Where the fish stops

Strong social mobilisation brought Piracicaba to the frontline of water management in the country. It was the first municipality to contribute R$ 0.01 per cubic meter of water collected for the recuperation of the hydrographical basin of the Piracicaba, Capivari and Jundiai Rivers. Sanitation has a primary role in the fight to clean up the basin, which supplies the metropolitan area of Sao Paulo with water. Piracicaba fights for its autonomy and tries to strengthen regional integration for the administration of water resources.

It is not only today that the sanitation is an important issue for Piracicaba. In 1824, the city council was already discussing the necessary measures to guarantee water supply for the population.

Piracicaba inaugurated its public water supply service in May 26, 1887, with a concert and a ball at the Club Piracicabano, the financial elite's meeting place at the time.

A reservoir with the capacity of two million litres was built by the Hydraulic Company of Piracicaba. The service was initially private and served 260 out of 4,000 residences in the municipality. It was the first water supply system installed in an interior municipality of Sao Paulo State. In Piracicaba, the water supply system was installed eight years before Araraquara and ten years before Ribeirao Preto.

Images from the inauguration ceremony were taken from photographer Fernando Skarder. They show the square packed with people watching speeches, spectacles and events.

More than 50 years later, city hall gave up the service. It started operating as the Department of Water and Sewage, which was linked to the Municipal Secretary of Works.

Piracicaba, Sao Paulo

Population estimate, 2005: 360,762 / Index of urban water assistance: 100% / Index of water monitoring: 100% / Number of water connections: 111,220 (2005) / Number of sewage connections: 107,863 (2005) / Intermissions in water supply: There are no intermissions, only pauses during maintenance and leakage repairs / Length of water supply network: 1,263,289m / Length of sewage collection network: 1,103,989m / Average tariff (water and sewage): R$ 2.43 per m3 / Index of invoice revenue loss: 21.25% / Productivity Index: 2.5 workers per thousand water and sewage connections / Gross annual operational revenue (direct and indirect): R$ 46,800,185.00 / Gross annual expenses, including service: R$ 39,344,340.00 (2004) / Annual utilisation expenses: 39,344,340.00 (2004) / GDP per capita: R$ 455.87 / HDI: 0.84 / Source: SEMAE Piracicaba, IBGE 2000

Piracicaba was a pioneer in water supply in the interior of Sao Paulo. The system was installed in 1887, preceding the installation of similar water supply services in the municipalities of Rio Claro (1895), Santo Amaro, Itapetininga, Araraquara, Sao Carlos do Pinhal, Mogi Mirim, Jau (1896), Jaboticabal, Brotas, Dois Corregos, Mineiros, Belem do Descalvado, Sorocaba, Itapira, Ribeirao Preto, Sao Jose dos Campos, Bananal, Monte Mor, Cachoeira (1897)

In order to guarantee the administrative and financial autonomy of the sanitation service, city hall created, in April 1967, the Municipal Service of Water and Sewage (SEMAE) as the municipal autonomous service of sanitation.

The Piracicaban's veins do not have blood, water from the Piracicaba River runs inside

"O Rio de Piracicaba vai jogar água pra fora, quando chegar às águas dos olhos de alguém que chora..."
(Piracicaba will throw water when somebody's crying eyes come closer to its surface)

The words of the song famous throughout Brazil reflect, at least partly, the love of the Piracicaban River, named after the city and representing a permanent attraction of the region.

During the dry period there is concern regarding the flow of the river. When it rains, the Piracicaban reaches the banks of Piracicaba, which experiences the force of its current. When there is plenty of water, the fish give the show of Piracema, a jump for spawning. Piracicaba, in Tupi-Guarani means "place where the fish stops".

The city became the pioneer in the administration of water resources in Brazil. It was the first municipality to contribute R$ 0.01 per cubic meter of water collected for the recuperation of the hydrographical basin of the Piracicaba, Capivari and Jundiai rivers.

Every year on the 15th of April, the city celebrates the Day of the Fight for the Piracicaba River, the fight against its degradation. Being the last city to be supplied by the river in 1960, Piracicaba experienced the gradual deterioration of the conditions of its water source.

