

A Complete Cycle

The universal provision of water, sewage and solid waste services is currently guaranteed by a continuous investment policy using DAEP's own resources. The policy is sustained by user participation and user control through the deliberative council of the autonomous service. The challenge now is to achieve sustainability in the rural areas.

All of Penápolis' residents have access to public services including water supply, sewage services and collection and treatment of solid waste. The municipality founded the centre for environmental education, the Ribeirao Lajeado consortium, to protect the spring where the entire water supply of the city comes from. In this case, the concept of environmental sanitation is visible in every plan of the service, which is also undertaking a series of other activities, such as cleaning water reservoirs and operation "farewell", the implementation of pest control throughout the city. These initiatives have contributed to the control of endemic diseases, such as leishmaniasis and dengue fever. In 2004, DAEP received the ISO 9001/2000 certification for all its production process.

Good sanitation services are reflected in health indicators. In 2002, Penápolis' infant mortality rate (11.11 per thousand live births) was smaller than the rate registered for the state of Sao Paulo (15.02 per thousand live births).

The water and sewage services, previously provided from within the municipal city hall's own infrastructure, began to develop after the mayor's political decision in 1978, to improve the sanitation administration system. Lourival Rodrigues of Santos, president of DAEP, points out that "[I]f the municipality had not assumed the responsibility for the services, certainly today we would be part of some type of concession, and I believe that we would not have taken over the management of solid waste and environmental education. For sure, we would not have applied the concept of environmental sanitation".

Furthermore, initiatives continue to be implemented, which, to a certain extent explains the service indexes achieved and the familiarity of the population with sanitation issues. Political orientation in regards to sanitation management has not gone through significant changes in the last decades. The definition of guidelines is directly derived from the service's deliberative council created at the same time as DAEP. In 1994, a law proposed by the executive branch changed the structure of the council in order to increase the participation of representatives from the local population. It is currently composed of ten members, with one representative from the trade and industrial association, three representatives from the executive and municipal secretaries, a member representing the social

Penápolis, São Paulo

Population estimate, 2005: 58,613 / Index of solid waste collection and treatment: 100% / Index of selective collection: 100% in the urban area / Index of water consumption measurement: 100% / Number of water connections: 19,541 / Number of sewer connections: 19,260 / Length of water supply network: 219,649m / Length of sewage collection network: 211,200m / Total cost of the service per m3 invoiced: R\$ 0.90 / Average tariff charged: R\$ 1.08 per m3 (R\$ 0.72 per m3 water and R\$ 0.36 per m3 of sewage) / Index of invoiced revenue loss: 26% / Productivity Index: 8 workers per thousand water and sewage connections / Gross annual operational revenue (direct and indirect): R\$ 6,572,195.97 / Gross annual expenses with the service: R\$ 6,639,942.68 / Annual utilisation expenses: R\$ 5,786,937.10 / GDP per capita: R\$ 6,509.00 / Human Development Index: 0.81 / Infant mortality rate: 11.11 per thousand live births /

Source: SNIS 2003, IBGE 2000 DAEP Penápolis

service entities, two representatives from DAEP, and three from the community. Council members are elected at the sanitation and environment forums of Penápolis, which is a sort of biannual municipal conference. In the sixth and latest meeting in 2004, the forum brought together more than 500 people; or, close to 1% of the city's population. Since its first meeting, the forum formally submitted 182 proposals to DAEP. The monitors of the forum are employees of DAEP and the city's opinion-makers, who go through a day-to-day capacity building process in order to coordinate the group activities.

A participatory structure to facilitate discussion was organised for the two day event. Vera Lucia Nogueira, who works for the administration department and is an employee of the service states, that "[i]n each forum, we provide reports on the progress of the proposals of previous forums so that the participants can be informed. We understand that the forum is a democratic space to produce public policies for the area, legitimized by the population".

The municipality's strategic plan is under review and will be developed together with the municipal sanitation plan. The plan is being prepared with the participation of society through the city council, by means of a technical agreement signed by the City Hall of Penápolis and the National Health Foundation.

According to the planning and strategic management department of city hall, the city council "was created from the need to democratise the executive branch in relation to the formulation of public policies linked to the strengthening of popular participation in order to provide information and technical knowledge that guarantee the conditions for a qualified discussion on public policies".

