

Ceará PforR – Technical Assessment

The Government of Ceará has asked for the Bank's support in implementing its multi-year plan (*Plano Plurianual or PPA*) for 2012-15. The objectives of the Plan are to promote equitable social development, sustainable economic development and to contribute to the emergence of a more efficient and participatory public sector.

The activities to be supported have been chosen on the basis of the importance to these goals, the state's commitment to and the Bank's capacity, in view of its experience in other Brazilian states and elsewhere, to contribute to improving their design and execution. The PforR will build on previous Bank support for public sector reform by strengthening results-based management within sector agencies and providing incentives for collaboration among agencies and with the private sector. This will contribute to strengthening the implementation of Government programs in the following areas: skills development, early childhood development and water quality.

Cross-Cutting Theme: Public Sector Management:

Since 2003 the Government of Ceará has attempted to strengthen its ability to deliver services to citizens and invest in the State's social and economic infrastructure. Among other advances it has increased the transparency and efficiency of revenue administration, including the adoption of new technology for tax and customs payments to increase efficiency and reduce corruption, with the result that tax revenues have increased by 13.5% annually in nominal terms since 2006 (7.7 % in real terms). Net current revenue meanwhile has increased by 12.7%, compared to an average of 12.4% in other Brazilian states. The Government has also integrated its financial management systems and adopted accrual accounting in 2012, and centralized its competitive procurement function. Though there is still room for improvement in contract management, Ceará's procedures for procurement planning are sophisticated and benefit from multiple information systems to ensure compliance and inform policy-making.

Perhaps one of the most important achievements has been the development of an integrated investment management system (MAPP) which keeps data on proposals for and the implementation of all public investment projects in the State. As part of this program the Government has introduced elements of Results Based Management (RBM) through the establishment of a series of strategic goals, which require each sector to develop a strategic plan and set of priority programs, each with its set of outputs and operational plans, and report on their implementation annually to the Governor. This involved the setting up of a Committee for Result-based Management and Fiscal Management (COGERF), a 'super-cabinet' composed of the four most powerful secretariats (SEPLAG, SEFAZ, CGE and Casa Civil), and a 'situation room' to facilitate monitoring by the Governor's office.

The current model has been effective in ensuring the implementation of the Governor's high priority investments. Moreover, the reforms to tax and revenue administration, together with a buoyant economy, have enabled the State to increase investment to over 20% of Net Current Revenues (RCL). However, despite the introduction of many of the characteristics of RBM models, the program did not, with one or two exceptions (e.g. SEDUC), engage sector agency staff or result in any changes to operational practices. Instead, RBM tools were implemented only in a formal sense at the level of the Secretaries and their core teams, functioning almost exclusively as a management information tool for the Governor and his staff. Even then, there have been concerns about the quality of the reports submitted by sectors to the Governor's office and no evidence that the data they contained has been reflected in resource allocation discussions or the implementation of policy. Moreover, the principal institutional element of the system

(COGERF) focuses more on detailed day-to-day budget management rather than on results. Overall, the culture of results based management within state secretariats has not yet taken root.¹

It is common that in their initial stages RBM techniques in many states and countries may concentrate on their formal manifestations and lack mechanisms to provide incentives to for individuals and teams within public institutions to align their behavior and action with the achievement of targets set by the executive. This was the case, for example, in the State of Minas Gerais, when it was quickly realized after the reforms in 2005, that simply having targets agreed between Secretaries and the Governor was insufficient in most areas to improve performance. The reforms were deepened by ensuring that first level performance agreements were backed by second level agreements between Secretaries and teams within each secretariat, and that incentives were introduced to ensure that each team was focusing on their results. In the third stage of evolution of the model it was decentralized so that individual secretariats could develop the ability and internal institutions to manage for results, rather than have a centralized and thus relatively fragile structure. The results based focus was also strengthened by the introduction of new trained managers, often with a private sector background. Finally there was continual attention to the quantity (reducing the numbers) and quality of indicators used for results management. There is however no one model of results management, rather there are general principles which will need to be applied to the specific characteristics of the state. These principles include ensuring that the results to be managed are relevant and achievable, that there are incentives throughout the whole administration to achieve them, that institutional mechanisms are developed to allow for experimentation and problem solving, and that basic administrative, financial and budgeting systems are working effectively.

Solving complex problems such as those in skills provision, early childhood development and water quality requires more than setting targets and monitoring. Equally, merely increasing the supply of public outputs through the top-down expansion of expenditure programs is not sufficient. The risk in this case is that resources will be wasted or simply spent ineffectively (particularly in the case of public investment). Instead improved public management requires governments to pay attention to service quality and to the alignment of its outputs with the real needs of citizens and the private sector. This involves developing and institutionalizing mechanisms for gathering and responding to feedback, both from within the public institutions and also through mechanisms including participation of citizens in both the design and implementation of policies. It also requires cooperation across institutional boundaries and with the private sector: between the agencies responsible for environment and land use management in the case of water quality; among education, health and social protection for early childhood development; and between public research and training institutions and the private sector for innovation and skills provision.

This suggests that what is required is a process of ‘diagnostic monitoring,’ or decentralized problem-solving subject to overall objectives. This comprises three stages, linked in an iterative cycle. First, it requires the setting of broad framework goals – in this case, improvements in water quality, the responsiveness of public training programs to demand and the quality of programs to stimulate early childhood development. Second, sector agencies are given broad discretion to pursue these goals in their own way, allowing space for innovation in technical designs and operational practices – including in their manner of interaction with each other and with end-users of the services they provide. Third and as a condition of this autonomy, these units would be required to report regularly on their performance and participate in a collective review of progress, and discussion of mechanisms to achieve targets, as well as focusing on internal mechanisms to review and improve performance. This review may lead to adjustments in the specification of objectives in line with an evolving social or political consensus, and the institutional process of discovery of what works and what does not.

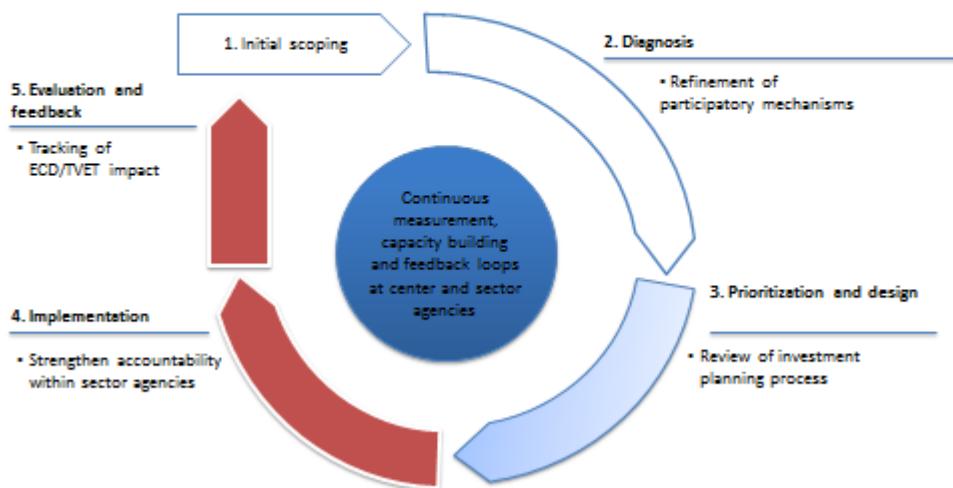
¹ As the Government observed in its comments on the ICR for the SWAp II: (i) the role of COGERF could have been better specified and (ii) those sector agencies involved in the project should develop procedures for communicating commitments and information to all levels of the organization.

Ceará already has some of the formal elements in place for this to work and has in some policy areas, through trial and error, been converging towards it in practice. It has an effective system for setting framework goals, through the PPA, and for transmitting these goals to the heads of sector agencies. It is also very effective at monitoring outputs, reviewing performance and at transmitting this information from sector agencies to the Governor's office, a process that was strongly reinforced through the two SWAs. The coordination committee established under IPECE involved key technical staff from all participating sector agencies, met twice monthly, and was a useful tool in uncovering problems and working towards multi-sector responses when warranted. It was through this repeated interaction among sector units and between sector and a central monitoring unit, for example, that the complexity of the challenge involved in tackling water quality became apparent.

Where Ceará is less adept is at measuring the relationship between these outputs and impact variables (e.g. productivity, learning outcomes, water quality), ensuring that their supply is properly aligned with the needs of citizens and private sector enterprises, and in holding sector agencies accountable if they are not. This applies equally to large infrastructure projects, where there is a common disjuncture between social objectives and the investment planning process, as to smaller scale service delivery, where there is a lack of targeting and evaluation. There is room for improvement at all points in the policy cycle: to strengthen the system of investment planning, ensure that there are mechanisms for effectively reviewing the proposed costs of projects, contesting their benefits and crucially ensuring that decisions are taken simultaneously so that potential trade-offs can be properly discussed and evaluated. This does not imply full formal cost-benefit analysis for all (or even most) investment projects, but it does imply the establishment of formal criteria to filter projects and ensure their alignment with strategic priorities. In the medium term it will also mean strengthening the ex-post evaluation of investment projects (of both their implementation and effectiveness) and assessing the impact of current programs, so that sector agencies can be held accountable for performance, but also given support to improve their performance.

Figure 1: Policy cycle

The project will strengthen all stages of the policy cycle



The PforR will reinforce this process of policy learning in two ways. First, it will further contribute to changing the operating culture in the four participating agencies – SEDUC, STDS, CIDADES, SRH – by encouraging them to concentrate on intermediate outcomes (as opposed to budget execution) and to reflect on the relationship between these outcomes and their social objectives (which will be tracked as PDO indicators). Second, the PforR will provide technical assistance for specific public sector management functions, improvements in which will also be tracked through secondary (i.e. non-disbursement linked) indicators. These will benefit both those agencies participating in the PforR program and others and are likely to be in the following areas:

Budget preparation and execution (US\$2.4 million): This activity will support reforms to budget preparation and execution procedures, particularly cash management and the management of increasing revenues to ensure that sufficient short and medium term financial shock absorption exists to reduce the need for detailed intra-year adjustment of the budget. One of the key elements in this assistance would be to develop procedures to allow flexible budget management of uncertain revenue sources and expenditures dependent on external sources (such as convênios with the Federal Government). Another element would be to develop an organizational and technical capacity to produce consistent and conservative revenue forecasts. This would involve the development of internal coordination and validation mechanisms for revenue forecasts. Finally this assistance would include support for the methodology and organization of a budget reform unit, whose function would be to identify deficiencies in the budgetary process, and develop proposals for changes and reforms. Together the measures supported by this consultancy would gradually restore the credibility of the budget and planning process and allow COGERF to concentrate on strategic issues rather than day to day budget management.

Costing methodology (US\$ 1.8 million): This consultancy would assist in the development of a methodology and system for costing programs and projects, including sector-wide guidelines that define cost concepts, methods of cost allocation, the relationship between cost and budget expenditures, cost management and the needs for development of cost information systems. The guidelines would be directed at standardizing cost definitions, improving the accuracy of basic cost information, so as to be able to relate the costs to the outputs and results of activities, and thus evaluate the efficiency of expenditure and provide information for resource allocation decisions. In addition the consultancy would assist in developing methodologies that ensure comparability across programs for use in budget formulation processes and forecasting methodologies for projecting forward estimates of expenditures. This would include ensuring consistency in (or the consistent application of differential approaches to) economic parameters, cost base assumptions and price adjustments over the forward year planning period.

Human resource management (US\$ 1.5 million): The assistance in this area would include a payroll audit to improve efficiency of personnel expenditures in the Government of Ceará by identifying anomalies and errors in pay and employment in the public sector; and developing recommendations to strengthen payroll processes and controls, ensuring an efficient payroll management going forward. The payroll audit would then be followed by assistance to redesign human resource management processes including a stock-taking of current and required skills, develop of career plans, processes of appointment, rotation, promotion and dismissal. The assistance would also include a developing a proposal to improve the technological basis of HR management in the State.

