

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).

Furthermore, roughly 65 percent of Brazil's electricity is generated from hydropower.¹ 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).

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.

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.

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.

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.

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.

While the ongoing Bank-financed Espírito Santo Integrated Sustainable Water Management Project,³ has continued investments to improve sanitation services,¹ 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.

¹ 4 Bank operations have contributed to improved sewerage treatment and collection indicators in Espírito Santo.

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.

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.

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 environment services.

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.

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 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 Espírito Santo Biodiversity and Watershed Conservation and Restoration Project (P094233) and subsequently, under the Espírito Santo Integrated Sustainable Water Management Project (P130682).

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.

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, Ibiraçu, Iconha and Alfredo Chaves, which are mostly located in the southern half of the state.

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 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.

classification; (v) act as court of appeal for water conflicts; and (vi) monitor the use of water use and discharge fees.

water user registries and balance of water availability in its area of operation.

(b) Disaster Risk Management (DRM). The Federal and State Civil Defense Law⁵⁰ 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.

(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.

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.

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 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).

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).

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.

² 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.

³ 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.

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.

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.

PDO Level Indicators

- PDO 1: Water resources management instruments improved.^{2, 5}
- PDO 2: Digital operations command system implemented.^{3, 6}
- 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.^{2, 1}

B.

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.

Proposed interventions are grouped around three components focused on the following geographic scales: statewide (Component 1), river basin (Component 2) and

^{2, 5} 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.

apact systems) and will benefit from the implementation of structural and non-structural measures to reduce water security risks in selected areas.

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.

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.

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.

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 (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 general aspects in DRM; and (iv) the design and implementation of an electronic emergency command, control and coordination response system (Incident Command System software).

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).

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 Reforestar 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 expand, 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 retention ponds, soil built dikes, etc.) and (iii) the provision of technical assistance to SEAMA to improve the Reforestar 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 Reforestar participants; targeting payments to priority areas; providing the desired environmental services; and strengthening the support to the Reforestar Program in keeping administrative costs low) and using the lessons to improve it; and (f) improving the Portal Reforestar, which participants use to enroll in the Reforestar PES Program and SEAMA uses to administer it.

Improving flood and drought management in priority river basins (US\$14.12 million of which US\$10.99 million IBRD). This subcomponent integrates flood and drought risk management approach, of physical and nature-based solutions (NBS), such as reduced flood risk 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 D^o 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 Reforestar 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; and (b) the strengthening of drought monitoring and alert system.

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.

Component 3 - Reducing flood risk in targeted municipalities (US\$60.91 million of which US\$41.67 million IBRD). Reducing flood risks in targeted municipalities in targeted municipalities which have experienced 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, as well as supervision of work services in three municipalities (Água Branca, João Neiva and Ibraçu) 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.

Component 3 supports the implementation of the World Bank's GCRF, Pillar 4 - Strengthening Policies, Institutions and Investments for Rebuilding Better.

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 Design and Build contracts, assistance, consulting and non-consulting services, training, operating costs and goods for 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.

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 cause, a major adverse economic and/or social impact associated with a disaster" (US\$60.91 million of which US\$41.67 million IBRD). When triggered, funds may be reallocated to facilitate rapid financing of goods and services under streamlined procurement and disbursement procedures. Component 4 - Project Management (US\$6.99 million of which US\$6.99 million IBRD) provides for the acquisition of equipment, goods and 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 GCRF supports the US\$6.99 million IBRD. World Bank GCRF Pillar 3 - Strengthening Resilience. It targets municipalities (US\$60.91 million).

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 has been used in the past few years. Innovative integrated solutions to increase runoff capacity, including dredging, widening of river sections, and river channeling.

The Global Facility for Disaster Reduction and Recovery (GFDRR) supports the tool in partnership with the World Bank Group and other institutions.

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).

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, Ibiraçu, and João Neiva) 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, while 29,000 residents of Alfredo Chaves and Icoaraci will stand to gain from improved designs and innovative studies that will inform future flood risk works in the municipalities.

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.

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.

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.

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).

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 Reforestar Program and its PES program.

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

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.

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.

Nature-based solutions and payment for Environmental Services (PES) should incorporate key lessons to improve their cost-effectiveness and sustainability.

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.

Water resources and disaster risk management are multisectoral in nature and require multisectoral implementation arrangements ensuring adequate participation of all government institutions involved.

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.

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.

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.

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.

In addition to the expected overlap between the two operations for advancing preparatory activities, 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). The PMU 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.

AGERH, CEPDEC and SEAMA will share the implementation of subcomponent 2.2,⁴ 5 which is expected to enhance their coordination and improve interinstitutional and cross-sectoral collaboration under the SIGERH-ES, resulting in a positive externality.

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.

The RF includes selected indicators used by the Borrower for the purposes of monitoring Project impacts. 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.

⁴ 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.

⁴ 5 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

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.

