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Document of
The World Bank

Report No: ICR2160

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IBRD-72480 IBRD-76550)

ON A

LOAN

IN THE AMOUNT OF US$ 107.5 MILLION

TO THE

STATE OF ESPIRITO SANTO, BRAZIL

FOR THE

ESPIRITO SANTO WATER AND COASTAL POLLUTION MANAGEMENT PROJECT

"*PROJETO AGUAS LIMPAS*" AND "*PROJETO AGUAS LIMPAS II*"

March 30, 2012

Sustainable Development Department
Brazil Country Management Unit
Latin America and Caribbean Regional Office

CURRENCY EQUIVALENTS

(Exchange Rate Effective September 30, 2011)

Currency Unit = Brazilian Real (R$)
R$1.00 = US$0.54
US$1.00 = R$1.84

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

BOD	Biochemical Oxygen Demand
CAS	Country Assistance Strategy
CEC	Special counterpart financing account (*Conta Especial de Contrapartida*)
CESAN	Water Supply and Sanitation Company of Espírito Santo *(Companhia Espírito Santense de Saneamento)*
CPS	Country Partnership Strategy
EA	Environmental Assessment
EBITDA	Earnings before interest, taxes, depreciation and amortization
EMP	Environmental Management Plan
ICR	Implementation Completion Report
IEMA	Espírito Santo's State Institute for the Environment and Water Resources
IPHAN	Brazilian National Institute for the Preservation of the Historical and Artistic Patrimony
ISR	Implementation Status and Results Report
SEAMA	Espírito Santo's State Secretariat for the Environment and Water Resources
UGP	Project Management Unit *(Unidade de Gestão do Projeto)*
GVMR	Greater Vitória Metropolitan Region
WWTP	Wastewater Treatment Plant

Vice President: Hasan A. Tuluy
Country Director: Makhtar Diop
Acting Sector Manager: Greg Browder
Project Team Leader: Carlos E. Vélez
ICR Team Leader: Lizmara Kirchner

BRAZIL

ESPIRITO SANTO WATER AND COASTAL POLLUTION MANAGEMENT PROJECT

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MAPS

A. Basic Information			
Country:	Brazil	Project Name:	BR Espírito Santo Water & Coastal Pollution Management
Project ID:	P087711	L/C/TF Number(s):	IBRD-72480,IBRD-76550
ICR Date:	02/03/2012	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	State of Espírito Santo
Original Total Commitment:	USD 36.00M	Disbursed Amount:	USD 107.50M
Revised Amount:	USD 107.50M		
Environmental Category: B			
Implementing Agencies: SEAMA/IEMA CESAN – Espírito Santo Water Supply and Sanitation Company			
Cofinanciers and Other External Partners:			

B. Key Dates				
Process	**Date**	**Process**	**Original Date**	**Revised / Actual Date(s)**
Concept Review:	11/24/2003	Effectiveness:	01/11/2005	01/11/2005
Appraisal:	03/22/2004	Restructuring(s):	-	-
Approval:	07/01/2004	Mid-term Review:	-	-
		Closing:	09/30/2008	09/30/2011

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes:	Satisfactory
Risk to Development Outcome:	Low
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)			
Bank	**Ratings**	**Borrower**	**Ratings**
Quality at Entry:	Satisfactory	Government:	Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory
Overall Bank Performance:	Satisfactory	**Overall Borrower Performance:**	Satisfactory

C.3 Quality at Entry and Implementation Performance Indicators			
Implementation Performance	**Indicators**	**QAG Assessments (if any)**	**Rating**
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	Moderately Satisfactory
DO rating before Closing/Inactive status:	Satisfactory		

D. Sector and Theme Codes		
	Original	**Actual**
Sector Code (as % of total Bank financing)		
Sewerage	75	75
Sub-national government administration	10	8
Water supply	15	17
Theme Code (as % of total Bank financing)		
Environmental policies and institutions	17	15
Other urban development	17	17
Pollution management and environmental health	33	33
Urban services and housing for the poor	33	35

E. Bank Staff		
Positions	**At ICR**	**At Approval**
Vice President:	Hasan A. Tuluy	David de Ferranti
Country Director:	Makhtar Diop	Vinod Thomas
Acting Sector Manager:	Greg Browder	Danny M. Leipziger
Project Team Leader:	Carlos E. Vélez	Franz R. Drees-Gross
ICR Team Leader:	Lizmara Kirchner	
ICR Primary Author:	Jean-Martin Brault	

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)
The overall project objective was to meet the original (1994) project objectives of: (i) improving the efficiency of CESAN's water supply and sewerage systems; (ii) increasing the coverage level of CESAN's water supply and basic sanitation services; (iii) providing appropriate water and sanitation infrastructure in low-income urban areas, and (iv) strengthening SEAMA's and IEMA's environmental management capacity.

Revised Project Development Objectives (as approved by original approving authority)
Not applicable

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Coverage level in CESAN water supply systems			
Value quantitative or Qualitative)	95% (active connections only) and 97.5% (active and non-active connections)	93.8% (active connections only) and 99.8% (active and non-active connections)	98% (active connections only) and 99.8% (active and non-active connections)	100% (active connections only) and 100% (active and non-active connections)
Date achieved	12/31/2004	09/30/2008	09/30/2011	09/30/2011
Comments (incl. % achievement)	Non-active connections refer to households that have been disconnected from the water supply services due to non-payment of bills; 100% achievement.			
Indicator 2 :	Coverage level in CESAN sewerage systems			
Value quantitative or Qualitative)	23.9% (active connections only) and 23.9% (active and non-active connections)	30.2 (active connections only) and 36.9% (active and non- active connections)	52.2% (active connections only) and 60% (active and non- active connections)	34.4% (active connections only) and 46.5% (active and non- active connections)
Date achieved	12/31/2004	09/30/2008	09/30/2011	09/30/2011
Comments (incl. % achievement)	66% achievement for active connections, 78% achievement for active and non-active connections. Once the sewerage works are finalized in May 2012 target of active and non-active connections will be 100% achieved.			
Indicator 3 :	Water Quality Index in the distribution network			
Value quantitative or Qualitative)	93%	96%	97%	96%
Date achieved	12/31/2004	09/30/2008	09/30/2011	09/30/2011
Comments (incl. % achievement)	99% achievement			
Indicator 4 :	Unaccounted-for water			
Value quantitative or Qualitative)	45.8%	40%	38.8%	35.6%
Date achieved	12/31/2004	09/30/2008	09/30/2011	09/30/2011
Comments (incl. % achievement)	108% achievement			

(b) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1 :	Prepare a sanitation master plan for the urban Metropolitan Region of Grande Vitoria			
Value (quantitative or Qualitative)	TORs for selecting the consultants are ready	Sanitation master plan completed and approved	Sanitation master plan completed and approved	Sanitation master plan completed and approved
Date achieved	01/11/2005	09/30/2008	09/30/2011	09/30/2011
Comments (incl. % achievement)	100% achievement; sanitation master plan completed and being used by CESAN as an important tool to assist the company's management in the planning and setting overall targets for the improvement in sewerage service provision.			
Indicator 2 :	Number of water quality monitoring stations			
Value (quantitative or Qualitative)	183	201	201	201
Date achieved	12/31/2004	09/30/2008	09/30/2011	09/30/2011
Comments (incl. % achievement)	100% achievement			
Indicator 3 :	Efficiency of the wastewater treatment system			
Value (quantitative or Qualitative)	73%	90%	90%	95%
Date achieved	12/31/2004	09/30/2008	09/30/2011	09/30/2011
Comments (incl. % achievement)	This indicator monitors the efficiency of the Project's wastewater treatment plants in reducing the organic load (as measured by BOD_5) observed in wastewater; 105% achievement.			

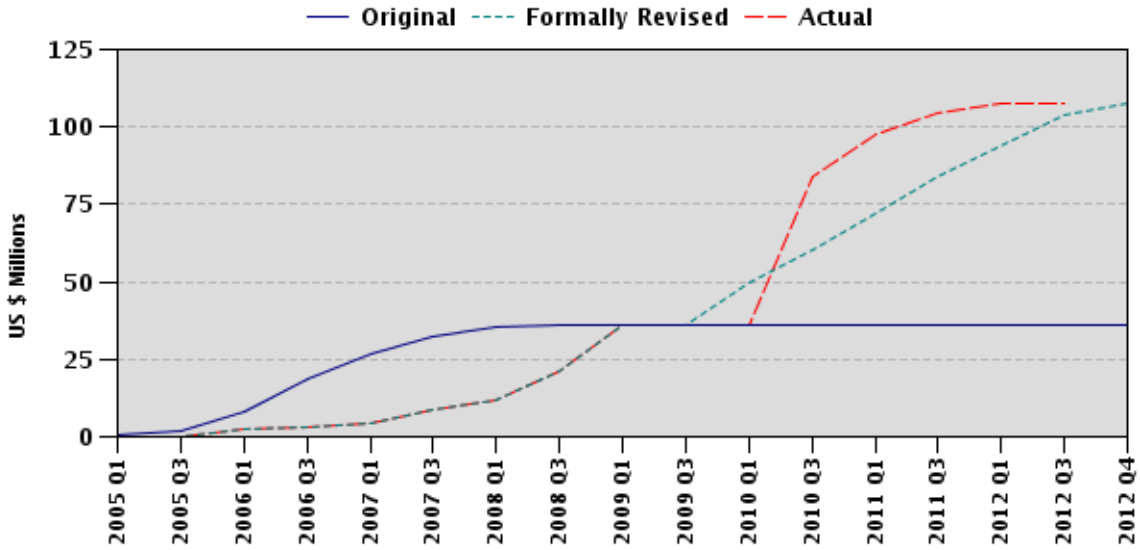
G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	11/10/2004	Satisfactory	Satisfactory	0.00
2	04/29/2005	Satisfactory	Satisfactory	2.18
3	06/29/2005	Satisfactory	Satisfactory	2.18
4	03/30/2006	Satisfactory	Satisfactory	2.86
5	12/22/2006	Satisfactory	Satisfactory	5.23
6	03/16/2007	Satisfactory	Satisfactory	8.64
7	10/17/2007	Satisfactory	Satisfactory	12.79
8	04/12/2008	Satisfactory	Satisfactory	21.17
9	01/16/2009	Satisfactory	Satisfactory	36.00
10	07/20/2009	Satisfactory	Satisfactory	36.00
11	02/07/2010	Satisfactory	Satisfactory	76.26
12	05/17/2010	Satisfactory	Satisfactory	83.70
13	02/14/2011	Satisfactory	Satisfactory	104.33

H. Restructuring (if any)

Not Applicable

I. Disbursement Profile



1. Project Context, Development Objectives and Design

1.1 Context at Appraisal

1. World Bank engagement in assisting the State of Espírito Santo to achieve enhanced and more equitable access to water and sanitation services began in 1994 through Board approval of the US$154.0 million Espírito Santo Water and Coastal Pollution Management Project (Loan 3767-BR), which was complemented by US$154.0 million in counterpart funds from the State of Espírito Santo and the Water Supply and Sanitation Company of Espírito Santo (CESAN), for a total of US$308.0 million. The project was highly ambitious and its institutional and operational risks were underestimated; as a result, the operation was substantially restructured in 1999, in which US$54.0 million were cancelled from the loan to bring the project's overall size in line with the State's ability to implement it. After the restructuring, implementation performance improved significantly, to the point where the Bank agreed in late 2002 to reinstate US$12.5 million in previously cancelled loan proceeds to complete ongoing works. By the time the 1994 loan closed on June 30, 2003, the original US$308.0 million operation had become a more limited US$183.0 million project with commensurate reductions in physical outputs and institutional achievements. The ICR for this loan was completed in April 2004.

2. At the end of 2003, the incoming State Government requested a loan to restore the financing that was included in the original loan but cancelled in 1999. This loan for US$36.0 million (Loan 7248-BR) was approved by the Board on July 1, 2004 and became effective on January 11, 2005. At the time of appraisal, the investment undertaken under Loan 3767-BR had helped to partially meet the water and sewerage coverage targets originally set in 1994, e.g., 46 percent of the original expansion target for sanitation connections was met. The US$36 million loan was needed to support the State in reaching the original coverage targets and institutional development objectives as set out in 1994.

3. Without the new financing, more than 50 percent of the capacity in four large secondary wastewater treatment plants (WWTP) built in the Greater Vitória Metropolitan Region (GVMR) would remain idle with negative environmental, social and financial consequences. In addition, the proposed loan planned to take the institutional achievements of the previous operation to CESAN a step further and undertake institutional strengthening measures that would hold the company accountable for results to its customers, improving governance structures and enhancing the overall transparency of the sector.

4. Finally, the institutional strengthening of the State's Secretariat for the Environment and Water Resources (SEAMA) as well as the State's Institute for the Environment and Water Resources (IEMA) was considered a major unmet challenge for the State Government, given the importance of strong environmental institutions for the sustainable management of water resources and sewerage infrastructure. There was strong political and administrative commitment from the State Government to the project and to continuing with the robust implementation arrangements in place since the 1999 restructuring.

1.2 Original Project Development Objectives (PDO) and Key Indicators *(as approved)*

5. The overall project objective was to meet the original (1994) project objectives of: (i) improving the efficiency of CESAN's water supply and sewerage systems; (ii) increasing the coverage level of CESAN's water supply and basic sanitation services; (iii) providing appropriate water and sanitation infrastructure in low-income urban areas, and (iv) strengthening SEAMA's and IEMA's environmental management capacity.

6. The project relied on key performance indicators used in the original 1994 loan and on a larger set of 41 physical, operational, environmental, and financial targets for CESAN which were a result of the company's benchmarking exercise. Key performance indicators identified and selected for the above project development objectives are presented in Table 1.

Table 1: Project development objectives and key performance indicators.