Investment planning (US\$ 1.9 million): This activity will assist the State to develop and implement the proposed investment planning methodology for strategic projects being developed by the State, a first draft of which is likely to be ready in June 2013. The consultancy will assist in applying and refining a methodology for quality-based investment selection and provide training in the economic analysis of investment projects. This consultancy would work closely with the consultancy on budget processes to ensure that investment planning is an integral part of the budget planning process. Just as importantly the

consultancy will provide support to help the State to design the necessary institutions and accountabilities to allow the planning methodology and economic analysis to feed into management decisions.

Strengthening management for results (US\$ 2.3 million): The consultancy will assist in the design of institutional mechanisms to build into administrative processes the necessary incentives to help staff to focus on the objectives of the State, and to have fluid communication and joint problem solving across sectors. While supporting the development of these mechanisms in for the overall public administration, special attention would be paid to the development of incentives and coordination mechanisms between the institutions involved in the areas of Early Childhood Development, Skills Development and water quality. An important element of this work would be to provide in assistance in improving quality, utility and relevance of results indicators. Particular attention would be paid to ensuring that the indicators should have operational content and managerial implications.

Citizen participation and monitoring (US\$ 1.4 million): The assistance would improve ongoing participatory processes in the state, leveraging its capacity to better identify citizens' demands for policies and services. This includes an evaluation of the current participatory practices in the multi-year state planning (PPA), followed by the development of a tailored methodology to optimize the process, aiming to avoid elite capture and redundancy in the process of identification of demands. It will also devise strategies and develop technological solutions to enable third party monitoring of governmental programs and actions, notably those related to ECD and professional education. Particular attention will be paid to a better articulation between participatory institutions and results based management practices in the state.

These activities are aligned with the PPA and fit squarely within the third pillar, 'Participatory, Ethical and Competent Government.' The technical assistance activities will support the execution of the following Guidelines: (i) 'Strengthening of the Relationship between Government and Society'; (ii) 'Democratic, Transparent and Results-Oriented Management.'

Program 1: Skills development

I: Scope of program:

The PforR will support expenditure programs in secondary professional education. Since 2008 Ceará has spent BRL 645 million establishing a network of technical and vocational training facilities targeted towards students of high school age and covering 74 of its 184 municipalities. More than 38 thousand students have enrolled in these schools since the program's inception. The goal is to increase the number of schools in operation to 140 in 128 municipalities by 2015, with some schools serving more than one municipality. The consolidation and expansion of this network to the rest of the state requires investments in the maintenance and refurbishment of facilities already in operation, the construction of new schools and the purchase of training materials, development of curricula and the hiring and training of instructors and teachers. The program sub-components are:

Maintenance of vocational training schools (BRL 491.7 mln): The program will support the maintenance of the 97 professional education schools already in operation and the additional 35 schools under construction or bidding. Maintenance costs include electricity, water, cleaning and office supplies, maintenance of laboratories, uniforms, food, and logistics costs associated with field trips and technical visits.

Construction, refurbishment of training schools (BRL 95.0 mln): The program will also support the construction of 8 new schools between 2013 and 2015, excluding those currently under construction or for which bids have been submitted. It will also finance refurbishment of the existing infrastructure and the building or adaptation of new technology laboratories in established schools.

Acquisition of teaching materials, program development (BRL 24.0 mln): This comprises the purchase of books and the development and printing of course materials. It also includes the provision of scholarships for students undertaking internships in the last year of their studies.

The operation will also finance technical assistance activities to help the state: (1) improve the design, monitoring and evaluation of programs related to vocational education and innovation; and (2) improve the design, planning and supervision of state strategies to support the growth of the productive sector. These activities will benefit several state government agencies beyond those involved in the PforR program, notably SECITECE, STDS, ADECE and CEDE.

Improvements in the design, monitoring and evaluation of vocational education and innovation programs (US\$ 2.8 million): The program will provide technical assistance to improve the monitoring, evaluation and design of vocational training and innovation programs in Ceará. It will emphasize the collection of new and better quality data on program processes, outputs and outcomes, as well as improved internal procedures to take this newly collected data into account in the decision making process. Technical assistance will also be provided to conduct impact assessments of vocational training and innovation programs currently under implementation and to strengthen the design of evaluation strategies of initiatives yet to be launched (for example, Technology Parks). The operation will also help improve the design of training for instructors and teachers, the provision of entrepreneurship training and student testing in the secondary professional educational system.

Improvements in the design and implementation of a private sector development strategy (US\$ 0.4 million): The operation will support an analysis of coordination mechanisms in the state and their effectiveness in promoting the growth of the productive sector. It will also assist in strengthening the monitoring of private companies' commitments under existing incentive schemes. The aim will be to

generate recommendations for improving coordination and feedback mechanisms to inform the planning, supervision and design of new instruments and helping improve the functioning of existing ones. The recommendations will also address how to improve participation of stakeholders outside the state government, such as academia, the private sector and the federal government, in developing a strategy for economic growth.

II: Strategic Relevance, Technical Soundness and Institutional Arrangements

A: Strategic relevance:

The state's recent economic growth has been driven by regional infrastructure projects like airports, ports and digital communications. Recent private sector development has depended mainly on large investments in capital-intensive industries like steel and petroleum refining. Otherwise, production has historically been concentrated in traditional sectors such as leather, agricultural products and tourism, with low levels of technological content that can be more vulnerable to shocks and that have not invested in upgrading the technology used in its productive processes. Exports consist largely of traditional products such as footwear and perishables to slow growing mature markets such as Europe and the United States. This pattern of concentration in low-skilled industries and more recently capital intensive investments with limited employment generation has prevented the state from raising its rate of growth of labor income.

To ensure that a larger share of the population benefits from growth, the state will need to shift towards a strategy based around increasing private sector productivity. There is a need to develop a shared vision for private sector-led growth, to attract additional large investments in activities consistent with the state's endowment and to develop connections between them and existing clusters of activity. Among other things, this will involve investing in worker training. Interventions to support private sector development in lagging regions address the need for better access to skills, technology and finance, targeted investment promotion and improvements in the investment climate, transport and physical infrastructure.²

Skills shortages are one of the main constraints on doing business not only in the north east, but in Brazil as a whole.³ It takes Brazilian firms on average 8.8 weeks to fill a skilled vacancy, compared to a LAC average of 6.5 weeks.⁴ The situation is particularly difficult in Ceará. According to the Bank's 2009 Enterprise Survey, over 90 percent of firms there view an inadequately educated workforce as a major constraint on their operations – ahead of business licenses, trade and labor regulations and infrastructure. This is a higher percentage than in any other state than Amazonas and Paraíba and well above the national average of 69 percent. Data from the *Instituto de Desenvolvimento Industrial do Ceará (INDI)* reinforce the picture: 66 percent of all firms and 75 percent of large firms surveyed point to the lack of qualified labor as a major problem for their operations.⁵ Shortages are particularly acute among production and technical staff – more so than for managers and engineers.

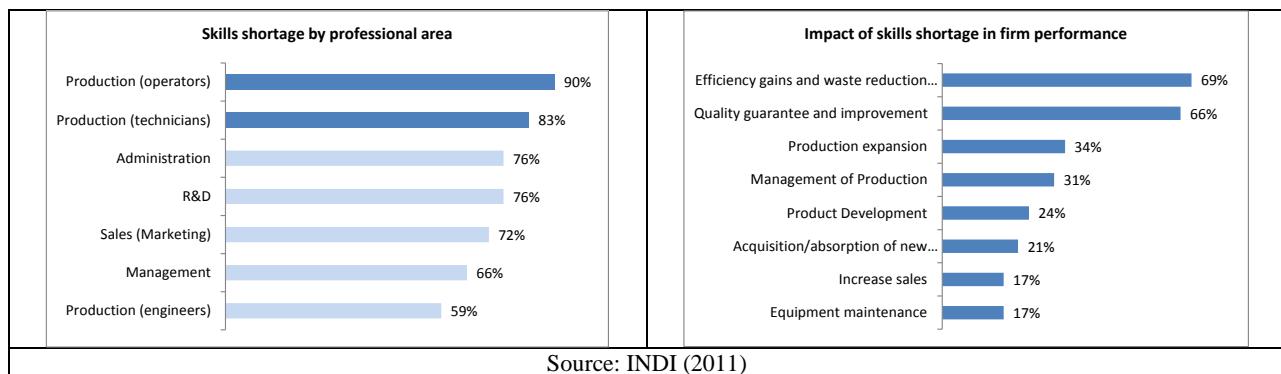
Figure 2: Skills shortages by type and impact

² Thomas Farole. *Competitiveness and Connectivity: Integrating Lagging Regions in Global Markets*.

³ Menezes Filho (2012), “Apagão de Mão de Obra Qualificada? As Profissões e o Mercado de Trabalho Brasileiro entre 2000 e 2010.

⁴ Almeida and Jesus Filho (2011). *Technology Adoption and the Demand for Skills: Learning from the Time to Fill Job Vacancies in LAC*. Mimeo, World Bank.

⁵ Instituto de Desenvolvimento Industrial do Ceará (2011). “Efeitos da Escassez de Trabalhador Qualificado na Indústria”. *Carta Econômica* No. 2, Ano 4, Fevereiro 2011.



Source: INDI (2011)

Strategies for coping with skills shortages range from in-house training through external training to the recruitment of professionals via the labor market. The prevalence of rural employment and of small and medium-sized enterprises in Ceará means that firms are less likely to train workers themselves and more likely to rely on external recruitment.⁶ Approximately two thirds of workers employed at the Pecen port complex, for example, are from outside the state. As in other northeastern states, the influx of large investments in strategic sectors (particularly refining and steel production) has created a gap between the demand for and availability of relevant skills.⁷ Behind this shortage of a qualified labor force is Ceará's relatively poor overall educational performance. Only 29 percent of the population has completed high school and just 7 percent has undergraduate degrees, compared to 42 percent and 15 percent for São Paulo.⁸⁹

Public investment in vocational and professional training is justified by the inability of private enterprises to appropriate returns on general training and in the uncertainty and lack of information about the returns on investment in human capital. In Brazil, the problem may be compounded by high rates of labor turnover that create additional disincentives for firms to train workers.¹⁰ Rates of private investment in training are even lower in Ceará than the rest of the country: just 30 percent of firms report compared to 53 percent in Brazil as a whole – and the proportion of workers undergoing formal training is also below the national average – 58 percent compared to 67 percent overall.

The state government has responded by establishing and expanding the state network of technical and vocational training institutions, targeted at those of high-school age (14-18 year-olds). The number of schools increased from zero in 2008 to 97 in 2013, with a further 43 under construction and planned for the 2013-2015 period.¹¹ The idea behind the expansion is to provide all those municipalities whose

⁶ Almeida and Aterido (2012) *The Investment in Job Training: Why Are SMEs Lagging So Much Behind?* , IZA DP No. 4981 show that SMEs in Latin America, including in Brazil, have a smaller expected return from the investment in job training than larger firms. Those differences hold after accounting for differences in a number of observable characteristics across firms.

⁷ Menezes Filho, N. (2012), “As profissões e o Mercado de trabalho no Brasil na Última Década,” mimeo.

⁸ Basic education was also an area of focus under the SWAp II, which supported early child learning. One of its objectives was to promote better service quality in education (particularly early-childhood literacy). This objective was met – the second grade literacy rate rose from 56 percent to 81.4 percent by the end of the project.

⁹ Data from National Census 2010 (IBGE).