Resilient integrated structural and non-structural solutions to flood, drought and WRM management.

Most sustainable land management practices and NBS supported by the Reforestar 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 Resource 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.

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-E's 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.

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.

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.

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.

Basin-scale, participatory and integrated water resources, flood and drought management combining both structural and non-structural measures.

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.

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.

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.

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.

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.

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. [REDACTED] 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.

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 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.

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.

Social

76. 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.

Resettlement and land acquisition costs will be financed with counterpart funds.

Nevertheless, the Project supports a technical assistance activity that will be relevant for all State territory: updating of the State Water Resources Plan.

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.

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.

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)

Citizen/stakeholder engagement will be monitored through three indicators included in the Results Framework.

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).

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.

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.

100% of water rights analyses.

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.

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.

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.

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.

The indicator measures the number of water retention structures that will be installed in the rural properties.

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.

Itapemirim river basin flood risk integrated management plan and benefited from green and/or gray infrastructure measures.

Total number of inhabitants of river basins benefiting from Drought Preparation Plans and implementing measures provided for in the Plans.

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).

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).

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 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.

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.

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.

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).

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.

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.

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.

The World Bank will continue to provide fiduciary, ESF and other Project-related training as needed.

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.

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.

The Bank performed a FMA of the FM arrangements for the Brazil Espírito Santo Water Security Management Project (P176982).

FM arrangements should place emphasis on governance controls applicable to Project components.

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.

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.

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.

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)

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.

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 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.⁵ ⁶ 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.

In parallel, the SAFF,⁷ a license owned by the State of Espírito Santo utilized to monitor the state's projects, will consolidate the Project's accounting entries, for

⁵ 4 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.

POA and the main bidding data.

It also allows for monitoring the

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.

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.

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.

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 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 Project will be included in the Annual Audit Plan and the PAINT system within one month after loan effectiveness.

SEAMA, in conjunction with SEFAZ, will manage the two Project's bank accounts (Brazilian reais and US dollars).

In addition, the PMU will ensure that all the Project's assets that are being acquired with the loan's funds will be accounted for.

The Project's assets will be accounted for through the SIGEFES, SIGA/Asset System, and SAFF system

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.

The POM should be prepared by the PMU, approved by the Bank and maintained/updated throughout the Projects' life.

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).

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.

The Designated Account (DA) will have a fixed ceiling of US\$ 16,000,000.

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.

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 CEPD. 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.

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.

The PMU will

include in the POM the process to monitor the counterpart funds.

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.

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.

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.

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.

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).

SEAMA should submit for Bank's validation the IFRs (the automated format and content) no later than sixty days after loan effectiveness.

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.

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.

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.

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 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.

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.

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.

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.

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 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.

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.

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.

The technical agencies (AGERH DER-ES SEAMA and CEPDEC are responsible for elaborating the Terms of Reference and Technical Specifications.

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.

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.

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.

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.

Strengthening SIGERH's water resources management capacity (US\$7.43 million of which US\$7.43 million IBRD).

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.

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 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.

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.

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.

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.

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.

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.

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. The proposed activities are underpinned by the PEPDEC 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.

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.

CBMES currently lacks a computer-based tool to support resource command, control and management actions.

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.

Expanding the support to the Reforestar 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.

The program, which consolidates and builds on the lessons of two earlier PES programs,⁶⁰ 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 Reforestar (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).

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. 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

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; 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.

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.

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.

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.

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

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.

The criteria is published annually detailing eligible areas and payment rates.

In addition to the Reflorestar PES, the Project will finance physical water and soil conservation structures.

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.

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.

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.

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 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).

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

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.

(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. The plans will be prepared following the methodology developed under the Bank-supported NLTA on Drought Preparedness and Climate Change Resilience⁵ based on the Drought Monitor⁶ 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.

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,⁷ 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).

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 Ibiráçu, 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.

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.

⁷ OECD (2015), Water Resources Governance in Brazil, OECD Studies on Water, OECD Publishing, Paris

⁸ In addition to AGERH, to a smaller extent, as AGERH will implement the studies to identify more innovative integrated

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.

Component 4 · Project Management (US\$6.99 million of which US\$6.99 million IBRD).

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.

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 Crisis or Emergency, to which zero financial support will be provided by the State of Espírito Santo, is defined as a disaster or emergency, defined as an event that has situation or is likely to significantly impact a region's 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 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.

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 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.

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.

The economic analysis of the Project focused on three subcomponents: the Reforestar program, the interventions in Itapemirim basin and the urban and flood risk management interventions in three vulnerable municipalities.

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.

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.

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).

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.

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 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).

The economic rate of return of the Project is 14.9 percent for the entire lifetime of 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.

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)

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).

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.

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 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)

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.

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 (

Most Relevant Gender Gaps for the Proposed Project

- Women are underrepresented among the State's Payment for Environmental Services beneficiaries.

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.

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.

