

## **Brazil: An innovative management model for rural water supply and sanitation in Ceará State (#411)**

### **Description**

Approximately 20 million people or 1/3 of the rural population of Brazil have no access to basic services such as safe drinking water and sanitation facilities. The National Health Foundation reported that in 2007 only 28% of the rural population was connected to a drinking water supply and the connection to a sewage system was 22%. Rural water supply and sanitation made no progress in Brazil in the last 30 years, not only as a result of limited funding and political will, but also due to inefficiency in the resources allocation, and absence of regulations and long term planning. In general, due to financial costs and operational complexity, Brazilian state water companies offer their services to urban areas and do not include rural and small communities as objects of their business.

### **Action taken**

The case describes the ongoing experience of the State of Ceará in implementing a model of participatory management to supply rural communities with drinking water and sanitation facilities. The model, called Integrated Rural Water Supply and Sanitation System (SISAR), consists of a federation of community associations created specifically with the purpose of self-managing the local systems, with technical support from the State's Water and Sanitation Company (CAGECE).

Each SISAR unit is legally constituted as a non-profit oriented civil association of private rights that manages the rural water supply and sanitation systems operated by the affiliated community associations. It administers its own proprietary goods with is either received from the government or private donors and other revenues include the money collected through the rates charged for its services.

### **Lessons learned**

- User participation is the most important factor of sustainability of rural water supply and sanitation systems. Effective participation is seen as a means of assuring that cultural, environmental and socio-economic characteristics of each community are properly addressed.
- It was experienced that this system is difficult to implement with less than fifty families and achieving self-sustainability.
- Participatory mechanism leads to more investments in rural water supply and sanitation and commitment of the public sector with the rural systems management.
- The partnership between CAGECE and SISAR has led to increased social responsibility there by contributing to environmental preservation.

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## Main Text

### Description

The case describes the ongoing experience of the State of Ceará in implementing a model of participatory management at the river basin level to supply rural communities with drinking water and sanitation facilities. The model, called Integrated Rural Water Supply and Sanitation System (SISAR), consists of a federation of community associations created specifically with the purpose of self-managing the local systems, with technical support from the State's Water and Sanitation Company (CAGECE).

Approximately 20 million people or 1/3 of the rural population of Brazil have no access to basic services such as clean drinking water and sanitation facilities. The National Health Foundation (FUNASA) reports that in 2007 only 28% of the rural population was supplied by a water delivery system; 22% by a sewage system; and 27% by garbage collection. Rural water supply and sanitation made no progress in Brazil in the last 30 years, not only as a result of limited funding and political will, but also due to inefficiency in the resources allocation, and absence of regulations and long term planning. To improve this situation, Infante, a government institution mandated to deal with the issue in 2006 suggested an expanded view of public sanitation beyond a focus on building infrastructure. This included operation, maintenance, continuing financing and in-home facilities.

To accomplish this vision it became necessary to include ongoing environmental education and health education programmes that will increase public consciousness concerning several other management features. The most important of these are: a sustainable use of water resources, adequate use of water supply and sanitation systems and rainwater and solid waste management. This supports the idea that the challenges in the management of rural water supply and sanitation systems are more complex than a simple administration of the services. The case study assesses the management models for water supply and sanitation adopted in Brazil, with the objective to point out feasible models to be supported by the National Programme of Rural Water Supply and Sanitation.

### Decisions and Actions Taken

In Brazil, it is a legal responsibility of the municipality to provide the services of potable water supply, sanitation, solid waste management and drainage as well as storm water management. The four components of basic sanitation in urban and rural areas, except in the case of traditional communities (extractive reserves, indigenous areas and slave-descendent communities) are under the legal responsibility of a union. The municipality can delegate the responsibility for these services to a third party through a Contract of Concession. Based on shared management, the structure of the SISAR Model applies to the existent typology of organizations which provide potable water and sanitation services in rural areas and traditional communities and these include:

- State companies of water supply and sanitation, mostly of public administration and mixed economy;
- State secretariats (of health, social development, agriculture, etc.), which are public institutions of the state governments;
- Local utilities (autonomous providers of services);
- Municipal governments (direct administration).

User participation is the most important factor of sustainability of rural water supply and sanitation systems. Effective participation is seen as a means of assuring that cultural, environmental and socio-

economic characteristics of each community will be considered in the project and in the way a system will be constructed and managed.

