Reforms could focus on boosting market competition, access to external markets, cheaper inputs and technologies, and simplification of the tax system. Higher levels of investment in infrastructure will also be needed to ensure adequate maintenance of existing infrastructure stock, removing bottlenecks and expanding access to social services. This calls for improving planning capacity at government level, strengthening regulatory environment and leveraging private resources to finance investments.

The former set the foundations for multiple use, decentralized and participatory water governance in the country.

Water has supported key drivers of economic growth and has been key to reduce poverty and promote shared prosperity through more equitable and widespread provision of water supply and sanitation (WSS) services to a growing population.

A more integrated approach to water resources management is crucial for Brazil to meet its sustainable economic development goals.

This decrease had severe negative impacts on the availability of water for human consumption (contingency plan in the MRF led to a 20 percent reduction since 2016) and productive use (12 percent decrease in rice production and 51 percent decrease in corn).

After the six consecutive drought years (2012-2017) and the 2018 rainy season 0, the reservoir levels were severely reduced, and the volume of water stored in the 155 reservoirs monitored by the Water

Women was just 48% of the total working force, 43% of the people employed, and 28% of them had only part-time jobs (BRK Ambiental, 2018, O Saneamento e a Vida da Mulher Brasileira.

Given the situation, COGERH implemented very stringent water allocation rules in 2017, with 75 percent of stored water allocated for human consumption, 16 percent for agriculture and 7 percent to industry. Figure 2 shows total water inflows to the reservoirs monitored by COGERH from 1986 to 2018.

The inefficient provision of water supply service contributes to growing pressure on already limited water resources.

It supplies water to 5.7 million inhabitants (2.65 million inhabitants only in the city of Fortaleza).

The Bank is supporting CAGEC in increasing the efficiency of the sanitation system of Fortaleza through a lending operation[15], which finances household connections in low-income areas and a comprehensive campaign to non-poor users to connect. Despite the challenges, CAGECE has been able to deal with the adverse water crisis scenario faced by the State over the past years. Besides providing incentives for responsible water use through a contingency tariff, with additional charges for water consumption above established targets, CAGECE has been working on a design, build and operate contract for a seawate desalination plant to increase water security to the municipalities within the MRF. Initially, the proposed new system will generate 1 m^3/s of desalinated water, increasing water supply by 12 percent.

CAGECE is working in line with the maximizing finance for development (MFD) approach. In addition to the proposed desalination plant, CAGECE is seeking partnering with the private sector to increase services coverage. The company has also engaged with the Brazilian National Economic and Social Development Bank (BNDES) in the assessme of other possible public-private-partnership (PPP) arrangements. However, as public sector investment capacity is reducing as a result of tighter fiscal situation, CAGECE will need to increasingly rely on its own cash generation capacity to finance needed investments. To this end, CAGECE also needs to increase its credit worthiness, through a series of measures comprising, among others, efficiency gains, cost reduction and increasing revenues from tariffs.

The World Bank has a long-lasting engagement with the State on water.

Subsequent operations helped consolidate the institutional framework and implement modern policies, planning and management tools. Water storage capacity and distribution infrastructure was further expanded to reduce vulnerability to droughts.

Currently, the Bank is supporting preparedness plan for drought in the MRF and increased capacity of water-related institutions to sustain water sources for agriculture and build resilience in water resource management through the use of tools and monitoring systems[18]

Despite this support, the current water crisis and increased vulnerability to climate impacts call for a more proactive approach to water management to ensure water security and improve resilience in the State.

The proposed Project will support the implementation of a number of priority investments under the Strategic Action Plan. In addition, it will support initiatives aimed at improving its public resources management and decision-making capacities as well as increasing its accountability.

The Project will further strengthen water management and governance, improve service delivery, increase accountability, and help develop tools for evidence-based planning and decision-making.

The CPF proposes a reorientation of new lending and advisory services and analytics toward supporting the government in addressing the main development constraints identified in the Systematic Country Diagnostic, including water security, with an emphasis on the third focus area of the Framework: inclusive and sustainable development.

The Project will address these issues by improving governance of scarce water. It will strengthen resilience to climate shocks through interventions aiming at improving the quality of hydro-met services. It will likewise improve the operational efficiency of water services, increase access to water supply and enhance water security in the poorest area of the State. Finally, the proposed operation will provide the analytical foundations for tariff revisions aimed at improving prospects for the conservation and sustainable management of scarce water resources going forward.

The CPF emphasizes the need for a more selective Bank focus on water and sanitation, urban transport, land use planning, risk management and resilience and energy efficiency. As mentioned in the CPF, the Bank will continue to invest in water and sanitation to foster resilience against the increased variability of water supply, while also focusing on pricing policies to ensure that water charges reflect provision costs; and the support from the Bank will be embedded in the broader context of water resource management and protection of scarce water resources, representing key areas of the proposed Project.

Strengthening capacity for water resources management will be measured by the increased knowledge on water use with the universalization of water macro metering and the regularization of water users; and the improved forecasting capacity with the provision of relevant information for decision-making on drought response, preparedness and mitigation.

Enhancing in efficiency of water services in the city of Fortaleza will be measured by water losses control and reduction in priority water supply sectors through sectorization and creation of District Metering Areas (DMCs).

PDO Level Indicators

(a) Percentage of strategic water users regularized.

(e) Reduction in Non-Revenue Water in the city of Fortaleza (liters/connections/day).

