalities, the displacement of 1,994 people, leaving another 52 homeless with total financial losses estimated at R\$273,588,316 (US\$0.054 million).

Component 4 – Project Management (US\$6.99 million of which US\$6.99 million IBRD). Implementing agency: SEAMA (PMU)

39. This component aims to strengthen the State’s capacity to carry out Project activities, including fiduciary, technical, environmental and social, and monitoring and evaluation aspects. To this end, it will finance the provision of technical assistance, consulting and non-consulting services, training, operating costs and goods to key government agencies necessary to effectively carrying out activities associated with Project implementation, including the hiring of a firm to provide Technical and Operational Support.

Component 5 – Contingent Emergency Response Component (CERC) (zero budget). Implementing agencies: SEAMA and CEPDEC⁶⁹

40. This component will support the State of Espírito Santo, following an Eligible Crisis or Emergency, to respond to emergency situations associated with hydrological events. This disaster recovery contingency zero-fund component could be triggered following the declaration of a disaster or emergency, defined as “an event that has caused, or is likely to imminently cause, a major adverse economic and/or social impact associated with natural or man-made crises or disasters.” When triggered, funds may be reallocated to facilitate the rapid financing of goods and services under streamlined procurement and disbursement procedures. Eligible activities may include emergency rehabilitation works, supply of critical equipment, or any other critical inputs to respond to the impacts of floods, landslides, droughts and other hydrological climate-related extreme events-. If activated, this component would therefore directly enhance the residents’ resilience to climate change.

41. **Project readiness and preparatory activities.** The ongoing Espírito Santo Integrated Sustainable Water Management Project (P130682) is supporting the preparation of terms of reference (TORs) and carrying out an institutional assessment and technical studies, preparing the ground for the proposed Project implementation. It is also funding additional staffing to improve the capacity of implementing agencies for advancing preparatory activities, with the expectation of an overlap between the two operations. Table A2.1 summarizes the status of key preparatory activities and their estimated completion under the ongoing operation.

⁶⁹ The typology of activities to be implemented and the detailed implementation procedures are detailed in the POM.



Table A2.1 – Project readiness and status of preparatory activities

Activity	Status	Expected completion
Hire consulting firm to provide technical and operational support to the PMU and PIUs	TORs under preparation to start selection process as soon as (or prior to) signing of Loan Agreement.	Nine months after effectiveness
Conclude AGERH's institutional assessment (Subcomponent 1.1)	Selection process under the ongoing project.	January 2024
Complete TORs for technical assistance activities under components 1 and 2	Hiring of individual consultants to support preparation of eight TORs.	November 2023
Prepare selection process documents for technical assistance activities under components 1 and 2	State project team trained in November 2022 to start preparation of consultants selection documents.	December 2023
Contract studies to identify new areas of intervention by Reflorestar also focusing on reducing impacts of floods and droughts (Subcomponent 2.1)	Under implementation as part of ongoing project.	January 2024
Revise feasibility studies and prepare technical requirements for flood risk interventions in 3 municipalities (Component 3)	Hiring of individual consultants.	December 2023
Prepare Design and Build procurement documents for the implementation of flood risk interventions in 3 municipalities (Component 3)	State project team trained in November 2022 to start preparation of bidding documents.	December 2023
Contract modeling studies to inform flood risk interventions in 2 municipalities (Component 3)	Individual consultants being hired to support preparation of TORs.	May 2024
Integrated Risk Management approach following EU Integrated Flood Directive	The experience of World Bank projects implemented in the Eastern Europe and Central Asia (ECA) region has been shared through a virtual introductory workshop with SES. A study tour by SES staff to selected countries in ECA is under preparation.	Study tour by October 2023



