

Efficiency in combating water waste

SAAE of Viçosa was the first sanitation service in the state of Minas Gerais to create a special investment fund whose resources were directed toward the construction of a water treatment plant. The Piau Law for protection of nascent and the creation of the Law against water wasting are reference points in the history of sanitation. The research partnership with the Federal University of Viçosa has brought positive results for the Autonomous Service.

The municipality of Viçosa is located close to the forest zone of Minas Gerais, around 240 km from Belo Horizonte. The urban area hosts a further 10,000 people working in the Federal University of Viçosa (UFV).

The per capita income of the municipality increased in the last decade. Viçosa reached the Human Development Index (HDI) of 0.809, which is considered “high” by the United Nations Development Program (UNDP). At the same time, the Gini Index, which measures income inequality, increased.

The projects of Viçosa’s Municipal Water and Sewage Service boosted the city’s development. The Infant Mortality Index for 2004 was 18.04. The goal is to bring it down to 12.5 for 2005.

In 1973, distributed water was fluoridated. Ten years later, research showed that the frequency of tooth decay in children aged 14 and younger had dropped by 70.41%.

SAAE of Viçosa was created by Municipal Order nº 541 in December 1969. Soon after, the Municipal City Hall signed an agreement with the Special Services of Public Health Foundation (FSesp), of the Ministry of Health, for the administration of SAAE. In 1999, the National Health Foundation (FUNASA), which had replaced FSesp, unilaterally called off the agreement.

Ever since, SAAE has been administered by the municipality. The Autonomous Service’s projects boosted the city’s development.

SAAE’s participation in the environmental defence committees and in ASSEMAE contributed positively to the transition process. In the beginning, the installation of the system went through intense negotiations regarding the management of the unit. Even though the previous experiences were positive, the Viçosa Municipal City Hall decided to take over the technical management of the Autonomous Service by appointing one of its engineers as director.

Not even the recent discussion on the Public-Private Partnerships (PPP) has raised doubt. The management of the distribution of treated water and the collection of sanitary sewage remains the big challenge.

Financial autonomy was a positive factor for the planning and implementation of projects during the 35 years of the Autonomous Service of Water and Sewage of Viçosa. The Autonomous Service is investing, on

Viçosa, Minas Gerais

Population estimate, 2005: 73,121 / Urban population: 67,000 / Index of urban water assistance: 100% / Index of rural water assistance: 86.83% / Invoice revenue loss index: 29.59% / Productivity Index: 3.67 workers per thousand water and sewer connections / Gross annual operational revenue (direct and indirect): R\$ 4,352,939.09 / Gross annual expenses, including the service: R\$ 2,731,531.68 / Annual utilisation cost: R\$ 2,731,531.68 / Infant Mortality Index: 18.04 /

Source: SNIS 2003, IBGE 2000

average, 25% of its revenues. Tariffs are adjusted after a detailed study of the expenditure and the projection of investments.

Since April 2004, the Operational Basic Tariff has been in use. The tariff has greatly reformed the water consumption charging system by the implementation of a “You Spend, You Pay” system. This system allows the citizens to control their expenses while benefiting from the rational use of water, which translates into a practical cross subsidy system - you spend more, you pay more.

The tariff system categorises consumption as: Social; Residential; Commercial, and Industrial. The average index of failure to pay bills for the Autonomous Service has been around 5% over the last years. This is considered well below the national average.

In 1989, city hall approved the creation of the Expansion Fund with tariffs that are clearly described in the water bill for the construction of the Water Treatment Plant II.

Sixteen percent of the revenue from tariffs was collected for the construction of the station. This covered 33% of the project’s cost. It was the first ever fund for the implementation of a specific investment in the state of Minas Gerais. The rest of the project’s cost was covered through resources provided by the National Health Foundation (FUNASA) and invested in the construction of the elevation station of raw water and the purchase of equipments for the Water Treatment Plant. Apart from FUNASA, the Federal University of Viçosa, SAAE and the city hall also participated in the implementation of the project.

SAAE has a partnership with the Federal University of Viçosa

The presence of the Federal University of Viçosa (UFV), a resource in environmental projects with significant history in sanitation, has assisted in the formation of various collaborations that support the projects of SAAE’s.

