

The capital of municipal sanitation

The municipal department of water and sewage (DMAE) is the largest municipal provider of sanitation services in Brazil and an example of successful public provision and social control. In Porto Alegre, society is the protagonist of history.

The largest municipal provider of sanitation services in the country, DMAE is an autonomous service of Porto Alegre's City Hall and is one of the clearest examples of the advantages of maintaining the autonomy of a public sanitation provider.

Throughout DMAE's history, its autonomy in relation to Porto Alegre's City Hall has been essential for the appropriate administration of the service, the maintenance of service quality and in guaranteeing important investments. Flavio Presser, the general director of DMAE affirms that, "The federal government's funding, for instance, was only supplementary to the foundation of the department. The municipal sanitary infrastructure was set up with the system's own revenues".

He further notes that Porto Alegre does not have a significant rural area, but it does have a high population density in urban areas, which allows large savings per kilometre of network, permitting significant cost reduction in the system. Presser further states "this was one of the factors allowing the capital of Rio Grande do Sul to stay out of the national sanitation plan" (PLANASA). Additionally, there is an internal subsidy system in place through which the progressive taxation of more affluent areas favours poorer communities.

The department, using its own resources raised by water and sewerage tariffs, invests in projects and in the purchase of equipment, materials and inputs, besides covering administrative and personnel costs.

In 2005, investments totalled around R\$ 27 million. These resources went toward project improvements such as construction, repairs, enlargement and replacement of water and sanitary sewage networks, reforms in operational units in several areas of the capital, and, even a new pumping station for untreated raw water.

Pursuing excellence

DMAE is an autonomous municipal service founded in December 1960, and is responsible for the collection, treatment and distribution of water to the residents of Porto Alegre, as well as for the collection and treatment of sanitary sewage.

Porto Alegre, Rio Grande do Sul

Population estimate, 2005: 1,428,696 / Index of urban water service: 99.5% / Index of urban sewage service: 86.5% / Index of collected sewage treatment: 25.61% / Index of waste collection and treatment: 99.66% / Number of water connections: 267,653 / Number of sewer connections: 117,134 (sanitary) and 77,094 (mixed) / Length of water supply network: 3,542,580.30m / Length of sewage collection network: 1,648,094.50m / Average duration of water supply disruptions: 105.4 hours per year/ Total cost of the service per m³ invoiced: R\$ 1.10 / Average cost: R\$ 1.85 per m³ / Index of invoice revenue loss: 36.61% / Productivity Index: 5.63 workers per thousand water and sewer connections / Gross annual operational revenue (direct and indirect): R\$ 258,306,971.50 / Gross annual expenses with the service: R\$ 166,216,761.52 / Annual utilisation expenses: R\$ 155,977,803.78 /

Source: SNIS 2003, IBGE 2000 DMAE Porto Alegre, RS/2004

It is DMAE's responsibility to supervise and maintain these services, while constantly planning and promoting the improvement and expansion of the services in order to guarantee the necessary infrastructure for the sustainable growth of the city.

DMAE's mission is to pursue excellence in the provision of public sanitation services, emphasising water and sewage, to contribute to the sustainable management of natural resources and to guarantee a good quality of life for the community of Porto Alegre that includes universal provision of the services, while incorporating social control.

The autonomous service includes seven water collection stations, eight untreated water pumping stations, eight water treatment stations, 95 elevation stations of treated water, around 3,500 kilometres of water network, 98 water reservoirs and 13 mobile water distribution tankers. Currently, 99.5% of Porto Alegre's residents receive treated water.

DMAE also has 17 sewer pumping stations, more than 1,600 kilometres of sewage collection network and nine sewage treatment plants. The sewage treatment capacity of the city covers 25.61% of the collected sewage volume.

DMAE's personnel is composed of 2,333 full-time employees. DMAE hires subcontractors in the case of very specific projects, such as structural or ventilation projects, for which it does not have qualified technicians. The implementation of projects related to water and sewage also involves subcontractors.

DMAE is a self-sustaining entity with financial autonomy. The department covers the areas of administrative, financial, commercial development and operations. DMAE's activities are monitored by the deliberative council, which was formed by representatives of society.