ANNEX 3: Economic Analysis

COUNTRY: Brazil **Espírito Santo Water Security Management**

Rationale for Bank's Involvement

1. The World Bank funding of this Project is based on a wealth of unique knowledge and experiences of the water sector from around the world. The lessons learned from past World Bank's projects in several Brazilian States have strengthened water institutions and established a long history of engagement in capacity building and water infrastructure development. The World Bank also attracts and convenes other donors, and relevant stakeholders, with a platform for sharing results regionally and globally to ultimately assess performance against best practices and inform this operation.
2. The environmental and economic impacts of infrastructures and institutional development support will create better conditions for inclusive and green growth in the State. By strengthening Espírito Santo water sector management, promoting water-related disaster risk management, improving land management practices, and refining water quantity and quality, the Project will contribute for long-term water security in the State. Improved coordination and strengthened capacities of State's water sector institutions are important support activities to achieve the development objectives of the Project. The financial support to the State for integrating water resources and disaster risks management, with strong capacity building activities represent a shift in the policy landscape of the sector for the coming years. The integrated Water Resources Management (WRM) and climate-related Disaster Risk Management (DRM) approach will contribute to support the development of tools to improve local decision making processes to ultimately reduce the hydrometeorological risks in the State. Specifically, the Itapemirim river basin and three vulnerable municipalities are critical Project areas with a potential of accruing relevant environmental and economic gains.

Cost-benefit analysis

3. The cost-benefit approach was used to compare the economic costs and benefits with and without the Project. If benefits surpass costs, the Project is economically viable. The present value of expected net benefits was calculated, as well as the economic internal rate of return, and benefit-to-cost ratios. The economic evaluation was completed with GHG emissions estimates, a sensitivity analysis with various scenarios to measure the impact that changes in costs and benefits, and a qualitative description of potential ancillary economic impacts of the Project.

Parameters, assumptions, and scenarios.

4. The economic analysis of the Project focused on three subcomponents: the Reflorestar program, the interventions in Itapemirim basin and the urban and flood risk management interventions in three vulnerable municipalities. The parameters used in the analysis include an exchange rate of R\$5.15 per US\$1, with a Project lifetime of 30 years, and standard conversion factor of 1.09 to transform financial to economic values.⁷⁰ Finally, a discount rate of 10 percent was considered for estimating Net Present Values

⁷⁰ The standard conversion factor is the ratio of economic price value of all goods in the economy at their border price equivalent values to their domestic market price value. Usually it is also approximated with the inverse shadow exchange rate factor (SERF) as follows: $1+(1/\text{exchange rate})/2 \approx 1.09$.



(NPVs). GHG net emissions of the Project were estimated and added to the economic analysis using the Shadow Price of Carbon (SPC) to monetize GHG net emissions with a baseline year in 2022 with different SPCs. A sensitivity analysis included the following scenarios that modified direct costs and benefits: (i) increasing Reflorestar direct benefits of reducing sedimentation and increments in avoided damages in Itapemirim's locations, (ii) cost overruns of 50 percent during the lifetime of the Project for all components under economic evaluation, (iii) a decline in both costs and benefits that reduces the NPV to zero (breakeven point), and (iv) delays of Project's implementation up to 10 years. In addition, the sensitivity analysis incorporated a scenario of extra indirect benefits and costs. Indirect benefits included increases in farm income due to better environmental and agricultural practices with higher economic value due to Reflorestar. Indirect costs considered costs of additional works (small ponds, dry boxes, and biodigesters) required for the first two subcomponents to materialize the indirect benefits after 10 years.

5. *Estimated costs.* The estimation of costs comprised the investment in infrastructure works for the three subcomponents and the recurrent operation and maintenance (O&M) costs from these interventions. Administrative and transaction costs of interventions were added based on data availability of each component. In the case of Reflorestar, an opportunity cost per hectare annually is proxied at R\$ 11,879 (US\$ 2,306) spent for alternatives of productive activities and environmental outcomes (see document on file for detailed description).

Project benefits

6. Direct Project benefits estimate economic impact of three subcomponents. For the reforestation interventions (PES-R Payment for Environmental Services - Reflorestar) it was assumed that the extension of forest areas modifies the future values of productive activities and promote better environmental outcomes. The Reflorestar benefits are accounted with an increase in mean value of land R\$6,400 (US\$1,242) per hectare for agricultural activities, with an increase up to R\$ 2,411 (US\$ 468) per hectare per year of land conversion. Benefits were net out by considering different transaction costs and subsidies of the Reflorestar program.

