

Case Study— SISAR Ceará, Brazil

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Key Characteristics of Aggregation Case Study

SISAR CEARA, BRAZIL	
Context	<ul style="list-style-type: none"> • Upper-middle-income country • Aggregation covering rural areas • Low level of WSS performance
Purpose	Access to water provision, performance, solidarity, economic efficiency
Scope	Water functions and services
Scale	<ul style="list-style-type: none"> • Watershed limits • Localities covered: 153 for water • Population covered: 89,500 inhabitants for water • Connections: 25,548 for water • Network length: 415 km for water
Process	Bottom-up with financial incentives
Governance	<ul style="list-style-type: none"> • Special-purpose vehicle • Private association • Decision making: General assembly in which each affiliated association has one vote • Asset transfer: Operating assets owned by the state, non-operating assets (office, workshop, vehicles, and maintenance tools) owned by SISAR • Liability: No liability as there was no service before • Staff transfer: No staff transfer as there was no service before • Clear entry and exit rules
Outcome	• Positive with financial sustainability for operation
Findings	• Successful model of aggregated utility to provide service in rural areas which has been duplicated in other parts of the country, close relationship between communities and their water associations, community-based labor force hired part-time, performance-based monitoring

In 1996, when SISAR was created in the Brazilian state of Ceará, its main purpose was to bring access to water supply in rural areas where such service was not available before. These areas had been left aside by state water supply and sanitation (WSS) companies, which had predominantly focused on urban access to WSS services. From 1996 to 2016, SISAR's coverage expanded dramatically, from 18 to 153 localities it reached operational cost recovery in 2012. This success, which has encouraged the replication of the SISAR model in other rural contexts in the Brazilian states of Piauí and Bahia, is mainly based on a gradual improvement strategy and a specific labor arrangement.

National Policy for Urban WSS Aggregation Leaving Aside Rural Areas

In the early 1970s, Brazil implemented a major service aggregation reform through PLANASA—the National Sanitation Plan. Municipal governments—which, until then, had been playing the role of service providers—began to delegate these services to state governments, encouraged by the criterion to access federal investments predominantly through these companies. Between 1970 and 1983, investments in the sector reached an average of 0.46 percent¹ of GDP. But PLANASA was affected by the global financial crisis starting in 1983. Between 1980 and 1990, investments in the sector dropped to 0.24 percent of GDP, then to 0.16 percent during the 1990s; in 2012 they reached 0.11 percent—the lowest level yet. In Brazil, for the purposes of WSS service provision, communities located outside city borders are considered rural. This represents a significant portion of the population that remains unserved by state companies, which focused on urban areas, serving municipalities' headquarters and their surrounding areas. This institutional vacuum of water and sewerage services in rural areas gave rise to aggregation models such as SISAR.

A Community-Based Aggregation Model to Provide Access to Water in Rural Locations

The state of Ceará spans an area of 148,920 km², with 184 municipalities and an estimated population of 8.9 million inhabitants in 2016. CAGECE, the state water and sanitation company, supplies water to 151 municipalities and sewerage services to 73. The 33 remaining municipalities have their own services. The WSS sector institutional is composed of a state-level regulatory agency called ARCE (the Regulatory Agency for Public Services in Ceará) which regulates energy, water, and sanitation activities; the Superintendent of Hydro Works (SOHIDRA); the State Secretariat of Agrarian Development (SDA); and the State Secretariat of Cities.

The process that gave birth to SISAR did not originate from a sector reform policy enacted nationally or at the state level, but from a state government investment program supported by international financial institutions. What prompted the state government to create the SISAR model were the conclusions that water and sanitation investments in rural areas were no longer effective and that they would need substantial improvements and replacements in the very short term. In this context, SISAR was originally set up in 1996 in the municipality of Sobral, aggregating 18 water users associations. Its creation took four years. SISAR required an intense participatory process, as every family in a community had to agree before its association would join. Many debates also took place with municipalities that initially resisted the idea but later came to support it. SISAR/Sobral was so successful that, in 2001, the state government decided to expand the model—through CAGECE—to seven additional regions, one for each river basin in the state.

The eight SISARs in Ceará are autonomous legal entities—non-profit associative organizations—making their own decisions, having their own governing bodies, and managing their own operations and finances.

They are based on community associations that join together to share service delivery—some of the activities being carried out by local associations and some by SISAR—to ensure the proper operation and maintenance of water supply systems. SISAR is presided over by a general assembly, in which each affiliated association has one vote. It also has administrative and fiscal councils. Its executive structure includes (a) a board made up of the presidents and chairpersons of the affiliated associations; (b) a team hired and paid to provide billing and collection services, as well as systems maintenance and social support to management; (c) a resident hired by each local association to carry out daily systems operation. Operating assets are owned by the state, whereas non-operating assets (office, workshop, vehicles, and maintenance tools) belong to SISAR. CAGECE provides technical, training, and business management support to SISAR. The aggregation model

of SISAR did not cause conflicts over asset ownership, since the communities that join usually did not have any service at all.