The importance of financing

Investments with resources collected through the tariff system are essential for the maintenance of DMAE. However, these investments are not enough to guarantee universal provision and the level of water excellence and, most importantly, sanitary sewer services.

"It is estimated that in Porto Alegre, in order to achieve universal provision of sewage services, an investment of around US\$ 200 million would be necessary, something impossible just with our own resources. Furthermore, it would necessitate the revision of DMAE's level of financial indebtedness", as engineer Valdir Flores, Operations Superintendent of DMAE, emphasises.

The fact is that, to carry out mega-projects with our own resources would take many years. Therefore, long-term loans are necessary.

An example of such a project is the socio-environmental integrated programme (PISA) that plans to increase the sanitary sewage treatment capacity of the capital from the current 27% to 77%.

The project, which was initially estimated at US\$ 115 million, is currently under revision. The Inter-American Development Bank (IADB), creditor of the project, decided to halt new operations with the City Hall of Porto Alegre due to the financial deficit registered by the municipality during the years 2002, 2003 and 2004, and the delays in, or failures to repay previous financing contracts.

In order to pursue new financing, the city hall has to demonstrate three years of financial stability so that the municipality can be regarded eligible.

In the last ten years, DMAE obtained funding from national institutions such as the State Bank of Rio Grande do Sul (BANRISUL), Federal Savings Bank (CAIXA), Ministry of Cities and the National Health

Foundation (FUNASA). The only foreign financing came from the IADB, which financed part of the Pro-Guaiba programme with the state government acting as intermediary.

During the above period the main projects financed were: the southern sewage system, including network and interceptors (IADB); the sewage treatment plant of Sao Joao (IADB); the sewage treatment plant of Novo Belem (CAIXA); and, the water supply network of Gloria District (BANRISUL).

Besides the funding obtained from FUNASA and the Ministry of Cities, all the others were burdensome. The matching funds required from DMAE varied according to the source: for BANRISUL, it was 25%; for the Federal Savings Bank, 10%; and for the IADB, around 35%.

DMAE's own resources

Until the mid 90s, the average annual investment using DMAE's own resources was close to 30%. Between 2000 and 2004 only an average of 12.07% of DMAE's own revenue was reinvested. Last year, this amount was 10.92%, totalling R\$ 29 million.

DMAE plans to return to the historic rates of reinvestment using its own resources. Flavio Presser affirms that "the aim is to reach 25% reinvestment of the tariff revenue, which is the predicted percentage of the cost of a cubic meter of water".

Cooperation with society

DMAE is facing at least two challenges in the next few years besides increasing investments. DMAE will have to expand the collection and treatment system of sanitary sewage for Porto Alegre based on sanitary policies and others related to the preservation of Lago Guaiba, the main spring supplying around 1.4 million inhabitants, as well as increasing community participation.

The improvement and expansion of the sewage collection and treatment system is not limited to the integrated socio-environmental programme (PISA). Furthermore, the strategic plan for the sewage directive (PDE) created between 1995 and 1999, is under revision, producing an "integrated water cycle vision", from installation at the property to the final destination of the effluents.

According to engineer Paulo Kessler, DMAE's sewage department director and co-ordinator of the PDE, such revision is necessary mainly because of the increased coverage of sewage treatment in Porto Alegre and due to the deterioration of the cyanobacteria (blue algae) problem in the Guaiba Lake, which necessitates the reduction of nutrients released by the sewage treatment stations.

Kessler affirms: "We will use the employees' experience to plan actions based on what already exists". DMAE's PDE is divided into six big action plans: hydrographical basins; geo-processing; the city's strategic plan on environmental urban development (PDDUA); the strategic plan for water (PDA); concentration on setting and meeting benchmarks (a comparative mechanism of the organisation's performance); and, previous PDEs.

The guidelines for the revision of the PDE are led by socio-environmental perspectives, integration with other municipal secretaries and decision-making forums, as well as incorporating the concept of "cities inside the city".

DMAE is also reinforcing the actions of a proper sewage programme. With emphasis on environmental preservation, the programme stimulates and advises the users to properly connect the containers of residential sewage to the sanitary collection network, saving Guaiba from the overflow of untreated effluents.

