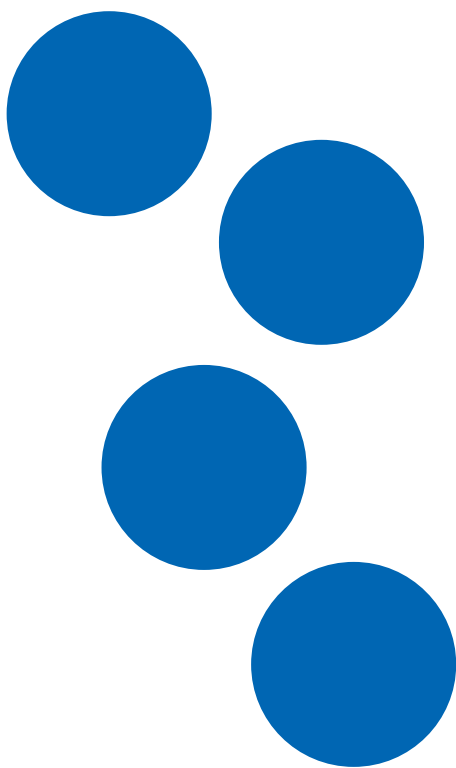


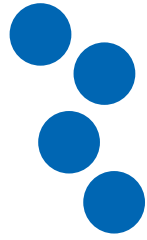
# Medellín River

A Case Study





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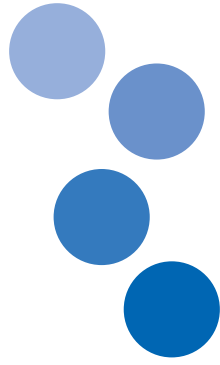
# Restoring the Medellín River to Health: A Long-Term Investment

**At the beginning of the 1990s, it looked like the Medellín River was about to receive an official death certificate. However, more than 15 years of sanitation programs carried out by Empresas Públicas de Medellín (EPM)—with the support of the IDB—have resulted in substantial improvements in the quality of life for a metropolitan area that is home to more than 3 million people.**

## Diagnosis

As is the case with many of the rivers flowing through large cities around the world, population growth, urbanization and industrialization had turned the major river in Medellín—Colombia’s industrial center and second-largest city—into a dump site for millions of tons of household and industrial waste.

By the early 1990s, pollution of the river had reached worrisome levels. This was compounded by the contaminated discharges from the city’s industrial area, all of which was leaving unhealthy traces in the Aburrá Valley, where Medellín is located. At the same time, the lack of open land had led people to settle on the banks of the river and along its 200 tributaries. As untreated household and industrial wastewater accumulated in these streams, they became an open sewer, threatening residents’ health, the aesthetic conditions of the city and the quality of life in the valley.



## Intervention

In order to confront the deteriorating sanitary and environmental conditions, as well as their adverse effects on residents' health and well-being, the Medellín River Sanitation Program was approved in the 1980s. The program included a set of defined projects, the first of which was estimated to cost US\$232 million. An Inter-American Development Bank (IDB) loan provided US\$130 million, while local counterpart funds provided the remaining US\$102 million. The overall goal for the first stage, which began in 1993 and concluded in 2000, was to clean up the Medellín River and its tributaries efficiently and sustainably. In order to achieve this objective, six secondary objectives were established: (i) partial decontamination of the river and its tributaries; (ii) partial treatment of 23 percent of the wastewater to be collected from the first of four treatment plants included within the master plan for the sewer system; (iii) extension of the potable water networks and sewer system to all areas lacking these services to reach 100 percent coverage; (iv) optimization of the water distribution system, management of consumption and reduction of unaccounted-for water losses from 38 percent in 1993 to 30 percent in 1999; (v) preparation of phase two of the sanitation program; and (vi) institutional strengthening of EPM's management system for aqueducts and the sewer system.