Project Development Objectives	**Key Performance Indicators**
Improve the efficiency of the water supply and sewerage systems of CESAN.	• Water Quality Index in the distribution network (%) • Unaccounted-for water (%) • Number of water quality monitoring stations (#) • Efficiency of the wastewater treatment system (% – BOD removal)
Increase the coverage level of CESAN's water supply and basic sanitation services.	• Coverage level in CESAN water supply systems (%) • Coverage level in CESAN sewerage systems (%)
Provide appropriate water and sanitation infrastructure in low-income urban areas.	• Coverage level in CESAN water supply systems (%) • Coverage level in CESAN sewerage systems (%)
Strengthen SEAMA's and IEMA's environmental management capacity.	• Water quality monitoring program implemented

1.3 Revised PDO and Key Indicators, and reasons/justification

7. The project objectives and key indicators did not change during implementation.

1.4 Main Beneficiaries

8. The Project was designed to enable 1.6 million people in the State of Espírito Santo to benefit from follow-on investments in improved water supply services (improved service continuity, pressure and water quality) and about 350,000 people to benefit from additional sewerage connections.

9. At appraisal, approximately 658,000 (41 percent) of the 1.6 million people that would benefit from improved water supply services were expected to be poor (family incomes of less than 3 minimum salaries) while 109,000 (31 percent) of the 350,000 direct beneficiaries of new sewage collection and treatment systems fell within the same category.

1.5 Original Components (*as approved*)

10. The project consisted of four technical assistance and investment components:

11. *Component 1: Institutional Strengthening of SEAMA and IEMA*. The activities included in this component constituted a program to strengthen the institutional capacity of SEAMA and IEMA. Investments included (i) an institutional and strategic planning exercise; (ii) the design and installation of an integrated environmental information system; (iii) the development of a monitoring network for environmental and water resource management; (iv) the development of IEMA's environmental licensing capacity; (v) the development of a state-wide water resource management system; and (vi) training and environmental education activities.

12. *Component 2: Strengthening of CESAN and of the State's Sanitation Sector*. The activities included in this component were selected to strengthen CESAN's institutional, operational and financial capacity and performance. This included (i) the development of a performance benchmarking system to track CESAN's service quality as perceived by users, and its operational and financial performance; (ii)

the design and implementation of actions to improve CESAN's corporate governance; (iii) training of CESAN's staff; (iv) non-revenue water reduction; (v) environmental management and education; (vi) support for new household sewage connections and operational improvements; and (vii) strengthening of the Borrower's sector organization and the legal and regulatory instruments for water and sanitation service provision.

13. *Component 3: Water Supply Investments*. This component constituted an investment program including (i) the expansion and upgrading of the Carapina and Caçaroca water treatment plants; (ii) the upgrading of the Ibes-Boa Vista transmission main; (iii) the expansion and upgrading of the Santa Clara, Pedreras/Santo Antônio, Garoto, Araçás, and Morro do Pico storage tanks; and (iv) the upgrading of the Guarapari raw water transmission and treatment systems.

14. *Component 4: Sewerage Investments*. This component constituted an investment program including (i) a sanitation master plan for the GVMR as well as the development of a water quality model; (ii) the expansion of sewage collection systems in the cities of Vitória, Vila Velha, Guarapari and Cariacica; and (iii) the construction of new sewage collection and treatment systems in the districts of Nova Almeida and Praia Grande (in the city of Serra), in the district of Manguinhos (in the city of Serra), and in the city of Viana.

1.6 Revised Components

15. Additional financing in the amount of US$71.5 million (Loan 7655-BR) was approved in 2008 to complement this loan and help finance the costs associated with a financing gap caused primarily by the devaluation of the US Dollar in relation to the Brazilian Real (39 percent of the cost increase), domestic inflation (42 percent of the cost increase), and additional costs of building the water and sewerage works (19 percent of the cost increase), corresponding mainly to design changes in the sewerage works. The additional financing became effective on February 24, 2009 and closed on September 30, 2011.

16. The original design of the Sewerage Component was modified during the preparation of the additional financing. The original bidding documents for contracting the sewerage works[1] were based on a 2005 updated engineering design, but given the cancellation of the bidding process in 2006,[2] the engineering design of these works was revisited in 2007. Studies concluded that a single stage of treatment works for an incremental capacity of 360 l/s (implemented as an extension to the Mulembá WWTP) would more efficiently satisfy the demand in the GVMR for the design horizon. This redesign also required increasing the capacities of the pumping stations and the outfall, as well as updating the cost estimate of completing the sewerage works and reviewing and re-launching the tendering process.

1.7 Other significant changes

17. In parallel to re-estimating the project costs, the State Government also revisited the financing plan. The redesign that took place during the preparation of the additional financing also required revising the financing plan, which implied removing some of the original activities from the Bank-financed program: (i) the new sewerage collection network works in Serra (94.7 km of pipes); (ii) the new sewerage networks in Praia do Canto, Praia da Costa, Praia do Morro and Cariacica (251.4 km of pipes);

[1] These works consisted of the expansion of the sewage collection systems in the cities of Vitória, Vila Velha, Cariacica, and Guarapari and the construction of new sewage collection and treatment systems in the cities of Serra and Viana.
[2] The bidding process was cancelled as a result of offers significantly above CESAN's cost estimates for the works. CESAN took this opportunity to revise and improve its bidding documents, technical designs, and parameters for estimation of costs.

and (iii) the new sewerage systems in Jucutuquara and Vitória Centro, including Ilha do Boi and Ilha do Frade (144.8 km of pipes).

18. As a result of this exercise and to keep the estimated cost of the sewerage works within the available financing envelope, the State Government transferred some of the works to a cluster of works to be financed by the Federal Government under the Growth Acceleration Program (PAC - *Programa de Aceleração do Crescimento*), and financed the remainder with its own resources, with the exception of the sewerage collection networks in Serra for which CESAN is currently considering the implementation of a public-private partnership.

Table 2: Financing plan revision.

Financing Source	**Initial Funding (US$ million)**	**Additional Funding (US$ million)**	**TOTAL (US$ million)**
IBRD	36.00	71.50	107.50
State of Espírito Santo/CESAN	26.32	38.50	64.82
TOTAL	62.32	110.00	172.32

19. The disbursement categories and the percentages of Bank financing for the US$71.5 million loan were modified and differed from the first US$36.0 million loan agreement. The works, goods, consulting services and training categories were grouped under one category for which 80 percent of the expenditures would be financed by the Bank, as opposed to 75 percent for works and for goods, 80 percent for consulting services related to institutional strengthening and water supply and sewerage works, and 100 percent for training in the first loan.

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

20. The project's design is considered satisfactory, as it sought to continue the original 1994 project approach of addressing water resource management in urban areas in a more comprehensive and sustainable manner, focusing on improving service levels as well as the performance of CESAN and incorporating the lessons learned to date. At the time of appraisal, the State Government had made clear its strong commitment to the project as it contributed to improved environmental management, which was a cornerstone of the State's strategic program.

21. The design continued with the implementation arrangements used for the project since the 1999 restructuring, which had proven to be robust and effective at meeting objectives in a timely and efficient manner. In addition, the project put in place adequate mechanisms to mitigate the identified implementation risks to the project, including:

a. Establishing an independent Project Management Unit (*Unidade de Gerenciamento de Projeto* – UGP) that would benefit from the support of an experienced, independent project management/engineering firm, and would closely coordinate project implementation activities with CESAN and SEAMA/IEMA.
b. Given earlier counterpart financing difficulties experienced earlier, project implementation for water and sewerage investments required the deposit in advance of the necessary counterpart funds for each phase (equivalent to 3 months' cash flow) into an escrow account. The State Government and the Bank viewed this as a mechanism both to ensure the timely completion of

project activities and to instill confidence in contractors and consultants that invoices would be paid without undue delay.

22. Project risks were adequately identified at appraisal and were associated in particular with CESAN's institutional sustainability, more specifically with (i) the environmental sustainability of sanitation investments and (ii) generating expected financial and economic benefits. In that sense, project activities would have to focus on better connecting new users to the sewerage collection network, improving bill collection performance, institutional strengthening of CESAN and on building a strong partnership with SEAMA.

2.2 Implementation

23. Project implementation arrangements proved once again to be robust and effective at meeting objectives in a timely and efficient manner. The contracting strategy adopted for the major water supply and sewerage works proved to be efficient, with the use of turnkey contracts as its center piece and the support brought to the UGP by a project management/engineering firm, who was also responsible for supervising the works. This firm (i) provided technical, administrative and financial management support for project implementation; (ii) reviewed and updated existing engineering designs for project works; (iii) prepared additional environmental studies as required; (iv) hired specialized individual consultants as required for project implementation; and (v) supervised contracts for works, goods and other consultants in cooperation with CESAN and IEMA.

24. The works (particularly the wastewater works) implemented under the project were complex in nature as an important portion of the collectors had to be installed in highly urbanized areas, which presented significant challenges, in addition to issues related to the high water table, high tide and rocky soil in a few areas. Relying on turnkey contracts with pre-qualification for the design and implementation of the works proved to be an advantage, as the allocation of greater responsibility and autonomy to the contractor in proposing value-added solutions attract companies of high quality and proven capacity to handle the risks, guarantees and established targets. In addition, turnkey contracts simplify the process of progress evaluation allowing for faster payments, and also allow for much faster execution, as the contractor has an incentive to quickly resolve obstacles faced during implementation.

25. In the second half of 2006, shortly after the State's decision to request financing for the completion of the sewage collection and treatment facilities, the bidding process of the first sewerage works to be financed by the Bank under the project was unsuccessful. The works were to be contracted via a large turnkey contract, with significantly larger scope and complexity, and the offers were exceptionally higher than the estimated cost.

26. After a round of discussions internally and with the Bank, CESAN decided to cancel the bidding process, which resulted in a delay in contracting these works, and review its approach to the sewerage turnkey contracts. As a result, the engineering design of these works were revisited and studies concluded that a single stage of treatment works for an incremental capacity of 360 l/s would more efficiently satisfy the demand in the GVMR for the design horizon. In this process, the project management company also revised and improved the methodology used to budget for planned investments, incorporating concepts related to the level of risk as well as to the scope of works. The revised bidding process was successful in 2007, the contract was signed in early 2008, and the contracted works were largely completed before September 30, 2011, the project's closing date.

27. CESAN has had limited success with the rate of connection to the sewerage network by users; as of December 2011 there were still 57,000 connections to the sewerage network to be made by CESAN representing about 58 percent of the connections already made active by the company to date (98,400 in

total). Once the works are completed in May 2012, another 57,000 connections will be ready to be made by CESAN. The company has been working on this issue since 2006 with the assistance of municipal governments and their environmental authorities in trying to remove legal obstacles and improve monitoring, and through communication and public education campaigns with mixed results. As described in Section 2.5 below, in late 2010, CESAN has increased the scope of its efforts to improve the rate of connection to the system, and it is expected that by 2015 all 114,000 households will be connected to the sewerage system.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

28. ***M&E design.*** Indicators identified to monitor progress toward achieving the PDOs were agreed upon in an exchange of letters between the State and the Bank and were similar to the ones used in the original 1994 loan. Care was taken to ensure that the indicators had technical, operational, environmental and financial meaning for the utility (and not only the project). These 25 indicators allowed a clear assessment of the contribution of project activities to performance improvements.

29. ***M&E implementation and utilization.*** During project implementation, these indicators were complemented with 16 additional ones as a result of further refinement of CESAN's benchmarking exercise, and were used to monitor the project targets and long-term benefits. The collection and monitoring of the project indicators data was coordinated by CESAN and IEMA. The Bank's project team followed up during supervision on the utilization of the agreed upon indicators to monitor the progress of ongoing project activities.

30. CESAN was responsible for reporting every six months on the indicators related to the company's operational performance and on the quality of service provision, while IEMA monitored water quality and coastal pollution, on a weekly basis, through a water quality sampling network in the main hydrographic basins of the state and a coastal pollution sampling network on 46 beaches along the state coast (totaling 71 sampling locations). Results of this analysis are posted on the internet on a monthly basis in a friendly format to inform the population about water quality on each beach, as measured by the coliform index.

31. An important element of M&E utilization during the project was the fact that CESAN internalized and refined the larger set of indicators described above for its own purposes, improving the utility's decision-making and resource allocation processes. The internalization and appropriation of these indicators ensure the sustainability of these M&E arrangements beyond the project's implementation period. Furthermore, CESAN published its results state-wide twice a year to enhance accountability vis-à-vis the public.

32. CESAN and SEAMA/IEMA also published yearly management reports and submitted them to the Bank. These complete and detailed reports offered an excellent review of the main accomplishments of both entities every year. The implementation of the M&E framework described above provided reliable and well coordinated results and can be considered best practice in the way they have been incorporated by the institutions in their day-to-day management.

2.4 Safeguard and Fiduciary Compliance

33. ***Safeguard.*** The following Bank Safeguard policies were triggered and applied to the project: Environmental Assessment (OP 4.01) and Physical Cultural Resources (OP 4.11). There were no deviations or waivers from Bank safeguards, fiduciary policies and procedures during the implementation of the project, and compliance with applicable safeguard policies was rated satisfactory throughout the

project. Given that the planned works took place in the public right-of-way and in unoccupied areas that were already owned by CESAN, OP 4.12 was not triggered and did not apply to the project.

34. The project was classified as Environmental Category B, requiring the preparation of an Environmental Assessment (EA). In accordance with the OP 4.01, EAs were carried out in 2004 and 2008, as a result of the modification in the design of the sewerage component. The US$71.5 million additional financing activities were reviewed by the Bank Safeguard Advisory Team, which confirmed the Environmental Category B classification for this project. Included in the provisions of the Environmental Monitoring Plan (EMP) was the adoption of an environmental construction manual during the construction of the planned works. This manual was included in the bidding process for all construction works, and the adoption of the adequate environmental practices established in the manual was deemed a contractual obligation to be fulfilled by companies contracted.

35. All other provisions of the EMP were adhered to, including carrying out research for the adequate treatment and use of sludge in agriculture. This work was developed through a partnership between CESAN and the State's Institute for Rural Development (INCAPER), and resulted in the publication of an extensive manual for the use of sludge in agriculture and forestry. In 2009, the research team received a State prize for innovation in public management (INOVES).

36. At the time of the completion of the original EAs, there was no indication that the areas where new sewerage and water supply systems would be implanted were located on archeological sites or areas of cultural or historical importance. However, once the project was redesigned and the decision was made to extend the Mulembá WWTP, the WWTP design could impact the "*Paneleiras*," a women's association that for generations has produced clay pottery used in the local cuisine.