Rural water supply and sanitation are public health services introduced by the federal law 11445/2007. The Law stipulates:

- shared management;
- micro-regional management;
- municipal plan for water supply and sanitation and other plans and programmes at the local, regional and state levels;
- economic/financial feasibility of the systems through payment of tariffs/rates which meet the needs of operation/maintenance and support community organization processes;
- development of community organizational processes to demand services and actions and assure sustainability and social control:
  - training and social mobilization prior to project design and systems construction
  - participation in project design and systems construction and management
  - sanitary and environmental education
  - public information.
- planning of services and actions and project development at the state, regional, municipal and community levels;
- technological solutions appropriate to environmental, cultural and socio-economic conditions in each community, taking the management feasibility and sustainability into consideration;
- technical administration of the systems, including employee hiring based on a competency examination.

### **The SISAR Model in the State of Ceará: Historical Background**

In general, due to financial costs and operational complexity, Brazilian state companies for water supply and sanitation offer their services only to urban areas and do not include rural and small communities. The first initiative focused on rural areas was taken by the Company of Water Supply and Sanitation of the State of Ceará (CAGECE). It was a Programme called Kreditanstalt für Wiederaufbau (KfW), implemented between 1992 and 1998, with financial support (loan and donation) of the German development bank. It provided potable water to 63 communities and sanitation services to 22 communities benefiting around 120,000 rural inhabitants in the north of the state. The SISAR Model was an output of this Programme and its implementation continues to be supported by the same bank.

In Brazil, the KfW concept of sustainable self-management of rural water supply and sanitation systems was first applied in the state of Bahia in 1994, under the designation “Central of Water”. However its application remained limited to two units i.e. Central of Seabra and Central of Jacobina and presently has no perspectives of growth. In 2004 the state of Piauí implemented a SISAR in the city of Picos, under the responsibility of the Secretariat of Health.

It should be noted that the states of Ceará and Piauí still receive technical support from KfW to expand the experience and improve the model, in order to achieve a condition of sustainability through a convergence between technical and theoretical conception and socio-economic and ecological conditions at the local level. An important result of this technical support was the recently elaborated regulatory framework for the SISAR Model.

### **General Concept of the SISAR Model**

The Integrated Rural Water Supply and Sanitation System (SISAR) consists of a federation of community associations created specifically with the purpose of self-managing local systems of rural water supply and sanitation. Each SISAR unit is legally constituted as a non-profit oriented civil association of private rights that manages the rural water supply and sanitation systems operated by the affiliated community associations. It administers its own proprietary funds received from the government and other private donors as well as money collected through the service fees. The implementation of a SISAR occurs at the state level under the coordination of a state company of water supply and sanitation, or a state Secretariat. In the case of the state of Ceará, the company created a parallel structure, the Coordination of Rural Water Supply and Sanitation (GESAR), to specifically manage its actions in rural areas.

The territorial distribution of the SISAR units is done at the convenience of the state. It can correspond, for example, to hydrographical basins as in the state of Ceará, where it follows the same logic of the state company with its 8 business units; the totality of a state area (as in state of Piauí); a not necessarily contiguous bunch of municipalities (as in state of Bahia); or a meso-region (as in state of Pernambuco). In Ceará, the community-operated systems that are managed by a SISAR can be planned, projected and constructed by different agents. However, they must meet the technical patterns established by the state company CAGECE in order to be accepted as a member of a SISAR unit. The membership depends on the approval by the SISAR General Assembly (Figure 1) and payment of an admission fee.

The company CAGECE responds for the systems implementation and owns the property rights for them. The financial support for a system implementation is provided by state and federal programmes, and in a smaller scale by municipal governments.

The management responsibilities performed by a SISAR unit and the Associations that operate community systems are:

- The SISAR unit:
  - Controls the operation and offers technical assistance – preventive and corrective – to the systems of water supply and sanitation operated by the Associations;
  - Performs electro-mechanic maintenance and clean the water wells;
  - Empties and cleans the individual sanitation facilities each 3 years;
  - Provides materials for maintenance, expansion and updating;
  - Provides operational information to CAGECE;
  - Selects and gives training to the systems operators;
  - Provides chemicals and materials to the Associations for the water treatment;
  - Controls the water quality (with CAGECE support);
  - Calculates the tariffs/rates for the Assembly approval;
  - Prepares and distributes the bills and collects their payment;
  - Offers training to the managerial level of the Associations;
  - Offers training to counsellors;
  - Promotes environmental education and health education in the communities concerning water use, health care, hygiene, environmental care, etc.;
  - Contributes to the sustainability of the system through pricing, influencing appropriate use of the facilities by the communities;
  - Contributes to community empowerment by investing in communitarian development and environmental education;
  - Contributes to improve the competences of associations by means of increasing the consciousness of the members of the boards.