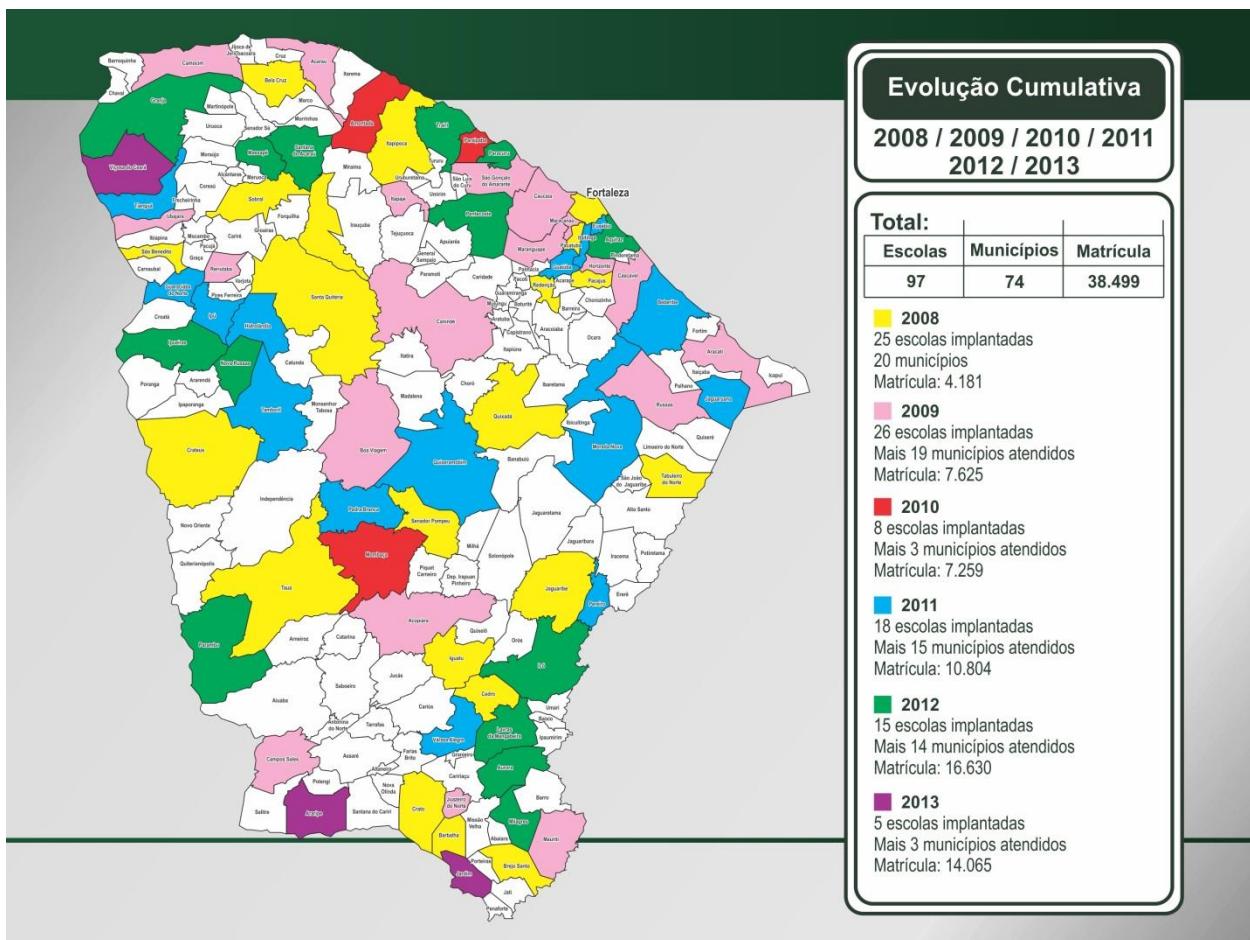
¹⁰ Corseuil, C., Foguel, M., Gonzaga, G. and Ribeiro, E. Youth employment in Brazil: Evidence on low attachment and an evaluation of a youth targeted program. Mimeo.

¹¹ The expansion of TVET in Ceará followed on the heels of a large push to increase technical education at the federal level, which led to the creation of 214 new federal training institutes between 2003 and 2011. It was accompanied by the creation in 2007 of the federal program *Brasil Profissionalizado* whose objective was to strengthen networks of middle school technical and vocational training at the state level. It will have disbursed around BRL 1.8 billion to state and municipal governments by 2014.

population is over 25,000 with a training institution, while attending to remaining locations through consortia with one school attending more than one municipality. This is one of the largest secondary professional education programs in Brazil and is preparing thousands of young people for the workplace and tertiary education.

In addition to these secondary professional schools managed by SEDUC, SECITECE also runs 12 Technology Vocational Centers, and is implementing a new Center for Technical Training (*Centro de Treinamento Técnico do Ceará, CTTC*). Also, like other states, Ceará benefits from the federally administered S system (SENAI, SENAC, SNAR, SENAT) and from a network of federal training institutions (CEFETs), both of which are targeted towards professional education and are funded, among other sources, from the federal *Programa Nacional de Acesso ao Ensino Técnico e Emprego* (PRONATEC).¹²

Figure 3: Expansion of secondary professional education in Ceará, schools built since 2013.



The challenge now is to ensure the program's effectiveness. This will require an emphasis not only on expanding coverage but also on improving quality and on properly aligning program content with private

¹² A large part of the funding for the S system comes from the Fundo de Amparo ao Trabalhador (FAT) which is financed by the PIS and COFINS taxes.

sector needs. It means assessing program impact and improving coordination and feedback mechanisms to allow the results of impact assessment to be absorbed into subsequent rounds of program design.

Exclusion of alternative activities:

Previous Bank operations (in particular the SWAp II P106765 and Cidades do Ceará P099369 projects) supported the provision of technological extension services to small and medium-sized enterprises, improvements in the process of business registration, investments in broadband internet access and the formation of regional clusters in established industries such as tourism and footwear. Several alternative activities were considered for inclusion in the PforR program:

- Innovation: the Bank considered supporting programs to improve research linkages to the market, through consolidation of network of innovation hubs (Redenit), improved system of grants for innovation (FIT) and support for new R&D centers. These are an important part of the government's private sector development program but the Bank considers them less crucial than professional education. Weaknesses in the financial management capacity of the implementing agency, FUNCAP, would also prevent it from participating in a Bank-financed operation.
- Technology extension services: SECITECE provides technological consulting to firms through NUTEC; demand has fallen off as a result of the growth of the private market for these services and there is no longer a sufficiently strong case for public provision;
- Business registration reform: Ceará has simplified its procedures for registering a new business and over 80 percent of new registrations are now completed in less than 72 hours. Further reform does not require Bank assistance;
- Investment promotion: The operation will support the development of a strategy for private sector led growth but it will not attempt to encourage any reform of the state's use of fiscal incentives to attract investment; this question requires a national-level political solution and is now under consideration by the Brazilian Federal Government;
- Broadband investment: The SWAp II supported the establishment of the Cinturão Digital, a broadband belt that reaches the entire state and that has brought internet access to its poorest regions. This investment is complete, with only last mile access to the more remote municipalities still under implementation. The government plans to take advantage of the Cinturão Digital to support distance learning and computer literacy courses through professional education facilities;
- Access to finance: The Bank's Enterprise Surveys suggest that access to finance may be an important constraint. Only 30 percent of firms use banks to finance investment in fixed assets, compared to 48 percent for Brazil as a whole, and 65 percent of investment capital comes from internal funds, the highest proportion anywhere in the country. The Government's efforts to improve SME access to finance are being coordinated through the *Banco do Nordeste do Brasil* (BNB), with funding from the *Fundo Constitucional de Financiamento do Nordeste*. BNB also has a specific program to support microenterprises ('Crediamigo').

B: Technical soundness:

International experience in both developed and developing countries indicates that a few basic principles and characteristics underlie most successful technical and vocational training programs. First, they respond to a clearly identified source of demand for skills and teach curricula that are aligned with what the private sector requires. Second, they enlist employers in providing opportunities for internships and in some cases contributing equipment for classroom use. Third, they measure results – in terms of firms' access to skills and students' employability and earnings – and develop policies and standards for quality

assurance.¹³ Fourth, they establish governance structures that encourage collaboration and information sharing among training providers and communicate this information to the public.¹⁴

The operation will strengthen the Government program in the following respects:

Responsiveness to demand: The government should do more to identify current and future sources of demand for skilled labor, particularly from among potential large investors. Some communication occurs between ADECE and private industry organizations but its results are often not transmitted to other public agencies. The government is aware of this deficiency and the PPA alludes explicitly to strengthening the articulation between SEDUC and SECITECE on the one hand and ADECE and CEDE on the other.¹⁵ The PforR will assist by supporting the validation with the private sector of the state strategy for private sector growth currently being developed, which includes a pillar on skills development. Moreover, the PforR will also support an evaluation of existing mechanisms for coordination of professional education initiatives in the state, with a goal of improving how institutions use information on program results and outcomes to inform program adjustments and the design of new initiatives.

Engagement with private firms: SEDUC has developed partnerships with companies and other institutions to jointly design curricula, to provide internships and other training opportunities for students and to make available laboratory materials and equipment for student training. More than 17 such agreements have already been established, with companies such as PETROBRAS, *Companhia Docas do Ceará*, and industry organizations such as SINDIQUIMICA and SIMEC.¹⁶ The PforR will support these efforts through a DLI that measures the number of such agreements to encourage increased participation of the productive sector in the development and performance of EEEPs. The program will also support an analysis of how to improve coordination and consultation mechanisms for professional and vocational training.

Results measurement: SEDUC has conducted one initial assessment of graduate placement but does not track graduates' career trajectories, earnings and employability systematically. Assessments among the other secretariats have also been few and sporadic, and have focused on outputs and not on impact. There is a need for periodic assessments of outcomes and comprehensive assessments of the effectiveness, efficiency, quality and relevance of training programs. These should inform the operation of current programs and provoke adjustments in the design of new ones. Improvements are also required in the assessment methodology, as survey response rates are low. The PforR will support improvements in the measurement of results through a number of activities: (i) the establishment of a monitoring and evaluation system for technical and vocational education programs run by SEDUC, SECITECE and STDS; (ii) implementation of impact evaluation assessments of professional education programs in the state; (iii) support to improve the design of a proficiency evaluation that all students will have to take to test mastery of content at the end of their program. Finally, the PforR will track outcome results - labor insertion rates and firm satisfaction with the training provided - as secondary indicators to further encourage a focus on results measurement and monitoring.

Coordination and information sharing: The diversity of professional education programs at different levels poses a coordination challenge. The government is aware of these issues and SECITECE, for example, has proposed to develop a professional and technological education plan for the state. The PforR

¹³ This is of particular importance given that professional and vocational education is generally more costly than other general education programs.

¹⁴ Almeida, R., & World Bank. (2012). *The right skills for the job?: Rethinking training policies for workers*. Washington, D.C.: World Bank.

¹⁵ Ceará: Diretrizes para o Plano do Governo, p. 78.

¹⁶ SINDIQUIMICA is the state association of chemical, pharmaceutical and refining industries; SIMEC represents the mechanical, electrical components and metallurgical industries.

will help the state government to evaluate and improve mechanisms for inter-institutional coordination and consultation on issues related to private sector growth (including skills development). Recommendations of this assessment will also include ways to improve and increase public dissemination of program results. This will help improve decision-making by providers, users (current and potential students) and beneficiaries (firms).

C: Institutional arrangements:

SEDUC is responsible for implementing the secondary professional training program in Ceará, through its department for professional education. Its tasks include policy development, curriculum design and implementation, teacher training, structuring partnerships with the private sector and tracking graduates in the labor market. It will execute the PforR Program in skills development.

Capacity: SEDUC has proved its capacity to launch and implement the secondary professional education program through the establishment of 97 schools since 2008. It is also a long term beneficiary of Bank operations and participated in both SWAps. It was the only sector agency in the SWAp II to receive a ‘high’ rating for all its target indicators according to the subjective assessment undertaken for the ICR.¹⁷ It was also ranked second of fifteen participating agencies in its financial and procurement management.