The number of locations gathered under SISAR Sobral (which was renamed SISAR/BAC for the name of the Acaraú and Coreaú river basins) reached 74 in 2006 and 153 in 2016. It presently provides water to 25,548 connections (family households), equivalent to 89,500 inhabitants. SISAR usually operates in communities with 25 to 800 families. The scope of aggregation covers the entire water supply process—abstraction, treatment, and distribution through network and connections, and all associated functions—administrative, financial, and operational activities, with the latter being shared with local associations. Experiences in Ceará with sewerage solutions have so far been incipient and have focused on only on individual households.

MAP 1. Service Area of SISAR Ceará

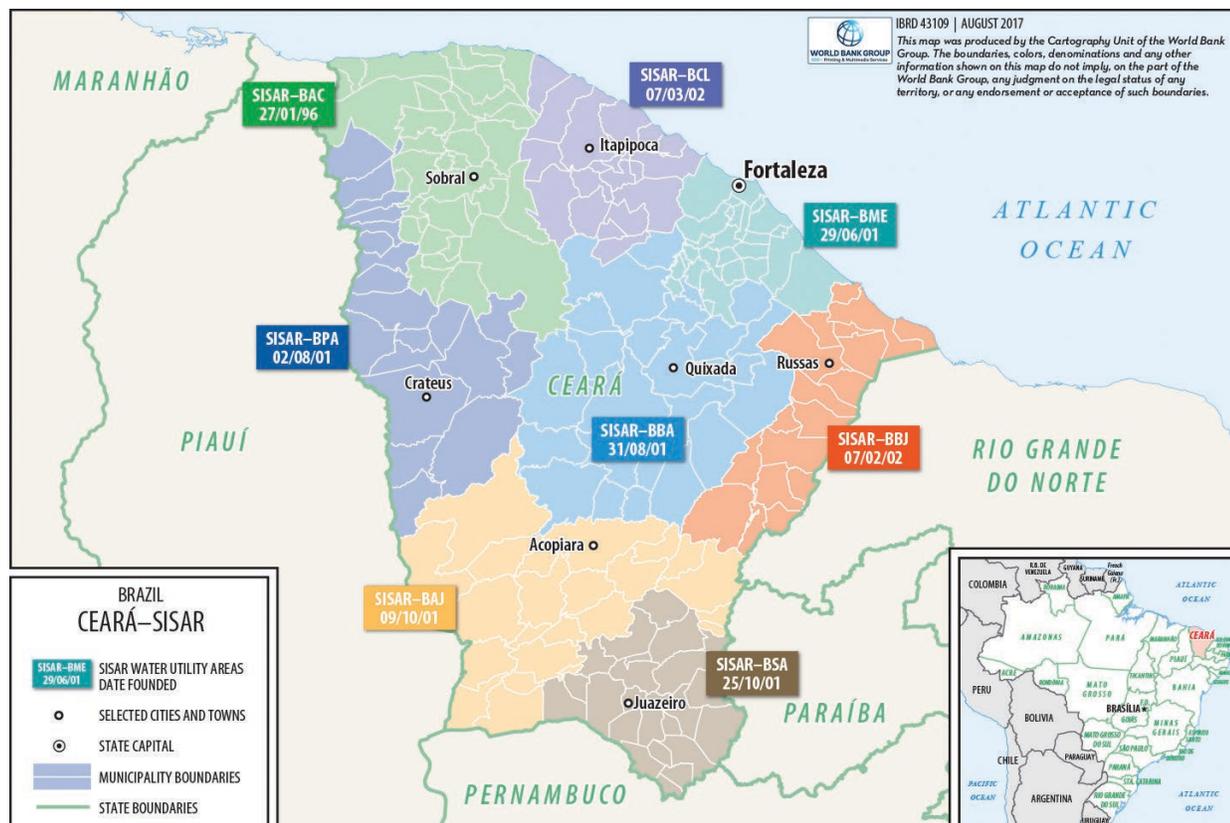


TABLE 1. Evolution of the Number of Locations Served by SISAR Ceará

Year	Number of aggregated locations
1996	18
2001	30
2006	74
2011	101
2016	153

The process of aggregation was voluntary and largely incentivized, as communities and their associations joined SISAR in order to obtain funds to invest in WSS equipment. Generally, investment comprises the state-level rural development program financed by the World Bank (PDRS, the São José Project), which dates back to 1995. Other investment sources have also contributed to SISAR aggregation, such as funds from the federal government made available through FUNASA—the National Health Foundation—as well as the Ministry of National Integration and Kreditanstalt für Wiederaufbau (KfW). Entry into SISAR aggregation was done on a voluntary basis from 1996 to 2010. Since then, it became mandatory for associations that wanted to join to have access to investment funds.