Porto Alegre's experience has shown that sanitary sewage thrown in the Guaiba, without previous treatment, stimulates oxygen reduction in the water column and subsequently creates the conditions for excessive

growth of blue algae, especially during periods of hot weather. Algae of that type are responsible for a “soil” taste and smell in water which requires more chemical treatment and increases the cost.

In residences where incorrect connections are identified through colour tests or filming (previously authorised by the residents), specialist teams for the proper sewage programme advise the users to divert their sanitary sewage from the rainwater network (the network is a responsibility of the rainwater sewerage department (DEP)).

Currently, the proper sewage programme works on monitoring and recovering the polluted Arroio Diluvio sub-basin, which divides Porto Alegre into east and west, within the first phase of the pro-diluvio programme of city hall.

Local Solidarity Governance

Porto Alegre is a city with a history of successful participatory initiatives, such as the participatory budget process, which are reflected in the sanitation policies. Since 1961, DMAE’s structure contains a deliberative council, currently formed by representatives of thirteen civil society organisations.

However, progress in terms of establishing collaborations between the government and communities in the administration of activities directed towards the improvement of local socio-economic development is necessary. In Porto Alegre, this policy is part of the municipal government's programme. It is named local solidarity governance.

In the case of DMAE, the idea is to increase the awareness of communities about the importance of their roles in preserving the water that their neighbourhoods or areas consume. The general director of DMAE, Flavio Presser points out that, “society should be the protagonist, by establishing partnerships with the state through organisations and entities, without meaning a transfer of responsibilities related to public services to the private sector”.

The proper water programme was created based on such logic. The focus of the programme is the 500 villages that are either unregulated, or, undergoing the process of regularisation, and the most impoverished areas of the city. It is estimated that 30% of the inhabitants of Porto Alegre live there, in large part with irregular water connections that are susceptible to contamination.

In such areas, DMAE considers water an essential element for the mobilisation and organisation of local communities. The teams of the proper water programme work on the renegotiation of water bills related to debt and the replacement of irregular connections with legal ones, besides conducting leaks repairs, installation and change of hydrometers, substitution of water registries and environmental education, among other activities. Presser affirms that “in this way, DMAE is sharing part of the responsibility for the quality of services with the communities, to such an extent that the users promise to prevent clandestine water connections, conserve the supply network, control consumption and combat the loss of water”.

DMAE tries to show the community that water has a production cost that needs to be paid by society. DMAE looks for and supports a type of co-management of water services between providers and consumers.

The first results demonstrated that the process of regulating water connections and compliance with the bills have been, in fact, welcomed by the community. The president of the residential association of Rubem Berta, Paulo Cesar Santos da Silva, observes that “the satisfaction is average, since the special conditions for the renegotiation allow the people to regularize their debts according to their financial conditions. Having the ability to meet their obligations brings the residents closer to the idea of citizenship”. The neighbourhood, located in the north of Porto Alegre, is a town of 35,000 to 40,000 inhabitants, characterized by low incomes and significant delays regarding bill payment.

The proper water programme facilitates dialogue between government and communities in the unregulated areas of the city by raising the awareness of people about the need to collaborate in order to solve local problems more efficiently. The same is being proposed for Vila Asa Branca, also in the north of Porto Alegre, where DMAE, since the beginning of 2005, coordinates an initiative with various entities of city hall.

This specific group studies the viability of engineering works in the locality. The irregular land situation of some residents of the area, its definition as a “risk area” by the municipal Secretary of Environment (SMAM) and its low elevation level that places the town below the level of an existing canal in the region, a fact that provokes constant flooding, are the primary obstacles to interventions by the municipal authorities and investments in the area.

Nevertheless, city hall has not given up working towards a solution. As Presser affirms, “the collective intervention of city hall in Asa Branca, through several government secretaries, seeks to improve the quality of life for the local residents with the support of the Rotary Club, Senai and other organisations”.