The council is formed of representatives chosen directly by the population, from regions with residents that have common social, cultural and economic characteristics. Penápolis has councillors from 26 sectors of the urban zone and three sectors of the rural area.

The councillors participate in capacity building courses on the function and history of the state, the responsibilities of the municipality, democratisation of the executive branch and public councils, the regulation of public policies and the municipal budget.

Mrs Nogueira further stated that "given the degree of responsibility attributed to DAEP by the population, for promoting quality of life and monitoring the growth of the city, all directors of the service are determined to improve the administration system. They feel the weight of the responsibility to administer a service monitored through popular participation. The citizen is increasingly capable of participating in the public policy making process".

Rural Sanitation

There is a large urban concentration in Penápolis: 14% of properties with an area larger than 100 hectares occupy 64% of the municipality's territory. Only 7% of the population live in the rural area, where sugarcane and grazing lands occupy 90% of the region. "We have to design sustainable public policies for this area. Rural sanitation is a priority", states the director of DAEP. DAEP is working on the sustainable rural development plan, administrated by the Locus Institute, with the participation of the rural producers of the Ribeirao Lajeado basin.

The project was developed in workshops, with the participation of family farmers. These encounters with the population revealed the need for capacity building courses for producers, integrating technologies that are both appropriate to their standards and that do not cause damages to the environment. The public authority was called upon to promote the necessary infrastructure for the maintenance of highways, bridges, soil management and the transport of production. In exchange, the producers assumed the task of conserving the natural resources.

DAEP joined forces with the environmental police, Cati, education institutions and NGOs. Conservation of the environment and the appropriate use of water resources are integral components of the plan that foresees the education and capacity building of producers and the conservation of natural resources.

The integration of solid waste services and the first autoclave installation of the Bacia do Baixo Tiete

What is interesting in Penápolis, is not the fact that the autonomous service works also with garbage, but rather the integral concept of solid waste management and proper environmental management. In 1993, a municipal law made DAEP responsible for the collection and the final disposal of domestic and industrial solid waste, health services and dumping sites.

The urban cleaning service, which incorporates rubbish collection, street cleaning and final waste disposal is also performed by the service. The city is divided into 15 divisions of intercalated sweeping, a central division and five commercial corridors swept daily. DAEP also installed rubbish bins on public pavements so that the population always has a place to discard small amounts of rubbish.

In 2000, the garbage selective collection system was implemented throughout the city. The municipal administration created the conditions for the organisation of the 31 families of former garbage collectors at the old embankment in Penápolis' recycling cooperative. The members of this cooperative participated in the collection and sorting of recyclable waste.

Penápolis' hospital waste autoclave, purchased with resources from the water resources state fund (FEHIDRO) and the municipality, was the first to be installed among the municipalities comprising the hydrographical basin of Baixo Tiete. The autoclave unit was installed close to the sanitary embankment and can process 400 kilos of infectious waste per day. However, its capacity can be doubled.

According to Lourival Rodrigues dos Santos, Director of DAEP "the projected operational cost in full system capacity is R\$ 0.58 per kilo, about 25% of the price usually charged by private companies. Today, besides covering the needs of the municipality, which produces 200 kilos of infectious material per day, the system generates income by providing service to the neighbouring municipalities charging R\$ 1.30 per kilo. This is the lowest price in the market, and covers the initial investment while guaranteeing the economic sustainability of the service".

The final destination of the municipality's waste is an embankment covering an area of 45 hectares where the deposited rubbish is spread in layers alternated with soil and a system of methane gas elimination. The lifespan of the embankment is until 2024. The collected industrial waste is deposited in a special embankment that meets the requirements of the environmental sanitation technology company of the state of Sao Paulo.

Investing with DAEP's own resources

The city of Penápolis lives off sugarcane cultivation that generates jobs for rural workers from the north of Minas Gerais and the northeast region from May to November. From December to April, the municipal district faces unemployment elevated by the seasonal variation of jobs in the agricultural sector. Even so, the public investments guarantee permanent sanitary infrastructure.

This is a constant investment. Most of the external resources came in 1988, when the municipality obtained a R\$ 152 million financing, still in novo cruzado (former Brazilian currency), in order to expand the capacity of the municipality's water reservoirs.