Commitment: The Government’s commitment to professional education is attested to by its inclusion in the PPA under three different sections: science and technology, basic education and economic development.¹⁸ The activities supported under the PforR Program correspond to the following PPA Guideline: ‘high-school professional education through the expansion of training facilities in municipalities and internship opportunities.’¹⁹ High-school professional education was also mentioned as ‘one of the most important strategic challenges’ facing the state by the Governor in his January 2012 address to the legislative assembly.

IV: Monitoring and evaluation framework:

The PDO-level indicator is the number of technical staff (*técnicos*) with a completed secondary education absorbed by the private sector. The intermediate indicator, also a DLI, is the number of agreements between EEEPs and companies in the productive sector to contribute equipment, training opportunities or instructors.²⁰ There are three output type indicators. The first is a DLI associated with retroactive financing: the development of an initial state strategy to promote the development of skills aimed at strengthening innovation and the development of the productive sector in Ceará, together with a formal commitment from key stakeholders in the private sector and academia to validate and monitor the implementation of that strategy. The second is the definition of a governance model, with attributions, roles and responsibilities assigned, to coordinate policies aimed at promoting the growth of the productive sector. The third is the establishment and operation of a monitoring and evaluation system for state programs related to professional and technical education.

The proposed results framework is as follows:

*Table 2: Results framework (disbursement linked indicators in bold; * = associated with retroactive financing)*

¹⁷ ICR p. 21.

¹⁸ Law nº 15.109, of January 2 2012, of the state of Ceará.

¹⁹ Education: Guideline 2. Ceará: Diretrizes para o Plano do Governo, p. 26.

²⁰ The productive sector comprises private and public companies in manufacturing, agribusiness, tourism and ICT. For more details, please refer to the indicator protocols.

Output-level indicators	Intermediate outcome-level indicators	PDO-level or impact-level indicator
Approval of skills development strategy, preparation and implementation of related action plan*	Number of agreements in effect with private companies to contribute equipment, in situ training, inputs to curriculum design or course instructors	Number of technicians with completed secondary education absorbed by productive sector (public and private)
Establishment of monitoring and evaluation system for skills development programs	Analysis of and improvement of governance mechanisms for productive sector development policy (including skills development)	

The results framework is based on the idea that regular institutionalized communication between public providers and the productive sector will help align the supply of skills with demand and this will be reflected in employers' willingness to hire and in their degree of satisfaction with the quality and relevance of training provided. The three output indicators with strengthen public-private coordination and consultation mechanisms and assist in making information about the effectiveness and impact of programs more reliable and widely available. The intermediate outcome DLI is a direct measure of private sector involvement in program execution and a proxy for the sustainability of the professional education effort in the state, in the sense that firms' willingness to contribute equipment and training opportunities is likely a reflection of the program's utility. It is important to recognize the existence of potential confounding factors – in particular the broader economic context and the potential growth of private training programs – when evaluating the performance of this indicator. Where possible, the targets have been adjusted for the economic cycle.

SEDUC, IPECE, CEDE and SEPLAG will be responsible for gathering and reporting information on these indicators (see Annex 2 in the PAD).

V: Program Economic Evaluation:

There have been relatively few rigorous evaluations of training programs in Brazil. All have focused on the effects of training on labor outcomes (employability and income) and none on firm productivity and performance. Severnini and Orellano (2010) use cross-sectional data from the Brazilian southeast and northeast to show that participation in vocational training is associated with higher earnings and a greater likelihood of employment. Reis (2012) uses longitudinal data from the Monthly Employment Survey in Metropolitan areas to find that training increases the likelihood of subsequent employment by around 6 percent and earnings by between 18 percent and 45 percent.²¹ Assunção and Gonzaga (2010) find a 9.8 percent impact of professional education on workers' earnings.²²

VI: Technical risk:

The main risk is that the state will continue to invest substantial amounts of its resources to its vocational training initiative while not really knowing or learning about the overall effectiveness and efficiency of the initiative in reaching its goals. The risk of significant overlap among different agencies in training activities also adds to the urgency in promoting better coordination and information sharing among

²¹ Mauricio Reis. 2012. *Vocational Training and Labor Market Outcomes in Brazil*. IPEA, Working Paper 045.

²² Assunção, J. and Gonzaga, G. (2010). *Educação Profissional no Brasil: Inserção e Retorno*. Série Cenários no. 3, SENAI.

agencies. The operation will mitigate both risks: in the first case, by providing technical assistance for impact assessment and creating an institutional mechanism for the consideration of program effectiveness; in the second, by assessing and generating recommendations for better governance of the training system.

Program 2: Early Childhood Development and Poverty Reduction.

I: Scope of program:

The PforR will support the expansion of social protection policies in poor municipalities. It will also provide technical assistance to improve the targeting, monitoring and impact assessment of programs funded by the state anti-poverty fund. The program sub-component is:

Expansion of coverage of family support plan for the most vulnerable (BRL 29.0 mln): This activity will support the implementation of social protection programs at the municipal level for the extreme poor with children aged 0 to 6 years by expanding the co-financing of the *Programa de Atendimento Integral às Famílias* (PAIF). The PAIF improves life quality by establishing links between families and community and promoting access to social assistance programs and benefits. Priority is given to those families with children between 0 and 6 years old receiving social assistance, the disabled and the elderly. The program is implemented through the network of 369 Social Assistance Reference Centers (CRAS). Currently, the state co-finances 170 CRAS in 148 municipalities. The PforR will support the extension of the co-financing mechanism to the remaining CRAS, expanding the range of services offered.

The operation will also provide technical assistance in the following areas:

Development and evaluation of a home-based parenting pilot program (US\$ 3.0 million): This activity will help design a pilot home-based parenting program and assess its impact and cost effectiveness vis-à-vis the standard institutional model. Ceará has a high rate of illiteracy among parents which poses substantial challenges for the quality of support provided by caregivers to children at home. The Early Child Development Support Program (*Programa de Apoio ao Desenvolvimento Infantil - PADIN*) will train parents and caregivers in providing better cognitive and language stimulation to children under 3 years old. The visits will be conducted by a trained ECD agent supervised by an education specialist. The agents will train caregivers in literacy skills, in interactions that encourage child development such as play dates and in building toys with low cost materials.

Monitoring and capacity building for the CRAS (US\$ 0.6 million): This activity will improve the family support plan of the CRAS by strengthening their ability to target families in need and oversee program implementation. It will facilitate the exchange of knowledge on monitoring systems between STDS, SDA, IPECE and the Federal Ministry of Social Development and promote their inter-operability and capacity to learn from each other. The project will start with support to ten municipalities and will, in the last year of the project, assess the feasibility of an extension to others.²³

Strengthening of monitoring and results-based management of FECOP-financed programs (US\$ 0.8 million): This activity will improve the targeting and effectiveness of FECOP-supported programs, with particular emphasis on activities related to ECD, by: i) producing an inventory of existing programs directed towards families registered in the CadÚnico and sharpening the articulation among them; ii) developing operations manuals for these programs; iii) providing training in the development and use of program log frames; and iv) providing IT support to ensure that the information contained in CadÚnico is the backbone of the targeting and monitoring system of FECOP-financed programs.

II: Strategic Relevance, Technical Soundness and Institutional Arrangements

²³ The ten municipalities will be chosen on the basis of their high levels of poverty, participation in the PAA-Leite Program and the presence of a CRAS. At least some will also be recipients of PADIN.

A: Strategic relevance:

Poverty levels in Ceará are still unacceptably high – according to one definition 13 percent of the population lives below the regional extreme poverty line and almost a third below the poverty line.²⁴ Infant mortality and adult illiteracy have fallen consistently over the last decade but remain well above the Brazilian average. As in the rest of Brazil, the highest rates of poverty are among families with children of between minus nine months and six years of age. Public investments in early childhood development therefore tend to produce disproportionate benefits for the poorest segments of the population. There is also compelling evidence that they produce the largest long run returns on human capital and can contribute to increasing the share of the female population in the labor force. Furthermore, many young people live in poor households and the prevalence of youth poverty plays an important role in perpetuating cycles of deprivation by retarding the acquisition of skills and experience at a crucial point in career development.

Ceará has been successful in raising the coverage and quality of basic and middle schooling. It has several programs – among them the PAIC and a network of CEIs – aimed at improving literacy and learning outcomes among young children. Ceará also benefits from the national network of CRAS, the main point of delivery for unified social assistance, whose principal service is the PAIF. In the three decades before 2000 the state made huge gains in access to basic education, achieving near-universal initial primary enrollment at entry (enrollment rates among 7-14 year olds rose from 44% in 1970 to over 95% in 1999). These gains continued, albeit at a slower rate, in the decade to 2010. Even though many challenges remain, there has also been marked progress in the quality of education in recent years. In 2009 and 2011 Ceará surpassed IDEB targets set by the Federal Ministry of Education (MEC) for both primary and secondary education at the state and municipal levels. In 2011, for example, state schools scored 3.7 at primary level and 3.2 at secondary level, compared to targets of 3.2 and 3.1.²⁵

The state now wishes to replicate this success with respect to early childhood development. Expanding commitments in this area will be essential if Ceará is to meet the constitutionally mandated enrollment in pre-school for children aged four to five. Enrolment in crèches and pre-school activities has been rising but it still low. At the national level, more than one million children are still not enrolled in preschools despite enrollment having been constitutionally mandated in 2009. Ceará has been working to improve access to and the quality of ECD since 2007 with the objective of attaining 100% coverage for all 4-5 year-olds and expanding coverage for 0-3 year-olds. By focusing related programs in education and social protection more closely on the target population of families with young children, the Government hopes to reinforce the complementarities between them. The CRAS play a key role in this regard, bearing responsibility for managing the network of basic social assistance and promoting the coordination of the units tasked with delivering it.

In Ceará ECD services are delivered by municipalities but coordinated by the state government, through a central unit in SEDUC, the *Cordenadoria de Cooperação com os Municípios* (COPEM). They are also financed in part by the state and federal governments. The state supports the construction of facilities through the PAIC and through the *Programa de Apoio as Reformas Sociais do Ceará*, a joint project with the Inter-American Development Bank. The federal government runs several programs whose aim is to

²⁴ The ‘Extreme Poverty Line’ is defined as the income required for a minimum intake of 2,000 calories per day according to the World Health Organization. The ‘Regional Poverty Line,’ as defined by IPEA, is double the income level of the Extreme Poverty Line. In February 2013 1.726.763 Cearense families were registered in the CadÚnico, of which 1,022,038 reported a per capita monthly income of less than BRL 70. In April 2013, just over a million families in the state were beneficiaries of Bolsa Família, each receiving an average monthly benefit of BRL 152.

²⁵ *Perfil Municipal de Fortaleza: Aspectos Educacionais*. Instituto de Pesquisa e Estratégia Econômica do Ceará (IPECE). Secretaria do Planejamento e Gestão. Governo do Estado de Ceará, Aug. 2012.

improve welfare among poor families with children, including *Brazil Carinhoso* and *Proinfancia Brasil Carinhoso*. *Brazil Carinhoso* establishes financial incentives to municipalities to provide child care with the goal of expanding access to kindergartens among children aged 0 to 48 months, especially beneficiaries of Bolsa Família. *Proinfancia* meanwhile provides resources for the construction, renovation and purchase of equipment and furniture for nurseries and pre-school education. However, many municipalities find it difficult to implement them.²⁶ Part of the problem is that the smaller municipalities lack the resources to meet the co-financing requirement. They also find it hard to cope with the administrative burden, in particular the need to provide proof of land ownership before building crèches and other facilities.²⁷

The Government is also conscious of the need to improve the targeting and evaluation of its efforts to reduce poverty more generally. Its main instrument for doing so is the state Anti-Poverty Fund (FECOP) which finances the programs of eleven departments, under the coordination of SEPLAG. As Table 4 shows, the bulk of funding goes to rural income support and technical assistance (SDA - including the milk distribution program - *PAA-Leite*), low income housing (CIDADES), training and active labor market policies (STDS), child literacy programs (SEDUC) and family health (SESA). FECOP's size and importance make it an indispensable actor in Ceará's education, health and social protection programs. Previous Bank operations have attempted to improve the execution of programs funded by FECOP but not the criteria according to which the programs receive funding or the quality of their design.

