Urban Water Supply and Sanitation

A new OED study reviews the Bank's experience in lending in the water and sanitation sector over 20 years. The projects supported have improved living standards for millions of urban dwellers, but the coverage achieved, particularly of poverty groups, has been much less than projected. Water and sanitation utilities have typically remained poorly managed. They have failed to build up the financial and institutional basis to maintain existing facilities, let alone expand. Both accelerated investment and policy-induced savings will be needed to increase the proportion of urban dwellers served.

The study finds that the Bank's policies and project guidelines in water and sanitation are generally sound. But borrowers often fail to comply with covenants, especially those on pricing and financial performance, and there have been lapses in their application by the Bank. Recommendations are made to guide the Bank's future lending in this area.

From 1967 to 1989, the Bank financed 129 urban water supply and sanitation projects. All the 120 of these projects that were studied in detail increased the supply of potable water to urban populations, and all except one were completed largely as designed.

The projects sought to:

- help create needed infrastructure under efficient economic conditions;
- foster institution building;
- promote the financial viability of borrower utilities;
- ensure a minimum supply of safe water to the poor.

**Project efficiency**

The economic analysis of the projects, and of the pricing policies applied, is poorly documented, but evidence suggests that it has been insufficient—casting doubt on project design and justification, on the ways some projects were reformulated in response to resource and time constraints, and on the Bank's ability to promote better tariff structures through project lending.

Identifying the least costly responses to infrastructure needs is critical to avoiding costly mistakes in this capital-intensive sector. Project reports do not show whether Bank staff properly identified communities' water and sanitation needs and the best responses to them. In practice, water supply investments almost always predominated over those for sanitation and environmental protection. Often, this reflected governments' failure to set up efficient sector organizations and to implement balanced strategies for managing water resources.

All but two projects provided the physical assets set out at project appraisal. Success was not always complete, particularly when escalating costs required borrowers to scale down or eliminate components, typically those planned for improving sanitation.

Planning to meet the infrastructure needs of utilities was inadequate in a fourth of the projects, which thus may cater to some demand not justified at cost-based prices. Bank staff often stepped in to improve demand forecasting. But with the recent decline in the availability of Bank staff to borrowers during project preparation, borrowers need to take more care to ensure that their consultants and in-house staff are competent.

**Cost and time overruns:** More than half the projects cost more than expected at appraisal. The whole group of projects cost 33 percent more than their appraisal cost estimates. Overruns were caused more often by inflation and delays in construction than by design errors or poor cost estimation. Funding of most cost overruns fell to borrowers, and delayed project completion.
Water and Sewerage in Botswana

Botswana is one of the few countries in Africa with a safe and reliable urban water supply. Botswana Water Utilities Corporation (WUC) maintains a 24 hour supply of high quality water to all its urban service areas.

Established in 1970, WUC is an autonomous corporation regulated by the Ministry of Mineral Resources and Water Affairs. From the start of Bank involvement in 1967, WUC has received sound leadership and guidance from the government through the parent ministry.

WUC’s rewards to its staff are above average for the public sector, but much of the company’s effectiveness also stems from a spirit of loyalty and enthusiasm, fostered by its competent senior management. Strong emphasis is placed on training.

Tariffs and charges have consistently been commercially oriented but appropriate. Tariff rates are progressive, rising with the volume consumed. In Gaborone, for example, a family of six using 100 liters per capita/day (lcd) would pay about $8.85 per month; a wealthier family using 200 lcd would pay about $32.25 per month.

Water is scarce in Botswana, and charges for it are high compared with those of many other African utilities. Over a year, a family of six, at the poverty line, would pay five percent of its income to use 80 lcd of water. But the charges effectively limit demand and ensure that WUC does not require subsidies. Consumers promptly pay all but 2 percent of the water charges they owe. Billing and collection are highly efficient.

The level of unaccounted-for water is about 25 percent overall. These losses are quite respectable, but are of concern to WUC with its rigorous management standards—especially because the next increment in water supply is likely to be even more expensive than the last.

Construction delays were endemic. Only five projects were completed by the due date, 17 were completed within one extra year, and 46 percent required two to four extra years to complete.

Pricing: The Bank’s promotion of economically efficient pricing conspicuously failed in many countries where large consumers are still subsidized. In general in this sector, the Bank has provided only scant guidance on marginal cost analysis and its application to tariff design.