The good news is that now, one can already notice the improvement of the peoples' relationship with the river. The relationship was declining in the past; but now, there is a viable effort made by the population to restore the quality of its waters. Through social mobilisation, the initiatives for the restoration of the river multiplied and became organized.

The most observant have even reported the return of various species of birds to the river banks.

Fifty years of social mobilisation

The Committee of the Hydrographical Basin of the Piracicaba River was the first to be created in the state of Sao Paulo in 1993, based on State Law n^{o} 7.663/91.

Piracicaba has a historic relationship with that law, brought before the Municipal City Council for approval by the then State Governor Luiz Antonio Fleury Filho.

The Committee, whose first chairman was the then mayor of Piracicaba, Antonio Carlos de Mendes Thame, had a trilateral structure (formed by equal number of representatives from the state, the municipality and civil society) and became a model for the creation of other committees in the state of Sao Paulo.

For more than 50 years, social mobilisation has been one of the characteristics of the region. The history of the movement started with protests over the death of the river's fish due to pollution.

The main culprits of the basin's degradation were the Cantareira System and the installation of sugar mills and alcohol production plants in the area. The water carried to Sao Paulo is taken from this basin. When pollutants are discharged in large quantities in the waterways they are not easily diluted, a fact that causes proliferation of the algae feeding on pollutants. Water of low quality and in small quantities causes occasional rationing of the supply to the basin's municipalities.

On the other hand, the Brazilian Government's official programme in the 70s called Pro-Alcohol, which subsidised the installation of alcohol production plants, encouraged the production of alcohol fuel in Piracicaba. The programme increased the production of alcohol within a very short period and, consequently, the waste released from the plants. "Vinhaca" is the main by-product of the alcohol and sugar industries. Currently it is being used as fertiliser, thus reducing the organic load discharged in the River.

Pro-Alcohol's vision also attracted a considerable number of companies associated with the sugarcane industry. In order to feed the mills of the plants, significant areas in the region were deforested and replanted with sugarcane.

The watercourses of the area were abused and reached their limits. The population began to protest rather than remain a mere observer of dying fish, the bad smell of the water and the poor state of the river.

The sewage treatment technology catches the attention of neighbouring countries

In December 1992, SEMAE inaugurated its first Sewage Treatment Plant (ETE) in the Dois Corregos area in order to treat the domestic sewage of up to 1,000 people.
The following step was the installation of interceptors along the margins of the Ondas Stream and the right bank of the Piracicamirim Stream.

SEMAE inaugurated the Sewage Treatment Plant of Piracicamirim in 1998, and projected to treat domestic sewage from 90,000 people. The 30,000 square meters area where the plant was built was donated by the Superior School of Agriculture Luiz de Queiroz, unit of the USP University.

Built with state of the art technology (anaerobic system followed by aerobic system), designed by Professor Jose Roberto Campos, of the Sao Carlos Engineering School of USP, the Sewage Treatment Plant is characterised by its low operation cost and attracts visitors from Colombia, Chile, United States and Mexico.

Due to its importance as the initial step of cleaning up the Piracicaba Basin, the Sewage Treatment Plant was partly financed by the State Fund of Water Resources.

The Public Authority respected the public opinion and the environmental issues won space in the city's political agenda, as journalist Jose Pedro Soares Martins remembers. He further recalls that in 1978, city hall inaugurated the Square of Ecological Manifestation on Beira Rio Avenue. The policies of the Clube da Toca, one of the first entities to be involved in the fight for the river's preservation, can be seen on the square's foundation stone. "This movement expresses the protest of the people in defence of a present from nature that was mistreated by the man, the Piracicaba River. It is the protest against the inefficiency and incompetence of the sanitation and monitoring organisations, the apathy of the governments, the greed of the economic power and against those that one way or another pollute the environment".

According to the journalist, "the mobilisation to defend the river revived the opposition spirit demonstrated in various moments of Piracicaba's history and further justifies the foundation of the International Humour Hall of Piracicaba in 1974, one of the most prominent cultural manifestations of dissatisfaction during the dictatorship".

