

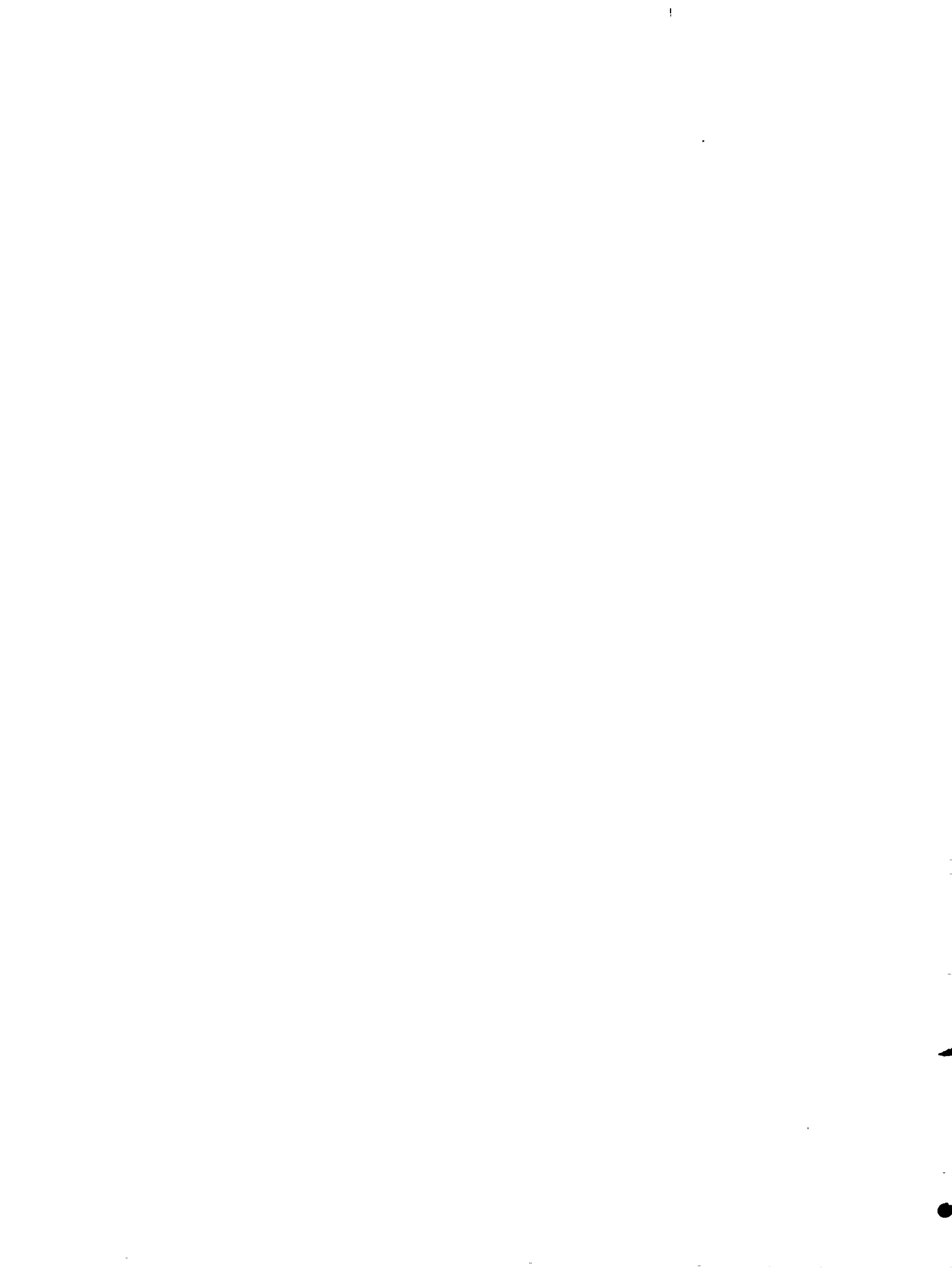
**PREPARING FOR PRIVATE SECTOR PARTICIPATION
IN THE PROVISION OF WATER SUPPLY
AND SANITATION SERVICES**

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WASH Technical Report No. 84
August 1993