Table 4: Distribution of poverty reduction programs financed by FECOP

Executing Agency	Program value	% total	Number of program	Mean budget per program
SDA	143,842	33.9	17	8,461
CIDADES	93,787	22.1	7	13,398
STDS	78,093	18.4	32	2,440
SEDUC	35,400	8.4	2	17,770
SESA	33,050	7.8	2	16,525
SEINFRA	21,860	5.2	2	10,930
SRH	6,550	1.5	3	2,183
SESPORTES	4,798	1.1	4	1,199
SECULT	3,050	0.7	3	1,017
SECITECE	2,726	0.6	2	1,363
SEPLAG	644	0.2	1	664
Total	423,800	100	75	5,651

²⁶ In Ceará services related to ECD are delivered by municipalities but part financed and coordinated by the state government, through a central unit in SEDUC, the *Cordenadoria de Cooperação com os Municípios* (COPEM).

²⁷ Federal financial benefits are proportional to the number of children registered in the Bolsa Família in crèches or per the number of new classrooms in crèches. For each eligible child aged 0-4 years enrolled in a public crèche or accredited private crèche, MDS provides an additional 50% of the resources allocated by FUNDEB. The process requires coordination between the municipal Bolsa Família and education authorities because the former has information on children in the program and the latter on children in crèches.

The most pressing problem facing FECOP is to ensure that its resources are being directed to the poorest segments of the population and that its activities are properly articulated with other anti-poverty programs. At present FECOP lacks a systematic approach or methodology for targeting and monitoring. Project selection is overly influenced by the availability of federal government financing²⁸ and there is only limited feedback of existing evaluation efforts into policy design. The PforR will provide technical assistance for a monitoring and information system. This will include training in defining log frames, needs assessments and impact evaluations. It will also support the development of an interactive data set to improve program targeting and the tracking of program performance. As with federal anti-poverty programs, the backbone of the system will be the CadUnico. The project will also facilitate the exchange of knowledge with the federal government (SAGI/MDS) which has invested heavily in its own monitoring system for *Brasil sem Miseria* and is keen on supporting capacity building among states and municipalities.

Exclusion of alternative activities:

Previous Bank operations supported improvements in the quality of education and healthcare. The SWAp I emphasized gains in the efficiency and equity of education spending and improvements in the testing cycle to improve child literacy. The SWAp II measured and provided incentives for improvements in early child literacy (grades one through four), in middle school education, in the quality certification of family health teams and in the efficiency of hospital administration.

The Government has shown itself capable of expanding the coverage and improving the quality of primary and secondary education without Bank support. In Fortaleza, for example, the share of school age children (aged four to 17) in either crèches or school is now at 93 percent. All municipalities now have early child literacy programs and literacy rates have increased, though they are still relatively low compared to the rest of Brazil. From 2000-2010, the literacy rate in Ceará of those aged 10 years old and up increased from about 90% to 93.5%. The literacy rate of those aged 7-10 years old experienced an even greater improvement, from 79.1% in 2000 to 88.2% in 2010.

At the Government's request, the PforR will exclude programs executed by SESA. The health component under-performed slightly under the SWAp, failing to meet one of its five DLIs by the end of the project (number of hospitals with ONA certification), and a portion of the final disbursement was cancelled as a consequence. It will however provide technical assistance for tracking the incidence of chronic diseases and the effectiveness of programs to treat them; also for the implementation of a statewide healthcare information system. This is important if Ceará is to tackle the broad range of factors that perpetuate poverty. These include large out-of-pocket spending on health care and the effects of illness on individuals' ability to work and provide for their families. Approximately 31 percent of Brazilian adults and 37 percent of the poor have physical conditions that severely or extremely limit their ability to work and carry out household activities.²⁹

The PforR will not support anti-poverty expenditure programs or initiatives that are the target of other Bank operations. For this reason it will not support the rural productive inclusion programs that are benefiting from the *Ceará Rural Sustainable Development and Competitiveness* (BR81240) project. These include three initiatives, in rural productive development and food and milk distribution to poor

²⁸ For example, program coverage is heavily pointed towards Fortaleza, which has relatively low levels of extreme poverty but receives 71 percent of the program's resources.

²⁹ PNAD.

families. SDA will however receive technical assistance to strengthen implementation of its milk-distribution program (*PAA-leite*).

B: Technical soundness:

At the heart of education policy is the idea that successful support for ECD requires a commitment to the family as the core unit. This in turn demands a high level of integration and coordination across social protection and labor, health and education programs and policies.³⁰ Ideally, the provision of education for early childhood development should be a component of an integrated intervention that addresses health, nutrition and early stimulation and learning needs together (Naudeau et al, 2010). It also requires close collaboration between the state and the municipalities responsible for service delivery, particularly in urban areas.

The two principal concerns are coverage and quality. Brazil as a whole and Ceará in particular suffer from an insufficient supply of early childhood education. The gap is particularly marked among the poor and in rural areas across Brazil. Enrollment among the poorest children is only 67% for pre-school and 12% for crèches. Achieving universal pre-school enrollment nation-wide would require almost 1.6 million new spaces. Expanding enrollment in crèches, which also cater to children younger than the mandatory pre-school target age of 4-5, to even 30% of the eligible population would require over 1.3 million new spaces (Evans et al 2012). In Ceará it would take an additional approximately 210 thousand slots, implying an expansion in coverage of 75%. Poorer municipalities with a lower tax base have fewer resources to dedicate to establishing and maintaining facilities, creating a financing gap that impacts poorer children who rely more heavily on public provision. Rural children's access is also undermined by longer and more complicated commutes and a lower population density that makes center-based care more expensive.³¹ This is worrisome because evidence from both developed and developing countries indicates that children from the poorest socioeconomic backgrounds are the most likely to benefit from center-based ECD, particularly when they start between the ages of 2 and 3 (Naudeau et al, 2010).³²

In addition to extending coverage, policy makers are also concerned with the quality of the services provided. Achieving universal access and enrollment itself is not sufficient: ECD providers also need to be strengthened as learning establishments. There is strong evidence of the importance of high quality programs. Evans et al (2012), for example, show that children receiving low-quality education perform no better on literacy tests than children who did not attend preschool. International experience points to several design and operational features of ECD that appear to have an impact on outcomes (Naudeau et al, 2010). Among them are the importance of starting with 2- or 3-year-olds, of ensuring that the curriculum is age-appropriate, targeting at-risk children (from low-income or otherwise disadvantaged backgrounds), recruiting teachers who are committed to ECD and have professional development opportunities and

³⁰ One such successful multi-sector ECD program in Brazil is Rio Grande do Sul's 'Better Early Childhood Program' (*Programa Primeira Infância Melhor - PIM*).

³¹ The quality of ECD is also typically higher in private pre-schools and crèches. As richer families tend to place higher value on education and are willing and able to self-finance, they more frequently enroll their children in privately provided ECE, reducing the push for higher quality public ECD. The progress in the recent years has also not been equal across all regions in Brazil. Infrastructure quality of crèches and pre-school centers is correlated with improved learning outcomes and quality of ECD provision, yet infrastructure quality of ECD is much lower in the North and Northeast of Brazil than in the South.

³² Along with developing countries like Bangladesh, Egypt, India, Mexico and the Philippines, children in Brazil show steep gradients in cognitive development according to socioeconomic level (Grantham-McGregor et al, 2007).

promoting outreach programs to provide parents with information nurturing their child's development, including advice on nutrition and stimulation.³³

There is evidence that Brazilian ECD programs have significant deficiencies both with respect to teacher-child ratios and the provision of appropriately structured learning.³⁴ A *Fundação Carlos Chagas* study found a lack of program structure and activities designed to develop key skills in children via appropriate activities, age appropriate content, and child-driven curriculum. This may be due in part to insufficient support and training for caregivers.³⁵ Parents play the primary role in providing a strong foundation for their children's development. Family background – in particular maternal education – continues to be among the strongest predictors of cognitive and socio-emotional development, even after controlling for the quality and quantity of care children receive outside the home.³⁶ Evidence suggests that supporting a parent education or home-visit component as part of an ECD program—replacing or in addition to center-based care—will yield significant learning benefits.

The proposed program addresses some, though not all, of these challenges. First, it will improve the coverage of education, social protection and active labor market policies. It will also expand the network of crèches and pre-escolar to regions with higher levels of extreme poverty, including those in remote and inaccessible locations, and extend the reach of existing social protection and labor market programs to poor families with children. Second it will improve the quality of crèches and pre-school care by investing in the skills of ECD coordinators and teachers. In rural areas with no education centers, it will also train parents to provide stimulation to their children and assist in their learning and development. Finally, it will promote collaboration among the sector agencies whose activities contribute to ECD through the establishment of a multi-sector ECD committee comprising representatives from SEDUC, SESA, STDS, SEPLAG and municipal counterparts, reinforced through a secondary indicator.

C: Institutional arrangements:

Capacity: The PforR program will be implemented by SEDUC (crèches and pre-school facilities) and STDS (social inclusion centers and family protection). SEDUC is a long term beneficiary of Bank operations and participated in both SWAps. It was the only sector agency in the SWAp II to receive a 'high' rating for all its target indicators according to the subjective assessment undertaken for the ICR.³⁷ It was also ranked second of fifteen participating agencies in its financial and procurement management.

Commitment: The activities to be supported are grounded in the social development axis of the PPA and correspond to the following Diretrizes:

³³ Naudeau et al (2011) argue that other important features of ECD centers include providing 15 hours or more of center-based ECD services per week, for at least 9 months a year; maintaining group size and adult-to-child ratios appropriate to the children's ages and overall cultural context; designing a curriculum that focuses not only on developing cognitive and language skills, but also socio-emotional skills; incorporating child-centered activities in which children freely choose from several structured play/learning corners and teachers adapt to the flow of children's choices.

³⁴ For example, the child to caregiver ratio is between 26-32 children per caregiver for pre-schools and crèches, respectively. This is significantly higher than the recommended 10 children per caregiver.

³⁵ The study noted that Brazil is relatively strong in child-caregiver interaction, demonstrating that ECE teachers and caregivers are indeed engaged in their work. ECE centers in Brazil, however, rated mostly inadequate in terms of program structure and with particular deficiencies in activities, in every area from playing with blocks, to physical activities, fine motor-activities, and use of books, amongst others. Caregivers need greater training and support to involve children in constructive activities.

³⁶ See Naudeau et al, 2011, Montie, Xiang, and Schweinhart 2006; Downer and Pianta 2006.

³⁷ ICR p. 21.

- Basic education with equity and a focus on the success of the pupil, undertaken in an environment of collaboration between different levels of government and the managers of the education system;³⁸
- Consolidation of the social security system; broadening of the network of protection and guarantee of the rights of children and young people.³⁹

All three sub-programs require substantial coordination with municipal government. Previous experience in Ceará has shown that this can be problematic.⁴⁰ In the case of these programs, however, these are reasons to think that things will be different. Both SEDUC and STDS have substantial experience of working effectively with municipalities:

- SEDUC/PAIC: Through PAIC, SEDUC has established close links with the municipalities, offering support for program management, continuing training for early and basic education teachers and early childhood literature for classrooms. In 2011, the Government launched PAIC MAIS, to extend support for early and basic education to all 184 municipalities.
- STDS/PAIF: STDS has a strong track record of working with municipalities to implement the PAIF, which is jointly financed by the Federal Government and the municipalities.