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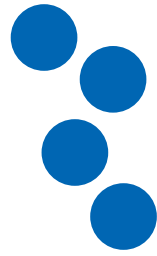
# Results

The **physical results** of this project came very close to its original goals: (i) completion of the San Fernando treatment plant, with a capacity of 2.0 m<sup>3</sup>/second, currently treating 23 percent of the wastewater; (ii) construction of approximately 270 kilometers of wastewater collectors and interceptors and 11,000 connections to the sewer system; (iii) installation of 80 kilometers of aqueduct networks and connections to approximately 26,000 homes; (iv) purchase and installation of almost 320,000 meters of pipe as part of the campaign to reduce unaccounted-for water, in addition to water improvement projects; (v) preparation of the next phase of projects within the sewer system master plan which began in 2008; and (vi) training courses for one hundred EPM professionals to enhance their specialized knowledge and to facilitate the operation and maintenance of the newly built installations.

However, the project's two basic **efficiency** components—investment cost and reduction of unaccounted-for water—have yielded mixed results. The investment cost of the San Fernando Wastewater Treatment Plant (PTAR) was higher, primarily because the initial calculations were based on the pre-design. This would have been easily avoided by waiting for the final design, which would have provided a more precise cost estimates. The volume of unaccounted for water decreased from 38 percent to 32 percent at the end of the project, two percentage points above the goal of 30 percent. This decrease, however, was achieved in just six years through increased and more precise measurement of consumption and by setting tariffs that increased in real terms.

The project's **sustainability** is reflected in the profits recorded for water and sewer services in EPM's 2006 financial statements as follows: (i) the ratio of operating costs before depreciation to operating income was 0.44, demonstrating sufficient debt service coverage; (ii) the ratio of current assets to current liabilities was 1.49, reflecting a comfortable working capital position; and (iii) the ratio of total liabilities to total liabilities plus shareholders' equity was 0.27, indicating a healthy balance sheet and a sound financing policy.

The **performance** of EPM management has been highly satisfactory. EPM established proper monitoring systems to track the work's progress and take corrective measures when necessary. This has led to, among other things, the rerouting of one of the major interceptors so that it would go under the Medellín River. Relocating this work prevented 140 families from being displaced, which would have led to adverse social consequences and additional compensation for resettlement.



## Lessons Learned

**Long-term planning and execution.** Because water and sewer projects are characterized by their large investment needs relative to the size of annual revenues, the service provider must seek financing sources whose terms match the assets' useful life. Otherwise rates have to be increased disproportionately to finance investments or pay short-term debt service. EPM has been able to adapt to these circumstances. The company's tariff and financial policies have created favorable conditions for undertaking the Medellín River's major sanitation projects. With the same purpose in mind, EPM has sought to strengthen its good relationship with the IDB in order to obtain long-term financing. The success of the river clean-up program and of EPM is in fact sustained by the long-term planning vision for the project.

**Solidarity between company and customer.** EPM is a public-sector entity that works like a private company. Its performance is measured by efficiency indicators comparable to those of the best international water operators. EPM is also known as an honest and transparent company that understands that the ability to provide efficient service depends on trust and customer's willingness to pay. EPM's development and management policies are based on sustainability and efficiency, which is also why information about EPM's management, financial, operating and technical performance is available to the public on the internet. This means that the public—from the most influential private business executives to the poorest inhabitants—remains knowledgeable about and identifies with EPM and is proud of it.

**Training and Human Resources.** Just like other efficient public-sector companies, EPM trains its personnel to be committed to public service, while incentivizing them to achieve professional excellence. EPM's experience has shown that its operational effectiveness and efficiency requires more than obtaining sufficient financial resources and community support. EPM must also attract fully qualified personnel and ensure that they receive ongoing training.

This successful collaborative effort between EPM and the IDB has led to a second phase for the Medellín River Sanitation Program, which will cost a total of US\$322 million. The IDB will provide a US\$225 million loan and will also help EPM expand its business in international markets.