Since then, investment has been carried out with DAEP's own resources and some financing from FEHIDRO. In 2004, DAEP invested 14% of the tariff related revenue, estimated as R\$ 6.5 million per year, in order to adapt the water treatment system to Decree no. 518/04, which determines water quality control for human consumption. DAEP's own investment has been growing for the last five years.

According to DAEP's management, all the services have created a financial surplus. In spite of the fact that DAEP is already ahead of the urban drainage works the largest demand for investments could come from these service, which will soon be incorporated by the service.

Protecting the water spring and treating the effluents

In 1992, the municipality created the Ribeirao Lajeado consortium in an effort to recover degraded areas of the hydrographical basin within a 20-year period. The consortium became the legal body responsible for the recovery and preservation works in the basin of the Ribeirao Lajeado. The consortium promotes revitalisation of the riverside forest by planting native seedlings.

The consortium conducts the conservation management of the soil by constructing rainwater collection basins, terraces and contour curves in the rural highways to reduce the silting and erosion of the basin.

The initiative to protect the springs of Ribeirao Lajeado that supply water to the municipality is based primarily on the sewage treatment system. To eliminate the effluents release without treatment in Ribeirao Lajeado, DAEP has two sewage stabilisation ponds that can treat 350 litres of domestic effluent per second.

The total sewage treatment time is 45 days. The treatment system, known as "Australian", is formed by an anaerobic pond, followed by a facultative pond and a maturation pond. This system achieves an organic matter removal index between 80% and 90%.

The municipal decree no. 543, of 1993, regulates the services provided by the municipality, defines each property's connection for collection and transport of sewage based on different characteristics from domestic effluents is conditioned to treatment before being release into the public network. In other words, the legislation does not allow the release of non-domestic raw sewage in the collection network. The decree also foresees the installation of volume meters for the users that possess their own water supply system while using the public sewage collection network.

Cost reduction increases the ability to provide services

The decision to apply for the ISO certification was made by the executive of DAEP in its mission to reduce operational costs while achieving standardization of services. The perspective of the organisation is to expand the provided services.

The optimisation of resources is based on the integral use of the service's internal resources. For instance, none of the projects are outsourced. The service has a database of projects produced by its own technical body, including reports, cost spreadsheets, financial and time specific activities chronograms and the process of environmental licenses. Concerns regarding costs are also obvious during project implementation. DAEP has a factory that produces concrete tubes of various diameters for the installation of sewage networks, exhausts and rainwater drainage networks. The installed production capacity is of approximately 30 tubes per day.

With the production of tubes, DAEP manages to reduce the cost of services implementation.

Environmental Sanitation

The creation of the Environmental Education Centre (CEA) in 1993, was the fruit of the sanitation and environment forum. All the environmental initiatives developed by the municipality converge in the centre. Students of public and private schools are the target group of CEA. The objective is to improve life and environmental quality

throughout the municipality by alerting students and their teachers to urban environmental problems and the importance of monitoring environmental quality.

The centre is a tool that supports the efforts of Ribeirao Lajeado and works strongly to warn the community of Penápolis, and the greater region, of the need to preserve and conserve the environment, especially in Ribeirao Lajeado.

The centre shares the task of monitoring the quality of water with the community and is already part of the municipal educational system's school curriculum. For example, in 2004, DAEP promoted the course entitled "Capacity Building in Environmental Education" for 250 teachers.

Penápolis also hosted the project of educational collectives of environmental educators for the municipalities of the hydrographical basin of Baixo Tiete. This project was a proposal of the Ministry of Environment and seen as a strategy to implement environmental management related public policies.

In their interaction with civil society and governmental bodies, CEA lives the example of productive coexistence. It already works in partnership with the Ribeirao Lajeado consortium, the environmental police and the NGO SOS Mata Atlantica.

In order to involve the personnel of the service with environmental sanitation, DAEP carries out a project with children that highlights the work developed by the Department together with the families. CEA is the host of the project.

The seed planted by CEA, led to the creation of the Environmental Education Regional Nucleus, a recommendation of the Environmental Education Coordination of the Secretariat of Environment and the state government and includes, in addition to Penápolis, the municipalities of Avanhadava, Brauna, Glicerio, Coroados, Brejo Alegre, Promissao, Alto Alegre and Barbosa.