7. The flood and drought management interventions in the Itapemirim basin component will aim to increase capacity to cope with severe droughts and manage excess water from floods in the State's selected hydrographic region. These interventions will result in more water available (from 866 m3/sec without the Project to 1772 m3/sec. with the Project) intended for different productive uses, mainly agriculture. A value of extra available water of R\$1.7 (US\$0.3) per m3 was assumed to monetize these additional water volumes as economic benefits. Because the specific nature-based solutions are to be designed as the Project gets implemented, changes in the effectiveness of this component are included in the sensitivity analysis by adding both indirect costs and benefits of complementary infrastructures. The changes in effectiveness add indirect costs and benefits based on similar conditions of Project's implementation.

8. The third component subject to economic evaluation (flood and landslide risk management interventions in the municipalities of Ibiraçu, João Neiva and Águia Branca) accrue benefits based on the avoided damages to property and physical assets resulting from extreme rainfall. Investments in structural and non-structural solutions contribute to avoid economic damages in the future. The effectiveness of this component is due to improvements in water-related risk management, dredging, cleaning of riverbeds, diversion channels, channeling rivers of structural investments implemented in three urban municipalities (Ibiraçu, João Neiva and Águia Branca). There are also benefits from increments in the value of properties and incomes of US\$494,000 per year (due to improved urban conditions that reduce



landslide risks).

9. *Results.* The economic rate of return of the Project is 14.9 percent for the entire lifetime of the Project. The Net Present Value (NPV) of all components included in the economic evaluation is US\$75.8 million, with benefits reaching US\$234.3 million, and total costs reaching US\$158.5 million at present values.

Financial analysis of Reflorestar

10. The financial assessment of 30 years of Reflorestar in Espírito Santo shows a financial return that ranged between 8.1 to 11.3 percent. The discount payback of Reflorestar was between 11 and 17 years after full implementation of the program. The annual present value of the financial assessment is between R\$ 1.2 million (US\$ 240,000) and R\$1.7 million (US\$335,000).

GHG emissions

11. The net GHG emissions of the Project are -8,682 tCO₂-eq on average per year. This includes the benefits from avoided gross emissions of -9,362 tCO₂-eq average per year from the expansion of reforested areas, and gross emissions of +680 tCO₂-eq on average per year. The extra net benefits with the low shadow price of carbon (US\$ 41.8 per tCO₂-eq) are US\$ 1.9 million and US\$ 3.8 million in the case of the high shadow price of carbon scenario (US\$ 83.7 per tCO₂-eq), and these benefits could add up to extra US\$ 9.0 million of NPV using the most updated price of carbon of US\$185 per tCO₂-eq. With increased water regulation and GHG emissions and capture capabilities of small ponds, there could be additional benefits or costs based on the future changes in the net emissions (including methane).

Sensitivity analysis scenarios

12. A multiple scenario sensitivity analysis considered four initial scenarios of changes in direct costs and benefits, and a scenario that added indirect costs and benefits from the construction of complementary water storage and biodigesters facilities. The results of the sensitivity scenarios show that the Project's economic efficiency is more sensitive to changes in cost structures compared to changes in benefits. The sensitivity analysis also showed that Reflorestar's and Itapemirim's interventions could have substantial economic gains in the future if additional works (small ponds and biodigesters) are used to produce extra environmental and productive outcomes, particularly for farmers. Other qualitative impacts of the Project show that the environmental and hydrological benefits could be substantial if the efficiency in implementation and adequate rollout of interventions are achieved.



ANNEX 4: Gender Action Plan

COUNTRY: Brazil

Espírito Santo Water Security Management

1. **The proposed Project aims to strengthen the State of Espírito Santo's capacity to manage water resources and extreme hydrological events, to reduce their long-term social impacts and increase resilience to water security risks.** The Project's interventions are targeted to areas most impacted by water security risks in the State: the Itapemirim basin – which is continuously flagellated by seasonal flooding events – and the northwestern hydrographic region – which is scourged by cyclical droughts. These water security risks are exerting a heavy and increasing toll on the State of Espírito Santo and their impacts are mostly felt by poor people, as they are usually located in more exposed urban and rural areas, and have less coping capacity. The Project will also support technical assistance activities of statewide relevance, including strengthening of SIGERH and CEPDEC as well as the updating of the State Water Resources Plan (PERH).