TABLE 2. Sources of Funding for Investment Projects within the SISAR Ceará Service Area

Investment source	Number of communities	Share of total (%)
State program with World Bank loan	98	64.1
State program with KfW loan	27	17.6
Federal program through FUNASA	24	15.7
Federal program through Ministry of Integration	4	2.6

A Gradual Improvement Strategy Monitored through Performance Indicators

Prior to joining SISAR, most localities had no water supply. As such, SISAR aggregation was primarily aiming at water provision, thereby improving population health, and a higher service quality with guaranteed operation

and maintenance capacities. In order to monitor the achievements of SISAR/BAC, some performance indicators were selected and targets were set. They encompass quality, technical and financial elements:

- A water quality target of 95 percent was set in reference to a water quality index; the recorded performance fluctuates monthly, with values ranging from 65 percent to 91 percent.
- An asset recovery target of 63 percent of the existing systems has been defined; the level achieved so far reaches 33 percent.
- The continuity of service is monitored, with a target of 24 hours per day. The values currently range from 6 to 15 hours.
- Leakage is not monitored at present as macrometers have not yet been fully installed. However, it should be noted that the communities are 100 percent covered by micrometers.
- A billing ratio target has been set at 20 percent and currently reaches 18 percent.
- A collection ratio objective has been set at 100 percent and currently reaches 96 percent.

This performance monitoring, which is carried out by CAGECE in its role as management supporter, proved to be one of the key factors contributing to the model's efficiency. Indeed it allows a sequenced strategy, spreading efforts and changes over time, thus not burdening the service provider with having to do too much too quickly. It also proved very useful to report to member associations on progress being made, thus facilitating accountability and engagement with local Communities.

Operational Sustainability Achieved after 15 Years, Based on Staffing Arrangements

Although the primary aim of the aggregation was provision of water access, aggregation also allowed economies of scale when purchasing water treatment products and performing equipment maintenance. It also allowed cross-subsidies, which benefit households in smaller localities. However, the SISAR

aggregation model was not always financially sustainable. In addition to the investment subsidies received, SISAR/BAC also received funds from CAGECE to cover operating costs. These were used to pay for part of the technical staff and vehicles. These operational subsidies were gradually phased out and were completely stopped after 15 years. Data from 2016 show the financial sustainability achieved by SISAR/BAC, which generates an operating surplus of 9.6 percent (US\$1.78 million in revenue and US\$1.63 million in OPEX). This result partly draws on the staffing arrangement chosen by SISAR. Its technical staff consists of 20 employees, with an average wage of US\$1,346 per month. It is complemented with local staff belonging to each member association at an average wage of US\$148.3 per month per operator. These workers only work part-time and usually carry out other productive activities. Hence, for local operations, SISAR draws on community labor hired by the association, which reduces average labor costs, compared with hiring full-time itinerant employees. This staffing arrangement allows SISAR to control labor costs and is key to achieving and maintaining operational sustainability.

Aggregation Case Study at a Glance

Key Lessons Learned from Aggregation Case Study

Aggregation Takes Time to Show Results; Gradual Improvement Strategies Are Particularly Successful

Both the aggregation design and implementation take time; in particular, implementation is a continuous process that can spread over decades. As a result, aggregation benefits also take time to materialize. A gradual improvement strategy with regard to the main purpose of the aggregation proved successful in many case studies, as it spread the efforts and changes to be made over time, thus not burdening utilities with having to do too much too quickly. Sequenced strategies often use performance-based targets that are monitored and regularly reported on. In the Brazilian state of Ceará, some performance indicators were selected and targets were set to monitor the gradual achievements of the

aggregated utility, SISAR. The target for the water quality index was set at 95 percent; best performance currently fluctuates between 65 percent and 91 percent. The continuity of service provision target aims at 24 hours; present values range from 6 to 15 hours.

Strong Citizens Engagement and Clear Accountability Improve Support for Aggregations

Accountability mechanisms, embedded in the aggregation and utility routine processes, help minimize customers' sense of distance from the utility and overcome political resistance. The creation of SISAR Ceará, an organization based on community associations, required an intense participatory process, as every family in a community had to agree before the association would join SISAR. The São José investment project routinely involves rural workers' unions and producer cooperatives. Along with the SISAR aggregation process, the social participation of communities and their associations has intensified, as several meetings and training sessions take place yearly.

Financial Support and/or Incentives (a "Big Push") Are Important to Help Services Get Out of the Low-Level Equilibrium Trap

To boost the success of aggregation reforms, national and external stakeholders can provide financial support to aggregating utilities to help them achieve the aggregation purpose. In most cases, these subsidies are used to fund investment programs thus acting as the Big Push, which helps WSS services get out of the low-level equilibrium trap. In Ceará, the investments implemented by the aggregated utility SISAR were funded for 18 percent by federal credits and for 82 percent by the central government through loans from international financial institutions. SISAR investments were targeted toward initial set-up of WSS infrastructure, as most localities covered by the aggregated utility had no water supply.

Note

1. According to the IPEA, Institute for Applied Economic Research.



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