The proposed Project is a US$174.85 million IPF operation financed by a US$139.88 million IBRD loan and US$34.97 million in State counterpart funds.

Project activities comprise a set of interventions in three main areas: (i) water resources management; (ii) water service provision; and (iii) governance.

This component aims at increasing water security through improved water resources management, expanded bulk water infrastructure and specific investments to ensure the safety of Project-related dams. It includes two sub-components:

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[1] Strengthening public sector management activities under component 3 are not reflected in the PDO as they represent a small portion of Project scope focusing on technical assistance activities that in part complement activities under components 1 and 2.

Sub-component 1.1: Integrated Water Resources Management (US$10.82 million).

Specifically, the sub-component will support: (i) COGERH in increasing knowledge on bulk water usage, universalizing water supply metering and regularizing water users; and (ii) FUNCEME in the strengthening of the climate forecasting system and the improvement of water quality and quantity monitoring.

Information obtained from medium- and long-term forecasts/scenarios together with improved knowledge on water demand in the river basins will serve as inputs for the negotiated water allocation process followed by the State. The climate forecasts produced by FUNCEME are relevant in decision-making processes concerning drought response, preparedness and mitigation actions at both State and Regional levels.

Integrated water resources management increases the available supply of clean water and contributes to its efficient use and distribution.

(b Sub-component 1.2: Water Infrastructure (US$139.11 million

Increasing the safety of dams also contributes to more reliable water supply services considering that a dam failure could significantly affect available water supplies as well as the environment.

The water delivered by the pipeline at the entrance of municipalities and districts will be stored in dedicated reservoirs and distributed by the existing systems.

Improving the Efficiency of Water Services (US$ 15.95 milli

The component includes two main sets [illegible]

(a Water Losses Control and Reduction. This set of activities will support CAGECE in improving water supply efficiency through the implementation of water losses control and reduction activities in the city of Fortal a. T The proposed activities will contribute to CAGECE Water Losses Reduction Program with focus on controlling pressure, sectorization and creation of District Metering Areas (DMAs) in priority sectors of Fortaleza. [illegible]

[illegible]

The creation of DMAs will allow CAGECE to have detailed knowledge of losses related problems in the system, provid better equalization of pressures, and contribute to manage the losses in smaller areas, bringing better returns both in relation to actual and apparent losses.

Activities are in line with the MFD approach, especially with the preparation of a turnaround plan and development [illegible] proposal for reforming tariffs and subsidies.

This component will contribute to improving public sector governance, particularly in the water sector, through a set of activities aimed at embedding the use of evidence in planning and decision-making, improving service delivery and management of the State water resources, as well as increasing accountability.

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 ensure the continued operation of water infrastructure and provision of services.

On average, the Project will generate estimated net emissions of -1,725 tCO2-eq annually. The water supply production increases under subcomponent 1.2 are estimated to experience net emissions of -25,817 tCO2-eq due to the fact that the reduction in tanker fuel use will lead to emissions reductions compared to electricity use by a more reliable piped system.

financing of goods and services under
supply of critical equipment, or any other critical inputs to ensure the continued operation of water infrastructure and
provision of services.
Eligible activities may include emergency rehabilitation works,

Direct beneficiaries in the sectors where water losses control and reduction activities will be implemented are estimated at 550,000 people.

The technical assistance activities focused on improving water resources management and strengthening the public sector will benefit the whole State population, around 9 million people.

The survey will measure, but not be limited to: (i) days of sickness or hospitalization due to water-borne and gastrointestinal diseases; (ii) time burden to secure access to water supply and to take care of sick family members due to water-borne disease; and (iii) impression of water quality and safety.

The value added of the World Bank goes beyond its ability to offer at-scale financing at conditions superior to commercial lenders. The World Bank is also uniquely positioned to support water resources management and water supply infrastructure investments and reforms due to its strong local presence, specialized staff, and considerable experience implementing water projects in the Northeast region of Brazil.

From a multisectoral perspective, between 2003-2019, the World Bank supported the State on several key areas of social and human development, service delivery, leveraging the greatest possible benefit for government actions and enhancing public sector management capacity in a scenario of high debt services commitments.

the PforR technical assistance component was successfully implemented by the same institutions involved in this Project.

The satisfactory performance of PforR as a multisectoral Project resulted mainly from the performance of the Project intersectoral committee created by State decree.

It also led to the systematic knowledge of technical and administrative procedures needed for good performance, providing a participatory and intersectoral collaboration platform.

The State has made significant efforts over the last decades to consolidate and strengthen its institutional set-up for water resources planning and operation and maintenance of bulk key water infrastructure. The Project will continue to support the State in improving the implementation of water resources management instruments and increasing information to support decision-making.

This has involved not only expansion of infrastructure but also strengthening management and user participation, leading to more reliable access to water for all uses.

The same type of contract will be adopted under the Project for the construction of large infrastructure.

Effective communications, consultations, and use of participatory approaches are integral to the success of water projects.

Recent experiences with technical assistance activities under water projects have shown that extra efforts are needed to ensure adequate implementation and achievement of results.

SEDET will be a Project beneficiary while providing technical support for the implementation of activities under Component 3 by IPECE as well as activities coordinated with FUNCEME. The PMU will be responsible for monitoring the overall Project execution, providing support to all implementing agencies on each of its responsibilities, reviewing each document for quality assurance, providing guidance in each procurement step and issuing internal no-objections to them. The PMU will also be responsible for legal matters and for monitoring and ensuring safeguards compliance; it will be the primary contact with the World Bank. Safeguards responsibilities related to Component 1 activities will remain under SRH considering its long experience in implementing World Bank investment operations with social, environmental and dam safety impacts.