Among the most prominent outcomes of the partnership between SAAE and UFV, are the expansion of the Master Plan, the monitoring of sewage treatment plants, the cleaning up of the spring, construction of the interceptor and maintenance of the sewage treatment plant, the cleaning up of Water Treatment Plant I spring and the Water Treatment Plant in the campus of UFV by removing *Salviniae* algae.

The start of the programme for the management and recuperation of the springs and the establishment of pavement construction projects along the banks of the Sao Bartolomeu Stream also demonstrate a successful partnership between SAAE and UFV.

This partnership has resulted in improved technical training and management of the Autonomous Service’s resources, which is always focused on sustainable development. SAAE has also been involved in internship programmes for municipal university students.

Searching for alternative supply sources

In 2000, the municipality implemented the Urban Development Master Plan in partnership with various sectors of the society. The document was finalised by an interdisciplinary group of specialists.

The Plan was approved by city council and became a law that redefined and reorganised the land occupations and disputes in the municipality’s area.

Additionally, the municipality defined the hierarchy between the administrative organisations so that the activities were technically legitimate and approved by the population. A classic example is the announcement of a

state of emergency in case of water shortage. Such an announcement and the necessary technical actions are the responsibility of the Environmental Development Council (CODEMA), which is set in motion by SAAE.

The Autonomous Service has also developed Master Plans for the water supply and sanitary sewage services by using planning as another administration tool.

Viçosa's water supply system has two sources. The first is the Sao Bartolomeu Stream, which supplies the main Water Treatment Plant ETA I that is responsible for 65% of the water supply. Water Treatment Plant II supplies the higher areas of the city with water it receives from the Turvo River, except during dry periods. The two water treatment plants are connected through a central tube. The treated water coverage in the municipality's urban area is close to reaching 99% of the population.

In the future, water availability could be a problem for Viçosa. Therefore, SAAE has recently started working on the recovery and management of hydrographical basins. In an effort to reduce water waster, a tariff readjustment strategy was adopted.

Construction of a state of the art laboratory increased the quality of the service, while the updating of the treatment system with online monitoring had a positive impact on the control of water losses. Programmes for water loss control and prevention of water wasting, foreseen in the municipality's Master Plan, are important for the sustainability of water resources, even though Viçosa continues to search for alternatives sources to meet the municipality's demands.

SAAE participates in the Administration Committee of the Hydrographical Basins of the Piranga and the Doce River.

Protection of the Springs

SAAE has a partnership with the Technical Assistance and Rural Extension Company of the state of Minas General (EMATER) for the implementation of a programme to clean up the area surrounding the springs and the construction of residential septic tanks throughout the rural area of the municipality.

SAAE is concerned with the constant reduction of the level of the Sao Bartolomeu Stream during the dry period; therefore, since 1999, it has invested in projects for its conservation.

The resources to be used are defined by State Law 12.503/97, which obliges the providers of water supply services in Minas Gerais to invest at least 0.5% of their gross operational revenue for the conservation of the basins they use to collect water. SAAE is complying with the law and reinvests around 2.5% of its revenues.

The investment programme was launched in 1999, starting with the selection of the most adequate technologies for the basin, installing small experimental units using conservation techniques (reforestation projects and improvement of pastures) and mechanical ones (terracing and excavation of reception ponds). Other initiatives were taken to improve water quality, such as the construction of residential septic tanks, simple residue treatment systems, covers for water reservoirs and installation of faucets. The reforestation and vegetation recovery of the sub-basins were part of another collaboration with the Department of Forest Engineering of UFV. Today, the Autonomous Service has a contract with the Brazilian Centre of Nature Conservation (CBCN).

The works are evaluated based on data collected by the monitoring system, which is composed of units recording the precipitation and flow rates and units measuring groundwater depth. The resulting graphs demonstrate the steady recovery of the flow in two experimental units. Post-treatment and water analyses indicate the stability of the initial quality indexes registered in the springs.

SAAE started progressively applying the successful technologies in all basin areas of the Sao Bartolomeu Stream. To evaluate the impact of the techniques in the whole basin, a flow recording station was installed at the beginning of the year in the dam that supplies Water Treatment Plant I.

This spring protection programme has already been presented before the Legislative Assembly of the State of Minas Gerais. The techniques used throughout this project won the Furnas prize in 2004, in the Community category.

Environmental education is a priority

SAAE's theatre team visits schools and performs at community events. The repertoire of the team includes SAAE's agenda for the year, such as the sustainable use of water and other environmental issues. It is very popular with the kids.