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PREPARING FOR PRIVATE SECTOR PARTICIPATION IN THE PROVISION OF WATER SUPPLY AND SANITATION SERVICES

Prepared for the Office of Health,
Bureau for Research and Development,
U.S. Agency for International Development,
under WASH Task No. 185

by

Jane Walker

August 1993

Water and Sanitation for Health Project
LIE Contract No. 5973-Z-00-8081-00, Project No. 936-5973
is sponsored by the Office of Health, Bureau for Research and Development
U.S. Agency for International Development
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The views and interpretations expressed in this paper are the author's. They should not be taken to reflect the views and policies of the World Bank, its Executive Directors, or the countries they represent.



ACKNOWLEDGMENTS

I would like to thank Dennis Rondinelli and Fred Rosensweig for their constructive comments and suggestions on a prior draft. I would also like to thank the staff of the WASH Project for their support in the preparation and completion of this paper.

EXECUTIVE SUMMARY

National and municipal governments in many developing countries are turning more and more to the private sector to supply the capital and management needed to expand services and extend infrastructure.

These efforts have been more successful in the power, telecommunications, and transportation sectors than in the water and sanitation sector. Roth¹ points out that “of all public services, the provision of piped water is the one with which the private sector is least involved....It may not be a coincidence that water is also the sector that, in many countries, seems to have the greatest problems.”

One difficulty arises from the fact that, since water and sanitation are natural monopolies tending to become more efficient as they grow larger, the arguments for economies of scale leave little scope for competition among private suppliers of public services. After all, it is competition that provides the incentive for private companies to maintain quality and minimize costs. Another problem is that governments are reluctant to relinquish day-to-day control of projects deemed vital to public health and welfare. Doing so requires a strong regulatory oversight, a role to which governments may not be accustomed.

This report is designed to assist governments in developing countries and international donor agencies in overcoming these and other obstacles to increased private sector participation in the water and sanitation sector. It is intended for policy makers in public sector institutions and their advisers who are contemplating comprehensive and formal arrangements with the private sector. Private sector participation is likely to be viewed as one option in an overall plan to improve the sector's performance.

The report outlines the most common forms of private sector participation: service and management contracts; short- and long- term leasing arrangements; and investments in build, operate, and transfer (BOT) or build, operate, and own (BOO) projects. The report also discusses divestiture.

Service and management contracts are the simplest to implement. Under a service contract, a private firm agrees to provide such services as meter reading, billing, or collection. Under a management contract, a contractor assumes complete responsibility for operation and maintenance of the system. Under a leasing contract, a private firm rents facilities from a public authority, assumes responsibility for operation and maintenance, and finances the replacement of some capital equipment.

Under a BOT arrangement, a private firm finances the construction of a plant or system, operates it for a specific number of years, and then transfers ownership to a public agency.

¹ Gabriel Roth, *The Private Provision of Public Services*, Oxford University Press, 1987.

Under divestiture, a private firm purchases assets from the government and assumes complete control.

Each of these arrangements with the private sector can increase efficiency, capital formation, or both. Their individual benefits are discussed, along with the criteria for assessing when each arrangement is appropriate. Private sector investment in the water supply and sanitation sector is a recent idea compared with the traditional model of infrastructure financing through direct government funding or multilateral and bilateral assistance. The size and strength of the domestic private sector, the regulatory environment, financing and political risks, and project size are reviewed in terms of the private sector's ability and willingness to participate.

The report concludes with guidelines for public agencies to determine the suitability and extent of private sector participation.

1

INTRODUCTION

1.1 Purpose and Organization

Private sector resources are proving increasingly important in enabling developing countries to meet the growing demand for municipal services, particularly now that central government funds and municipal revenues are becoming more scarce.

The private sector typically has provided transportation and solid waste removal services, and only recently has been encouraged to take a share in water supply and sanitation services. As Roth noted in his seminal work on privatizing public services²: “Of all public services, the provision of piped water is the one with which the private sector is least involved....It may not be a coincidence that water is also the sector that, in many countries, seems to have the greatest problems.”