Project beneficiary while providing technical support for the implementation of activities under Component 3 by IPECE
SEDET will be a
as well as activities coordinated with FUNCEME
Project beneficiary while providing technical sup
SEDET will be a

Sustainability of water investments supported by the Project relies on the financial and economic sustainability and technical capacity of beneficiary utility to efficiently operate and maintain built infrastructure and to bear at least the O&M costs. The investment cost will be covered by the State and it is not expected to be recovered from the tariff. Arrangements will be made during implementation for transferring the infrastructure to CAGECE. The Project will assist CAGECE in improving its financial and technical performance through technical assistance towards improving commercial efficiency, increasing operational efficiency, and being better prepared to plan and manage service delivery and operation of water infrastructure, especially with the use of the Utility Turnaround Framework.

The Project will also address sustainability through the following activities: (i) education and communication programs to induce knowledge, attitude, and behavioral changes related to a range of drinking water issues and with regards to tariffs; (ii) citizen engagement mechanisms to enhance accountability; and (iii) application of Brazilian technical design standards, or international standards where Brazilian standards do not exist in the Brazilian normativity framework.

SRH, COGERH and FUNCEME will receive additional support from the Project with capacity building activities focusing on water resources management, climate and infrastructure, including dam safety. The technical specifications and terms of reference for improving water quality and quantity monitoring as well as for strengthening the climate forecast system are being prepared by FUNCEME, which has been a partner with the World Bank in several technical assistance activities over the past ten years.

The public good nature of climate change adaptation interventions related to more reliable supply of water, coupled with the large capital outlays required for their construction, justifies public financing of these investments. Nevertheless, the impact of these investments to the government budget could be mitigated by progressively increasing cost recovery within the water sector. This Project will contribute to this aim by revising and supporting the application of new tariff structure, setting the stage for the most direct beneficiaries of infrastructure investments to start paying for these services.

On the public sector strengthening side, the Project will strengthen institutional capacity for public resources management and decision-making. The proposed activities build on the previous initiatives supported by the Bank.

A preliminary environmental license has been issued with the requirements for the preparation of an Environmental Viability Analysis (EVA). The detailed designs including study of alternatives, the environmental and social analysis, the EVA and the works will be procured in the first year of Project implementation under a design and build contract.

The water tariff charged by CAGECE to the municipal water operators will be regulated by ARCE.

The decision to invest in water losses reduction was driven by the need to improve efficiency of water services provision to the city of Fortaleza, which relies on inter-basin transfers. The approach to sectorization and pressure control follows international best practice promoted by the International Water Association. Implementation of water losses reduction will be done by the private sector through performance-based contracts.

All the Terms of Reference for the implementation of technical assistance activities are being prepared and the selection processes for implementation of activities will be initiated right after effectiveness. The proposed technical assistance to improve CAGECE management and performance is based on both international best practices and successful experiences in Brazil.

By addressing water scarcity in the poor Northeastern region and improving efficiency of services, the Bank involvement is justified given its vast experience in addressing these water issues that ultimately bolsters equitable access to water supply.

Costs and benefits were expressed in constant prices as of 2018 at an exchange rate of 3.72 Reais per US dollar. The discount rate recommended by the World Bank guidelines is 6 percent, but the analysis uses a discount rate of 10 percent.

The net present value (NPV) of net benefits reaches US$59 million with a benefit to cost ratio of 1.42. The Internal Economic Rate of Return (IERR) for the Project reaches 14.5 percent.

In 2016, gross revenues were R$869.88 million (US$233.8 million) for water supply services and R$298.07 million (US$80.3 million) for sanitation services.

CAGECE is tackling losses based on reviewing accounts receivable and other receivables and contractual assets fo an amount equal to the expected credit loss, to ultimately improve its financial position based on increasing operating margins vis-a-vis debt and liabilities. Current financial liabilities expose CAGECE to risks and higher financial costs from variations in input prices and interest rate fluctuations.

Also, the negative balances from social contributions and tariffs that follow statutory periods have a cap of 30 percent of annual taxable profits to prevent the company to rely on subsidies or transfers to cover for lost revenue due to these provisions.

8,716 granted onerous and exclusive rights to CAGECE for the delivery of water supply services and water management for 30 years.

CAGECE assumed the commitment to pay the City concession, the equivalent of 1.5 percent of the monthly direct water and sewage revenues generated in Fortaleza

Fiduciary

(i) Financial Management

68. Financial Management Assessment (FMA)

The PMU within IPECE will undertake the primary fiduciary responsibilities for the Project, including: (i) preparing and obtaining approval of Project FM arrangements; (ii) coordinating and supervising Project implementation by all project executors; (iii) preparing and submitting Project interim unaudited financial reports (IFRs) for disbursement and monitoring 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 POM is observed.

Based on previous projects lessons learned, to mitigate implementation delays and documenting the use of funds, the PMU has been properly staffed to provide timely support and advice to the Project, including use of the asset management system, systematically assuring that the control of all funds transferred is properly and timely monitored.

First of all, the implementing agencies will: (i) develop terms of reference and technical specifications; (ii) prepare bidding documents; (iii) evaluate bids and proposals; and (iv) negotiate contracts.