37. In 2001, during the environmental licensing process of the original Mulembá WWTP, an agreement was signed between the State Government and the *Paneleiras* Association guaranteeing that the *Paneleiras* would have access to the site, and that their traditional activities would not be impacted or affected by the construction. This 2001 agreement already included the area for expansion of the WWTP, and among other points, established that the clay material existing in the area of construction of the WWTP would be removed, stored and put at the disposal of the *Paneleiras*.

38. In 2002, the craft of the *Paneleiras* was recognized formally by the Brazilian National Institute for the Preservation of the Historical and Artistic Patrimony (IPHAN) as National Cultural Patrimony, and from this date, IPHAN needs to approve any action that impacts the craft or the clay deposits. All of this information was taken into account in the design and the location of the expansion to the Mulembá WWTP. The IPHAN provided its approval during the environmental licensing process of the expansion works, and requested specific procedures to be adopted during the clay removal process, which were included in the environmental license granted for the works. The work of identification and removal of the clay material was carried out with the participation of the *Paneleiras* (as it was done in 2001), and all specified provisions were adhered to during construction of the WWTP.

39. ***Financial Management.*** Financial management arrangements in place were satisfactory and the implementation arrangements ensured adequate financial management capacity and systems were in place and operational. Financial Monitoring Reports were submitted on a quarterly basis, and audits for both the Project and CESAN were carried out on an annual basis and timely submitted to the Bank for review and comment. All audits were unqualified.

40. ***Procurement***. Most of the procurement financed by the project was subject to prior review, given the Borrower's preference for larger turnkey contracts that better suited the large and complex nature of the works to be implemented. Procurement plans were updated on a regular basis, and aside from the

unsuccessful bidding process in 2006 for the contracting of the first large sewerage works mentioned in Section 2.2 above, there were no other major issues related to procurement during implementation.

2.5 Post-completion Operation/Next Phase

41. As of March 2012, a small fraction of the sewerage collection construction works needs to be completed and the full benefits of these activities were therefore not reflected in the ICR, particular with regards to the indicators related to the sewerage investments. The construction of the extension to the Mulembá WWTP is at the assisted operation phase and will enter into full operation in August 2012, and the sewerage collection works in Vitória will be finalized by May 2012 (99 percent completed as of March 2012). The finalization of these works has been financed with CESAN's own resources.

42. The benefits resulting from the completion of these works will increase the coverage of sewerage collection and treatment by an additional 14 percent of the population of the GVMR to reach a total of 60 percent. This is an important result as it enables CESAN to further build and increase the number of active – revenue-generating – connections to the network.

43. CESAN has the adequate capacity and experience to manage the operation and maintenance of the water and wastewater systems built under the project. The company subcontracts the operation and maintenance of some of its systems to the private sector, as is the case with the wastewater system financed under the project.

44. As a result of the financial support provided by the project, as well as the strong and continued commitment by the State Government to strong environmental institutions for the sustainable management of water resources and sewerage infrastructure, SEAMA and IEMA have improved their capacity to manage water resources, issue environmental licenses, manage knowledge and foster innovation. Examples of these improvements include the development and implementation of an environmental licensing information system, which reorganized the environmental licensing procedures in a systematic way and reduced the time needed to grant environmental permits, and the modernization of the hydro-meteorological network, which is still underway. In the recent strategic planning exercise focused on results undertaken by the State of Espírito Santo, these institutions have prepared a strategic plan that builds on the project achievements and continue to prioritize future activities and projects with well-defined targets, schedule and scope. As a result of the strategic planning exercise, SEAMA and IEMA are planning to undertake a full review and re-engineering of its organization and processes, with a view towards improving their efficiency and performance in all aspects of the State's environmental management.

45. Faced with the costs of the operation and maintenance of the sewerage networks being completed, in late 2010 CESAN created a specific division dedicated to improving communication related to connection to the sewerage system with households and accelerating connections to the sewerage networks being delivered and under construction. This division was able to mobilize funding from the State government to subsidize connection costs to low income households[3] and has created a multi-faceted program "Connect to the Network" ("*Se Liga Na Rede*") to scale-up the communication efforts with the community in order to increase the rate of household connections to the network and promote the health and environmental benefits of doing so. The program plans to connect 12,000 households in its first phase set to begin in April 2012, with an additional 102,000 evenly distributed until 2015 (34,000 connections per year). Its main activities consist of: (i) a larger and better targeted communication and

[3] A major identified impediment for low income households to connect is the connection cost and a further deterrent is the increase in the bill overall to include sewerage charges.

marketing campaign, (ii) an environmental education program targeted to schools, (iii) mobilization at the community level, and (iv) door-to-door campaigns on the importance of connecting to the sewerage network. The marketing campaign and the education program have already been launched, but the contracts to assist CESAN with the targeted outreach and actual connections are set to start in April 2012.

46. Finally, the State is eager to continue the evolving partnership with the Bank through a new operation that would build on the achievements to date and focus on financing technical assistance and investments in integrated urban water management coupled with watershed protection aiming at improving water quality upstream of treatment for the capital and thus reduce the burden on its water treatment plants.[4] Among the activities being considered for financing under this new operation is the review and re-engineering of SEAMA and IEMA's organization and processes.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

47. The objectives of the project were clearly defined and were highly relevant to the State's and the Country's social and economic development and continue to have a high degree of relevance at the national and local levels. The project objectives were designed to enable the beneficiaries in the project area to benefit from improved quality of and access to water supply and sewerage services through improving the efficiency of CESAN's water supply and sewerage systems, as well as strengthening the environmental management capacity of SEAMA and IEMA.

48. The project was fully consistent with the Country Assistance Strategy (CAS) developed for the fiscal years 2003-2007 period which selected long-term development indicators for a more equitable access to basic services such as safe water supply and sanitation services. It was also consistent with the Country Partnership Strategy (CPS) developed in 2008, which continued to support the four pillars put forth in the original CAS: equity, sustainability, competitiveness, and sound macro-economic management. The project's development objectives were also in line with the water sector strategy for Brazil. This strategy recognized water as an important element to promote sustainable growth and a more equitable and inclusive society, and highlighted the importance of improving institutional capacity and efficiency.

49. Bank implementation remained responsive to changing needs, particularly at appraisal of the additional loan when the sewerage component needed to be redesigned, following an unsuccessful bidding process. Based on the above, the ICR rates the relevance of this project as high.

3.2 Achievement of Project Development Objectives

50. The achievement of the project development objective is rated satisfactory based on the continued improvements in CESAN's overall efficiency of service provision and financial performance, as well as on the marked improvement in capacity of SEAMA and IEMA. CESAN increased water coverage to 100 percent in its area of service, and sewerage coverage in the GVMR will increase from 20 to 60 percent between 2004 and May 2012 (when all works are completed), representing an additional 679,350 people with access to the sewerage network. The company, also over the same period: (i) reduced its water losses

[4] The gradual changes in technology in Vitoria's water treatment plants over the last three decades from direct filtration in the 1980's, to floatation at the beginning of the 2000's, to the current need to upgrade to conventional treatment exemplify the deteriorating quality of water supply sources for the State's capital.

from 45.8 to 35.6 percent (which represents a reduction from 676 liters/connection/day to 459.6 liters/connection/day), (ii) reduced its expenses as a share of revenues from 74.4 to 66.7 percent, as a result of a 40 percent increase in revenue and a 32 percent reduction in commercial losses, and (iii) increased its EBITDA margin from 26 to 30 percent between 2004 and 2011.

51. The assistance provided to SEAMA and IEMA enabled these institutions to improve their performance in the areas of water resource management, in which: (i) a licensing process for water rights was established and improved upon, (ii) incentives were provided for the creation of basin committees, and (iii) an inventory of main water users was carried out in 12 basins and the resulting information management system is the main tool used in the process of licensing for water rights. SEAMA/IEMA also implemented a water quality monitoring program, in which the quality of waters of the state coast is monitored in 71 different points and the information made publicly available on the internet as to whether or not the beaches are appropriate for bathing. In addition, the environmental licensing process was improved, streamlined and a new information system was developed to manage more efficiently the licensing process. As a result, the number of environmental licenses issued by SEAMA/IEMA increased almost threefold from 599 in 2003 to 1,628 in 2011 – with a peak of 2,111 environmental licenses issued in 2010.

52. One shortcoming to the achievement of the PDOs was the relatively low rate of connection to the sewerage network by users. As of December 2011, there were 57,000 connections to the sewerage network to be made by CESAN, representing about 58 percent of the connections to the network made to date (98,400 in total). Once the works are completed in May 2012, an additional 57,000 connections will be made available as well for a total of 114,000 connections to be made by CESAN. The company has been working on this issue since 2006 with the assistance of municipal governments and their environmental authorities in trying to remove legal obstacles and improve monitoring, and through limited communication and public education campaigns, with mixed results. As described in Section 2.5 above, in late 2010, CESAN increased the scope of its efforts to improve the rate of connection to the system stepping up its communication efforts, and it is expected that by 2015 all 114,000 connections to the sewerage system will be made by the company (12,000 in 2012 and the remainder evenly distributed in subsequent years). In contrast, all other Project targets have been fully achieved.

53. *Component 1: Institutional Strengthening of SEAMA and IEMA*. Under this component the water user cadastre was updated and the processes for licensing water rights have been streamlined; water basin committees were created, and 300 committee members received training; water resource demand studies and guidelines for the preparation of state watershed plans have been developed; and the hydro-meteorological network has been configured and modernized.

54. The project financed important information systems that, coupled with the State Government's resolve to strengthen environmental management as evidenced by putting in place a strong management team and dealing with the understaffing of these institutions by carrying out staff contracting processes in 2004 and 2007 and training the contracted staff, proved to be key in advancing the structuring of these institutions to adequately perform their functions.

55. In the area of environmental licensing, the project supported the creation of the Environmental Licensing Information Management System (*Sistema de Informações para o Licenciamento Ambiental*), which improved IEMA's capacity to respond to licensing demands by reorganizing the environmental licensing procedures in a systematic way and reducing the time needed to grant environmental licenses. This allowed IEMA to gradually increase the number of licenses granted each year between 2004 and 2011, reaching a total of over 11,000 licenses during this period.

56. *Component 2: Strengthening of CESAN and of the State's Sanitation Sector*. Important results were achieved by CESAN with regards to its financial, commercial and institutional performance. These achievements are impressive, considering the limited size of the resource envelope dedicated to this component, and reflect the company's dedication to improving its performance and quality of service, with the sustained support of the Bank since 1994. One of the main results from this component was the development of an information system for operational control as well as performance benchmarking to monitor both CESAN's service quality as perceived by users and its operational and financial performance. This system restructured the company's databases and its approach to storing information to one where the data is structured in a way which allows for easy identification of issues and the indicators are geared toward supporting the company's strategic goals. The project also financed the development and deployment of an information system to help the company better manage its environmental information and licensing processes. Table 3 illustrates CESAN's financial and service quality performance.

Table 3: Main financial and service quality results achieved by CESAN.

Indicator	**2004**	**2007**	**2009**	**2011**	**Target**
EBITDA margin (%)	25.6	27.3	26	28.6	23.3
Days in accounts receivable	76	65	71	61	60
Return on equity	6.39	4.43	6.15	5.75	3.4
Water Quality Index (% of analyses within established quality standards)	93	97	95	96	97
Total time for repairing leaks in the water network (hours)	214	78	77	53	90
Total time to repair/maintain sewerage network (hours)	289	53	27	26	48
Water losses (%)	45.8	39.9	35.9	35.6	38.8
Water losses (liters/connection/day)	690	606	480	460	511

57. CESAN's improved service delivery also helped achieve efficiency gains and enhanced its effectiveness. The Water Quality Index improved over the course of the project and CESAN also installed 201 water quality monitoring stations, reaching the respective targets set at appraisal.

58. *Component 3: Water Supply Investments*. The works financed under the project included reservoirs, water treatment plants and transmission lines. CESAN increased its treated water storage capacity by 56 percent compared with 2002, reaching 108,970 m^3 in 2011, reducing intermittency and providing services with greater operational security and more efficient system management. The water supply network was also increased by 28 percent from 2002, reaching 6,924 km in 2011 and the project allowed production capacity to increase by 22 percent.

59. As a result, 1,688,485 people have benefited from improved water supply services, 40 percent of which are considered low income (657,278 people). CESAN now provides water to urban areas of 52 municipalities of Espírito Santo, which represent 75 percent of the State's population. Unaccounted-for water was reduced from 45.8 percent at appraisal to 35.7 percent in 2011. In 2003, CESAN launched a program to eliminate the 7 percent of the population which remained with intermittent and deficient service provision in the GVMR. Low income municipalities such as Cariacica had a large share of its residents affected by this issue. This program improved the reliability of supply and the rate of intermittency of supply was reduced to 1.5 percent of the population in the GVMR.

60. *Component 4: Sewerage Investments*. Works implemented under the project allowed for the extension of sanitation coverage to about 679,350 people, 31 percent of which are low income (210,598

people). While CESAN's performance in connecting households to the network has improved, additional and sustained efforts need to be made to address the expanding gap between connected and available-but-not-connected households: only 66 percent achievement for active connections and 78 percent achievement for active and non-active connections were reached. CESAN has taken important steps in this regard, creating in late 2010 a division in charge of efficiently controlling the rate of sewerage connections, devising the connection policy and developing strategies to attend to its clients. Also, as CESAN faces the increased costs of operation and maintenance of the sewerage networks being completed, the issue of accelerating the pace of connections to the network has been seen as a critical one and has been given a high profile by the company's management. At the time of the finalization of this ICR, CESAN was also finalizing the hiring process of firms to support the implementation of its "Connect to the Network" Program ("*Se Liga Na Rede*") to scale-up the rate of household connections to the network and promote the health and environmental benefits of connecting to the network. The program plans to make 12,000 connections starting in April 2012, with the remaining 102,000 connections evenly distributed until 2015 (34,000 connections per year).

61. The extension of the Mulembá WWTP is at the assisted operation phase and is on track to enter into full operation in August 2012, after sewerage collection works are completed in Vitória.[5] The finalization of these works was being financed with CESAN's own resources. This is an important result as the State and CESAN would now provide universal access to the utility's sewerage systems in Vitória, and 60 percent sewerage coverage in the GVMR, representing an increase of 164 percent in the population served since 2002. In addition, the sewage treatment efficiency targets were surpassed by 5 percent.