Sector-Relevant Gender Gaps

2. **Projects that provide equal opportunities for women and men to participate in the management of both water resources and hydrological disaster risks have the potential to accelerate progress toward meeting WRM goals and reducing prevailing gender gaps.** International literature acknowledges that women are key players in managing water resources given that they influence how water resources are used, conserved, or wasted and that women and men use and value water (and other natural resources and ecosystem services) in different ways due to their different roles, responsibilities, priorities, and needs. However, women often have limited representation in water resource governance systems, institutions, processes, and decision making roles. Consequently, women's knowledge, priorities, and needs are rarely considered in water resource planning and they often lack information, voice, and opportunities to participate in water resource management activities and interventions that are critical to the protection of ecosystems and human livelihoods as well as to enhance resilience to climate fluctuations and water scarcity.

3. **Prevailing gender inequalities and norms in societies also influence how women and men are affected by, prepare for, respond to, and recover from water-related disasters (floods and droughts).** International literature shows that, during droughts, women and girls eat less, pay more for water, and spend more time to collect it. In times of water scarcity, it is more difficult for families to maintain proper hygiene, including menstrual hygiene. Hence, women are often more adversely affected, both individually and as caretakers. Incidences of drought increase time spent on household water collection, which is ordinarily assigned to women and children. During floods, women have less access to emergency shelters than men; and enjoy less mobility as they often tend to children and the elderly when disaster hits. Women are also more vulnerable to gender-based violence (GBV) which often increases during disaster situations. They often have less access to disaster preparedness information and early warnings; are less equipped than men to respond to disasters; own less assets to cope with disaster-related economic losses; and are less likely to own disaster insurance to pay for damages. They are also typically underrepresented in disaster risk management (DRM) institutions and professions and DRM policies and programs rarely consider women's and men's different concerns and needs.

4. **Women's higher vulnerability to disasters associated with water security risks (floods or**



droughts) has many dimensions. Understanding how gender relations shape women's and men's lives is critical to reduce or mitigate the adverse impacts of water security risks. Since women and men have different roles, responsibilities, and control over assets and resources, they are impacted differently by hazards, and likewise, cope with risks and recover from disaster in different manners and paces. Unequal power relations between women and men mean that – despite the incredible resilience and capacity for survival that women often exhibit in the face of disaster – they also experience a range of gender-specific vulnerabilities.

5. **A key gendered impact of disasters is women's increased post-disaster workload.** Women are often at the frontline of reestablishing households in relocated or reconstructed sites and collecting basic household needs such as water, food, hygiene items, and fuel. Such post disaster duties may cause girls to drop out of school, disrupt female skill building and other livelihood opportunities, and negatively impact women and girls' time poverty. Furthermore, women's reproductive roles can limit their chances of survival—those in their final stages of pregnancy and women with young children tend to be less mobile. In cases where basic health care infrastructure is severely damaged and access to obstetrical care is limited, chances of miscarriage as well as maternal and infant mortality increase.

6. **International evidence therefore shows that the impacts of disasters are not gender-neutral.** A 20-year study on the gendered nature of natural disaster shows that in societies where the socioeconomic status of women is low, natural disasters kill more women than men—both directly and indirectly through related post-disaster events. The study also shows that disasters kill women at a younger age than men, and that the impacts of natural disasters are never merely determined by nature alone. The reason for the difference in mortality lies in the fact that women, in general, have lower socioeconomic status which, in turn, leads to unequal access to opportunities and exposure to risks, rendering them more vulnerable to natural disasters.

7. **The presence in SES of women in decision making and managerial roles within institutions responsible for water resources and disaster risk management varies widely.** It mostly reflects obstacles faced by women participating in decision making and leadership positions. On the positive side, in 2021, women held a slight majority of managerial positions in agencies involved with SIGERH – occupying 57.1 percent of managerial positions in SEAMA and 53.6 percent of such posts in AGERH. They further account for 60 percent of CERH's members. In contrast, women account for only 22 percent of members of the State's 13 existing River Basin Committees (CBH) - 64 of its 289 members. Women likewise account for only 1.9 percent of CBMES (which hosts CEPDEC) and represent a minority of participants in the annual training courses offered by CEPDEC to municipal committees of civil defense and protection (COMPDEC) and Community Civil Defense Nuclei (NUDEC).⁷¹ Of the 10 DRM courses offered by CEPDEC in 2021 to

