Sustaining Urban Water Supplies: A Case Study from São Paulo, Brazil

Rapid urban population growth over the past 40 years has introduced important implications for the environment. Urban domestic and industrial consumers are using larger amounts of water and, consequently depleting the available sources. At the same time, they are degrading these resources with their wastes.

Yet, urbanization and the consequent concentration of production are an essential part of economic development. They help lower unit costs for water supply systems and for many forms of sanitation services, including access to health services. However, in developing countries, the rate of investments needed to provide water supply and sanitation falls behind the urban growth, leading to a situation of intense pollution due to the concentration of industrial and domestic wastes. In these countries the problem is aggravated due to the unplanned way the cities grew. Migration induced by economic difficulties lead poor populations to settle in peri-urban areas with poor housing conditions and almost no urban infrastructure, creating large slum areas.

The fact is that one of the greatest challenges posed by the fast urbanization rates and rapid population growth is to guarantee safe, adequate and reliable water supply, as well as adequate sanitation conditions, to all people and permanently. Beyond difficulties of reaching a large area with reliable service, a situation that is aggravated if the urban expansion was unplanned and chaotic, it also leads to severe strain on the water resources accessibility and on the environment due to the increase in the water demand and pollution loads.

The challenge is augmented when megacities are concerned, but a selection of water management principles can be adopted to surpass such obstacles and recover part of the water supply system, as an ongoing case with the Guarapiranga reservoir of São Paulo, Brazil, illustrates.

In 1955, 68% of the global population lived in rural areas and 32% in urban areas. In 1995 these figures were changed to 55% of the population in rural areas and 45% in urban areas.

By the year 2025, the urban population will represent 59% of the global population and only 41% of the population will live in rural areas. In some areas the situation is much more critical. For instance, in Latin America and the Caribbean, 70% of the population live in the cities.

Supplying Water to a Megacity: São Paulo Metropolitan Region

The metropolitan region of São Paulo, Brazil, demands 57 m^3/s of drinking water to supply its 16 million inhabitants. The water supply utility operates six large production systems, with nine reservoirs, tunnels, pipelines and treatment plants. The second largest system is the Guarapiranga reservoir, which produces 11 m^3/s and supplies almost 20% of the entire demand. Its watershed is located on the edge of the urban area of the city of São Paulo.

Because of the growth of an industrial district near the reservoir, the Guarapiranga watershed suffered a gradual, unplanned and disorganized development over the last 30 years. By 1997, 622,000 mostly low-income people were living within the watershed and occupying 15% of the total watershed area.

In 1990, algae blooms became the first nuisance observed by the water supply company. By then, intensive water quality degradation was underway due to untreated domestic waste being discharged into the reservoir.

Because of its yield and proximity to the city, state water managers in 1992 decided that the Guarapiranga system was in need of

protection and initiated a seven-year, USD 336 million project to recuperate and maintain the water quality of the reservoir. A World Bank loan of USD 119 million together with a collateral investment of the State of São Paulo of USD 217 million allowed the implementation of the project.

Overcoming Challenges Through an Integrated Approach

The project required a multisectoral approach and a coordination effort to put together four different management levels: the state government, the municipalities within the watershed, the water supply utility and a housing and development agency. The watershed committee was also involved in the decisions. Environmental sustainability of the watershed and quality of life improvement for the poor population were the two main objectives to be achieved by the project.

Five different sub-programs were developed: water supply and sanitation (USD 94.3 million), solid waste collection and disposal (USD 5.7 million), rehabilitation of degraded urban sites (USD 187.1 million), environmental protection (USD 27.7 million) and watershed management (USD 22.4 million). These sub-programs dealt with very different topics, from the implementation of wastewater treatment plants and diversion of part of the waste, to urbanization of slums and relocation of people living in risk areas, from waste collection to environmental education and improvement of recreation areas.

The implementation program concluded in 1999, so results in the improvement of the water quality in the lake will take a few years to notice. In spite of that, some very important benefits are already noticeable. The two most important are that the institutions involved have learned to work in an integrated way, and the living conditions of the poor people in the watershed have improved through the implementation of water supply and sanitation services. There has also been a greater recognition of the economic value of water, increased local capacity building, and more community and stakeholder involvement.

Another important lesson is related to the enforcement of water laws. Water laws in general must be flexible to adapt to different situations and must also foster integration. In the Guarapiranga watershed, the agency in charge of enforcing the prohibition of the area occupation was working apart from the housing projects agency and apart from the water supply company which used the reservoir. This lack of essential institutional arrangement was not solved for many years and led to the intensive degradation of the area. Also, the inflexibility of the law, prohibiting any form of occupation in the area was unrealistic. This law was reviewed recently to include and to accommodate such institutional arrangements.

Conclusion

Demand management and environmental conservation are essential to achieve success in managing urban water supplies. Both are important elements of any strategy to make the use, allocation and distribution of water more efficient. It must also include pollution abatement programs and enforcement of pollution control legislation. All these elements will require the implementation of the principles outlined above.

Therefore, water managers are to look up to projects that aim at the sustainability of the water supply sources. Renewed commitment of all water managers to the implementation of the integrated management is necessary to achieve this final goal. It will not be an easy task since it will require better integration of all involved sectors and a greater attention to improving all regulatory and institutional framework in water management. It may be difficult but it is possible, as the Guarapiranga project shows.

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Still, there is no one model for such projects. Solutions are to be locally adapted and then refined during project implementation. Decentralized and participatory management solutions are essential neutral instruments to deal with competing and conflicting uses of the water. To achieve efficiency and equity under this scenario is only possible with integrated views and commitment of the water managers to these principles.

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