62. Other important results of this component include: (i) the elaboration of a new Sewage Master Plan for the GVMR which has become an important tool to assist the company's management in the planning and setting of overall targets for the improvement in sewerage service provision; (ii) the elaboration of a hydrodynamic modeling program to evaluate the impacts of water and sewerage works on water quality in water bodies in the Vitória Bay area as well as to provide direction in the analysis of alternatives for treatment of sewage and the disposal of treated effluent. This tool has also been used to support the analysis of the company's environmental licensing requests.

3.3 Efficiency

63. The economic and financial analysis of the project was based on actual investment and operating costs, as well as actual benefits. The 10 percent discount rate used during appraisal was used for this evaluation.[6] The cost-benefit evaluation was made for two scenarios for the sewerage component. The first one includes only those customers currently connected to the system. The second one includes those potential customers that according to CESAN will be connected in the next five years. The required network expansion for these potential customers is already implemented with the project.

64. *Results of the evaluation under the First Scenario*. The water component is profitable in financial as well as economic terms, with returns of 25 percent and 159 percent respectively; and profits of US$26 million and US$285 million. The sewerage component however is not profitable. It gets losses of about US$40 million in financial terms and US$31 million in economic terms. The financial profits of the water component are not enough to payoff for the losses of the sewerage component, resulting in a net loss of

[5] As of March 2012 the progress of works in Vitória stood at 99 percent.

[6] The discount rate of 10 percent was estimated to be the opportunity cost of capital during preparation. A sensitivity analysis was carried out to variations in the opportunity cost of capital and the results did not vary significantly.

US$14 million for the whole project. In economic terms, the profits of the water component offset the losses of the sewerage, and the net profit for the whole project is US$253 million and return of 30 percent.

65. *Results of the evaluation under the Second Scenario.* In this scenario, the sewerage component becomes profitable in both financial and economic terms, with results significantly higher than projected at appraisal. The financial profit attained in sewerage is US$67 million and the return is 16 percent, while the economic benefit is US$236 million and the return 21 percent. The net benefit for the whole project is now US$94 million in financial terms, while in economic terms it is US$521 million. Returns for the whole project are 16 percent and 35 percent in financial and economic terms respectively, which are both higher than the 15 percent and 22 percent expected at appraisal.

66. CESAN could possibly be on the optimistic side for connecting those potential customers. To evaluate the impact of a lower connection rate, a switching value was estimated. Results show that an adhesion of potential customers of at least 15 percent would make the economic results positive, while for the financial results, at least a 40 percent adhesion rate is needed to make the project profitable.

67. *Financial Analysis of CESAN.* Overall, CESAN financial performance surpassed targets and showed a sound financial situation. All financial indicators show improvement during the period 2005-2010: net income threefold during the period; account receivable turnover decreased by 10 days; capital structure went from 69 percent liability-31 percent equity in 2005 to 58 percent liability-42 percent equity in 2010.

3.4 Justification of Overall Outcome Rating

68. The ICR rates the overall outcome of the project as satisfactory. CESAN increased water coverage to 100 percent in its area of service, and sewerage covered in the GVMR will increase from 20 to 60 percent between 2004 and May 2012 (when all works are completed), representing an additional 679,350 people with access to the sewerage network. The company also: (i) reduced its losses from 45.8 to 35.6 percent (which represents a reduction from 676 liters/connection/day to 459.6 liters/connection/day), (ii) reduced its expenses as a share of revenues from 74.4 to 66.7 percent, and (iii) increased its EBITDA margin from 26 to 30 percent between 2004 and 2011. In addition, cost benefit analysis results for the water and sewerage components show positive rates of returns, with the sewerage component achieving a positive economic rate of return upon making 15 percent of the planned connections, and a positive financial rate of return when 40 percent of the planned connections are made.

69. The project also contributed IEMA's capacity to respond to licensing demands by reorganizing the environmental licensing procedures in a systematic way and reducing the time needed to grant environmental licenses. This allowed IEMA to gradually increase the number of licenses granted each year between 2004 and 2011, reaching a total of over 11,000 licenses during this period.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

70. **Social responsiveness.** The State Government's and CESAN's attention to social issues, and capacity to address them, increased significantly during the course of the project. Through project activities, a social communication program was developed to inform the community coexisting with the works about each stage of construction and a sanitary and environmental education program was carried out to increase consciousness with respect to the importance of environmental sanitation and rational water use for improving quality of life.

71. **Poverty impacts.** Growing attention was also given to the challenges of providing services to the poor in underserved areas during project implementation. This is exemplified by the results in reducing intermittency and rationing in GVMR neighborhoods, where nearly 73,000 people who were considered to be poor benefitted from these works from 2003 to 2011, as well as in the number of low income people that benefited from improved water supply services (657,278 people) and wastewater collection services (210,598 people). Moreover, through its program to promote connecting to the sewerage system (*Se Liga Na Rede*), CESAN put in place a pilot program with low income households to subsidize the cost of connecting to the network, thus enabling poor households to realize the environmental health benefits of joining the network without creating a financial burden on their limited ability to pay. In addition, CESAN's program focused on enhancing perceptions of the importance of the adequate disposal of domestic sewage (and the availability of treated water) and explaining the benefits and responsibilities of sewerage connections. It is to be noted that all inhabitants of the project areas will also indirectly benefit from cleaner rivers and beaches.

72. In parallel to the project implementation, CESAN also implemented a reform and simplification of its tariff structure in partnership with the Espírito Santo Regulatory Agency for Water, Sanitation and Road Infrastructure (*Agência Reguladora de Saneamento Básico e Infraestrutura Viária do Espírito Santo* – ARSI), giving special attention to achieving a more equitable distribution in terms of tariffs and water volume consumption brackets. This reform was based on a thorough analysis to ensure that customers in the lower income brackets would not have their water bills increased as a result of it. The redefinition of the original four residential categories in one "social" category for low income households and one "residential" category for all other households is one of the key changes introduced. As part of the implementation process, CESAN will confirm with clients deemed low income (about 4 percent of the GVMR for water and 2 percent for sewerage) on their participation in Federal Government social programs in order to benefit from the social tariff structure. This structure includes reduced tariffs for water and sewage for the first 20 m^3 of water consumed per month. The implementation of the new structure is gradual and it will be fully effective in July 2014.

73. **Gender Aspects.** CESAN and the State government ensured that the process of extension of the Mulembá WWTP, guaranteed access of clay deposits located at the WWTP site to the *Paneleiras*, a women's association that for generations has produced clay pottery used in the local cuisine; therefore not impacting their traditional activities during or after construction. The clay material existing in the area of construction of the WWTP was removed, stored and put at the disposal of the *Paneleiras*, thus facilitating their economic activities. In addition, the work of identification and removal of the clay material was carried out with the participation of the *Paneleiras*, and all specified environmental licensing provisions were adhered to during construction of the WWTP.

(b) Institutional Change/Strengthening

74. **CESAN's** institutional capacity was strengthened through the creation of an information system for operational control as well as performance benchmarking, which has been adopted by the company's management to set strategic targets and monitor overall performance. In 2008, the company started publishing performance indicators at six-month intervals. CESAN reports through the media the time it needs to connect new users to services, repair leaks that have been reported by the public, increasing consumer awareness. Over the course of the project, this has served to improve the company's image and increase its accountability vis-à-vis the general public and its clients, as well as to establish a strong brand for environmental responsibility. CESAN has received a number of awards in 2010 and 2011 for the quality of its service, both at the state and the national levels.

75. Particularly noteworthy are CESAN's financial, commercial and institutional results, because of their positive impact on the company's long-term sustainability. Significant institutional reforms implemented in parallel to the project include (i) the distribution since 2006 of dividends to the utility's shareholders; (ii) the definition and implementation of a Code of Ethics and a performance-based bonus program to complement salaries based on the achievement of results that are established and monitored using the performance benchmarking system; and (iii) the universal application of the simultaneous reading and billing of customers. CESAN also made tremendous institutional progress with regards to transparent human resource practices, as its top level management positions (including Board members) are appointed on technical rather than political grounds. It is also to be noted that, on the institutional side, the Espírito Santo State water and sanitation policy evolved during the project with the approval of Law 477 in 2008, which created the State's regulatory agency for water and sanitation (ARSI).

76. The institutional strengthening measures implemented under the project successfully enabled SEAMA/IEMA to develop its environmental information systems, improving its licensing capacities (by simplifying the process of environmental licensing) needed to accompany the rapid industrialization of Espírito Santo in a sustainable manner. These measures were reinforced and made sustainable by the Espírito Santo state government's decision to recruit a significant number of qualified staff in 2004 and 2007 combined with an effort to provide adequate technical capacity building to its operational staff, demonstrating again its commitment to these institutions and their sustainability.

77. Is it also to be noted that, on the institutional side, the State water resources policy evolved during the project with the approval of Law 8.960 in 2008, which created the State Fund for Water Resources (FUNDAGUA). This instrument allows for securing and applying funds to guarantee better management of water resources in the State and is executed by IEMA. The funds, which come from petroleum royalties, can be applied to projects related to the Payment for Environmental Services Program (*Programa de Pagamento por Serviços Ambientais* – PSA), which provide important income supplements to poor rural producers and households.

(c) Other Unintended Outcomes and Impacts (positive or negative)

78. Based on the successful experience CESAN had with the inclusion of the environmental construction manual in the works financed by the project, it adopted the environmental construction manual in all of its contracts to elaborate designs, execute works and perform operation and maintenance activities related to water and sewerage systems.

79. The strong partnership established between the Bank and the State Government paved the way for opening complementary interventions, such as the payment for environmental services pilot financed by the Global Environmental Facility – the Forests for Life Project (*Florestas para a Vida).* This grant signed in 2008 has focused on the management of water river basins of Santa Maria and Jucu, both strategically important for the provision of water to the population of GVMR (46 percent of the State's population), through payment for environmental services schemes for the recuperation and extension of forestry coverage.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

80. No formal beneficiary survey was performed during or after the project evaluated in this ICR. However, CESAN has been following its clients' satisfaction level with regards to the services provided since 2003, through annual opinion surveys in which a representative sample of clients are asked to rate the quality of the service provided. Satisfaction levels have been rising since 2003, from 76 percent of CESAN's clients rating its services "good" or "excellent" to 85 percent in 2010.

4. Assessment of Risk to Development Outcome

81. The project is a part of a long-term program which has evolved since 1994, and was able to successfully put in place and solidify internal and external incentives at the sector and utility levels, which are critical for sustaining the project's main objectives and benefits; therefore, the project made a significant contribution to the sustainability of environment, water and sewerage services in Espírito Santo.

82. CESAN's improved financial and commercial indicators over the course of the project not only reflect improved efficiency gains, but reflect its capacity to financially sustain itself. This improved financial sustainability along with an increased focus on client responsiveness (including through the internalization and monitoring of service quality indicators) which provides pressure to maintain service levels, are important factors in securing more sustainable water and sewerage services in the State of Espírito Santo. CESAN is capable of adequately and sustainably maintaining the systems it has built and it plans to further build on these improvements by implementing a R$1 billion investment program in water supply and sewerage works, as well as in operational and institutional development until 2014.[7] In contrast, it is interesting to remember that implementation of the initial 1994 project had been severely affected because the cost of the project, US$308 million, had proven to be too large for CESAN.

83. Finally, even though improvements still need to be made in connecting sewerage services clients in order to realize the full impact of sewerage service provision, water supply and sewerage collection and treatment services are now more environmentally sustainable. Water resources quality and the GVMR's beach water quality are better protected now that sewage collection and treatment have increased during project implementation. The strong partnership developed between SEAMA/IEMA and CESAN is also a key sustainability factor. For these reasons the ICR assesses the risk to the development outcome as low.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Satisfactory

84. The Bank's performance in the preparation and appraisal of the project was Satisfactory. The project was consistent with the government's development priorities and the Bank's CAS and following CPS. The Bank took into account the adequacy of project design and all major relevant aspects, such as technical, financial, economic, environmental, institutional and fiduciary aspects, and risk factors and lessons learned from the original 1994 project in Espírito Santo were considered and incorporated into the project design. For example, given the difficulties experienced in the availability of counterpart financing, in addition to the special account in US Dollars created for Bank funds, CESAN opened a separate "special counterpart financing account" (*Conta especial de contrapartida* – CEC) in which counterpart payments equivalent to 3 months' cash flow were deposited in advance. The project relied on an extensive set of indicators, agreed upon via side letters at the time of appraisal, to measure and disseminate outcomes and thus further incentivize performance. These indicators proved to be specific, measurable and relevant.

[7] Between 2003 and 2010 CESAN's executed investments amounted to R$1 billion, of which R$750 million were implemented between 2008 and 2010.

(b) Quality of Supervision
Rating: Satisfactory

85. The project was subject to a quality of supervision assessment by the quality assurance group in the last quarter of 2006. The assessment's timing coincided with the immediate aftermath of the failed bidding process for the large sewerage works and quality of supervision was rated moderately satisfactory. The reviewing panel's assessment of the project diverged from that of the project team and regional management in that it considered the failed bidding process for the large sewerage works and associated cost increases in project implementation as a significant threat to the achievement of project development objectives. The reviewing panel was also skeptical of reports on the higher institutional development impacts and efficiency given the original project's performance on these aspects. As largely a result of these factors, it deemed performance ratings by the supervising team overly optimistic at the time of the review.

86. The ICR assessment of Bank's performance during the implementation of the project is Satisfactory. The Bank supervision team was comprised of highly qualified and experienced professionals, particularly on procurement, engineering and utility management. The team provided timely and high level technical assistance to CESAN in reviewing its bidding documents and cost estimates, which was critical to the success of the re-launched bidding process for the large sewerage works. In addition, the team continuously monitored the project's indicators as well as CESAN's physical, operational, environmental and financial indicators, and also adequately supported institutional strengthening efforts of CESAN and SEAMA/IEMA. An extensive review of project performance and results was carried out in mid-2007 when the team carried out the appraisal of the additional financing loan. With the provision of important implementation support during implementation, the project achieved its intended objectives.

(c) Justification of Rating for Overall Bank Performance
Rating: Satisfactory

87. Based on Bank performance during appraisal as well as supervision, overall Bank Performance is rated Satisfactory.

5.2 Borrower Performance
(a) Government Performance
Rating: Satisfactory

88. The State of Espírito Santo (as well as CESAN) provided clear evidence of strong political and administrative commitment throughout the project. In fact, this project was considered the highest priority by the State and CESAN, and, when faced with cost increases, both institutions placed considerable effort in ensuring adequate resources were mobilized and made available to undertake planned project activities.