In 1985, the Campaign Year 2000: Ecological Redemption of the Piracicaba Basin, was launched. The Campaign proposed the constant evaluation of the business proposals in the basin.

For specialists like Joao Jeronimo Monticelli, "it is right to associate the creation of the consortium with Campaign Year 2000, whose launching translates, until today, the aspirations of the Piracicabans". The Campaign stressed the importance of integration between the municipalities and regional planning, proposing the creation of an elected intermunicipal organism. Jose Machado, ex-mayor of Piracicaba and current president of the National Water Agency, was the first president of the Consortium of Piracicaba. He was elected in October 1989. The Consortium introduced the financial contribution tax intended to cover expenses, which was separate from the contribution tax directed for investments.

The strength of the movement throughout the whole basin dominated the first meeting of the State Council of Water Resources to Piracicaba, which declared the status of the basin as critical.

Piracicaba River sustains the Cantareira System

In order to attend to the increasing needs of the metropolitan area of Sao Paulo, the Cantareira System was created. It consists of three big stabilisation dams (Jaguari, Cachoeira and Atibainha) and is operated by the Sanitation Company of the State of Sao Paulo (SABESP). The reservoirs are linked by tunnels permitting the transfer of 31 cubic meters of water per second to Sao Paulo.

At the time of the construction of the Cantareira System the regional population mobilised against the project. The Municipal City Hall of Piracicaba pushed the state and requested compensation. The System provides 60% of the water consumed in the metropolitan area of Sao Paulo.

The Piracicaba Basin is one of the biggest and most important in the state of Sao Paulo. The basin has a mixed administration system, partly from the federal and partly from the state governments, since it also includes the Jaguari River, which starts in the Minas Gerais State. The basin hosts important agricultural and industrial activities, along with a population of

more than 4 million people, with superficial waters covering the needs of more than 95% of them, according to the committee's data.

Being the last of the 37 municipalities along the basin, Piracicaba collects only 20% of the water consumed from the Piracicaba River. The degradation of the Piracicaba River increased the water supply cost for the municipality by forcing it to collect 80% of the water from the Corumbatai River, which is further. The raw water is pumped through a 5.3 kilometres network to Water Treatment Plant III, the closest to the water collection station. Water Treatment Plants I and II are even more distant at 12.8 kilometres from the river.

The construction of the Corumbatai System that supplies the Water Treatment Plant Capim Fino, started in 1980. The current concern of SEMAE is related to water quality, which becomes worse over time. Adding to that the increasing demand for domestic, industrial and agricultural uses further compromises water availability and quality, especially in the dry season.

The Master Plan of Water Supply, which introduced guidelines and basic projects for the improvement of the system, was elaborated in 1991 and reviewed in 1998. The city has two collection systems, one in the Piracicaba and the other in the Corumbatai River. Currently the water supply system is automated.

The Management and Control System of Water Distribution and Treatment counts with a computer network, special software, valves, level sensor, alarms and interconnected flow meters, for the remote control of water treatment and distribution services. With this automated system, SEMAE prevents water loss, as happens during reservoir overflow, saves electricity, monitors the situation of the distribution network and controls water quality.

The Corumbatai Basin has a Forest Management Master Plan

The Corumbatai River Basin includes eight complete or partial municipalities (Analandia, Corumbatai, Itirapina, Ipeuna, Santa Gertrudes, Rio Claro, Charqueada and Piracicaba) covering a total area of 170,775.6 hectares, with a population of approximately 550,000. Its forest are ruined and cut down, compromising the conservation of water resources, biodiversity and the sustainable development of the region. The Corumbatai River Basin represents the principal source of water for Piracicaba and the other municipalities.

Due to the strategic importance of the Corumbatai River Basin, the Piracicaba Municipal Service of Water and Sewage, collaborated with the Forest Studies Research Institute (IPEF) on the Master Plan for "Water Resources Conservation through the Recuperation and Conservation of the Corumbatai River Basin's Forests". The elaboration of the plan was completed in December 2001.

SEMAE is a pioneer in financing and implementing a plan of such magnitude, creating an example for other institutions involved in water supply and administration of water resources at the municipal, state and federal levels.