IV: Monitoring and evaluation framework:

The PDO-level or impact indicator is the percentage of families in Cadastro Único in targeted municipalities receiving support from CRAS with trained staff. There is one intermediate DLI: the number of children of target families attending day-care centers/crèches. The other intermediate indicators are the number of targeted municipalities providing training to at least 60 percent of ECD coordinators and principals in pedagogical and school management skills, and the number of CRAS technical teams receiving training in family support.⁴¹ There are also three output indicators: the adoption of a change in the municipal co-financing rule for state-level ECD; the establishment of a multi-sector ECD advisory committee; and the number of FECOP ECD projects with properly defined log-frames. All are objective and closely correlated with and attributable to program activities.

*Table 5: Results framework (disbursement linked indicators in bold; * = associated with retroactive financing)*

Output-level indicators	Intermediate outcome-level indicators	PDO-level or impact-level indicator
Reduction in municipal co-financing requirement for the construction of crèches and preschools with state funding*	Percentage of technical teams in CRAS receiving training in family support	Percentage of families in Cadastro Único in targeted municipalities receiving support from CRAS with trained staff
Percentage of FECOP-financed ECD projects with log frames		
Creation of multi-sector advisory ECD committee		

³⁸ Diretrizes do Governo p. 26.

³⁹ Diretrizes do Governo p. 51.

⁴⁰ In August 2012, for example, the Municipality of Fortaleza returned unspent funds it had received from the state government as a transfer to support family health teams.

⁴¹ Targeted municipalities are those 20 percent with the highest percentage of families below the Bolsa Família administrative poverty line.

(SEDUC, SESA, STDS, SEPLAG, municipal counterparts)		
---	--	--

The objective of this component is to increase the coverage and quality of ECD services provided to children aged 0 to 5 years, especially among vulnerable families. This will happen in two ways. First, the program will support an expansion in crèches and pre-schools through the PAIC which finances the construction of facilities. It will also alleviate the financial constraints faced by the poorest municipalities by incentivizing the relaxation of the co-financing requirement from 50 percent to 20 percent through a DLI. This expansion in coverage will be captured by the intermediate-level DLI. Second, the program will support improvements in the quality of ECD by providing technical assistance to municipalities, especially in the most vulnerable areas, for the training of teachers, ECD coordinators and principals. Among other things, this training will cover teacher coaching methods and issues in school management for principals. The operation will also support a home-based parenting training program to promote language and cognitive development among children of low-income parents.

Close program monitoring will be needed with the possibility of adjustments during implementation. Both SEDUC and STDS are committed to the objective of improving the effectiveness of the programs for which they are responsible but lack the technical knowledge to define appropriate indicators and carry out a comprehensive assessment of the results and impact evaluations. These deficiencies are even more pronounced at the municipal level. The operation will provide technical assistance to support the development of evidence-based program management. In particular, it will support the assist in the evaluation of ECD policies through the collection of detailed information on children's motor and cognitive development and their family characteristics. This data will then be used to assess the impact of programs at the municipal level and to inform any changes in program design that might be necessary. This process of review and adjustment will be overseen by the multi-sector ECD committee.

V: Program Economic Evaluation:

The ECD interventions are expected to generate significant returns. The dependence of individuals' ability to learn and subsequent success in the labor market on foundational skills acquired in early childhood means that handicaps come by early in life are difficult if not impossible to reverse. As poor families tend to lack the awareness and material resources necessary to provide adequate child care or an appropriately stimulating environment, there is a strong case for public provision.

Early child education has been demonstrated to show significant impacts, the best example being a 7-10 percent rate of return on the United States-based Perry Pre-school Program. Estimates from northeastern and southeastern Brazil are between 12.5 percent and 15 percent.⁴² Rehabilitation of existing early child education centers is expected to yield improved physical and social development, as per recent studies in Brazil, both of which are correlated with increases in earnings.

VI: Technical risk:

The evidence regarding the likely impact of these interventions on program take-up and impact is strong. But there are several risks. The first is political. Investment in crèches and pre-schools is led by

⁴² Evans and Kosec, *Early Child Education: Making Programs Work for Brazil's Most Important Generation*. World Bank, 2012.

municipalities and there is a possibility that they may fail to view it as a priority. A second risk relates to the municipalities' capacity to deliver training of sufficient quality. Ceará has a total of 184 municipalities and COPEM will find it hard to service all of them adequately, despite technical assistance.

Program 3: Water Quality

I: Scope of program:

The PforR will support initiatives to improve raw water quality in the Metropolitan, Acaraú and Salgado strategic watersheds. This will be done through a combination of measures to strengthen watershed management including inter-institutional collaboration and coordination, extend the network of household sewage connections and assist in the preparation of solid waste management plans. It is expected that the pilot approach employed in these three watersheds will then be scaled up to the rest of the state, though this is beyond the scope of the operation.

The PforR will support expenditure programs in the following four areas:

Development of water security plan for strategic watersheds (BRL 40.0 mln): The PforR program will support research, analytical work, environmental testing and monitoring to identify: (i) the main causes of the degradation of water quality in the three strategic watersheds; and (ii) structural and non-structural interventions needed to improve water quality in these watersheds. This will lead to the development of a water security plan, the first steps of which the program will implement through (i) the setting up of an executive group within the water security committee and (ii) state-wide public consultations.

Increase in number of connections to existing sewerage networks (BRL 124.8 mln): The program will support the connection of an additional 14,628 households to the existing sewage network, of which 10,588 will be in Fortaleza and 1,656 in other municipalities of the Metropolitan basin, 1,044 in the Acaraú basin and 1,340 in the Salgado basin. This corresponds to an overall increase in usage of existing connections from 83 to 86 percent, which will benefit an estimated 52,600 individuals.

Strengthening solid waste management (SWM) (BRL 37.4 mln): Strengthening solid waste management by preparing state-level, regional and watershed-level solid waste management plans and by implementing measures (excluding the construction of disposal facilities) to improve the coverage and effectiveness of the solid waste management services provided in the Watersheds, including reviewing the legislative framework for solid waste management, and evaluating the efficiency of public sanitation services and the application of tariffs in regulated sectors.

Strengthening hydro-environmental prediction and monitoring (BRL 10.6 mln): The program will support: i) the integration of weather and climate forecasting into water resources management; ii) the expansion, modernization and maintenance of the state's hydro-meteorological monitoring network (including via upgrading of meteorological radar and data collection and transmission network); iii) hydro-environmental mapping of the three strategic watersheds; (iv) monitoring of pollution, conservation units and protected areas and (v) a review of water resource management monitoring and supervision.

The operation will also provide technical assistance to strengthen water resource, environmental and solid waste management:

Water resource management (US\$ 2.6mln): This activity will evaluate and provide recommendations for improving the institutional framework for water management in Ceará, including mechanisms for participatory watershed management; it will support a strategic environmental assessment of state policies and programs that will inform the water security plan; it will assist in classifying the state's strategic reservoirs (Pacoti, Riachão, Gavião) by use and water quality objective, as required by federal legislation; it will develop a methodology for modeling water quality in Ceará, using the Aracoiaba reservoir as an example; and it will strengthen capacity to monitor water quality, including through participatory water management.

Environmental Management (US\$ 2.4mln): This activity will strengthen the municipal environmental agencies in the three strategic watersheds through capacity building for technical staff and identification of necessary regulatory instruments; it will provide technical assistance to assess the economic impact of environmental degradation and to develop draft legislation to support the emergence of a market for environmental services in Ceará; it will also strengthen capacity to monitor environmental compliance and punish infractions.

Solid waste management (US\$ 4.0mln): This activity will assist municipalities in preparing recovery plans to mitigate the environmental liabilities associated with degraded open air dumps, as required by federal legislation (CONPAM); it will also provide assistance, including environmental education, in devising and implementing a recycling program in the three strategic watersheds (CONPAM); and it will assess and provide recommendations for improvements in the structure of solid waste management regulation in Ceará, in particular the design of regulatory instruments and financing mechanisms for regulatory bodies (ARCE).

II: Strategic Relevance, Technical Soundness and Institutional Arrangements

A: Strategic relevance:

Ceará is one of Brazil's driest states. Approximately 70% of its territory lies within the so-called 'drought polygon' (*Polígono das Secas*). Rainfall is limited to three to four months a year. Due to the physical characteristics of the land, composed of crystalline rocks and shallow soils, the portion that infiltrates and is stored to be released through base flow is very small. Most precipitation is converted into runoff and practically all streams are intermittent. As a consequence and as is common in the rest of the Brazilian Northeast, Ceará experiences chronic water scarcity, with long and severe droughts. To minimize the impact of its climate and geology the state has, over the course of its history, built over five thousand reservoirs. More recently the Government, with Bank support, has invested heavily in transposing water basins, drilling wells and constructing aqueducts. These efforts have transformed stretches of rivers from intermittent to perennial and increased the reliability of water supply. However, this strategy has run its course. Water storage capacity is already estimated at over 90 percent of potential with approximately 18 billion cubic meters available in existing reservoirs. Another five dams under construction will add a further 1.3 billion cubic meters.⁴³

At the same time, there has been a troubling deterioration in raw water quality. During the period of implementation of the SWAp II, the proportion of sampled treated water complying with the state regulator ARCE's quality standards fell from 37.5 to 20 percent, compared to an end-project target of 80 percent.⁴⁴ Historically, Ceará's water management strategy has paid insufficient attention to quality.⁴⁵

⁴³ SRH has issued a call for proposals for the following new dams: Lontras (350 million m³), Melancia (27 million m³), Amarelas (48 million m³) and Germinal (2 million m³) and through DNOCS for the Fronteiras dam (850 million m³).

⁴⁴ In addition to the decline in raw water quality attributable to watershed pollution, this may reflect the increasing stringency of standards applied by SESA.

Increased influxes of pollutants, combined with fluctuations in water volume, have contributed to a degradation of the water quality in key reservoirs throughout the state. As water levels fall, particularly during droughts, conditions may reach highly eutrophic states and water becomes unusable, precisely when it is most needed. More generally, the degradation of surface and groundwater resources from pollution resulting from increased urbanization and economic growth, increased use of agrochemicals, and improper water resource management practices, has led to a reduction in the supply of safe water and increasing negative impacts on the environment.