- The Association with the affiliation to SISAR, it effectively takes responsibility for the proper functioning of the community system of water supply and sanitation which represents among other things payments, tariffs collection, and the operator and for consumed energy.

Although the operators of the community systems are selected and trained by the SISAR, there is no work contract between them and the SISAR or the Association. They are hired by the Association on the basis of Terms of Volunteer Work and receive a monetary compensation for their part-time collaboration. This kind of informal work relationship is a fragile aspect of the SISAR Model, because it can lead to legal problems.

The attributions of the operator are: reading the water meter, verification of levels and performance of water pumps, supervision of the water treatment, sand cleaning (filters), installations conservation and cleaning, leak repair, new connections, delivery of bills, preparation/referral of operational data reports.

### **Tariff system of the SISAR Model**

The tariff system is designed to recover the full cost of water supply or water supply and sanitation, depending on the service provided by the SISAR to each community. The bill is composed of two parts: one for m<sup>3</sup> delivered to a water client plus a charge for maintenance of the sanitation facility, and the other for maintenance of the communitarian association which operates the system (like consumed energy and operator's salary).

### **Technological solutions adopted by CAGECE**

In the case of rural water supply, CAGECE applies the “on the door” system (network and feeders to the buildings), using water from wells and catchments; treating the water with chloride in tablets and slow filtering; performing water quality analysis in the field and using external laboratories for more complex control; and maintaining services with automatic water meters in 100% of the home connections.

Concerning sanitation, the technical solutions are individual systems or sewage network and sewage treatment in stabilization lagoons. The use of pumping stations is avoided. Each household is provided with sanitary facilities (toilet with flushing tank).

### **Outcomes**

The Ceará experience with the implementation of the SISAR Model is seen as an outstanding one due to its spatial broadness, permanent expansion of the services of water catchment and distribution in rural areas, and prospects for sustainability. There are eight SISAR units in the state of Ceará, one for each river basin. They are located in the cities where CAGECE maintains its business offices. This makes the provision of technical and administrative support and the monitoring of SISAR activities easier to the company. In addition, each SISAR unit is provided by CAGECE with a fully furnished building; payment of some employees and basic needs like energy, water, a vehicle, internet and software until a unit reaches financial autonomy.

The SISAR units perform their work through tripartite agreements involving State Government – CAGECE – SISAR and SISAR – Municipality – Association, which aims to provide technical

cooperation, access to subsidy use of infrastructure. Besides these agreements, the main management instruments used by the SISAR are its Social Statute and a Letter of Agreement between Municipality and Community Association that allows the Association to operate its system.

The table below shows the number of municipalities, systems, affiliated communities, connections to the water supply network and beneficiary population of these SISAR units in August 2009.

SISAR	Municipalities	Systems	Affiliated Communities	Water Connections	Beneficiary Population
Sobral	29	88	88	16.303	71.570
Acopiara	12	51	51	7.148	31.380
Quixadá	20	87	98	11.198	49.159
Russas	8	23	24	3.073	13.490
Itapipoca	17	60	61	6.961	30.559
Fortaleza	9	33	33	3.062	13.442
Crateús	13	92	95	11.040	48.466
Juazeiro	21	100	100	10.928	47.974
<b>TOTAL</b>	<b>126</b>	<b>534</b>	<b>550</b>	<b>69.713</b>	<b>306.040</b>

The SISAR Model is based on active participation of the beneficiary population in decision-making, through the affiliated community Associations that operate the systems. The organizational structure of the SISAR (Figure 1) is composed of: a General Assembly, a Financial Council, an Administrative Council and Auditing. The Auditing team is responsible for the preparation of technical and administrative/financial evaluation reports and the chief auditor is nominated by CAGECE. The company is a co-participant member of the Administrative Council and offers technical and operational support to the eight systems through cooperation agreements.

The responsibilities of each component of a SISAR Management System are:

- a) **General Assembly** - highest decision level, it elects the members of the Administrative Council and the Financial Council. Each affiliated community Association is represented in the Assembly. This provides a rich exchange of experiences and empowers the communities to better perform activities related to the coordination, administration, maintenance and monitoring of their systems.
- b) **Administrative Council** – executes the decisions taken by the Assembly, plans the activities and administers the SISAR. In the case of Ceará, this Council has the following composition: six effective and six substitute members representing the community Associations; five co-participants members (one representing the local government; one representing CAGECE; and three representing the state government, the Secretariats of Environment, Water Resources and Agriculture).