The Procurement Plan will be updated in agreement with the Bank on a biannual basis or as required to reflect the actual Project implementation needs and improvements in institutional capacity.

Among the activities under the Project, direct environmental impacts are expected mostly from the works related with (i) the expansion of the water infrastructure and (ii) the implementation of water losses control and reduction activities.

It is expected that mitigation measures will be required for the following direct potential environmental and social impacts that are common on these project types: (i) civil works/construction activities can bring about noise, dust, and wastes; and (ii) local communities can be affected by the use of local roads for improving water services provision, affecting traffic patterns and local infrastructure, increasing levels of noise and dust and other nuisances and, consequently, posing risks to safety in local communities.

As part of the preparation process and in accordance with the World Bank project financing procedures, a screening of the type of activities proposed, their location, scale and magnitude and their potential direct and indirect socioenvironmental impacts was conducted. An institutional capacity assessment of the implementing agency for management of social and environmental risks was also carried-out. The following environmental safeguards are triggered: OP/BP 4.01 on Environmental Assessment; OP/BP 4.04 on Natural Habitats; OP/BP 4.36 on Forests OP/BP 4.11 on Physical Cultural Resources; and OP/BP 4.37 on Safety Dams

In this context, an Environmental and Social Management Framework (ESMF) was prepared, publicly disseminated and consulted.

The ESMF was also prepared based on the World Bank Group Environmental Health and Safety Guidelines (EH Guidelines). The ESMF includes a section on the CERC, listing the types of activities likely to be financed and evaluates the potential environmental and social risks and mitigation measures associated with them.

The ESMF considers the requirements of OB/BP4.36 whenever restoration activities are being planned.

The Project will rely on two existing dams

The Independent Dam Safety Assessment Report concluded that none of the two large dams related to the Project exhibit major anomalies, which could lead to imminent failures but recommended some additional investigations and analyses for detailed safety inspection and preparation/upgrading of non-structural measures, including improvements in the O&M plans and development of Emergency Preparedness Plans.

The

framework EPP and the preliminary O&M plans for both dams have been defined at Appraisal

A communication strategy related to the dam safety activities being implemented by the Project will be formulated and implemented. [illegible]

Additionally, the Borrower agreed to conduct immediate actions recommended by the independent expert and provide technical support for DNOCS for safety and operational monitoring, as required.

For the purposes of the proposed Project, a full assessment of the environmental and social impacts and benefits of Project activities has been carried out.

The Project will also improve the reliability of the water services in the city of Fortaleza.

First, it will be required that the Environmental and Social Management Plans (ESMPs) include labor influx management/camp management measures.

Therefore, no impacts are expected in the further approval process of the loan agreement.

Since the Federal Government is the guarantor of the operation, a change in fiscal space for new debt at both Federal or State levels would have impacts on the signing of the loan agreement.

Current CAGECE tariffs do not fully cover capital costs and COGERH bulk water charges to agricultural users have yet to be fully implemented. Project activities include support to the review of the CAGECE tariff structure and improvements in the regulation and charging of COGERH water users, with a focus on the agriculture sector.

Alternative studies, environmental and social analysis and engineering design of the large works will be developed under a design and build contract after loan effectiveness.

Although institutional capacity of implementing agencies and the institution in charge of Project Coordination is good, they will be further strengthened building on their previous experience in Bank-financed multisectoral operations.

The Client has a long and positive experience with the safeguard policies of the World Bank, having developed operations in a satisfactory way since the 1990s. A full assessment of the institutional capacity of State agencies to manage social and environmental risks was prepared and a strategy for institutional capacity building in this area is included in the ESMF.

SEDET will be a Project beneficiary while providing technical support for the implementation of activities under Component 3 by IPECE as well as activities coordinated with FUNCEME.

Project Implementation Arrangement

activities for SEDET with their technical support.

The PMU will be responsible for monitoring the overall Project execution, providing support to all implementing agencies on each of its responsibilities. It will be composed of a technical team to support the implementing agencies with financial, management, monitoring, control, operational and logistic tasks.

The specific attributions of the PMU will include: (i) general coordination of the Project; (ii) acting as focal point with the World Bank and its technical missions; (iii) preparation and submission of contractual reports (including Procurement and Financial Plans, Progress Reports, Midterm Review and Final Report); and (iv) monitoring and supervision of activities related to the socio-environmental aspects to ensure the compliance of the Bank safeguards.

Although the implementing agencies are responsible to prepare the bidding documents, it is the PMU's responsibility to guarantee the adequate and minimum quality for acceptance by the Bank.

The PMU will also be responsible for legal matters and for monitoring and ensuring overall safeguards compliance. Safeguards responsibilities related to Component 1 activities will remain under SRH considering its long experience in implementing World Bank investment operations with social, environmental and dam safety impacts; and CAGECE will have safeguards responsibilities for Component 2.

Procurement of works, goods, consulting and services will be carried out in accordance with the World Bank Procurement Regulation. Each of the implementing agencies will be responsible for its own projects and their due implementations, following the government's state flow for each phase of the contracting.

All projects will have a technical staff assigned by the sectoral executor, who will oversee all steps of the process, from the elaboration of the Term of Reference to the accountability of the service, work or good purchased.