This report is designed to help water supply and sanitation institutions prepare for private sector participation. The private sector has substantial resources to offer, including funds for investment and management expertise to improve productivity and organizational efficiency. But it is easy to underestimate the complexity and costs of effectively marshalling these resources, especially at the beginning of the process. The benefits of private sector participation must be carefully weighed against the costs of bringing it about.

The report is intended for managers of public sector institutions contemplating comprehensive and formal privatization and for their advisers, recognizing that the private sector already plays an important informal role in urban water supply and sanitation services. Private sector participation is likely to be viewed as one option to improve the water and sanitation sector's performance.

The report is organized to guide a water supply or sanitation agency in preparing for private sector involvement. It sets out the range of available options, providing examples from the experiences of different countries; it discusses the issues surrounding private sector participation, such as competition and regulation; it identifies the main players in the process; and it presents a set of questions for public agencies or utilities to consider in deciding how to promote private sector involvement.

² Gabriel Roth, *The Private Provision of Public Services*, Oxford University Press, 1987.

1.2 Setting the Stage

The substitution of private for public provision of various goods and services has become an international trend, encouraged by the demonstrable benefits from properly executed privatization in Latin America, Africa, and Asia, as well as in the industrialized countries.³ Privatization improved domestic welfare in 11 of 12 cases analyzed by the World Bank in Chile, Malaysia, Mexico, and the United Kingdom.⁴ Productivity went up in 9 of the 12 countries studied and showed no decline in the other 3. Many of the firms reviewed could prove increased production and investment. In general, labor was not less well off, in spite of redundancies and early retirements; consumers for the most part were pleased; and investors in the enterprises made money. Thus, most of the stakeholders in the process gained from private sector activity.

This favorable evidence for private sector intervention comes mainly from experience in competitive sectors such as industry, agriculture, and retail operations that produce tradables. It is more difficult to adduce evidence from successful private ownership of enterprises that operate as natural monopolies—for example, water supply, power, and telecommunications—and that cover the majority of infrastructure sectors. These enterprises tend to be larger, foreign investment is more complicated, and capital markets show less interest in providing finance.

Although the optimal mix of private and public ownership of infrastructure is a matter of debate, the need to improve and expand infrastructure is not. Infrastructure development is critical to the growth of productivity and the expansion of an economy⁵ and to raising standards of living. In Asia and in Latin America's newly industrializing economies, there has been a huge surge in domestic and foreign investment that has concentrated on manufacturing and service industries to the neglect of infrastructure. The governments of these countries, often strapped for cash because of fiscal constraints and debt burdens, have been quick to curtail outlays on infrastructure. Private sector participation offers a ready means of reversing infrastructure underfunding and deterioration.

The shortfall between the current investment and the actual need for infrastructure capital has been called the third deficit, an addition to the budget deficit and the balance of payments

³ For a comprehensive overview of the benefits of privatization, see "Privatization—The Lessons of Experience." Kiken, Nellis, and Shurley, The World Bank, 1992

⁴ See Galal, Jones, Tandon and Vogelsang, "The Welfare Consequences of Selling Public Enterprises. Case Studies from Chile, Malaysia, Mexico, and the United Kingdom." Public Sector Management and Private Sector Development Division, The World Bank, Washington, D.C., forthcoming.

⁵ A study of U.S. physical infrastructure concludes that a 1 percent increase in its current level would increase GNP by nearly a quarter of a percent. The study also states that more than one-half of the decline in U.S. productivity since 1970 can be explained by lower infrastructure spending. Aschauer, David "Infrastructure: America's Third Deficit" *Challenge* March/April 1991, pp. 39-45

deficit. Involving the private sector in infrastructure development is based on a growing recognition that the three deficits are interrelated.⁶

1.3 The Case for Water Supply and Sanitation

Like other segments of the infrastructure, water and wastewater systems in most developing countries are experiencing management, operational, and financial problems. They must contend with neglected and leaking water pipes, are unable to fund service improvements or system expansion to satisfy unmet demand, and must face the prospect of increased costs imposed by more stringent environmental standards.

The options for private sector participation described in this report can help public water and wastewater agencies meet these challenges by strengthening their institutional and management performance. This, in turn, may produce efficiency gains and better use of existing resources. The principal private sector instruments for direct capital formation are concession arrangements and the BOT (build, operate, and transfer) and BOO (build, operate, and own) models, whether through joint ventures or independent investments and divestiture procedures.