The Water Museum is a tribute to the River

In 2000, Piracicaba inaugurated the first Water Museum in the country. It is considered a tribute to the river crossing the municipality. The Museum integrates all the activities of the Freshwater Environmental Education Programme, in which practically all the public schools of Piracicaba have participated.

The building is strategically located on the left side of the Piracicaba cataract and occupies an area of 12,000 m^2. The building, which is visited by 30,000 people every year, is rich in details of past times: arches, floors, stone walls, centennial aqueducts, iron tubes, pumping station, equipments and objects recounting the city's sanitation history.

The central theme of the Museum is the respect for water resources. Its main objective is to increase the awareness of students and teachers regarding the significance of the river to the city's history. As engineer Jose Carlos Esquierro, environmental assistant of SEMAE points out, "we want to let the visitor comprehend the importance of preserving the river, so that it can keep attending to the population's needs. They are also instructed on rational use of water, by studying sanitary

installations, with faucets, toilets and transparent water reservoirs, demonstrating the amount of water consumed and the ways for a more efficient consumption".

Three aquariums with native fish species serve both for research and observation by the visitors. Trained guides inform the visitors and perform pedagogic exercises, and distribute to the teachers specific teaching material for the classroom.

The courses on water are inspired by France

The famous Water Classes (*Les Classes D'Eau*) carried out in France by hydrographical basin agencies, inspired the Week of Water up to 1999. From 2000 onwards, the Week of Water was replaced by the Freshwater Environmental Education Programme, from which, more than 400 teachers from Piracicaba and 7,000 students of 55 local schools have already graduated.

In addition to environmental education, the water classes aim to motivate students and authorities to develop solutions for the problems by promoting visits to water and sewage treatment facilities, degraded areas of ciliary forests and rivers' nascents.

The normal school programme is substituted with classes that have a multidisciplinary approach. The mathematics teacher, for example, works on water quantities and expenses; the geography teacher uses maps, hydrographical basins replicas and models; the history teacher recounts the economic and agricultural activity of the municipality and its relation with water.

"The schools are important vehicles for the comprehension of environmental issues by the society as a whole and its transformation. Understanding the hydrographical basin system, involves direct contact with its problems, its potential, its people, their culture and the use of its resources. Through this project, the teachers visit upstream areas of the main rivers of the Piracicaba Basin and the critical urban and industrial areas contributing to the pollution of the watercourses with their waste".

International support

Aiming to make science more accessible for the society, SEMAE of Piracicaba signed an agreement with the International Development Research Centre (IDRC), a Canadian organization that invests in capacity building and assistance technology in Third World countries through research funding.

In 2000, the Aquatox Project was implemented, the first project developed together by SEMAE and IDRC. Two years later, SEMAE developed an environmental education project called Aquamiga (Waterfriend) with the support of the Canadian organisation.

The project financed the creation of an environmental education nucleus aiming to increase the awareness of public school students on the conservation of natural resources and helping them to adopt a more participative approach. The project continued in 2003 and 2004, with the participation of 11 and 12 schools respectively. The teachers went through training courses in order to participate in the project.

The mobile laboratory, financed by the project, demonstrated to the participating students the daily practice of water analysis. In the vehicle and school laboratories various experiments are carried out such as sulphuric gas tests, bioassays on germination of lettuce seeds, evaluation of toxic effect on freshwater hydras and pH measurements.

In 2006, the project will be expanded to the municipalities of Analandia, Corumbatai, Itirapina, Rio Claro, Santa Gertrudes, Ipeuna and Charqueada, comprising the hydrographical basin of the Corumbatai River.

The network Aquatox-Aquamiga is part of the Freshwater Environmental Education Programme and was incorporated into the Pan American Centre for Sanitary Engineering and Environmental Sciences (CEPIS) of the Pan American Health Organization (PAHO).

Besides IDRC, SEMAE receives support from the Intermunicipal Consortium of the Hydrographical Basins of the Piracicaba, Capivari and Jundiai Rivers, the Centre of Nuclear Energy for Agriculture (CENA) of USP, the Methodist University of Piracicaba, the Regional Education Secretary, the Federal Savings Bank Caixa and private companies.

With the collaboration of Wilhe Gerdes