The PMU will oversee the management, coordination, monitoring and evaluation of all Project activities, and 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 by all project executors; (iii) preparing and submitting Project interim unaudited financial reports (IFRs) for disbursement and monitoring 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 Project Operational Manual (POM) is observed.

Other executing agencies: Other project executing agencies will be responsible for providing technical inputs, but no funds will be transferred to these agencies, except in the case of COGERH and CAGECE, as explained below

To fulfill their mandate, the State annual budget law (LOA) includes a capital increase for the respective companies, which are transferred annually to each entity, through their line Secretariats.

An equivalent to a ledger account and a fund number will be created to separately account and record all loan transactions. All project contracts (including those that will be accounted as counterpart funds) will be associated to the project, thereby enabling the tracking of all sources and uses of funds, which will be reconciled with the monthly budget execution report sent to IPECE.

However, CAGECE and COGERH corporate systems will need to be customized to enable the export of the respective financial information to S2GPR.

All transaction processing (recording annual budgets, budget commitments, and payables; authorizing payments; and internal control reviews) will be carried out by the respective companies, who will execute payments and control the respective segregated project operational bank accounts.

The respective audit units will undertake the relevant project internal control activities, through reviewing bidding processes and financial execution of contracts.

IPECE, COGERH and CAGE staff must observe the highest standard of ethics, take all appropriate measures to prevent and refrain from engaging in, and reporting allegations of fraud and corruption in connection with the use of the loan proceeds, maintaining appropriate fiduciary and administrative arrangements, cooperating with Bank investigations, taking timely and appropriate action to address the problem, and following other applicable government and corporate related rules and guidelines.

The system can provide FM data to prepare respective reports in local currency (BRL) and USD (for purposes of documenting the DA), which are to be prepared for Bank purposes on a cash-basis (although the State follows accrual accounting). A specific cost center will be created in the system, to record all loan transactions and will be aligned with the structure of the loan to record transactions by category and component/subcomponent. The PMU will ensure the timely production of semester IFRs to be submitted to the World Bank, within 60 days after the end of each semester.

Accordingly, the format and content of the IFRs (in both BRL and USD) will cover the following items:

a . IFR 1A - Sources and Uses of Funds by Component and Subcompone 6, cumulative (project-to-date, year-to-date, and for the period) versus actual expenditures, including a variance analysis

b IFR 1B - DA bank reconciliation (as appropriate).

The disbursement of Project funds will be processed in accordance with 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 FM (PFM) country systems.

In case of CAGECE (works) and COGERH (goods), funds will be advanced from the DA to the separate segregated operational accounts opened by COGERH and CAGECE in BRL, to cover their project expenses for a three-month period

Retroactive financing will be allowed for components 1, 2and 3 of this Project up to an aggregate amount not to exceed USD27,976,000 to be made for payments up to 12 months before the signing date of the loan agreement for eligible expenditures as set out in the Legal Agreement.

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 Loan will have a Minimum Application Size of US$ 250,000 equivalent for Reimbursements and Direct Payments.

The table below specifies the categories of eligible expenditures that may be financed out of the proceeds of the Loan.

Counterpart funds will be managed separately from the DA and will be properly accounted for in S2GPR, monitored, and reported by IPECE in the IFRs.

When triggered, funds may be reallocated from other components and activities to facilitate the financing of goods and services under streamlined procurement and disbursement procedur El Eligible activities may include emergency rehabilitation works, supply of critical equipment, or any other critical inputs to ensure the continued operation of water infrastructure and provision of services.

Procurement for the proposed Project will be carried out in accordance with the World Bank Procurement Regulations for IPF Borrowers dated July 2016 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 timeframe will be agreed between the Borrower and the Bank in the Procurement Plan.

The World Bank's Standard Procurement Documents will govern the procurement of World Bank-financed Open International Competitive Procurement.

Procurement of works are expected under the project, including one large Water Treatment and Distribution Plant estimated at US$132 million and smaller water loss control interventions.

Goods procured under the Project will include, among others: IT and electronic equipment, water meters, software licenses, weather stations, drones, etc.

During Project preparation, it was agreed that operating costs are the ones associated with the coordination and implementation of the Project, including: (a) operation and maintenance of vehicles, repairs, fuel and spare parts; (b) equipment and computer maintenance; (c) shipment costs (whenever these costs are not included in the costs of goods); (d) office supplies; (e) utilities; (f) travel and per diem costs for technical staff carrying out supervisory and quality control activities; (g) communication costs, including advertisement for procurement proposals); and (h) all costs associated with audits.

The type and level of support will be guided by the scope of the Project, the activities in each component, relative risks involved, and the institutional capacity in place. Implementation support by the World Bank will consist of semiannual full supervision missions, short technical missions, meetings, and audio conferences between the World Bank and the Project representatives, including senior management and the PMU team, as appropriate.

National and international technical experts from the World Bank team will also provide advice to the institutions involved and to the PMU, as required, regarding draft ToRs, design and feasibility studies, technical assistance needs, knowledge exchange activities and, especially, promote/share innovative approaches.

Semiannual supervision missions and short follow-up technical missions will focus on the following areas:

(a) Strategic support.

During construction and commissioning, technical supervision will be provided to ensure that technical contractual obligations are met.

Moreover, technical assistance including capacity building and institutional strengthening will be provided to enhance performance of the Project-supported activities.

(c) Fiduciary support.

Supervision from the World Bank safeguard specialists will take place at least twice a year.