Other activities developed by SAAE of Viçosa are the distribution of informational booklets on the importance of water, the planning of school visits in the water treatment plants, lectures and video shows on the treatment of the city's water system. The communication department produces a newsletter for internal circulation and prepares news clippings for the mass media. The central philosophy of this practice is to inform the user on the services, alert him on environmental issues and, above all, motivate him to rationally use water resources.

Sanitation with control from the society

SAAE has already carried out two surveys on consumer satisfaction in 1992 and 1998. The results were important for the municipality's database and for getting to know the behaviour and expectations of the user.

The Autonomous Service is also taking care of its staff. In order to democratise the working environment and promote good relationships, SAAE distributes a newsletter aiming to illustrate the progress of various projects and the activities of the many sectors. The Autonomous Service's structure includes a planning nucleus composed of the directors of the various sections and sectors that meets every two months. The management carries out capacity building courses and seminars to stimulate professional development. There is even a partnership with the Education Department of UFV for the implementation of the Literacy Programme for Adolescents and Adults of the Federal Government. The regular meetings and a suggestions box allows the exchange of information on the daily life of the Autonomous Service.

SAAE of Viçosa has also installed a box for suggestions and observations in its customer assistance office in the centre of the city.

SAAE participates in the rational energy use programme of the Ministry of Cities

SAAE of Viçosa was selected through a public call of interest from the Ministry of the Cities to participate in the programme for the reduction of water and energy losses.

The objective was to develop an administration model for rational use of electricity and combat water losses through the identification of the system's deficiencies.

During the evaluation process, the technical structure of the Autonomous Service was taken into consideration as a guarantee for its ability to implement the model. According to engineer Jose Luiz Pereira Correa, "this is an important recognition of the attitude of the Autonomous Service. It will further stimulate our staff and improve the relationship of SAAE with the community and the financing agencies of sanitation programmes".

Law against wasting water

SAAE has identified the water shortage problem during the dry period and verified that each year the situation in Water Treatment Plant I (Sao Bartolomeu System) gets worse. On the other hand, a serious problem with water wasting can be seen in the city's streets due to the improper use and insensitivity of the consumers to leakages or to even inform the technicians. .

SAAE drafted a bill to deal with this situation, which was voted into law as 1,440/2001. During 2002 and 2003, the law was implemented with the permission of CODEMA and there was an extensive campaign in the media on the issue. SAAE got the approval of the population to harden its stance and even cut off water supply in cases of abusive behaviour from the consumers. The law gives wide powers to SAAE and CODEMA to act for the protection and the preservation of water in periods of shortage, with the application of sanctions to the offenders.

Universal Sewage service is expected in 2010

The Sewage Master Plan was evaluated by the Municipal City Hall and the Public Ministry, keeping the public thoroughly informed of its details.

The Master Plan foresaw the construction of the sewage interceptor in the Sao Bartolomeu Stream. Today, all the units that previously discharged their sewage in the stream without been registered as users are connected to the interception network, which has now reached 3,000m. Two sewage treatment plants are currently operating. A third one of a much larger treatment capacity is already planned.

SAAE is installing a geoprocessing system for the creation of registries and the development of projects, which will unify the databases and provide a multipurpose central register for city hall.

The Autonomous Service is involved in other fields of sanitation

SAAE, in partnership with the city hall and the National Health Foundation (FUNASA) assists in the construction of toilets for low-income families. These projects are implemented in partnership with the Secretary of Social Action within city hall, which responds to the inquiries of the population.

The sanitary kits installed through this project are composed of a water reservoir, a washbasin, a toilet and a sink. The project has already constructed 1,200 toilets for low income families.

SAAE also has a Municipal Sanitation Workshop for the promotion of domestic sanitation. One of SAAE's Sanitation Assistants received training from FUNASA. The Sanitation Workshop became an excellent model for the region. Between 1994 and 1997, FUNASA used the workshop to train more than 200 Sanitation Agents from various cities of the state of Minas Gerais through the state government's programme for the reduction of infant mortality rates.

The programme for the construction of toilets for low-income families reached the rural area. SAAE also constructed a sewage collection network, deep tubular wells and water reservoirs, as well as a water distribution network for rural communities. This created a positive relationship with rural producers and communities.

With the collaboration of Fernando Campos