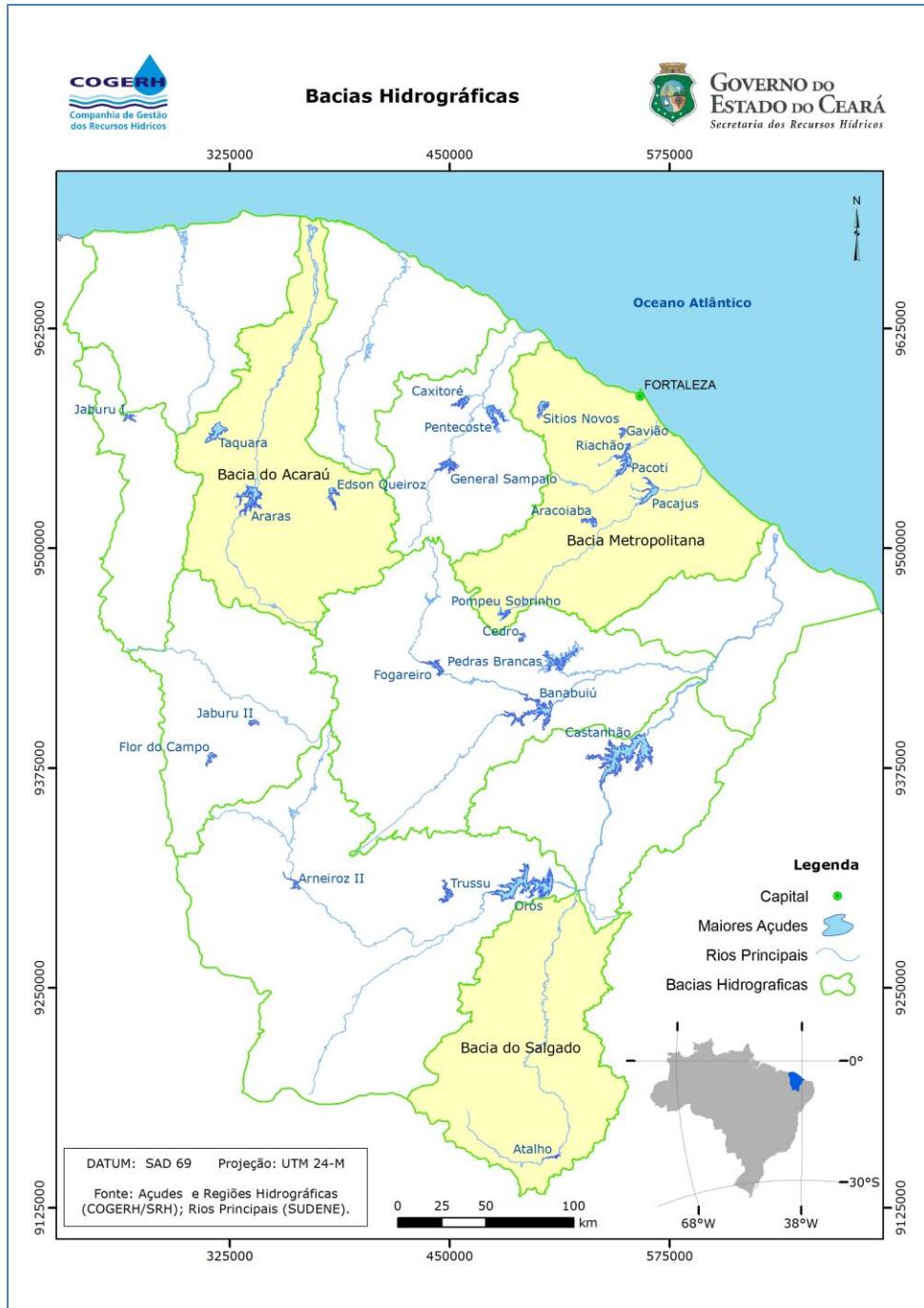
The primary sources of pollution of surface and groundwater vary by location.⁴⁶ In urbanized areas, such as the metropolitan region of Fortaleza, discharges of untreated municipal sewage and industrial effluents have been growing steadily over the past four decades, at a much faster pace than capacity to treat them, even at a primary level. The widespread, unregulated and unmonitored use of septic tanks in dense urban areas has affected the quality of groundwater. Years of solid waste dumping in inadequate facilities, alongside rivers, or directly into drainage channels has polluted groundwater and surface water.⁴⁷ In rural areas the primary sources of pollution are agricultural run-off, livestock discharges and lack of basic sanitation. In the case of reservoirs, the encroachment of livestock, including the use of water bodies for fish farming, and pollution generated by the inappropriate application of fertilizers and pesticides has led to widespread eutrophication. Bays and stretches of urban coastline also show persistent levels of pollution, primarily caused by discharges of raw sewage and depending of the area, untreated industrial waste.

Figure 4: Strategic Watersheds in Ceará

⁴⁵ The Bank's IEG Report on the Ceará Integrated Water Resources Management Project (P006449) noted as a lesson learned that more attention should have been paid to water quality in the project's design.

⁴⁶ Ceará is divided into 12 Units for Water Resources Management (*Unidades de Gerenciamiento de Recursos Hídricos* or *UGRH*).

⁴⁷ There are approximately 284 open dumps in Ceará, all of which are required by the 2010 National Law to have closed by 2014.



The PforR program will concentrate on three water basins (Metropolitan, Salgado and Acarau), chosen for their economic importance and because they have already built, or are in the process of building, sanitary landfills and so do not require additional investments in physical infrastructure. All three face pollution from a combination of domestic sewage, pesticide and fertilizer runoff, garbage dumps and waste from livestock. The Metropolitan basin is home to more than 29 million people or 71 percent of the state's population. It also hosts a large concentration of industries, including the Maracanau industrial district and the Pecen industrial complex which includes a steel plant and oil refinery. The Salgado basin has a population of 914,000 and is dominated by Juazeiro do Norte, the second largest city in the state and

destination for 2-2.5 million religious tourists per year, who come to pay homage to Padre Cicero. The Aracau basin has a population of 790,000 and is mainly urban.

Poor water quality imposes a large economic and social cost. It pushes up the cost of treating water intended for human consumption and reduces its suitability for other uses. CAGECE reports a steady increase in the level of chemicals used in its treatment plants – to the point where investment in a secondary treatment process has become necessary. There are also important consequences for health and wellbeing. It is estimated that the reduction in gastrointestinal infections arising from extending access to basic sanitation for all Brazilian households would save BRL 745mln a year in hospital costs.⁴⁸

The problem will become worse as population continues to shift from rural to urban areas and climate change further raises the risk of drought. According to a Bank study, the Brazilian north east will experience lower precipitation and higher water loss through evaporation and plant transpiration, implying an increased likelihood of drought.⁴⁹ In the Jaguaribe river basin, one of the main basins in Ceará, mean annual evapotranspiration may rise by 5–15 percent accompanied by significant increases in the variability of rainfall, leading to reductions in surface runoff and flow.

Exclusion of alternative activities:

The Bank has a long record of supporting investments in water management in Ceará. The SWAp I supported the establishment of two ‘caatinga’ parks and the development of a mechanism of environmental-economic zoning. The SWAp II addressed environmental issues only tangentially, through a sub-component that streamlined environmental licensing procedures. The most significant Bank contribution in the water sector, however, was through the Integrated Water Resources Management Project (PROGERIRH – Loan 45310-BR & Ln 76300-BR) which supported investments in physical infrastructure and institutional strengthening with the overall objective of ensuring reliability of supply. PROGERIRH originally comprised six components: (i) management and institutional strengthening; (ii) design and construction of rural water supply infrastructure; (iii) construction of a new river basin transfer in the Fortaleza watershed; (iv) restoration of existing bulk water infrastructure; (v) micro watershed management project; (vi) development of groundwater management plans. A further two components in water resource management and hydraulic infrastructure were added under an additional financing.

The state continues to invest heavily in physical infrastructure, including in extending the sewerage network and in new dams. Category A investments of this type are ineligible for support under the PforR instrument. The operation will however continue to support organizational and managerial improvements.

B: Technical soundness:

Improving water quality demands a systematic approach that comprises: a) an adequate legal and regulatory framework; b) appropriate institutional arrangements; c) management tools for controlling pollution sources and promoting water quality management in rivers and reservoirs.

Ceará already has some elements of this approach in place. The legal frameworks for environmental and solid waste management are generally adequate, though work is still required in some cases required to align federal and state laws and to define regulatory instruments. Land use and water management are governed by the recently passed Federal Forest Code (Law 12.651/2012), which establishes forests and

⁴⁸ Trata Brasil, Fundação Getulio Vargas. 2010. Benefícios Econômicos da Expansão do Saneamento Brasileiro.

⁴⁹ Climate Change Impacts on Water Resources Management: Adaptation Challenges and Opportunities in Northeast Brazil

other forms of vegetation in the country as public goods of common interest to all Brazilians and establishes clear property rights and obligations for each category of use. The code allows rural smallholders to plant temporary and short cycle crops on the banks of rivers or lakes exposed during the dry season, subject to their not suppressing native vegetation or wildlife and conserving water and soil quality. The framework for solid waste management is determined by the National Policy on Solid Waste (Law 12.305/2010), which establishes obligations at the state and municipal levels. The state has a plan for integrated solid waste management which is consistent with national guidelines and identifies general targets for the collection, treatment and disposal of solid waste. The PforR program will assist in operationalizing it in the three strategic watersheds. There are no legal or policy-related obstacles to extending the scope of sewage connections. The federal legislative and regulatory frameworks for pesticide use and control are also adequate.⁵⁰ The principal weaknesses are institutional and managerial.

Incompatible policy objectives: The deterioration in water quality in large part reflects a failure of coordination among the institutions responsible for environmental and natural resources management. This is partly due to incompatible policy objectives. Agricultural interests, for example, often run counter to those of the agencies responsible for water quality and, indirectly, to the health and well-being of downstream users. Programs to support rural productive inclusion encourage fish-farming in reservoirs or allow farmers to graze their livestock or plant crops in riparian zones, all of which raises nutrient and pesticide loads. Aligning these divergent interests requires political intervention.

Inefficient institutional arrangements: The current institutional framework makes it difficult to promote an integrated approach to water resources management. The existence of multiple agencies with overlapping mandates and jurisdictions is confusing and inefficient. Collaboration is perceived as a burden that impedes individual agencies from accomplishing the tasks agreed on in their multiyear planning instrument. Inter-agency agreements exist on paper but are ineffective in practice.⁵¹ Moreover, river basins often span several municipalities, meaning their management is subject to multiple local committees. These committees lack decision-making powers and their recommendations have rarely translated into policy actions at either the municipal or the state level.

Poor management tools: Ceará lacks the capacity to properly monitor and value natural resources. Some initial steps have been taken towards measuring the impact of human-caused degradation, for example through environmental inventories of critical hydraulic basins that assess the effects of effluent from domestic sewage, animal husbandry in riparian zones, irregular disposal of solid waste and the indiscriminate use of pesticides in agriculture. It also lacks the capacity to enforce environmental regulation. SEMACE, the agency primarily responsible for enforcement, is overloaded, partly because it takes on functions that are properly within the remit of municipalities.

Lax social attitudes: There is a widespread lack of public awareness of the magnitude of the water quality problem, of its causes and of the complexity involved in mitigating pollution. A shift in social attitudes and individual behavior will be needed if integrated management approaches are to be effective. This will require environmental education to better demonstrate the impact of individual actions (e.g. illegal

⁵⁰ Federal legislation for pesticide use and control is enshrined in Law 7.802/1989 and its regulatory instrument Decree 4.074/2002 and Law 9.974/2000 which establishes procedures for final destination of packaging. At the state level it is guided by Law 12.228/1993, its regulatory instrument Decree 23.705/1995 and Resolution No. 08/1998 which approves the internal regimen of the State Pesticide Commission. More recent legislation, Law 14.145/2008 and its regulatory instrument Decree 30.578/2011 which deals with plant health protection establishes that ADAGRI (Plant and Animal Protection Agency) is responsible for monitoring pesticides. This has created some overlap in responsibilities which the operation will help resolve through technical assistance.

⁵¹ In 2011 SRH, CONPAM and SEMACE signed an agreement to manage water resources through ‘joint efforts to integrate enforcement actions, quantitative and qualitative monitoring of water and environmental education.’ The results have been modest due to inertia, lack of funding for cross support and a failure to involve local water committees.

sewage discharges, dumping of municipal solid waste, agricultural and industrial discharges) on environmental quality.