Rates of return: In most water supply and sanitation projects, incremental revenues have been well below the economic cost of service and economic rates of return at completion have been below 10 percent. Most of the projects were approved as least-cost solutions, with forecast ERRs accepted by the Bank; projects were considered justified if they showed promise of meeting service needs and of reasonably assuring financial viability.

Sectoral context

The Bank’s policies in the sector, dating from the 1960s, are basically sound, but they do not address the need for country strategies in water resources management that are environmentally sustainable and strike an adequate balance between competing uses of water. Decisions often suffer from political interference. The time span afforded by one project is generally too short for developing an enabling sectoral framework and building well-staffed, efficient utilities.

The Bank’s guidelines state that proposed lending must be considered in the context of country sector policies, with attention to the level and quality of services, governmental goals and development programs, and the constraints on achieving those goals.

In practice, however, almost half the projects were begun without an established policy for the sector, or without studies of the sectoral context. Many projects addressed only immediate local problems, such as how best to get water supplies quickly into a major city regardless of other demands for water in the country. Experience shows a clear need for better organization and management of national water sectors, for water sector surveys, and for water supply and sanitation strategies.

Sector and institutional development takes sustained efforts and assistance over many years, while Bank projects are typically geared to producing physical facilities within 4 - 6 years. Repeater projects have a better record of success. Utility management in Botswana, Côte d’Ivoire, Korea, Jordan, Singapore, and Tunisia improved considerably in the course of series of projects.

Institution building

For the utilities supported, freedom of action—largely determined by the character of the regulatory system—was critical to good performance. Efforts to help strengthen water supply institutions through project lending succeeded rather rarely.

The Bank seems not to have made systematic recommendations to governments on the autonomy and regulation of water supply and sanitation authorities. It did not use its influence effectively, either before or during project implementation, to press for freedom of action for the utilities supported.

June 1992
In several cases, once project implementation was underway, the Bank did not pursue institution building vigorously. In other cases, it called for reforms to be instituted too quickly or before borrowers were fully committed to them.

**Management:** Many problems were rooted in poor management, often stemming from utilities' lack of autonomy. When managers were free to set tariffs, select staff, and set competitive salaries, utilities were more successful and so were their projects. Experience in Botswana and Singapore shows the value of giving water utilities substantial operational and financial freedom, with regulatory oversight by parent ministries to ensure appropriate policy direction.

The Bank tried to ensure that the water authorities had adequate managers in place before projects were implemented, but it could not guarantee that the managers would stay in position. Its lack of influence on utilities' retention of staff casts doubt on its ability to achieve institution building.

**Operation and maintenance (O&M):** In many projects, a serious lack of maintenance was already apparent during preparation and implementation. Its root cause was usually lack of funds, which led to lack of management qualified to organize O&M, lack of skilled staff and training, and lack of spare parts. Project completion and audit reports gave O&M little attention, but they suggest the Bank has done little to persuade utilities and governments to remedy these deficiencies.

Operational managers should ensure that:

- staff analyze the borrower's capacity for O&M, and require that it be adequate before new investments are made;
- the borrower's institutional policies and practices emphasize the importance of adequate O&M, of both existing and planned facilities.

**Unaccounted-for water (UFW)** includes both physical and administrative losses. The resulting loss of revenue needs to be offset by increases in tariffs and charges, or by larger transfers from government budgets, preempting other uses of these resources.

Excessive levels of UFW were a costly problem in 83 projects, and in 54 projects, UFW rose over the six-year project cycle by much more than forecast. Reasons for UFW problems include:

- poor engineering construction and maintenance;
- poorly managed metering, billing, or collection;
- poor consumer relations;
- illegal connections and theft, endemic in some cities (Bogota, Manila) and often exacerbated by large inflows of immigrants.

A few authorities addressed the UFW problem vigorously. Among them were those in Singapore—whose 8 percent level of UFW is the lowest in the world—and in Botswana (see box).

**Recommendations**

1. Bank policies need to promote balanced and sustainable strategies for managing water resources. A policy statement is needed on urban water supply and sanitation issues, in particular to provide guidance on how to reconcile the goals of public sector management and private sector development with the emphasis on poverty alleviation and environmental protection. More detailed guidelines and dissemination of best practice would be particularly useful in the following areas:

   - Coordination of water resources management across major sectors and project optimization/reformulation within a broad range of alternatives, including water conservation measures.
   - Design and administration of tariffs and charges for water and sewerage which reconcile economic efficiency, social equity, and financial viability.
   - Monitoring of performance in operation and maintenance, unaccounted-for water, impact on populations, and the physical environment.