However, privatization carries certain costs and risks, for example the risk of equity participation and asset ownership by a private entrepreneur in a BOT arrangement. Another issue affecting private participation is the question of natural monopoly. Water supply and wastewater services are natural monopolies, tending to become more efficient as they become larger. But these economies of scale leave little scope for competition and traditionally have led to the public provision and regulation of these services. However, the examples presented later in this report show that a number of long-standing beliefs about natural monopolies are being reconsidered.

In privatizing water and wastewater services, public agencies must ensure that they do not abrogate their responsibilities to the consumer. More private sector activity often requires greater public regulation and oversight. For comparison, this study reviews the regulatory systems of three countries with differing levels of private sector activity.

⁶Bacha, Edmar L. "A Three-Gap Model of Foreign Transfers and GDP Growth Rate in Developing Countries." *Journal of Development Economics*. April 1990, Volume 32, No. 2.

2

THE PRIVATE SECTOR PERSPECTIVE

Of the three main players in private sector provision of water supply and sanitation services—the private sector, government, and the consumer—the private sector is the newest and most dynamic. As a result, this report gives considerable attention to examining the private sector’s perspective on the public-private partnership, its risk and reward structure, and its specific financial requirements, such as sovereign guarantees.

The private sector has been perceived by some as a panacea for ending shortages of investment capital and inefficient operations in water and wastewater utilities. The private sector can contribute in these areas, but it is important for decision makers to understand the opportunities and constraints that govern the private sector’s willingness to participate. To enable the private sector to make a profit, the main and legitimate motivation for its interest in the sector, public managers must create an environment that lowers risks and offers a high probability of a reasonable return on investment. Private sector capital is fungible across a range of investments by types and by countries and will be attracted by the prospect of the highest returns. The opportunity cost of investment in a particular water supply project will be viewed against other opportunities. Some of the factors that affect the private investor’s perceptions of risk and adequate return are discussed below.

Financing Risk

Infrastructure investments in developed and developing countries have different risk and reward expectations. In developed countries, water supply and wastewater facilities are often thought of as low-risk and low-to-medium return investments, with tax policy playing an important role. The low risk is the result of a lack of competition in the water supply “market” and is balanced by limited growth potential and lack of diversification. Utilities attract institutional investors looking for safe long-term returns rather than investors who are drawn to growth industries, which are more risky but offer higher returns (e.g., venture capital).

In some developing countries, however, infrastructure investments are achieving healthy returns of over 30 percent on equity in a number of BOT-type projects, reflecting the higher risks in utility investments. The equity or credits of suppliers make up a big part of equity in certain infrastructure investments like telecommunications and power, both of which have large requirements for imported equipment that are often written into bilateral agreements to favor the export programs of donor countries. Water supply and wastewater facilities, on the other hand, have a high local construction content and consequently a lower foreign exchange and import requirement. Here investors tend to be sector-specific and to see long-term revenue-generating activities, such as management and operation contracts, that are not directly reflected in the return on equity.

Once equity investors are engaged, they can usually attract debt finance (lenders) if the deal looks sound and the country risk is not too great. The current split of 70/30 between debt and equity is considered good where equity investors are assuming a reasonable portion of risk. Commercial lenders are wary of country risk and take into account political instability, macroeconomic management, and foreign exchange reserves. Lenders in infrastructure financing⁷ have problems with the long investment life of infrastructure, e.g., water supply and wastewater treatment plants, and the profile of the cash flow, which is characterized by a slow buildup in revenues as user fees increase over time. Infrastructure requires an extended period of construction, even when efficiently implemented, and its economic life, when properly maintained, tends to be very long compared with most investments in industry. For example, the required financing terms for water supply and wastewater treatment plants is 20 to 25 years. This long gestation significantly increases the political and commercial risks associated with the investment.

Guarantees

The willingness of foreign investors to take part will depend on the profitability of a specific investment in relation to the overall country investment risk. Government guarantees and investment incentives may mitigate this risk and attract suitable partners. Contracting and leasing options are another factor in attracting international as well as domestic interest. Country risk, government guarantees, and the length of the contracting period are important considerations affecting investment.