⁷¹ At the municipal and community levels, each COMPDEC coordinates collaboration with state agencies for disaster prevention, preparedness and response. Each COMPDEC is responsible for: (a) preparing and implementing municipal risk reduction, contingency and civil defense operation plans; (b) training human resources for civil defense actions and promoting the development of volunteer associations, seeking to articulate, as much as possible, joint actions with beneficiary communities; (c) managing databases and elaborate thematic maps on multiple threats and vulnerabilities and keeping the population informed of risk areas and the occurrence of extreme events as well as of prevention and warning protocols and emergency actions during disasters; (d) carrying out simulated exercises, with participation of the population, for team training and improvement of contingency plans; (e) identifying/mapping disaster risk areas and promoting the inspection of building and risk areas, preventive interventions and disaster prevention/reduction behaviors; (f) evacuating the population in high-risk areas or vulnerable buildings, supervising disaster risk areas and seal new occupations in these areas; (g) collecting, distributing and monitoring supplies in disaster situations; and (h) evaluating damages and losses in areas hit by disasters. The Community Civil



municipalities across the State, female participation accounted for only 29 percent of the 1,399 participants.

8. **There is also a growing body of evidence in international literature highlighting the importance of endorsing a gender-sensitive approach for payment of environmental services** given that ecosystems are highly gendered. Such evidence shows that: (i) women and men derive different values and benefits from ecosystem services and resources; (ii) ecosystem services affect different dimensions of well-being that are distinctively valued and known by men and women; (iii) decreased access to/or availability of ecosystem resources and services have different impacts on the livelihoods of women and men; (iv) women and men recognize and value different types of environmental services (regulating versus provisioning services, respectively); and (v) participation in payment for environmental services has been lower for both female-headed households and women within male-headed households.⁷²

9. **The international literature has also emphasized that:** (a) women and men often have differential access to and derive different benefits from ecosystem services, (b) their perception and knowledge of ecosystem services differ and the understanding of these differences is critical for ensuring that policies aimed at enhancing access to and use of ecosystem services can provide benefits to all genders, and (c) female-headed households reported expending more yearly effort on PES activities despite protecting less land, and also increased their conservation activities over time as they presumably became more familiar with PES. Use of income from PES also showed differences between male and female-led households, with men more likely to spend funds on non-essential goods than women, whereas women often value, prioritize, collect, grow, or use ecosystem services for producing energy, food, water and medicine more than men. Therefore, restrictions on women's participation in PES may have a disproportionate effect on their wellbeing and can lead to declines in their income and livelihood options.⁷³

10. **The participation of women in Payments for Environmental Services is largely limited by the invisibility of their economic contribution in rural areas, poor control of land assets and imbalances in intra-household decision making.** As revealed via implementation of the Reflorestar Program in Espírito

Defense Nuclei (NUDEC) are formed by a community group organized in a district, neighborhood, street, building, community association, entity, among others, which participates in civil defense activities as a volunteer. Their objectives are to organize and prepare local communities to respond promptly to disasters, enhance community awareness of natural disaster risks and the importance of preserving the local environment from the perspective of minimizing disasters, and to prepare local communities to collaborate in times of accidents and disasters. By 2020, 58 out of SES' 78 municipalities have organized their COMPDECs and NUDECs, however, only six municipalities have prepared contingency plans, seven have prepared risk reduction plans and ten have completed the mapping of risk areas (desastres.cnm.org.br).

⁷² The international literature has also emphasized that: (a) women and men often have differential access to and derive different benefits from ecosystem services, (b) their perception and knowledge of ecosystem services differ and the understanding of these differences is critical for ensuring that policies aimed at enhancing access to and use of ecosystem services can provide benefits to all genders, and (c) female-headed households reported expending more yearly effort on PES activities despite protecting less land, and also increased their conservation activities over time as they presumably became more familiar with PES. Use of income from PES also showed differences between male and female-led households, with men more likely to spend funds on non-essential goods. In support of these statements: Yang et al. (2018), *Gendered perspectives of ecosystem services: A systematic Review*, in *Ecosystem Services* 31, 58–67; Fortnam et al. (2019), *The Gendered Nature of Ecosystem Services*, in *Ecological Economics* 159, 312–325; McElwee et al. (2021), *Gender and payments for environmental services: Impacts of participation, benefit-sharing and conservation activities in Viet Nam*. *Oryx*, 55(6), 844-852.