2. The Bank should thoroughly review ongoing projects in the areas of major concern identified by this study, determine where performance is inadequate, and indicate the appropriate management response in each case.

3. The Bank should consider engaging borrower countries in medium-term lending programs focused on sector adjustments and technical assistance operations. Investment lending should follow only when the minimum conditions are met for a healthy capacity expansion: i.e. autonomy and accountability of management in day-to-day operations, acceptable levels of UFW, and cost-based prices for all except low-income residential consumers.

4. Covenants requiring critical actions to be taken should be included sparingly in loan/credit agreements. They should be designed in full understanding of the country/sector circumstances, and not used as a substitute for reforms that are really needed before the Bank loan or credit is approved. Once agreed, they should be enforced with all the leverage available to the Bank.
Financial viability

Covenants between Bank and borrowers have too often been violated, irrespective of their design and of the importance of the financial, economic, or institutional principle involved. Too often, the Bank has gone ahead with projects that (nominally) expand the country's infrastructure, rather than using its influence to press for needed sectoral reforms. The resulting operations are hard to sustain and they lack development effectiveness.

One of the Bank's most important goals in lending is to help borrower agencies become financially viable and able to attract capital for expansion.

Governments of 42 countries—more than three fourths of those borrowing for the projects studied—did not comply with the financial covenants in loan agreements with the Bank. The Bank took remedial action only in one case. Countries and utilities that complied with financial covenants were those where individual utilities and the sector as a whole were well managed; sixteen of the 30 projects in compliance were in Botswana, Korea, Singapore, and Tunisia. The managers of the other 14 projects were not impeded by political factors from complying with the covenants.

Financial problems arose most often from failure to impose tariffs and charges that would cover O&M costs and contribute to new investment. The Bank seems to have been hesitant and methodologically ill-prepared to promote tariffs and charges that reconciled economic efficiency, social equity, and financial criteria. Yet such pricing policies will need to be implemented. Only then will utilities be able to achieve the efficiency savings and the funds for investment required to increase the share of the population with access to safe water and sanitation.

Often, governments did not provide transfers to water utilities on time in the agreed amounts. Many government or public enterprises also failed to pay their bills. Ultimately the burden was borne by consumers, when poorly maintained services deteriorated. In several projects (e.g. in Nepal), consumers would not accept higher service charges until services had been improved. In such cases, the Bank should not finance more projects until acceptable financial reforms have been made.

Water for the poor

The impact of the projects on poverty is not well documented. Efforts to provide poor households with water and sanitation seem to have been constrained both by project design and by lack of resources.

In many cases, project design did not provide adequately for the poor, largely for lack of sufficiently detailed data on the numbers of poor households and their locations—often the poor are mobile—and because of pressure from influential groups for better water and sanitation for themselves.

Only two projects demonstrably succeeded in improving conditions for poor households. Another 20 claimed success but offered no means of measuring it. Another 15 certainly failed. Poverty issues were not addressed in 52 projects (40 percent of these were begun before the Bank's declaration of commitment to poverty relief); pressure by the Bank induced governments to address poverty in second or third projects with the same utilities later in the review period.

Environmental issues

Environmental impacts are not well documented; the environment may have suffered from the relative inattention to sewerage lending and, indirectly, from the weaknesses in sector institutions and key policies such as pricing.

As water supplies improve, the volume of waste water increases. Of the 120 projects, 104 brought increased volumes of water into the urban areas they served. The 62 projects for water supply alone relied on existing sanitation systems, but in none of the urban areas served were these systems up to the task. The 42 projects that combined water supply with sewerage almost all gave priority to water supply; in nine, sanitation components were eliminated or reduced after implementation began. The reason usually given was that water supply costs were higher than anticipated. Despite delays, the 16 sewerage/sanitation projects were completed satisfactorily.

OED Précis is designed to help inform Bank managers and staff of new evaluation findings and recommendations for the Bank's current and future work programs. It is produced by the Operations Evaluation Department of the World Bank for distribution to the Bank's executive directors and staff. The views here are those of the Operations Evaluation staff and should not be attributed to the World Bank or its affiliated organizations. Please address comments or enquiries to the managing editor, Rachel Weaving, T7-015, World Bank, ext. 31719.

June 1992