89. This strong political commitment in prioritizing the water and sanitation sector with adequate resources and articulation with municipalities for the planning of works was fundamental for project implementation and in creating a productive and harmonious work environment. Furthermore, the State Government had made improved environmental management a cornerstone of its program and this emphasis was maintained throughout the project.

(b) Implementing Agency or Agencies Performance
Rating: Satisfactory

90. As mentioned earlier, the implementation arrangements proved to be robust and effective at meeting objectives in a timely and efficient manner. UGP staff members were able to maintain financial

management arrangements compatible with Bank requirements, and counterpart funds were available throughout project implementation. Project accounts (including contracts for consultants, goods, and works) as well as the deposits and withdrawals from the Special Account and the CEC were audited each year and were acceptable to the Bank under terms and conditions satisfactory to the Bank. The Steering Committee,[8] through the UGP, was effective at managing the project and coordinating the different stakeholders involved.

91. Moreover, the implementation structure put in place and coordinated by the UGP was particularly effective at managing the project management/engineering firm and the turnkey contracts, both of which played a major role in the smooth execution of water supply and sewerage works. The UGP prepared and submitted quarterly project management reports to the Bank and procurement activities were carried out in accordance with the Bank's Guidelines. Financial management was also carried out satisfactorily.

92. During Bank supervision missions, the project team observed the gradual improvement in the client's implementation of project works and monitoring of indicators. In fact, the last two ISRs upgraded the monitoring and evaluation rating to Highly Satisfactory. Because CESAN's financial situation improved throughout the project, financial risks were gradually mitigated and CESAN could effectively focus on overall project oversight functions and executing water supply and sewerage activities.

(c) Justification of Rating for Overall Borrower Performance
Rating: Satisfactory

93. Based on the Espírito Santo State Government's as well as CESAN's commitment and performance during the lending phase as well as supervision, overall Borrower Performance is rated Satisfactory.

6. Lessons Learned

94. **Integration in implementation arrangements.** The implementation arrangements used brought together a number of State Secretariats in Espírito Santo and improved cross-sectoral integration. They evolved as a result of the State's implementation experience through the long-term partnership established with the Bank since 1994, and the willingness of the government to experiment with this new approach at the time the 1994 project was restructured. These arrangements, as well as continued commitment and support to the project, facilitated overcoming obstacles encountered during project implementation and catalyzed the development of new strategies to move forward.

95. **Environmental and social sustainability.** The integrated arrangements mentioned above also mainstreamed social and environmental sustainability amongst representatives of both the State Government and project executing agencies. Sustainability was also emphasized in the design and use of a comprehensive project approach which included water supply, sewerage collection and treatment as well as water resources management.

96. **Turnkey contract approach.** The design, build and operate ("turnkey") contract model used in the execution of most works proved to be robust and effective. The following advantages compared to traditional individual contracts, were observed during implementation:

[8] The Steering Committee (*Comitê Diretivo do Projeto*) was chaired by the State Secretariat of Development (SEDES) and comprised the State Secretariat of Finance (SEFAZ), the State Secretariat of Water Supply and Sanitation, Housing and Urban Development (SEDURB), SEAMA and CESAN, and was responsible for overall project oversight functions.

- The allocation of a larger part of the responsibilities onto the contracted firm along with a certain technical autonomy can be attractive to firms of quality with proven capacity to tolerate risks, to furnish performance securities as well as to comply with the established targets;
- This type of contract can also lead to faster execution of works, particularly in terms of resolving implementation problems: the contract model provides an incentive to the firm to resolve issues rapidly, and fewer contract amendments are necessary.

97. It is to be noted that the success of using a turnkey contract model is greatly attributable to the technical capacity of the executing agency. In this case the UGP hired a qualified project management/ engineering firm in order to ensure adequate technical expertise was timely available. This firm had well established terms of reference and contract arrangements were well defined. Aside from assisting with overall project management, the firm was responsible for reviewing the project detailed engineering designs and supervising the works.

98. Sub contracting under turnkey contracts should only be considered for expansion or rehabilitation of sewage collection or water distribution networks. Elements of a higher technical level such as pumping stations and water or wastewater treatment plants should not be allowed to be sub-contracted under turnkey contracts.

99. **Connecting households to the sewerage network.** Connections to sewerage networks should be included in the works contracts that are building the network, and related social and communication activities should be put in place before and during construction, as well as when collection and treatment works are initiated. The lack of up-front buy-in from communities increases the chances of a low rate of connection to the sewerage network. For Brazil in particular, where households are required to connect once the network is available, in addition to a solid communication effort, partnership with local governments is critical, since responsibility for enforcing connections (and the political will needed for enforcement) lies with them.

100. It is also to be noted that to realize the environmental, health and productivity benefits arising from access to sanitation, it is particularly noteworthy to stress the importance of affordability through the provision of subsidies for low-income households and of the relevance of the social tariff for poor households.

101. **Creating a sustainable M&E system.** Project financial and monitoring indicators should have meaning not only for Bank reporting purposes, but for the utility and implementing agencies themselves. This project was particularly successful in its M&E system in the sense that most of its indicators had real world relevance and meaning, and constant reporting over time led to the adoption of these indicators by the concerned institutions in their day-to-day management and strategic planning. The long-term involvement of the Bank in this regard (since 1994) was a key factor in creating a sustainable M&E system.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

102. The Borrower reviewed a draft copy of the ICR and provided comments along with revised figures in terms of the beneficiaries from water supply and sewerage investments, as well as with an updated forecast for the completion of the ongoing sewerage collection and treatment works, including costs. This information was included into the final version of the ICR. The Borrower agrees with the ratings of the ICR.

(b) Cofinanciers

Not applicable.

(c) Other partners and stakeholders
(e.g. NGOs/private sector/civil society)

Not applicable.

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Components	Original Appraisal Estimate* (USD millions)	Additional Financing Estimate** (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal***
1. Institutional Strengthening SEAMA/IEMA	2.00	3.80	1.83	- 48%
2. Institutional Strengthening – CESAN	2.85	5.99	3.47	- 58%
3. Water Supply Investments	8.56	26.35	38.56	+ 46%
4. Sewerage Investments	39.29	121.63	185.37	+ 52%
5. Project Management and Supervision	3.95	11.95	20.01	+ 67%
Total Baseline Costs	56.65	169.72	249.24	+ 47%
Contingencies	5.67	2.60	0.00	0.00
Total Project Costs	62.32	172.32	249.24	+ 44%
Front-end fee IBRD	0.18	0.36	0.36	No change
Total Financing Required	62.50	172.68	249.60	+ 44%

* These project costs were estimated at appraisal of the US$36.0 million loan.
** These project costs were revised at appraisal of the US$71.5 million additional loan.
*** The percentage is calculated by comparing the revised and the actual/latest estimates.

The reduction in the final costs of the institutional strengthening components reflects the fact that many of the planned activities to be financed under the project were undertaken with the institution's own staff and resources, making it difficult for the costs to be singled out and added to the actual estimates. The increase in sewerage costs is partly due to an increase in the scope of the project to include two WWTPs that were financed with counterpart funds (Manguinhos and Nova Almeida/Praia Grande).

Increase in overall project costs since the appraisal of the additional financing reflect a significant increase (39 percent for the period) of construction costs in Brazil, due to specific circumstances of high demand caused by economic growth, including public and private investments in infrastructure, housing and other civil construction activities, as well as the effect of federal infrastructure investments in the last couple of years, specially through the Federal Government's Growth Acceleration Program (PAC).

(b) Financing

Source of Funds	Appraisal Estimate (USD millions)	Revised Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Borrower	26.32	64.82	141.74	+118%
International Bank for Reconstruction and Development	36.00	107.50	107.50	No change

Annex 2. Outputs by Component

1. *Component 1: Institutional Strengthening of SEAMA and IEMA.* Component 1 was designed to address the complementary objective of the original 1994 project of strengthening SEAMA's and IEMA's environmental management capacity, which had been eliminated at project restructuring. The managerial and technical capacity improvement activities revolved around the areas of water resources and environmental licensing, receiving technical support from the project with financing provided mostly from SEAMA and IEMA's own resources. These activities and their outcomes are presented in Table 2.1 below.

Table 2.1: Activities and outcomes for Component 1.

Activity	**Outputs**
Strategic and institutional planning of the SEAMA/IEMA system	• Completion of two public service exam processes to hire new staff in 2004 and 2007 and training of technical staff, creating a solid base to consolidate the IEMA's structure, comply with its institutional obligations and elaborate annual planning exercises to select a portfolio of projects.
Environmental Information Integrated System (*Sistema Integrado de Informações Ambientais* – SIGA): Structuring IEMA's information technology systems	• Acquisition of 6 network servers, software and computers to help IEMA structure its Data Processing Central Office (*Central de Processamento de Dados* – CPD). • Acquisition of geographic information systems (GIS) mapping software which allowed the IEMA to create an efficient management structure capable of acquiring and processing images from across the State. • Development and implementation of the Environmental Licensing Information Management System (*Sistema de Informação para o Licenciamento Ambiental*) which reorganized the environmental licensing procedures in a systematic way and reduced the time needed to grant environmental permits. Basic information on the environmental licensing processes is now available online. • Elaboration of a new cartographical base of the State of Espírito Santo (1:10,000 scale) replacing the set developed in the 1970's. This is currently underway financed with IEMA's own resources and will allow the institution to identify the area covered by the Atlantic forest and land uses, and thus allow for a more efficient use of its natural resources.
State environmental and water resources monitoring program	• Reconfiguration and modernization of the hydro-meteorological network by IEMA, in partnership with the Espírito Santo Research, Technical Assistance and Rural Extension Institute (*Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural* – INCAPER). The acquisition of hydrological and meteorological stations with the installation of telemetric systems will allow IEMA's network to expand to 53 stations in 2015. • Acquisition of 2 boats to support water resources monitoring and control in the coastal areas and of 3 vehicles to support environmental control and enforcement in remote areas.
Improvement of environmental licensing	• This activity did not require project financing, but is a result of an increasing demand relative to licensing and to the control and supervision of granted licenses, as well as increased technical and administrative quality in IEMA's environmental management. • The use of environmental licensing information system allowed IEMA to gradually increase the number of permits granted each year between 2005 and 2011, reaching a total of over 11,000 permits during this period.

Activity	Outputs
Program for structuring the State's water resources management system	• Establishing a cadastre of main water users in 12 basins; a detailed cadastre of users in a pilot area, as well as creation and streamlining of the processes for licensing related to the use of state water resources. • Creation of water basin committees and elaboration of demand studies and guidelines for the state water basin plans. At the time of the finalization of this ICR, the State was finalizing the bidding process to elaborate water basin plans for the Jucu and Santa Maria da Vitória rivers, which are part of the scope of the Forests for Life project (*Florestas para Vida*).

2. *Component 2: Strengthening of CESAN and of the State's Sanitation Sector*. The activities included in this component were selected to strengthen CESAN's institutional, operational and financial capacity and performance. The main result from this component was the development of a performance benchmarking system to track both CESAN's service quality as perceived by users and its operational and financial performance. This decision support system used historical, current and predictive views of business operations and contributed to improving CESAN's performance over the course of the project. These performance indicators followed by CESAN are shown in Table 2.2.

3. In addition, CESAN has been implementing an Environmental Management System (*Sistema de Gestão Ambiental – SGA*) based on ISO 14.000 as a pilot in the WWTP of Guarapari and the water treatment plant in Caçaroca, as agreed with the Bank. These systems will be undergoing the ISO certification process in the first half of 2012.

Table 2.2: CESAN performance and quality indicators.

Indicator	2004	2007	2009	2011	Target
Physical indicators					
Water treatment capacity (l/s)	6,734	8,043	8,203	8,203	8,327
Sewage treatment capacity (l/s)	2,030	2,014*	2,292	2,414	2,799
Number of water connections – active connections	317,617	322,569	367,019	378,584	374,459
Number of water connections – active and non-active connections	317,617	363,195	382,930	393,449	393,134
Ratio of active to non-active water connections (%)	100	89	96	96	95
Number of sewerage connections – active connections	65,091	76,955	91,678	98,398	147,455
Number of sewerage connections – active and non-active connections	65,091	98,451	109,729	155,428	174,496
Ratio of active to non-active sewerage connections (%)	100	78	84	63	85
Social indicators					
Low income population subject to water intermittency/rationing (% of urban pop.)	-	3.1	3.1	3.1	1.4
Operational indicators					
Coverage level in CESAN water supply systems (%) – active connections only	95.0	92.7	100	100	98.0
Coverage level in CESAN water supply systems (%) – active and non-active connections	97.5	98.9	100	100	99.8
Coverage level in CESAN sewerage systems (%) – active connections only	23.9	28.1	31.9	34.4	52.2
Coverage level in CESAN sewerage systems (%) – active and non-active connections	23.9	34.1	37.0	46.9	60.0
Water connections with meters (%)	89.4	91.2	92.9	94.1	99.0
Number of active water and sewerage connections / total permanent CESAN employees (# connect./total employees)	505.4	495.1	506.4	494.9	495.1

Indicator	2004	2007	2009	2011	Target
Number of active water and sewerage connections / total permanent and temporary CESAN employees (# connect./total employees)	322	324	317	305	324
Commercial losses (%)	33.0	33.2	26.3	25.1	30.5
Unaccounted-for water (%)	45.8	39.9	35.9	35.6	38.8
Water loss index (l/day/connection)	676.0	594.0	479.8	459.6	570.0
Environmental indicators					
Sewerage treated relative to water consumption (%)	16.0	19.5	21.9	23.3	26.4
Wastewater treatment plant quality control index – ICQE (%)	-	-	95	77	100
Efficiency of the sewage treatment system (% – BOD removal)	73	85	97	95	90
Financial indicators					
Average tariff - water (R$/m^3)	1.27	1.25	1.23	1.11	1.19
Average tariff - sewerage (R$/m^3)	0.84	0.85	0.86	0.79	0.75
Operating margin (%)	74.4	72.7	74.0	66.7	85.0
Ratio of personnel costs to operating revenues (%)	22.3	24.7	24.4	24.7	28.0
Accounts receivable (days)	76	65	71	61	61
EBITDA (%)	25.6	27.3	26.0	28.6	23.3
Return on equity (%)	6.39	4.43	6.15	5.75	3.40
Liquidity Index	1.55	1.43	0.93	1.21	1.24
Return on capital employed (%)	5.03	4.92	4.21	10.16	4.66
Debt service coverage ratio	3.76	4.83	4.37	3.19	4.60
Service quality and operational performance (GVMR) indicators					
Total time needed to handle connection requests - water (h/request)	305	351	248	195	220
Total time needed to handle connection requests - sewerage (h/request)	304	1,724	389	439	960
Average customer handling time in Greater Vitória office (min)	28	23	16	16	13
Total time needed to handle leak elimination service requests - water (h/request)	214	78	77	53	90
Total time needed to handle maintenance service requests - sewerage (h/request)	289	53	27	26	48
Number of leaks per 100km of network (# leaks/100km)	52	26	18	13	29
Electricity consumption per volume of water treated (kWh/m^3)	0.46	0.48	0.49	0.49	0.50
Average time needed to handle requests at the call center (min)	3.0	3.0	4.0	2.6	2.0
Water Quality Index in distribution network (%)	93	97	95	96	97

*In 2007, the Parque das Gaivotas WWTP (Vila Velha) was deactivated, which explains the reduction in sewage treatment capacity from 2004 to 2007. This capacity loss was later compensated by the construction of the Araçás WWTP.