The Changing Government Role

Traditionally, water and wastewater services have been operated by government agencies at the national, regional, or municipal level. With the introduction of the private sector, the public sector role changes from that of providing a service to that of managing and overseeing service delivery. It is important that consumers and the general public recognize this changed role and are aware of their right to bring suggestions and complaints before the public regulatory and oversight authority.

Regulatory and Legal Framework

It is competition that provides the incentive to maintain quality and minimize costs. Since water supply and sanitation are natural monopolies and competition in day-to-day operations is not practical, public regulation or oversight must step in to protect consumers from exploitation. Regulation is especially important to prevent monopolies from charging excessive rates. Prices

⁷ The recent World Bank publication "Privatization—The Lessons of Experience" notes that privatization of SOEs operating as natural monopolies (e.g., power, water supply, and telecommunications) is more difficult than privatization of firms in competitive markets. The enterprises are larger, the stakes are higher, foreign investment issues are even more salient, and capital markets are usually sparse

must reflect the level of service delivered. This ensures that private sector profits do not come at the expense of government efforts to achieve social equity.

The regulatory process must recognize the collective weakness of consumers and must provide incentives for suppliers to treat consumers fairly and appropriately. This is particularly true of wider environmental concerns. Independent watchdog organizations such as public utility commissions, offices of fair trading, and monopoly commissions must be established outside the control of the ministry or agency responsible for providing water supply/wastewater service.

Since water supply and sanitation in developing countries are overwhelmingly public sector operations, public authorities may need to examine current legislation and institutional arrangements for the introduction of private sector participation. Private sector enterprises need to know how to interact with public sector agencies. Thus in joint ventures, the ownership of assets must be specified, along with the government's right to intervene to protect the public good, for example public health. In the financial area, an important concern is control of the tariff and the authority to make changes in it. This may require a review of the sector's current legal, financial, and institutional characteristics for a better perspective of the opportunities and constraints that would face the private sector.

Cost Recovery

Any strategy for private sector participation must take its direction from market forces, recognizing that private sector investment is most appropriate in undertakings where consumers can bear full cost recovery, such as industrial development, tourism, and high-income housing. But the strategy also must take into account the implications of current sector policies on cross subsidies. Often water and sanitation agencies rely on high volume and high income users to subsidize the cost of service to other consumers.

The Way Forward

Private sector participation in water supply and wastewater investment and management is just beginning in many countries, but the opportunities for greater involvement are increasing every day. Experience, particularly from the power sector, shows that most difficulties in public-private partnerships arise from the unrealistic expectations of public agencies, which eagerly embrace the concept of privatization but have no clear policy to guide them as the process unfolds. Without clear "rules of the game," both sides are likely to be disappointed. Public-private partnerships are much more likely to succeed where there are well-defined public policy goals and an appreciation of the costs and benefits of involving the private sector.

3

OPTIONS FOR PRIVATE SECTOR PARTICIPATION

This chapter discusses the five principal types of private sector participation in the water supply and sanitation sector and outlines the circumstances in which each type is appropriate.

The five types are service contracts; management contracts; lease contracts; concession arrangements (longer-term leases) that include BOT and BOO; and divestiture. They are described below and summarized in Table 1. Other types of legal agreements such as franchises, affermage, and public offer are considered a subset of these types.

3.1 Service Contracts

Under a service contract, a private firm agrees to provide a specific service such as meter reading or bill collection for a fixed fee, on a cost-plus basis, or for compensation based on the volume of service provided. Service contracts, normally written for a year and often for three to five years, are reviewed periodically as an inducement to the contractor to maintain the quality of service.

Service contracts are the most common form of private sector participation in developing countries. They ensure satisfactory service at a reasonable cost provided there are a sufficient number of qualified contractors to constitute a competitive market. A contractor's performance is easily assessed against the cost of the service clearly stipulated in the contract; this is unlike the general cost allocations that fund many municipal services and may conceal cross subsidies.

The principal advantage of a service contract is its flexibility. Service contracts can be used to meet a short-term emergency or personnel shortage, or to transfer operational responsibility from the public to the private sector.