The proposed Project is a US$174.85 million IPF operation financed by a US$139.88 million IBRD loan and US$34.97 million in State counterpart funds.

Project activities comprise a set of interventions in three main areas: (i) water resources management, (ii) water service provision, and (iii) governance.

This component aims at contributing to increase water security through improved water resources management, expanded water infrastructure and specific investments to ensure the safety of Project-related dams.

Sub-component 1.1: Integrated Water Resources Management (US$10.82 million).

The State Water Resources Management Policy updated by State Law 14.844/2010, presents as one of its main management instruments, the concession of bulk water use rights. The concession of water rights aims at controlling the use and ensuring the right to access to bulk water, subject to the priorities established in the Water Resources State Plan and in the River Basin Plans. The same legislation addresses another important management tool, which is the water charging as an inductor for water resources management, using its economic value as a productive input. According to the law, water charge aims to encourage the rational water use, obtain financial resources for program financing, cover water resources management systems and associated interventions contemplated in the Water Resources State Plan and in the River Basin Plans.

Information obtained from medium- and long-term forecasts/scenarios together with improved knowledge on water demand in the river basins will serve as inputs for the negotiated water allocation process followed by the State. The climate forecasts produced by FUNCEME are relevant in decision-making processes concerning drought response, preparedness and mitigation actions at both State and Regional levels.

Integrated water resources management increases the available supply of clean water and contributes to its efficient use and distribution

Improving water use knowledge

6. The activities proposed by COGERH focus on the improvement of bulk water use knowledge through the macro metering and regularization of large water users. Universalizing macro metering aims at increasing more precise knowledge on the major systems demands through the implementation of flow meters for large users (i.e. urban supply, industries, irrigated perimeters), fostering the right assessment of volumes produced and volumes delivered. The regularization of users, together with the macro metering initiative, will provide knowledge on real water use demand, essential for water resources planning and implementation of management instruments. The implementation of these activities will lead to better knowledge of water demand in the state river basins water systems, including the representative aspect of the categories of water resources users, based on type of use, interference, size and/or consumption. It will provide inputs for the River Basin Committees, through the negotiated allocation process, to take decisions more coherent with the water reality, allowing for more adequate water distribution and more efficient water restriction policies; as well as elements for improved implementation of water resources management tools such as rights concession, charging and enforcement.

At water scarcity conditions, the updated registering may guide policies for water use restriction and make the monitoring and enforcement of system users more effective. From the state water resources system sustainability aspect, the activities will provide strategic information for the expansion of water use charges, with the possibility of defining the charging parameters based on the percentage of updated users, customized to the water condition, type of use, etc.

Provision of information about the following rainy season allows for early dialogue between water managers and users as well as for early decisions in the case of water crisis.

The climate forecasts produced by FUNCEME are relevant in decision-making processes concerning drought response, preparedness and mitigation actions at both State and Regional level.

The Drought Monitor is deployed as a key tool to support impact assessments and on-going dialogues between the nine states in the Northeast and the Federal Government about addressing drought risks and conditions in the region, thereby creating a platform for consensus building and institutional integration.

This tool will also bring additional drought indicators (i.e. Lear Area Index -LAI- and soil moisture) to further support agricultural and irrigation planning activities as well as risk/impact evaluations associated with drought conditions. Improved accuracy in generated climate forecasts will cascade into operating DSS with reduced uncertainties and enhanced reliability.

All these products are then either directly used or integrated into operating Decision Support Systems (DSS) to inform water resources planning and drought risk management.

Individual combinations of GCM forecasts considering different downscaling approaches surpassed the multi-model ensemble skill only occasionally, for specific combinations of regions, months and tested meteorological and hydrological drought indicators.

The assessment evidenced that with a multi-model ensemble probabilistic drought forecasting skills can be consistently enhanced for northeast region in Brazil.

As raining forecast is not the same as reservoirs inflow forecast, FUNCEME has been standing out for promoting climate information focused on the water resources sector, in particular, inflows forecast based on climate forecasts and its use for water allocation.

The proposed activities under the Project will guarantee the continuation of the efforts to provide timely information on climate, for water allocation decision making by water resources sector. They will strengthen the climate forecast system, not only by including an extra model, but also by increasing frequency of climate forecast, from monthly to bi-monthly basis. This effort for improving the processing and storage infrastructure capacity should be continued considering the evolution of numerical models in time and spatial resolution, which requires more IT resources. The scope of activities also includes the

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[4] ECHAM4.6 developed at the Max Planck Institute for Meteorology in Germany; more information in: Roeckner et al., 1992

[45] Drought events considered: a rainfall anomaly during the rainy season, standardized precipitation indices below a given threshold and anomalies in regional reservoir storage.

[4] The skill of the forecasting systems was evaluated with regard to root mean square error (RMSE), the Brier skill score (BSS) and the relative operating characteristic skill score (ROCSS).

Sub-component 1.2: Water Infrastructure (US$139.11 million).

ncreasing the safety of dams also contributes to more reliable water supply services considering that a dam failure could significantly affect available water supplies as well as the environment

The water delivered by the pipeline at the entrance of municipalities and districts will be stored in dedicated reservoirs and distributed by the existing systems.

The drought period, from 2012 to 2016, revealed serious impacts resulting from water scarcity, which led the main reservoirs of the State to depletion, and exposed the vulnerability of some existing systems abstracting water from rivers perenized by the reservoirs. Such abstractions require the release of water flows by reservoirs highly above the demands of the urban centers to be served, considering the losses in transit and the consumption of the other uses throughout the perennial, such as irrigation.