4. *Component 3: Water Supply Investments*. Bank-financed implementation for this component totaled US$22.2 million, while counterpart funds provided US$16.4 million. These works are described in detail in Table 2.3. In summary, these works consisted of:

- The expansion of one water treatment plant (Caçaroca);
- The expansion of one treated water pumping station (Morro do Pico) and of one raw water pumping station (Santa Maria);
- The construction of 2 new treated water pumping stations (Caçaroca and Pedreiras/Santo Antônio) and one new raw water (Caçaroca) pumping station;

- The construction of 2 booster stations (Garoto and Araçás);
- The construction of 4 treated water tanks (Garoto, Araçás, Pedreiras/Santo Antônio and Morro do Pico), increasing storage capacity by 28,500 m^3 and the recuperation of the Santa Clara storage facility;
- The installation of 11.6 km of water pipes (including water mains and impulsion lines);
- The installation of 4.7 km of network pipes for water supply.

5. These investments contributed to providing treated water to 1,688,485 people (106 percent of appraisal target), the GVMR's population in 2011. The State and CESAN now provide universal access to the utility's water supply systems throughout the state, an increase of 18 percent in the population served compared with 2003. In such a manner, Vitória increased its coverage from 11 percent at appraisal of the original project in 1994 to 100 percent at the end of the project and CESAN now provides water to urban areas of 52 municipalities of Espírito Santo, equivalent to 2,239,000 people.

6. Of the 1,688,485 additional people served by CESAN, 46 percent (approximately 776,700) were considered to be of low income (family incomes of less than 3 minimum salaries), compared with an estimate at appraisal of 658,000 beneficiaries of low income. The project thus achieved 118 percent of that target.

Table 2.3: Water supply works financed under the project.

Municipality	**Outputs**
Cariacica	• Construction of the 8,000 m^3 Morro do Pico water storage tank. This tank will benefit an estimated 120,000 people in Cariacica and Viana. These works included the expansion of the São Francisco treated water pumping station and installation of 2.8 km of water mains.
Serra	• Expansion of the Santa Maria water production system. CESAN increased to 3,600 l/s the capacity of a raw water pumping station by installing two new pumps. This will benefit 495,000 people in Serra and the northern part of Vitória.
Vila Velha	• Construction of the Ibes / Boa Vista water main. This 2.6 km water main will help solve the water supply problems experienced by 128,000 people in the Boa Vista and Grande Itaparica region. • Expansion of the Caçaroca water production system. This included: increasing the Caçaroca water treatment plant's capacity to 393 l/s, building a new treated water pumping station as well as a new raw water pumping station and raw water and treated water mains to provide services to more than 110,000 people in the southern part of Vila Velha and in Cariacica. • Construction of the 10,000 m^3 Garoto water storage tank and installation of 3.3 km of water mains. These works will benefit an estimated 105,000 people. • Construction of the 6,500 m^3 Araçás water storage tank and installation of 2.6 km of water mains. These works will benefit an estimated 68,000 people in Araçás and surroundings.
Vitória	• Rehabilitation of the 4,080 m^3 Santa Clara water storage facility. This work will benefit an estimated 67,900 people in the Vitória-Center region. • Construction of the 4,000 m^3 Pedreiras water storage tank, of a treated water pumping station and installation of a 1.8 km of treated water main. These works will benefit an estimated 45,000 people in the Grande Santo Antônio region.

7. With the works described in Table 2.3, CESAN increased its treated water storage capacity by 56 percent compared with 2002, reaching 108,970 m^3 in 2011, providing services with greater operational security and more efficient system management. The water supply network was also increased by 28

percent from 2002, reaching 6,924 km in 2011 and the project allowed production capacity to increase by 22 percent.

8. CESAN made some steady gains over the course of the two loans. For example, coverage levels exceeded the original targets and unaccounted-for water was reduced from 45.8 percent at appraisal to 35.6 percent at project closure (surpassing the target at appraisal by 8 percent). The impact of the original 1994 project on reducing unaccounted-for water had been deemed negligible and the investments during the 2004-2011 period helped optimize the existing delivery systems and sustain operational efficiency, by, for example, installing additional storage infrastructure in the problematic areas to counter rationing and intermittency in the municipalities of Vila Velha, Cariacica, Serra, Guarapari and Vitória. CESAN now provides 24h water supply services to 98.5 percent of the GVMR, while the remaining 1.5 percent does not perceive the intermittency of these services due to the use of house storage tanks. An estimated 60,000 people of low income benefitted from intermittency and rationing elimination works from 2003 and 2011. The improvements in water supply reliability in the municipality of Cariacica are illustrated in the Maps Section.

9. *Component 4: Sewerage Investments*. Bank-financed implementation for this component totaled $73.8 million while counterpart funds provided $112.4 million. These works are described in detail in Table 2.4. In summary, these works consisted of:

- The construction of 3 WWTPs (Mulembá II, Manguinhos and Nova Almeida/Praia Grande);
- The construction of 16 raw sewage pumping stations;
- The installation of 177 km of sewage collection and impulsion pipes;
- The installation of 20,824 new residential connections, both individual and for buildings.

Table 2.4: Sewerage works financed under the project.

Municipality	**Outputs**
Cariacica	• The construction of 2 raw sewage pumping stations and the installation of 3.2 km of sewage collection pipes, 170 new connections in Castelo Branco and Jardim de Alah.
Guarapari	• The construction of 2 raw sewage pumping stations and the installation of 20.5 km of sewage collection pipes and 2,064 new connections in Praia do Morro.
Serra	• The construction of 4 raw sewage pumping stations and of the Manguinhos WWTP (capacity of 111 l/s), with 100% counterpart funds. • The construction of 6 raw sewage pumping stations and of the Nova Almeida/Praia Grande WWTP (capacity of 120 l/s), with 100% counterpart funds.
Vila Velha	• The installation of 5.8 km of sewage collection pipes and 350 new connections in Praia da Costa (basin B13).
Vitória	• The construction of the Mulembá II WWTP in Jucutuquara to expand the existing Mulembá WWTP's capacity by 360 l/s. • The construction of 8 raw sewage pumping stations and the installation of 95.3 km of sewage collection pipes and 8,630 new connections in Jucutuquara (basin B5). • The installation of 16.1 km of sewage collection pipes and 1,810 new connections in Praia do Canto (basin B4). • The construction of 4 raw sewage pumping stations and the installation of 37.1 km of sewage collection pipes and 7,800 new connections in Vitória Center (basins B1 and B2).

10. These works contributed to providing sewerage coverage to 1,033,350 people, an increase of 679,350 since 2003 (194 percent of appraisal target). However, one of the main WWTPs (Mulembá II) of which the construction was financed by the project was, at the time of the finalization of this ICR, at the assisted operation phase and was on track to enter into full operation after sewerage collection works were to be completed in Vitória (99 percent completed) in May 2012. The finalization of these works was

being financed with the client's own resources and would account for 153,000 of the 679,350 additional beneficiaries. With these results, the State and CESAN now provide universal access to the utility's sewerage systems in Vitória, and 60 percent sewerage coverage in the GVMR, representing an increase of 192 percent in the population served compared with 2003.

11. If full completion of the sewerage works is considered, 30 percent (203,805) of the 679,350 additional people served by CESAN, were considered to be of low income (family incomes of less than 3 minimum salaries), compared with an estimate at appraisal of 109,000 beneficiaries of low income. The project thus achieved 187 percent of that target.

12. The project succeeded in surpassing the sewage treatment efficiency target by 5 percent, but only achieved partial implementation of coverage level in CESAN sewerage systems: 66 percent of the original target for billed connections and 78 percent of the original target for billed and non-billed connections were achieved.

13. With these results and the Mulembá WWTP in full operation, the State and CESAN expect to have universal access to the utility's water supply systems throughout the state, universal access to the sewerage systems in Vitória, and 60 percent sewerage coverage in the GVMR. Vitória will then become the first Brazilian state capital besides Brasilia to reach universal access to water supply and sewerage services.

14. Other important results for this component include (i) the update of the 1978 Sewage Master Plan for the GVMR, improving CESAN's and IEMA's ability to confront demand increases with adequate planning; (ii) the elaboration of a hydrodynamic modeling program to evaluate the impacts of water and sewerage works on water quality in water bodies in the Vitória Bay area as well as to provide direction in the analysis of alternatives for treatment of sewage and the disposal of treated effluent, and (iii) carrying out detailed studies for the treatment and use of the sludge from the WWTP as fertilizer in agriculture, which amounted to a 4-year research project that established agricultural, sanitary and environmental criteria for the treatment and utilization of the sludge in agriculture and resulted in the publication of an extensive manual for the use of sludge in agriculture and forestry for the State. The research included pilot crops of sugar cane, coffee, pineapple, guava, banana, eucalyptus, rubber tree, açaí, and royal palm and its results received an innovation prize from the State of Espírito Santo.

Annex 3. Economic and Financial Analysis

A. Economic and Financial Analysis of the Project.

1. The economic and financial analysis of the project was based on actual investment and operating costs, as well as actual benefits. The methodology used for this evaluation corresponded to the same used at appraisal, including the same discount rate of 10 percent.[9]

2. *Investment costs.* The evaluation was carried out including all components of the investment except the institutional strengthening of SEAMA/IEMA. For the evaluation of the water and sewerage components, the costs of institutional strengthening of CESAN, and project management and supervision were added in proportional form to each of the components. The actual investment costs were 48 percent higher than the estimated costs at appraisal as shows Table 3.1.

Table 3.1: Investment costs.

	At appraisal	*Actual*	*Increase*
Institutional Strengthening – CESAN	5.99	3.47	-58%
Water Supply Investments	26.35	38.56	46%
Sewerage Investments	121.63	185.37	52%
Project Management and Supervision	11.95	20.01	67%
Physical and Price contingencies	2.60	0	
Total Project Costs	*168.52*	249.24	48%

3. Additionally to these investments, this evaluation, as well as the one carried out during appraisal, includes all the cost of required investment to adjust the in-house connections for sewerage, and the cost of new connections for water and sewerage.

4. *Economic costs*. Financial costs were transformed in economic costs with the same conversion factors used at appraisal.

5. *Benefits*. Under the water component, the capacity of the water system was expanded. The coverage of the service increased as well as the reliability of the water supply, eliminating water intermittency in most of the served areas. Moreover, some efficiency gains, such as reduction of non-revenue water, increase in revenue collection rate, and improvement of labor productivity, were achieved by CESAN, resulting in an increase of revenue or reduction in costs, or both.

6. The water service coverage increased more than expected, reaching almost universal coverage. The efficiency gains were also higher than anticipated: as shows the reduction of water losses, which reached 35.6 percent in 2011, when 38.8 percent were expected. Labor productivity improved more than expected by 4 percent in 2009 and then reduced to 2 percent in 2011. Revenue collection rate improved, reducing the account receivables turnover from 71 days to 61 days by 2011.

7. Under the sewerage component, the system was expanded as well as the wastewater treatment facilities. To date, the actual sewerage connections are below the expected target. By 2011, the coverage was 34 percent, lower than the 52 percent foreseen at appraisal (Table 3.2). Yet the required network to achieve and surpass the expected target is already implemented, missing only the final works needed

[9] The discount rate of 10% was estimated to be the opportunity cost of capital during preparation. A sensitivity analysis was carried out to variations in the opportunity cost of capital and the results did not vary significantly.

inside the house and in front of them. Some wastewater treatment plants are already in the concluding steps for completion of implementation, and expected to enter in full operation in August 2012 (works in Vitoria are 99 percent completed).

Table 3.2: Sewerage coverage.

	2004	2005	2006	2007	2008	2009	2010	2011
Estimated at appraisal	32.5	38.5	47.6	53.5	30.2	36.9	46.7	52.2
Actual	23.9	26.2	27.0	28.1	30.7	31.9	33.5	34.4

8. CESAN is working with the potential customers to finalize what is missing to complete the connection, and expects to connect about 289,000 additional households until 2015 (114,000 connections). If CESAN succeeds in this effort, the target would surpass by far the expected at appraisal.

9. Given that the full benefits will be attained when all the potential customers are connected, this evaluation was carried out under two scenarios: (i) including only the benefits obtained by the current beneficiaries; and (ii) including all potential beneficiaries, based on the connection schedule provided by CESAN in which all 114,000 connections would be made by 2015. A sensitivity analysis was done to find the switching values for connection rates of potential beneficiaries.

10. *Financial Benefits* were estimated as the increase on revenue from new customers, as well as, the reduction of operating costs that come along with the reduction of water losses. The increase in revenues was calculated with the actual tariff and the volume of water billed for both water and sewerage. The reduction of operating losses was calculated based on the variable unitary cost and the volume of water actually produced.