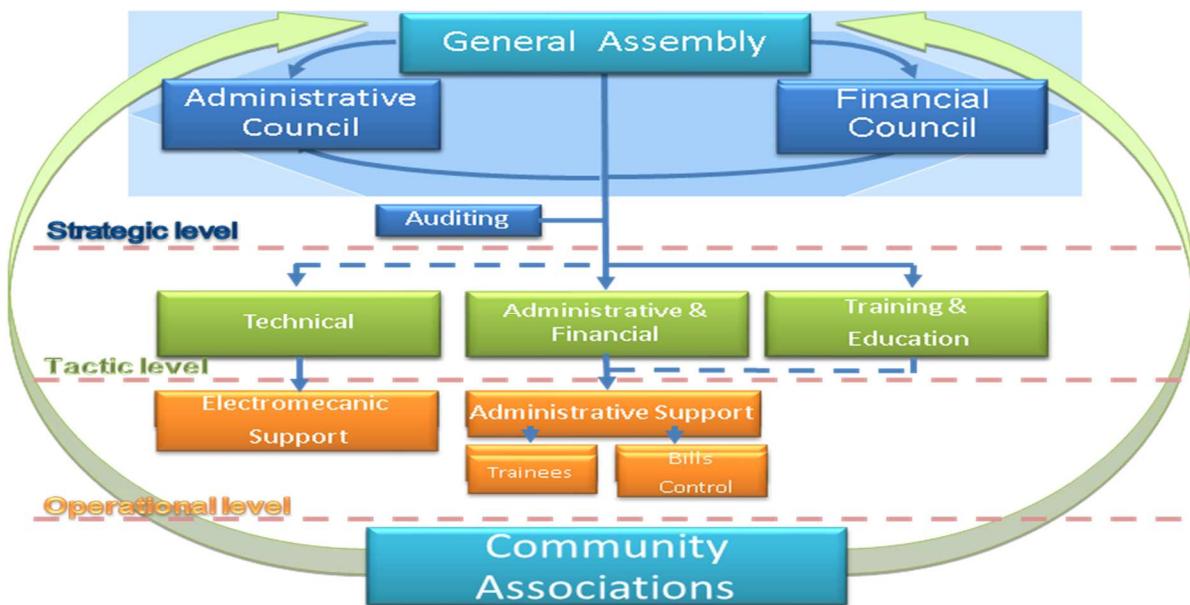


Figure 1: Organizational structure of the SISAR Model in state of Ceará.  
 Source: CORTEZ, 2010, slide 18 (adapted by Faria).

c) **Financial Council**; composed of three effective and three substitute members, all of them representing the affiliated Associations.

d) **Auditing**

e) **Community Associations** - non-governmental organizations formally created (or adapted) to construct, operate and maintain rural systems of water supply and sanitation.

The process that leads to the construction of a rural system starts with a formal request of the Association to CAGECE, after having obtained Terms of Agreement from the Municipality. In general, all requests that prove to be economically sustainable (in case of water supply, this means a minimum of fifty house connections) are approved. A project is then prepared by the company, which organizes meetings to discuss the bidding process for construction of the projected system by the Association, and the community participation of 10% in the costs. When the community cannot provide financial resources, its participation occurs in terms of work. After the system construction, two persons are trained in on pump maintenance, billing and accounting. They then operate the system and perform administrative activities.

### Lessons learned and replicability

A SWOT Analysis supported by CAGECE (CORTEZ, 2010) synthesizes the positive and negative aspects of the SISAR Model as follows:

- Internal Environment:

#### Strengths

- Improves citizenship through collaborative work
- Contributes to universalizing the access to potable water
- Warranties a longer life to the systems of rural water supply and sanitation
- Contributes to increase the IDH index

- Relieves CAGECE of small systems management
- Partnership CAGECE/SISAR indicates social responsibility
- Contributes to environmental preservation.

#### **Weaknesses**

- Difficulties to implement systems with less than fifty families
- Difficulties for achieving self-sustainability
- Difficulties to gain access to the systems
- Affiliated communities with small number of connections
- Lack of technical support: legal orientation, geological studies, etc.
- Tariff/rate does not cover expansion and improvements
- High costs of management (geographical distribution).

- External Environment:

#### **Opportunities**

- Partnership with the communities for project conception and implementation; and construction focused on ease of management
- Partnership between CAGECE and municipalities in actions related to sanitary education and environmental education
- Model replication by other states in North-eastern region
- More investments in rural water supply and sanitation
- Commitment of the public sector with the rural systems management.

#### **Threats**

- Lack of specialized workforce in the interior of the state
- Reduced budget for projects
- Insufficient water sources
- Manipulation of the Associations by opportunists
- Practice of cronyism still exists
- Political pressures for systems construction out of CAGECE patterns.

### **Contacts, references, organisations and people**

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