The State Government has, then, prioritized the use of resources to minimize the effects of droughts and has developed several actions to increase the State water security.

below presents, in a general way, the current situation of abstraction and distribution of raw water for the water supply systems of the municipalities of the State.

It comprises the construction of 4500 km of treated water pipeline network for a total estimated investment of US$1.4 billion that will benefit 6.3 million people in the next 25 years.

Current and proposed situation for water supply abstractions

19.

Although the focus of the project is the urban population, and therefore does not contemplate the construction of pipeline systems for the rural population, the project will consider in its dimensioning the entire population of the municipality, to allow, in the future, the integration with other supply systems, serving as a water source.

The Project will rely on two existing dams

Existing Dams Related to the Project.

treatment plant in the MRF.

The Independent Dam Safety Assessment Report concluded that none of the two large dams related to the Project exhibit major anomalies, which could lead to imminent failures but recommended some additional investigations and analyses for detailed safety inspection and preparation/upgrading of non-structural measures, including improvements in the O&M plans and development of Emergency Preparedness Plans.

Additionally, the regulating entity must immediately inform the National Water Agency (ANA) and the National Civil Defense System in the event of any non-compliance which involves an immediate risk to safety, or any accident occurring in dams under its jurisdiction.

The Borrower agreed to engage an independent panel of experts (the Panel) consisting of three or more experts, with expertise in the various technical fields relevant to the safety aspects of the dams.

Additionally, the Borrower agreed to conduct immediate actions for improving the safety condition of the dam. The framework EPP and the preliminary O&M plans for both dams have been defined at Appraisal.

A communication strategy related to the dam safety activities being implemented by the Project will be formulated and implemented .

Improving the Efficiency of Water Services (US$ 15.95 milli

Water Losses Control and Reductio This set of activities will support CAGECE in improving water supply efficiency through the implementation of water losses control and reduction activities in the city of Fo eza. The The proposed activities will contribute to CAGECEs Water Losses Reduction Program with focus on controlling pressure, sectorization and creation of District Metering Areas (DMAs) in priority sectors of Fortaleza Under its Water Losses Reduction Program CAGECE presents structuring actions for progressive reduction of water losses in distribution also in alignment with other strategic projects such as the PPP for design, build and operation of a seawater desalination plant to increase water security in specific sectors of the city of Fortaleza, which are being prioritized for the creation of DMAs.

The creation of DMAs will allow CAGECE to have detailed knowledge of losses related problems in the system, provide better equalization of pressures, and contribute to manage the losses in smaller areas, bringing better returns both in relation to actual and apparent losses.

Activities are in line with the MFD approach, especially with the preparation of a turnaround plan and development of a proposal for reforming the current tariff and subsidies.

This following phase will allow CAGECE management to plan and implement the Action Plan.

Water Losses Control and Reduction in the Metropolitan Region of Fortaleza

38.

Most of these losses are due to the difficulties of operational management, since its hydraulic sectors are very extensive and with a great number of connections.

The pressures in the MRF are controlled only at the exit of the macrosystem, being very difficult to maintain adequate pressures that allow to attend the bordering areas or in constant expansion, which causes a high rate of leaks.

Each DMA will have an input macro-meter, a pressure regulating valve (VRP) remote piezometric stations (EPZs) for critical pressure points (maximum and minimum), a VRP controller module, a VRP maintenance bypass and meter and a standard protection and hydraulic parts required for installation. In addition, it is planned to set up a control room to receive all the information and make decision-making, information management and supervise field and maintenance services.

The creation of DMAs is a methodology used worldwide and will allow for appropriate pressures for each specific area, as well as allowing to work with indicators, minimum nightly flows, localized fraud surveys, water balance and several other tools dedicated to the management of supply system losses. It is expected that the IPD (Distribution Loss Index) will be reduced from the current 52.20 percent to 41.76 percent after the implementation of the DMAs in the four sectors.

In addition to reducing losses and considering that the current average flow rate of the RMF water supply system is 8.5 m. 3/s, the implementation of the DMAs will provide a strong relief for the sources that supply water to the MRF.

This component will contribute to improving public sector governance, particularly in the water sector, through a set of activities aimed at embedding the use of evidence in planning and decision-making, improving service delivery and management of the State water resources, as well as increasing accountability.

The Bank will support capacity building activities, including for data analysis, particularly in those institutions that directly work in or with the water sector.

Activities within this group include support to establish, a dedicated and on-demand research group at the IPECE that would provide technical support in designing policies in the water and agribusiness sectors.

Improving public sector investments and management.

It will also include the implementation of a Public Investment Management System (PMIS) to support decision making throughout the entire public investment cycle (proposal, design, implementation and evaluation), as well as improve the management and monitoring of investments.[54]

46.

When triggered, funds may be reallocated from other components and activities to facilitate the ra financing of goods and services under streamlined procurement and disbursement procedur El Eligible activities may include emergency rehabilitation works, supply of critical equipment, or any other critical inputs to ensure the continued operation of water infrastructure and provision of services.

The project will also improve water efficiency in the main urban areas of Fortaleza. These investments will increase the volume of water available while also improving the efficiency of water withdrawals and use.

Public investments by the state are necessary for strengthening water security because of the limited financial return on these investments.