11. *Economic Benefits* were estimated for the water component as the willingness to pay of eliminating the rationing, which was assumed as the average tariff actually paid for a higher volume of water received. For the sewerage component, the economic benefits were estimated as the savings obtained by the beneficiaries when having the sewerage connection, compared with the expenses incurred with other on site discharge solutions.

12. *Results of the evaluation under the First Scenario*. This scenario includes only the benefits attained by the current customers, without connecting any additional potential beneficiary. This scenario is very conservative as CESAN expects to scale up future connections to the network. Results are shown in Table 3.3.

13. The water component is profitable in financial as well as in economical terms, with returns of 25 percent and 159 percent respectively and profits of US$26 million and US$285 million. However, the sewerage component is not profitable. It gets losses of about US$40 million in financial terms and US$31 million in economic terms. The financial profits of the water component are not enough to payoff for the losses of the sewerage component, resulting in a net financial loss of US$14 million for the whole project. In economic terms, the profits of the water component offset the losses of the sewerage component, and the net profit for the whole project is US$253 million, and the rate of return is 30 percent.

14. For the water component, results show similar financial results than expected at appraisal; yet the economic results surpassed significantly the ones foreseen at appraisal. For the sewerage component however, results are lower than expected. The main reason is that the number of connections is not enough to compensate for the increase in the investment costs.

Table 3.3: Results of the evaluation.

	NPV of flows (000 USD)			*IRR*
	Benefits	*Costs*	*Net Benefit*	*%*
Financial Results				
Water	73,854	47,356	26,498	25%
Sewerage	93,095	133,817	(40,722)	4%
Total	166,950	181,173	(14,224)	8%
Economic Results				
Water	324,248	39,424	284,825	159%
Sewerage	106,562	137,839	(31,276)	7%
Total	430,810	177,262	253,548	30%

Table 3.4: Comparison between actual results and expected at appraisal.

	Actual Results)		*Expected benefits at appraisal*	
	Net Benefits	*IRR (%)*	*Net Benefit*	*IRR (%)*
Financial Results				
Water	26,498	25%	35,574	26%
Sewerage	(40,722)	4%	9,453	11%
Total	(14,224)	8%	45,027	15%
Economic Results				
Water	284,825	159%	104,686	32%
Sewerage	(31,276)	7%	76,023	18%
Total	253,548	30%	180,710	22%

15. *Results of the evaluation under the Second Scenario*. In this scenario, all potential sewerage customers are included according to CESAN's projections for the next five years. This will increase the number of sewerage customers by about 290,000 (114,000 connections). Under this situation, the results for the sewerage component change dramatically. The sewerage component becomes profitable in both financial and economic terms, with results significantly higher than projected at appraisal. The financial profit attained in sewerage is US$67 million and the rate of return is 16 percent, while the economic benefit is US$236 million and the rate of return 21 percent. The net benefit for the whole project is now US$94 million in financial terms, while in economic terms it is US$521 million. Returns for the whole project are 16 percent and 35 percent in financial and economic terms respectively, which are both higher than the 15 percent and 22 percent expected at appraisal (Table 3.6)

Table 3.5: Results of the evaluation when including estimated additional connections.

	NPV of flows (000 USD)			*IRR*
	Benefits	*Costs*	*Net Benefit*	*%*
Financial Results				
Water	73,854	47,356	26,498	25%
Sewerage	214,281	146,781	67,500	16%
Total	288,136	194,137	93,998	16%
Economic Results				
Water	324,248	39,424	284,825	159%
Sewerage	390,208	154,255	235,953	21%
Total	714,456	193,678	520,778	35%

16. CESAN could possibly be on the optimistic side for connecting those potential customers, and therefore a switching value was estimated in order to know how much effort CESAN needs to make the project profitable and sustainable. Results show that with at least a 15 percent adhesion of potential customers would make the economic results positive; while for the financial results at least 40 percent adhesion is needed to make the project profitable.

Table 3.6: Comparison between actual results and expected at appraisal.

	Actual Results)		*Expected benefits at appraisal*	
	Net Benefits	*IRR (%)*	*Net Benefit*	*IRR (%)*
Financial Results				
Water	26,498	25%	35,574	26%
Sewerage	67,500	16%	9,453	11%
Total	93,998	16%	45,027	15%
Economic Results				
Water	284,825	159%	104,686	32%
Sewerage	235,953	21%	76,023	18%
Total	520,778	35%	180,710	22%

B. Financial Analysis of CESAN

17. The financial results of CESAN, as the utility in charge of implementing the service, show that the company is in a sound situation. From 2005 to 2010, billed revenues increased at a higher pace (56 percent) than operating costs (43 percent). Net income increased threefold in the same period, going from 8 percent in 2005 of billed revenues to 14 percent in 2010.

Table 3.7: Income statement (R$ '000).

	2005	*2006*	*2007*	*2008*	*2009*	*2010*
Billed Revenue	292,318	319,026	345,858	378,878	437,697	455,918
Operating Costs	215,740	239,744	273,602	273,886	294,968	308,998
Operating Margin (EBITDA)	76,578	79,282	72,256	104,992	142,729	146,920
Depreciation	33,703	36,652	39,142	41,505	44,729	48,701
EBIT	42,874	42,629	33,114	63,487	98,000	98,218
Other non operating revenue/expenses	1,657	1,565	12,667	4,375	(13,638)	(9,361)
Financial Expenses	22,239	18379	13,653	24,033	14,054	26,443
Net Income	22,292	25,816	32,128	43,827	70,308	62,414

18. The company's capital structure shows improvement as well. In 2005, total assets were 69 percent financed with liabilities and 31 percent with equity. By 2010, this relation had improved to 58 percent liabilities and 42 percent equity.

Table 3.8: Balance sheet (R$ '000).

	2005	*2006*	*2007*	*2008*	*2009*	*2010*
Assets						
Current Assets	96,017	103,662	109,789	113,763	134,572	124,859
Fixed Assets	889,701	915,018	986,330	1,175,204	1,446,307	1,678,389
Total Assets	985,718	1,018,680	1,096,119	1,288,967	1,580,879	1,803,248
Liabilities						
Current Liabilities	82,419	81,975	79,791	97,702	145,225	116,537
Long Term Liabilities						
Long Term Debt	34,967	44,315	47,728	68,554	113,611	181,324
Other LT liabilities	186,524	187,419	222,050	317,402	382,431	451,395
Total Long Term Debt	221,491	231,735	269,778	385,956	496,042	632,719
Total Liabilities	303,911	313,710	349,569	483,658	641,267	749,256
Equity	681,807	704,970	746,550	805,309	939,612	1,053,992
Liabilities plus equity	985,718	1,018,680	1,096,119	1,288,967	1,580,879	1,803,248

19. All financial indicators show improvement in the period 2005-2010. Working ratio went from 0.74 to 0.68; account receivables turnover decreased from 69 days in 2005 to 59 days in 2010. Liquidity ratio has been greater than one during the period, and debt ratios show improvement as well.

Table 3.9: Financial indicators.

	2005	*2006*	*2007*	*2008*	*2009*	*2010*
Working ratio	0.74	0.75	0.79	0.72	0.67	0.68
Operating ratio	0.85	0.87	0.90	0.83	0.78	0.78
Account receivable/income (days)	69	60	58	60	65	59
Liquidity ratio	1.41	1.49	1.51	1.30	1.05	1.16
Equity/total assets	0.69	0.69	0.68	0.62	0.59	0.58
Liability/total assets	0.31	0.31	0.32	0.38	0.41	0.42
Net income/revenue	8%	8%	9%	12%	16%	14%

20. In 2011, the financial results show better results than expected in most of the indicators. Only the liquidity and coverage of debt service were a little bit lower than expected, yet their values are above acceptable levels.

Table 3.10: 2011 Financial indicators (unaudited).

	2011	
	Expected	*Actual*
Return on equity	3.4	5.75
Margin EBITDA	23.3	28.6
Liquidity	1.24	1.21
Debt service coverage (times)	4.8	3.19
Operational margin	71	67

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit
Lending		
Franz R. Drees-Gross	Sector Manager	EASIS
Luz Maria Gonzalez	Consultant – Financial Analyst	AFTUW
Francisco Jose Lobato da Costa	Consultant	LCSEN
Claudio Mittelstaedt	Consultant	LCSFM
Jose Alexandre Monteiro Fortes	Consultant – Environment	LCSUW
Nicola Ruggero Saporiti	Senior Investment Officer	C3PDR
Carlos E. Velez	Lead Economist	LCSUW
Supervision/ICR		
Alexandre Borges de Oliveira	Senior Procurement Specialist	LCSPT
Armando Ribeiro Araujo	Consultant – Procurement Specialist	LCSTR
Carlos E. Velez	Lead Economist	LCSUW
Claudio Mittelstaedt	Consultant	LCSFM
Etel Patricia Bereslawski Aberboj	Senior Procurement Specialist	LCSPT
Jean-Martin Brault	Water Supply and Sanitation Specialist	LCSUW
Jose Alexandre Monteiro Fortes	Consultant – Environment	LCSUW
Julia Tierney	Junior Professional Associate	LCSUW
Juliana Menezes Garrido Pereira	Infrastructure Specialist	LCSUW
Lizmara Kirchner	Water Supply and Sanitation Specialist	LCSUW
Luis Alberto Andres	Senior Economist	SASSD
Luiz C. Gazoni	Consultant – Procurement	LCSPT
Luz Maria Gonzalez	Consultant – Financial Analyst	AFTUW
Marcos T. Abicalil	Sr. Water & Sanitation Specialist	LCSUW
Marta Elena Molares-Halberg	Lead Counsel	LEGES
Nicolas Drossos	Consultant – Financial Specialist	EAPCO
Paulo Canedo De Magalhães	Consultant – Engineer	LCSUW
Peter J. Kolsky	Sr Water & Sanitation Specialist	LCSUW
Susana Amaral	Financial Management Specialist	LCSFM

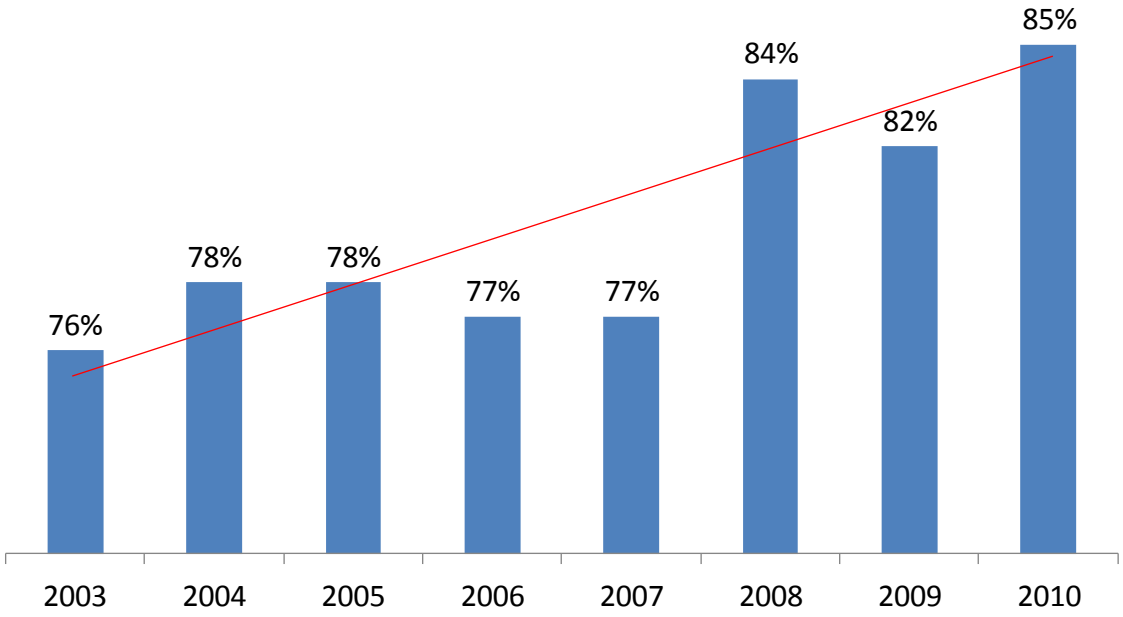
(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
Lending		
FY04	14	$102
FY05	0.1	$1
Total:	14	$102
Supervision/ICR		
FY05	11	$49
FY06	9	$71
FY07	10	$122
FY08	10	$90
FY09	20	$99
FY10	11	$73
FY11	7	$60
FY12	6	$31
Total:	84	$595

Annex 5. Beneficiary Survey Results

No formal beneficiary survey was performed during or after the project evaluated in this ICR. However, CESAN has been following its clients' satisfaction level with regards to the services provided since 2003, through annual opinion surveys. Clients are asked to rate the quality of the service and it was found that satisfaction levels have been constantly rising since 2003, as shown below. In 2003, 76 percent of CESAN's clients rated its services "good" or "excellent", and this percentage rose to 85 percent in 2010.

Furthermore, by publishing performance indicators at six-month intervals and reporting via the media on the time needed to connect new users to services, repair leaks that have been reported by the public, etc., public opinion was mobilized in favor of CESAN. This is shown by a number of prizes that the utility was awarded in 2010 and 2011 for the quality of its service, both at the state and the national levels.



Annex 6. Stakeholder Workshop Report and Results

Not applicable.

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

1. The Borrower reviewed a draft copy of the ICR and provided comments along with revised figures in terms of the beneficiaries from water supply and sewerage investments, as well as with an updated forecast for the completion of the ongoing sewage collection and treatment works, including costs. This information was included into the final version of the ICR. The Borrower agrees with the ratings of the ICR.

2. The Borrower prepared its own ICR, and the full version of the Borrower's report in Portuguese is available in the project files. Overall the report presents a positive view of the project and the assistance provided by the Bank. Below is an excerpt of the report, which documents highlights of their lessons.

Lessons Learned

3. The extended political support of the Borrower in prioritizing the sanitation sector ensuring adequate resources and inputs were available, in working together with the municipalities in planning and getting buy-in for the Project was instrumental in the implementation and establishment of a harmonious working relationship and productive.

4. The project indicators as well as monitoring of operational activities and service provision were improved and constitute an important tool for monitoring and decision-making.