Table 7: Institutional Responsibilities for Water Management

Agency	Mandate/objective/responsibility
<i>Secretaria de Recursos Hídricos (SRH)</i>	Responsible for the provision, management and preservation of water resource in the state. It relies on several agencies to attain the minimum standards necessary for human use and consumption, as well as for consumption of other productive sectors. Within the SRH, the <i>Companhia de Gestão dos Recursos Hídricos</i> (COGERH) is responsible for water resource management, and the <i>Superintendência de Obras Hidráulicas</i> (SOHIDRA) is in charge of the planning of water-related infrastructure
<i>Superintendência Estadual do Meio Ambiente (SEMACE)</i>	Environmental agency responsible for control and enforcement of legislation, such as those for the protection of riparian zones and for solid waste management
<i>Conselho de Políticas e Gestão do Meio Ambiente (CONPAM)</i>	Formulates, establishes and coordinates state-level environmental policies
<i>Companhia de Água e Esgoto do Ceará (CAGECE)</i>	Water supply and sanitation utility, which services the majority of municipalities in the state
<i>Secretaria de Desenvolvimento Agrário (SDA)</i>	Defines and implements the state-wide agricultural development policies, which have impacts on land-use designations
<i>Conselho Estadual de Recursos Hídricos (CONERH)</i>	The highest state level organization dealing with the State Water Resources Policy. It has the following objectives: i) coordinate and execute the State Water Resources Policy; ii) Make explicit and negotiate use policies; iii) promote coordination among Federal, State, municipal agencies and civil society; and iv) deliberate on issues related to water resources.
Watershed Committees	Legal entities created by decree that have representation from civil society, user organizations, state and federal representatives and municipal authorities. It is administered by an elected Directorate.
<i>Sistema Integrado de Gestão dos Recursos Hídricos (SIGERH)</i>	Aims at implementing the legal instruments granting water resources use rights; license water works and raw water charges; water resources monitoring; operation and maintenance of water infrastructure; support water user organizations and run the collegiate bodies that make up the CONERH and Watershed Committees; monitor sources of water, develop the Information System for Water Resources and Meteorological as well as the implementation of the <i>Plano Estadual dos Recursos Hídricos</i> (PLANERH)

The PforR program will address these weaknesses. The water security plan will facilitate the achievement of a balance between water supply and its many competing uses (e.g. drinking water, irrigation, sanitation, energy and environmental services) in a way that sustains economic growth and social welfare without compromising its long-term sustainability.⁵² The formation of an inter-agency group for water security will improve coordination among the various bodies whose activities have a bearing on water quality. Meanwhile, the development of solid waste management plans will clarify the responsibilities of municipalities with respect to collection, sorting and disposal and provide them with tools (e.g. models for consortia) to fulfill these responsibilities. The optimization of the sewage network will include a

⁵² Water security is defined as “the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies.” Grey, D., C. W. Sadow. Water Policy 9 (2007) 545–571.

campaign to sensitize citizens to the health and other costs of illegal connections or of not connecting at all. Finally, the technical assistance component will support the monitoring of variables that affect water quality, better enabling the state to anticipate and mitigate the effects of extreme weather, including drought.

C: Institutional arrangements:

Four separate agencies will execute the four components of the water quality program: (i) SRH will lead the preparation of the water security plan and the organization of the Water Security Committee, with the involvement of other agencies; (ii) CAGECE will be responsible for household sewage connections; (iii) CONPAM will lead the development of municipal solid waste management plans and associated measures to improve municipal capacity; and (iv) FUNCEME will lead the consolidation of the water quality monitoring effort.

Capacity: All four agencies are well established, were involved in earlier World Bank projects and should be capable of executing their assigned tasks. However, the performance of the Government in implementing the PROGERIRH project was rated moderately unsatisfactory, due to delays in completing works and a failure to address issues around resettlement at the Gameleira and Umari dams. SRH in particular and, to a lesser degree, SEMACE suffer from a shortage of experienced and qualified staff. The agencies will also need to learn to work more effectively with each other – for example, through the Water Security Committee and regular meetings of the PforR Committee. Also, the municipalities which are responsible for solid waste and natural resource management lack the trained personnel and financial resources to do so properly, even though obliged to by law. CONPAM has set the creation of a cadre of environmental managers as a top priority and provides training for municipal officials, though budgetary constraints have limited its effectiveness.

Commitment: The PPA includes several guidelines to improve water management. These are grouped under the theme of ‘Economy for a Better Life’ and three headings: urban development and regional integration, environment and water resources. They include all those activities to be supported under the PforR program. The PPA was amended in March 2013 to include the development of a Water Security Plan. At the same time the Governor approved the creation of the inter-agency group for water security. The original PPA had already specified several of the actions that will be taken in developing the plan (e.g. classification of water bodies by use, identification of sources of pollution of water bodies, promotion of inter-agency coordination around water quality). The PPA also recognizes the importance of optimizing the sewerage network through additional connections, including through an information campaign to raise awareness of the benefits of adequate sewage disposal. It includes measures to improve solid waste management and achieve compliance with the federally mandated requirement of eliminating open air dumps by 2014. Finally it recognizes the need to strengthen the monitoring of water quality, even though the resources devoted to enforcement and policing are inadequate.

Table 8: Water Quality Program – Guidelines and Actions

Strategic objectives	Guidelines and actions
Urban development and regional integration	<p><i>Diretriz 1: Institutional Development – Strengthening urban development and regional policy integration, seeking institutional support to municipalities and regions, as well as urban planning and environmental control</i></p> <ul style="list-style-type: none"> • Encourage the creation of systems of municipal urban planning and environmental control • Encourage the implementation of consortia for environmental sanitation (water, sewer, solid waste) <p><i>Diretriz 2: Sanitation – Offer appropriate environmental conditions for the disposal of solid waste</i></p>

	<ul style="list-style-type: none"> • Encourage and support municipalities in drafting municipal sanitation plan • Encourage the establishment of inter-municipal consortia for landfill management
Environment	<p><i>Diretriz 1 – Strengthening State Policy on Forests and Biodiversity</i></p> <ul style="list-style-type: none"> • Encourage the creation of new protected areas • Study the institution of payment for environmental services for the conservation and preservation of natural resources <p><i>Diretriz 4 – Strategic Planning for Economic Development with Environmental Justice</i></p> <ul style="list-style-type: none"> • Plan for inclusion in the PPA of Strategic Environmental Assessment - SEA, and Ecological and Economic Zoning - EEZ as instruments of Planning and Management of Environmental Policies
Water resources	<p><i>Diretriz 1 – Decentralized, integrated and participative management of water resources</i></p> <ul style="list-style-type: none"> • Support the actions of water basin committees and commissions for management of water systems • Develop an intelligent and integrated information system for decision making in management of water resources of the State. <p><i>Diretriz 2 – Water for everyone</i></p> <ul style="list-style-type: none"> • Develop plan to identify alternative solutions and management models, aiming at establishing the program ‘Water for All Ceará’ <p><i>Diretriz 5 – Rational use of water and preservation of water resources</i></p> <ul style="list-style-type: none"> • Carry out environmental studies of water basins to identify pollution sources • Promote inter-sectoral coordination for the implementation of actions aimed at improving quality of water at the sources

IV: Monitoring and evaluation framework:

The results framework for the water quality program is as follows:

*Table 9: Results framework (disbursement linked indicators in bold; * = associated with retroactive financing)*

Output-level indicators	Intermediate outcome-level indicators	PDO-level or impact-level indicator
Establishment of inter-agency water security committee* Submission to legislature of water security plan for three strategic water bodies Submission to legislature of new watershed protection laws Submission of revised solid waste management law	Percentage of households with adequate connection to sewage system in three strategic watersheds Index of environmental enforcement quality Implementation of participatory water quality monitoring	Raw water quality in the Metropolitan Region of Fortaleza

The PDO-level or impact indicator is an index of raw water quality for the metropolitan region of Fortaleza (i.e. entering the existing treatment plant at the Gaviao reservoir and the planned new plant in the municipality of Caucaia).⁵³ The Project is expected to contribute to a modest but measurable

⁵³ The Water Quality Index was developed by the National Sanitation Foundation in 1970 to provide a standardized method for comparing the water quality of various bodies of water. There are nine parameters included in the index: dissolved oxygen (DO); fecal coliform; pH; biochemical oxygen demand (BOD) (5-day); temperature change (from one mile upstream); total phosphate; nitrate; turbidity; total solids. It is on a scale of 0 (worst) to 100 (best) and has been widely adopted in Brazil.

improvement in its value from 61.2 to 67.5. The intermediate indicators are (i) an index of enforcement quality (percentage of environmental infractions corrected, fraction of total reservoir area monitored through telemetry, percentage of population participating in municipal environmental education programs) (ii) the number of municipalities trained and involved in a participatory water quality monitoring program and (iii) the number of households with adequate connections to the sewage system as measured by the sewage optimization index (IURE).⁵⁴ The index of environmental enforcement quality will be the joint responsibility of CONPAM, COGERH, SEMACE and SRH. The number of municipalities trained and involved in a participatory water quality monitoring program will be the responsibility of COGERH and CONPAM.

The results framework is based on the idea that untreated sewage and the use of riparian zones for agriculture, animal husbandry and waste disposal are important causes of the decline in water quality.⁵⁵ There are several important risks to achieving the expected result. The main one is drought. Under normal meteorological conditions and assuming no other changes in relevant policies, we would expect better sewage and watershed management to achieve the desired effect. However, Ceará is now experiencing the worst drought in 60 years. Reservoir capacity is now at 44 percent and the majority of reservoirs are in a eutrophic or hypereutrophic state.⁵⁶ If the drought continues, the state's reservoirs may become unusable.

The state's capacity for monitoring outcomes related to the water quality program is weaker than in other areas of the PforR program. There is only a limited amount of reliable data on water quality, most of it for the metropolitan region of Fortaleza. Also the information that exists is often presented in terms of water quality indices, which provide easy to interpret qualitative representations of environmental parameters (e.g. 5-point scale composite ratings), but do not convey the specificity and magnitude of actual pollution impacts. Reporting actual data on, for example, coliform bacteria, dissolved oxygen, biochemical oxygen demand levels and heavy metal concentrations would provide a more accurate guide for mitigation. The operation will provide technical assistance to improve the collection and dissemination of this data.

Monitoring the performance of the sewage system optimization index will require strengthening the relationship between CAGECE and SEMAM (*Secretaria do Meio Ambiente Municipal*) to identify non-compliant households (particularly in the smaller municipalities outside Fortaleza). The information required to construct the environmental enforcement index is already available.

V: Program Economic Evaluation:

The proposed interventions in water quality and solid waste management are expected to generate significant returns, in part by enabling the state to capitalize on investments already made (e.g. the sewage network). Water is an indispensable necessity whose supply is inelastic. The benefits associated with averting mortality and morbidity from poor sanitation far exceeds the cost of implementing and maintaining low-cost sanitation systems. Globally, the return on investments in low-cost sanitation provision may be as high as \$9 for each \$1 spent.⁵⁷

⁵⁴ IURE – Índice de Utilização da Rede de Esgoto.

⁵⁵ Riparian zones provide a series of well documented environmental services: water infiltration and flood mitigation; soil retention, with a corresponding reduction in erosion and siltation; retention of nutrients and pesticides (insecticides and herbicides) originating in agricultural areas; biodiversity conservation; ecological corridors creating habitat for flora and fauna throughout the productive landscape; and a source of food and shelter for aquatic organisms.

⁵⁶ <http://www.hidro.ce.gov.br/reservatorios/qualidade/eutrofizacao>

⁵⁷ Hutton, G., Haller, L. and Bertram, J. (2006) 'Economic and health effects of increasing coverage of low cost water and sanitation interventions.' Report prepared for the United Nations Development Programme Human Development Report 2006.

VI: Technical risk:

There are several risks associated with this program. The first is that sector agencies will revert to established practice and fail to cooperate with each other. The involvement of agency heads in the Water Security Committee should send an appropriate signal, but similar initiatives have failed before. As the Bank's IEG report on the PROGERIRH Project noted, strong political will is required to integrate actions around water management. A second risk has to do with attrition among staff in executing agencies. SRH, in particular, suffered an exodus of experienced technical staff after the 2006 elections and the same may happen in 2014. It will be important to be able to contract expertise in local universities, NGOs and other centers of knowledge should this happen. Finally, a third risk concerns the interaction between state and municipalities. Municipal cooperation is required in several areas: for the development of the SWM plans, for the establishment of the consortia that will implement them in the strategic watersheds and for water quality monitoring. Federal law obliges the municipalities to comply with SWM requirements; but their commitment and capacity to monitor and enforce sustainable water resource management is uneven.