Current water treatment stations do not have the capacity for addressing current pollution loads, particularly of phosphorus pouring into water bodies, which shows an increasing trend of concentration.

Costs and benefits are expressed in constant prices as of 2018 at an exchange rate of 3.72 Reais per US dollar. The discount rate recommended by the World Bank guidelines is 6 percent, but the analysis uses a discount rate of 10 percent.

Without the project, there are approximately 101,000 inhabitants being supplied water from dubious quality from water tanker, with average route of 115 km.

Hence, the Project will provide benefits in the form of consumer surplus[5] 6 moving from truckers to piped water services (adjusted with the connection charges).

The net present value (NPV) of net benefits reaches US$59 million with a benefit to cost ratio of 1.42. Overall NPV of costs (capital, operation and maintenance costs) reaches US$140 million, and NPV of benefits reaches US$199 million. The Internal Economic Rate of Return (IERR) for the Project reaches 14.5 percen

The Project also yields positive NPV of net benefits under a 30 percent benefits reduction (US$0.65 million) and a 30 percent

Most of this population already has access to water distribution services of some kind but depends heavily on water trucks.

Total burden of disease avoided for the entire State of Ceara is estimated at US$52.7 million year and NPV of health benefits of the Project is estimated at US$2.5 million per year.

The GHG emission estimates were also included in the efficiency analysis of the Project The annual net emissions from subcomponent 1.2 are estimated at -1,033 tCO2-eq per year (-25,817 total tCO2-eq) and for subcomponent 2 net emissions are -692 tCO2-eq per year (-17,298) for the entire lifetime of the project.

The shadow price of carbon uses a low estimate of US$40/tCO2-eq and a high estimate of US$80/tCO2-eq as baseline values for 2021. The average values between low and high prices are applied to the GHG emissions assuming a growth rate of 2.26 percent per year for the lifetime of the Project. Accounting for the GHG emission, the NPV of the Project increases from US$59 million to US$60.5 million. By adding both the GHG estimates and health benefits, the NPV of the Projects reaches US$69.5 million.

Sensitivity of Project Adding Health and GHG benefits

	NPV Total (US$ million)	ERR
Baseline	59.0	14.5%
Adding health benefits	62.1	14.7%
Adding GHG estimates	60.5	14.6%
Adding GHG + Health Benefits	61.9	14.7%

14.

These initial investments will be the basic works needed to make other subsystems more efficient in producing, treating, distributing and storing water.

In addition, COGERH and CAGECE would need to improve coordination to maximize the returns of the Project in terms of water management and resilience against scarcity, water infrastructure delivery, and water and sanitation services.

Decentralization from state to local levels for water management and services has been partial. Although COGERH and Cagece are decentralized administratively, the allocation of strategic reservoir waters to local

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[8] Brazil is one of the few countries with disaggregated data of the Burden of Disease, published by the Institute of Health, Metrics and Evaluation.

This could place additional risks to the effective implementation and economic performance of the project.

In 2016, it was R$869.88 million (US$233.8 million) with water supply and R$298.07 million (US$80.3 million) with sewage services.

The Company is tackling losses by reviewing accounts receivable and other receivables and contractual assets for an amount equal to the expected credit loss, to ultimately improve its financial position based on increasing operating margins vis-a-vis debt and liabilities.

Current financial liabilities expose CAGECE to risks and higher financial costs from variations in input prices and interest rate fluctuations CAGECE built three financial scenarios to assess these financial risks and incorporate further variation in the US dollar and the respective future financial results that would be generated to cap with any increasing cost of financing.

To address these risks, CAGECE is monitoring capital to financial leverage ratios. That index corresponds to net debt divided by total capital of the company. The net debt, in turn, corresponds to total loans and financing subtracted from the amount of cash and cash equivalents and financial investments. The total capital is determined through the sum of the shareholders' equity, as shown in the balance sheet, with net debt.

Also, the negative balances from social contributions and tariffs that follow statutory periods have a cap of 30 percent of annual taxable profits to prevent the company to rely on subsidies or transfers to cover for lost revenue due to these provisions.

8,716

granted onerous and exclusive rights to CAGECI for the delivery of water supply services and water depletion management and mitigation activities for 30 years. In addition to the investments that CAGECE does for Fortaleza, the State transferred to the Municipal Government 22 percent of its shares with the right to vote on water and sanitation issues CAGECE assumed the commitment to pay the City concession, the equivalent of 1.5 percent of the monthly direct water and sewage revenues generated in Fortaleza ıe

Water and sewage services charged according to tariffs approved by the agency regulator are also legally bounded between Fortaleza and CAGECE.

Simultaneously, the share of the Brazilian population with access to wastewater services rose from 38.4% to 51.9%, giving access to sewage systems to more 40.6 million people, which means an increase of 64.2% in the number of Brazilians served.

Access to wastewater services have improved, but in a slower pace than at the regiona and national levels.

It is expected to improve reliability of water services for nine municipalities (including urban areas and selected rural districts).

First-hand data will be collected in three points in time (T 0, 1 and): T 0 baseline data will be collected before the new water infrastructures start operation on a sample basis; T 1 data will be collected at mid-term; and 2 data will be collected at the last year of project implementation.

The survey will measure, but not limited to: (i) days of sickness or hospitalization due to water-borne and gastrointestinal diseases; (ii) time burden to secure access to water supply and to take care of sick family members due to water-borne disease; and, (iii) impression of water quality and safety.