5. The State had already been successful with the use of the turnkey approach in the second phase of the previous project. The adoption of turnkey contracts for the implementation of main works under this project confirms that this was the right decision. The comparative advantages to traditional models show very favorable results:

- Allocating greater share of responsibility to the contractor with technical and environmental parameters consistent with legal backing and autonomy to propose a range of value-added technical solutions attract high quality companies with proven ability to withstand risks, guarantees and targets established.
- Simplification of procedures for assessing the progress of works and measurement of the services performed, providing great flexibility in the production and processing of the necessary documentation to allow disbursements and minimize the risks of re-reviews and reprocessing.
- Faster implementation with the turnkey contract, as the obstacles come up during implementation, than with the traditional contracting approach which would have led to a longer time in technical debates, delays and therefore increases in contract amount. The contractor had an incentive to seek adequate technologies that would quickly address the situation.
- Less attrition on the relationship with the contractors and agility in solving problems encountered during construction.
- The arrangements that provided for the execution of the works, including the preparation of detailed engineering designs and pre-operating the system constructed, enabled the contractors to propose value-added technical solutions, without prejudice to the requirements of operational performance and quality of facilities. Undoubtedly, the adoption of this type of contract had a significant contribution to the success of the Project.

6. Structuring the project management/engineering firm with local professionals, which have knowledge of the areas and implementation conditions. This can be an item to be more strongly

encouraged in request for proposals. The qualifications of key staff of the project management/ engineering firm has a higher focus and gives more weight to previous experience as opposed to degrees.

7. The execution of the Project within a Project Management Unit (PMU) in an independent and autonomous environment, proved the effectiveness of this response for the Project. However, the magnitude of the works and their interference in the day-to-day routine of the population underscore the need to rethink some of the activities that come under the jurisdiction of CESAN.

8. During the execution of the Project, there was a dependency on CESAN's communication department, whose capacity could not fully satisfy the demands of the Project. This confirms the need to increasingly improve the implementation structure of these types of projects and increase its independence from routine/day-to-day activities of the implementing agencies, particularly in the aspects related to social communication.

9. CESAN's decision to postpone the hiring of consulting services for social mobilization and environmental education, as well as to undertake the work of connecting the population to the sewerage systems was not satisfactory. The work done by CESAN's own team generated results, but it was found to be insufficient, proving the need for a scaled up and expanded approach at the start of works.

10. The previously established partnership with municipalities and key segments of society, associated with the prior notice to residents and public and commercial areas of upcoming works are crucial for planning and execution of works in the desired time. This integration with public managers also served to help establish a mutual commitment to solving obstacles and minimize conflicts caused by inconveniences associated with the works under implementation.

11. With regards to legal support for the examinations of the processes and contractual disputes, the project management/engineering firm failed to meet the desired timetable. To improve the response process, it is recommended to incorporate in the staff of the PMU and/or the staff of the project management/engineering firm legal professionals to provide the required support and avoid undue delays in the settlement of contractual disputes.

12. The application of the environmental construction manual as it was recommended in the environmental management plan (an innovation brought to the project by the Bank), later improved upon by the UGP and the project management/ engineering firm was one of the main tools used to ensure adequate management of the project vis-à-vis the population and society at large with reference to the inconveniences resulting from the works, by the PMU with the construction firms to ensure that they were compliant with legal, safety and social-environmental aspects.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

Not applicable.

Annex 9. List of Supporting Documents

Project documents:

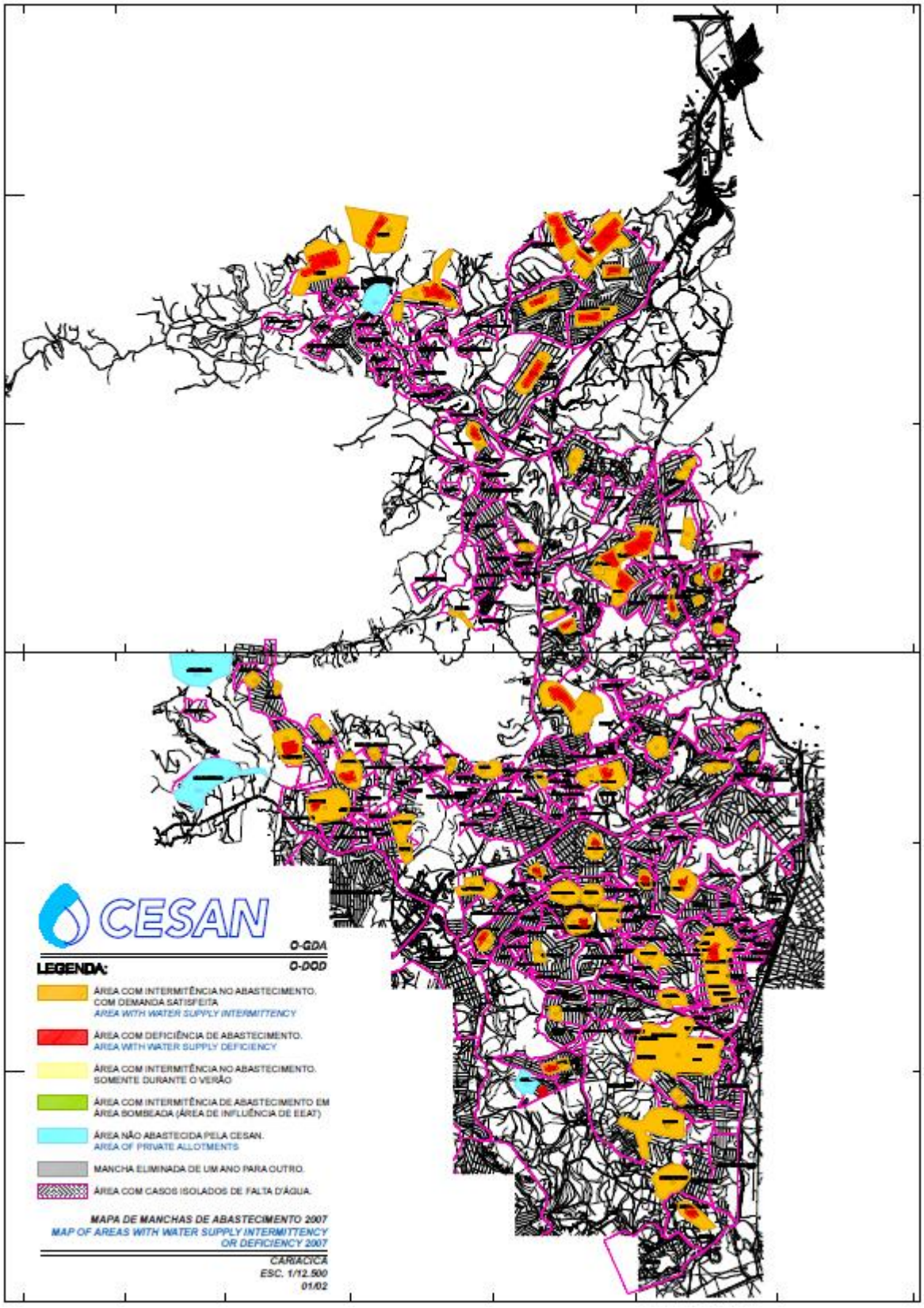
- Project Appraisal reports (Technical Annex and Project Paper) and official communication;
- Auditing reports;
- Loan Agreements and Project Agreements;
- ISRs;
- Quality of Supervision Assessment;
- Aide-Memoires;
- Environmental Assessments.

Other background information:

- CESAN (2010). Environmental Manual for Projects and Works (*Manual Ambiental de Projetos e Obras*);
- IEG (2007). Project Performance Assessment Report: Brazil – Water Quality and Pollution Control Project (Loans 3503-BR, 3504-BR, 3505-BR to the states of São Paulo and Paraná) and Espírito Santo Water Coastal Pollution Management (Loan 3767-BR);
- World Bank (2004). ICR for Loan 3767-BR (Report No 27848);
- World Bank (2003). Country Assistance Strategy 2003-2007 for the Federative Republic of Brazil in support of A More Equitable, Sustainable and Competitive Brazil;
- World Bank (2006). Country Assistance Strategy 2003-2007 Progress Report;
- World Bank (2008). Country Assistance Strategy 2008-2011 for the Federative Republic of Brazil;
- World Bank (2010). Country Assistance Strategy 2008-2011 Progress Report;

- CESAN. Performance indicators monthly reports;
- Progress reports and presentations from the Project Management Unit (UGP), CESAN and SEAMA/IEMA.

MAPS


CESAN
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LEGENDA:
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ÁREA COM DEFICIÊNCIA DE ABASTECIMENTO.
AREA WITH WATER SUPPLY DEFICIENCY
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ÁREA NÃO ABASTECIDA PELA CESAN.
AREA OF PRIVATE ALLOTMENTS
MANCHA ELIMINADA DE UM ANO PARA OUTRO.
ÁREA COM CASOS ISOLADOS DE FALTA D'ÁGUA.
MAPA DE MANCHAS DE ABASTECIMENTO 2007
MAP OF AREAS WITH WATER SUPPLY INTERMITTENCY OR DEFICIENCY 2007
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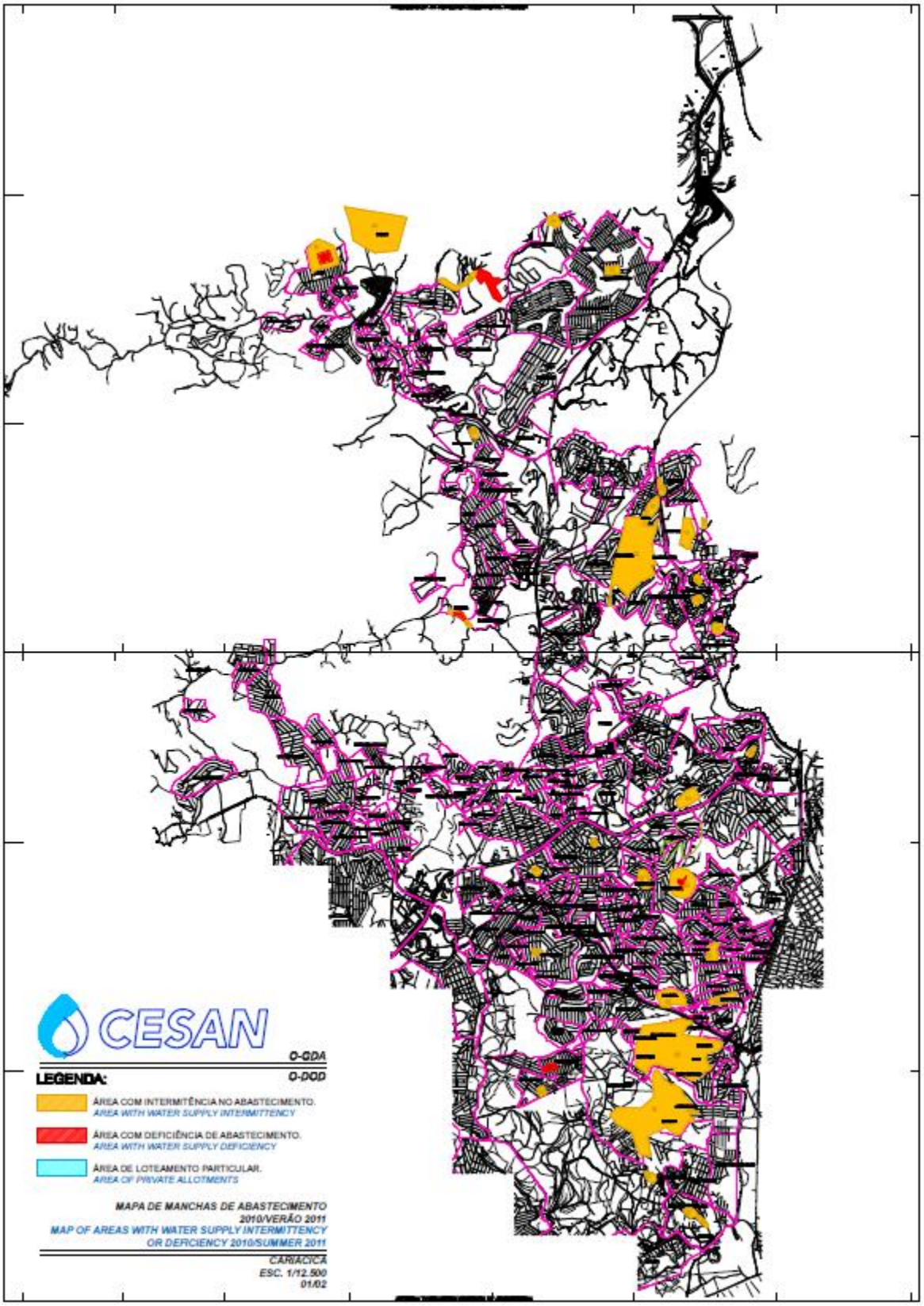
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AREA WITH WATER SUPPLY DEFICIENCY
ÁREA DE LOTEAMENTO PARTICULAR.
AREA OF PRIVATE ALLOTMENTS
MAPA DE MANCHAS DE ABASTECIMENTO
2010/VERÃO 2011
MAP OF AREAS WITH WATER SUPPLY INTERMITTENCY
OR DERCIENCY 2010/SUMMER 2011
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IBRD 39186

BRAZIL
CITY OF VITÓRIA PROJECT

WATER:
- STORAGE TANK
- TREATMENT PLANT
- WATER MAIN

SEWERAGE:
- SEWAGE COLLECTION/TREATMENT

- MAIN RIVERS
- RIVER BASIN BOUNDARIES
- MUNICIPAL CAPITALS
- STATE CAPITAL
- MUNICIPAL BOUNDARIES

40°30' 40°00' 20°00' 20°15' 20°30'

Santa Teresa
Fundão
Santa Leopoldina
Serra
Cariacica
VITÓRIA
Vila Velha
Domingos Martins
Viana
Marechal Floriano
Guarapari

STA. MARIA DA VITÓRIA RIVER BASIN
JUCU RIVER BASIN
GUARAPARI RIVER BASIN

R. Sta. Maria da Vitória
R. Mangaraí
R. Duas Bocas
R. Bubu
R. Galo Nor te
Jucu Braço
R. Formate
R. Marinho
R. Jucu
R. Una
R. Conceição
R. Perocão
R. Jabuti

ATLANTIC OCEAN

0 5 10 15 20 25
KILOMETERS

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APRIL 2012