⁷³ Yang et al. (2018), *Gendered perspectives of ecosystem services: A systematic Review*, in *Ecosystem Services* 31, 58–67; Fortnam et al. (2019), *The Gendered Nature of Ecosystem Services*, in *Ecological Economics* 159, 312–325; McElwee et al. (2021), *Gender and payments for environmental services: Impacts of participation, benefit-sharing and conservation activities in Viet Nam*. *Oryx*, 55(6), 844-852.



Santo, the participation of female family farmers has been negligible. Between 2013 and 2019, this program – which will be supported by Subcomponent 2.1 – has financed 3,795 landholdings in the State (3.5 percent of the rural landholdings), which has resulted in the adoption of sustainable land use practices in a total of 9,000ha (5,400ha reforested and 3,700ha under productive sustainable uses) and the preservation of over 10,000ha of standing forest (https://seama.es.gov.br/resultados_programa). The share of women-headed family farms among Reflorestar beneficiary landholdings accounted for just 0.79 percent and only 0.68 percent of the total women-headed family farmers in the state.⁷⁴ When it became evident that women landholders were not participating in the Reflorestar, since 2021, the Program Implementing Unit has made some efforts towards a more gender-responsive design and implementation, adding gender of the landholder as a criterion to prioritize proposals submitted by women producers in the 2021 Call for Expressions of Interest. Since then 30 percent of the 300 contracts signed by Reflorestar benefit women-headed family farmers.

Most Relevant Gender Gaps for the Proposed Project

- Women are underrepresented among the State's Payment for Environmental Services beneficiaries.
- Women are underrepresented in DRM planning and decision making institutions and processes at the State, local and community levels and their specific concerns and needs may often be neglected.
- Women have less access to information about disaster preparedness and actions as well as early warning systems than men at the local and community levels.

Proposed Gender Actions

11. **The proposed Project is aligned with the World Bank's corporative commitment of bridging the gender gap through (i) increasing female beneficiaries in the Reflorestar Program to reduce gender gap in income, voice and agency; and (ii) increasing the participation of women in DRM trainings to reduce gender gap in access to information, participation, voice and agency by preparing women to respond to the situation of risks and disasters.** The Project's approach recognizes that the immediate impact of disasters related to water security risks – displacement, destruction of homes, schools, and health services, loss of financial security and livelihoods, and disruption of existing social protection mechanisms – may further expose women and girls to more devastating and long-term effects than men. These may include increased vulnerability to GBV and exposure to sexual exploitation, abuse and sexual harassment (SEA/SH). Accordingly, the Project acknowledges that failure to apply a gender lens in disaster risk management and response can reinforce or perpetuate these social consequences on women and girls as well as magnify existing inequalities between women and men. The Project approach acknowledges that engaging and empowering women are beneficial means of strengthening resilience to disaster risks. Just as gender roles and relations shape vulnerability to disaster, conversely, they also shape people's capacity to prepare, withstand, and recover. It also recognizes that women have particular experience and skills to contribute to disaster risk management due to their role as primary caregivers within the family and often within the wider community as well as strong local knowledge of natural resources, surroundings, and valuable links with others in the area.

12. **Considering the most relevant gender gaps that lead to women's disproportionate exposure to the social and economic impacts of water security risks and disasters, and that women and men often have differential access to and derive different benefits from ecosystem services, the Project incorporates**

⁷⁴ There are 33,093 family farms in the state and 13.4 percent (4,345 family farms) are headed by women in the state of Espírito Santo.



a set of actions and gender sensitive approaches that are expected to reduce gender gaps. These actions are:

- (a) **Increasing the participation of women beneficiaries in the Reflorestar Program:** Ensuring female family farmers are provided a more equitable share of the benefits of the Reflorestar Program's payment for environmental services. Achievement of this goal will include activities related with: (a) carrying out an assessment of the drivers of exclusion of women family farmers (in addition to imbalances on land tenure) from the Program, aiming to better identify and help overcome gender barriers that have so far hampered women's equitable participation in its benefits as well as to promote the payment of ecosystem services that are mostly recognized and valued by women; (b) improving its communications strategy and the web-based Portal Reflorestar (which participants use to enroll in the program) aiming to attract, reach out and foster participation of female family farmers; and (c) implementing a participatory strategy to monitor and evaluate the effects on increase in income and agency as a result of the expansion of women's contracts with payment for environmental services – Reflorestar Program (participatory monitoring implemented).
- (b) **Increase the participation of women in the DRM training courses** offered by CEPDEC to municipal civil defense and protection committees (COMPDEC) and Community Civil Defense Centers (NUDEC). Strengthening the capacity of the State's disaster management officers by: (i) introducing improvements to the existing information management, monitoring and evaluation system rendering it able to collect and analyze sex-disaggregated data;⁷⁵ (ii) carrying out capacity building events on the gendered aspects of disaster risk management for Project workers, staff of the implementing (PIUs) and coordination (PMU) agencies, and members of CEPDEC, COMPDEC and NUDEC; (iii) carrying out dissemination campaigns on best practices for gender mainstreaming in disaster resilience and disaster response activities; and (iv) fostering women's participation in community preparedness training events and disaster risk response drills organized by CEPDEC.
- (c) **Ensuring that disaster risk management plans and activities supported by the Project rely on gender-inclusive risk and vulnerability assessments and foster through collaborative workshops the active participation of women and girls** in: (i) the definition of risk maps; (ii) the development of community-based risk management procedures and activities for preparedness and response; (iii) development of action/contingency plans for post-disaster preparedness and recovery that are able to address women's and girls' special needs to cope with disasters; and (iv) the definition of early monitoring and/or warning activities adjusting communication channels and incorporating gender-sensitive content that are easily understood, used, and accessible to both men and women.

The goals of these activities are to: (i) enhance women's participation in the COMPEC and NUDEC, and aiming to increase women's participation up to 40 percent of the new contracts signed by Reflorestar; (ii) ensure that women's views, concerns and particular needs are taken into consideration in disaster risk preparedness and response; and (iii) ensure disaster preparedness information and actions conveyed in these municipalities are gender-sensitive and rely on access channels that are readily available to women living in at-risk areas including improvement of Databases for Disaster Risk

⁷⁵ CEPDEC has a disaster information management system that provides data on number of affected people by type of impact. The system informs that Between 2013 and 2020, 794 disasters were registered in the state of Espírito Santo, more than double the previous decade, which 27 percent were related to floods, 21 percent to droughts and 7 percent to landslides, leading to an estimated 120 deaths and the displacement of roughly 230,000 people. However, this system does not hold gender disaggregated data. Therefore, a first activity will consider the establishment of a gender-sensitive baseline.



Management.

13. **In addition to this main focus, the Project will also support the state in raising awareness of reducing gender disparities in representative participation in the River Basin Committees (RBCs).** Thus, the Project will support actions fostering women's participation in the RBCs so that their specific concerns are better represented in these planning and consultative instances which play a central role in water resources management. This goal will be pursued through the carrying out of awareness raising campaigns amongst the State's RBCs on the relevance of including female representatives and considering their perspectives for sustainable water resources management. These campaigns will focus on recognizing the importance of better understanding the particular concerns and views women may have with regard to water resources and the need to address these concerns and views in water resources management.

- The goals of these activities are to: Support the State to reduce the level of female underrepresentation in these instances by 10 percent in the next mandate, creating an enabling environment for the proper consideration of women's views, concerns and particular needs in water resources management and planning at the local level. The initial focus of these interventions will be the RBC organized within the areas of Project interventions that are drought or flood prone (the Itapemirim River Basin and the Santa Maria do Rio Doce, Santa Joana, Pontões, Lagoa do Rio Doce, and Barra Seca e Foz do Rio Doce basins).

Proposed Key Indicators

14. The implementation and effectiveness of the Gender Action Plan will be monitored and evaluated throughout Project implementation, for which two Intermediate Results indicators have been selected to be measured as part of the Results Framework:

- Increase the participation of women (women-headed family farms) among the beneficiaries of the Reflorestar PES Program - (10% increase in the percentage of signed contracts); and
- Increase the participation of women in the annual training courses offered by CEPDEC to municipal civil defense and protection committees (COMPDEC) and Community Civil Defense Centers (NUDEC) - (increase at least 10% the participation of women in the total number of course participants).



ANNEX 5: Map

COUNTRY: Brazil

Espírito Santo Water Security Management