In this intervention, the responsibility of the community is to regularise the connections, water bills and control leaks. At the beginning of the partnership, 76% of the residents held debts with the department and, the unregulated consumption was reaching an average of 60,000 litres, while the legal consumption was reaching 15,000 litres a month.

According to Clovis Welter, the community leader of Asa Branca, the community (which has 950 families), realised that paying water bills on time would allow DMAE to invest in sanitation, one of the chronic problems of the area.

Another characteristic of the proper water programme is working closely with women. According to Presser, “this is because of the important role they play regarding health and water consumption, and since they are frequently the head of the family”. In Ipe-Sao Borja, another area of Porto Alegre, women hold the majority of leadership positions in the community. As Cristina Borges, president of the Association of Residents of Vila Ipe, Sao Borja, states, “here, 70% of the women are the head of the family, and even the Association Friends of Bocce, is presided by a woman”. According to Helena, women are concerned about the community’s social and financial issues and about the well-being of their children.

In October 2005, DMAE started a five kilometres extension of the water network project, installing more than a thousand connections in properties. This solution was long anticipated by the five thousand inhabitants of the unregulated area, who suffered from the lack of water supply, especially in the extreme heat. The investment reached up to R\$ 876,000, with the completion anticipated at the beginning of summer 2006.

According to the sales superintendent of DMAE, engineer Marcelo Neubauer da Costa, the target for the next four years is to take the proper water programme to 67% of the unregulated areas of the city, requiring around R\$ 16 million to reach this goal.

The Participative Budget Process

In addition to the policy on local solidarity governance, DMAE has honoured its commitments to the participatory budget, including projects from previous years not yet implemented. Between January and September 2005, three water network installations were completed, totalling 19,000 meters, as foreseen in the participative budgets of 2003, 2004 and 2005. The investment reached R\$ 6.42 million, directly benefiting close to 68,000 people.

Other water projects of the participative budget (2001, 2003 and 2004) include the substitution of 13,300 meters of water network and the construction of an elevated reservoir with a capacity of 100,000 litres. Together, the projects required an investment of R\$ 1.9 million from DMAE's own resources.

Regarding sanitary sewage, DMAE has started 17 projects, in order to replace 11,467 meters of network, meeting demands assembled from 2001 to 2004. The investment will reach R\$ 1.43 million, benefiting approximately 4,000 inhabitants from nine out of the 16 divisions of Porto Alegre defined by the participative budget. Two other sewage network replacements that the communities considered a priority in 2005, require investments of R\$ 981,000.

The Sanitation in Porto Alegre was private

DMAE was created in December 1961, but the sanitation history of Porto Alegre started in 1772. Since the foundation of the city, the residents have been supplied mainly by the Guaiba spring. At that time, Guaiba was already the destination of the city's waste.

Progressively, with the increase of the population and the occupation of areas more distant from Guaiba, the need for water supply in the city increased.

In 1779, the first two public fountains of Porto Alegre were built, from which vendors collected water to distribute from door-to-door. By the second half of the following century, other public fountains were dispersed throughout the capital.

Between 1861 and 1944, Porto Alegre had two water supply systems. The *Hydraulica Porto-alegrense* (that explored the services of channelled water between 1866 and 1944) and the *Companhia Hydraulica Guaibense*, responsible for water collection and distribution to the population from 1861 to 1904. In that year, the latter company was nationalized and named *Seccao de Abastecimento de Agua* (water supply section); it was subsequently renamed *Seccao da Hydraulica Municipal* (hydraulic municipal section). Previously, there had been no developments in the sanitary sewage sector.

The first sewage system, with a collection network of 51,000 meters, was only inaugurated in 1912. Until then, the waste was collected from the residences and other establishments and then thrown into the Guaiba. In that same year, the regulation of sewage service was launched.

Water began to be treated in 1928, with the creation of the general sanitation administration (DGS). In 1956, DGS became the municipal Secretary of Water and Sanitation.

In the early 1960s, the municipality received a US\$ 3.15 million loan from the IADB for investments in basic sanitation. The Secretary of Water and Sanitation was later transformed into the autonomous municipal authority (DMAE), as demanded by the international financial institutions.

With the collaboration of Helio Neto, Ieda Pezzi and Vera Petersen.