Service and short-term technical assistance contracts are the most common forms of private sector participation. They may be used in tandem with more comprehensive types of private sector participation. Santiago, Chile, provides a good example of successful contracting in the water sector. In 1971, the public water company of Santiago encouraged some of its employees to leave the company and form private firms that would bid for contracts to provide meter reading and billing services. Currently, this company has one of the highest staff productivity rates among Latin American water utilities.

Table 1
Types of Private Sector Participation in Water Supply

TYPE	DEFINITION
Service Contract	A private firm agrees to provide specific services such as meter reading, billing and collection, or system operation.
Management Contract	A private firm assumes overall responsibility for operation and maintenance of the water supply system, with freedom to make day-to-day management decisions.
Lease Contract	A private firm leases facilities from a public authority and assumes responsibility for operation and maintenance and for financing working capital and the replacement of capital components with a limited economic life (not fixed assets).
Concession Arrangement—Build, Operate, and Transfer (BOT)	A private firm finances fixed assets as well as working capital and assumes complete operational responsibility as under a lease contract. It owns the assets for the period of the concession (say, 10–20 years) and transfers them back to the public authority at the end of this period.
Divestiture	A private firm takes complete control through the purchase of public sector assets.
Source:	Adapted from T. Triche, Infrastructure Notes, Infrastructure and Urban Development Department, PRS, The World Bank, September 1990.

3.2 Management Contracts

Management contracts are more extensive than service contracts, giving the contractor complete responsibility for the operation and maintenance of the water system and the authority to make all operating decisions. To encourage the contractor to maintain the facility in good condition, compensation is usually linked to a physical output, such as the volume of water delivered. The contractor is not responsible for capital improvements nor for a decline in revenue. Some examples of this type of operation feature profit-sharing arrangements.

Management contracts are a suitable option where there are enough experienced firms to compete. Once a contractor is in place, however, and has acquired the advantage of an incumbent, it may be inconvenient to make changes or terminate a contract. Thus, effective regulatory oversight is essential to ensure that the contractor does not do anything inconsistent with the interests or policy objectives of the water and sewerage authority. For example,

because the contractor does not own the facility or have any responsibility for capital assets, the maintenance of these assets could be neglected.

It is particularly important to recognize the effect of decisions by the authority or other public agencies on the contractor's revenues and on consumers. In one Latin American city, a 30 percent surcharge on wastewater discharges caused volume water sales to industrial consumers to fall by 25 percent, thus reducing water revenues. In California, the promotion of conservation measures reduced water consumption so much that one authority's revenue losses required it to add a surcharge to water bills. Consumers ended up paying more for less water.

Electricite de France (EDF), a French public enterprise, recently entered into a renewable management contract, following a two-year technical assistance contract, to provide electricity and water supply services in Guinea Bissau. From the French ministry for bilateral aid, EDF receives 80 percent of what it earned under the technical assistance contract, and is eligible for additional compensation of up to 30 percent of the previous fee from the water company's profits. This means it can earn 110 percent of what it did previously.

Management contracts are most useful for private sector operators who may wish to assess the operational and financial problems of a system before making more comprehensive commitments. This is how longer-term contracts have developed in France.

3.3 Lease Contracts

Lease contracts are more comprehensive than management contracts and normally require the lessee to finance working capital and the replacement of equipment with a fairly short productive life, such as vehicles and pumps. In essence, a private firm rents capital assets—the existing facilities—and assumes total responsibility for operation, maintenance, and service delivery under the terms of the lease. The lessee does not own or assume liability for the major fixed assets.

Under a lease arrangement, the private contractor collects the tariffs from users, retains an agreed proportion (the lease-contractor rate), and pays the remainder to the authority as a rental fee. If the agreed rate is based on collection efficiency, the lessee has an incentive to increase coverage, increase collections as a percentage of billable water and sewerage services, reduce costs, and generally improve efficiency to increase profits. Lease contracts normally run between 6 and 15 years.

Lease contracts (often referred to as “affermage”) for water supply are highly developed in France and have been used most often in developing countries with a French connection (see Box 1). The main water company in Cote d'Ivoire operated under a lease contract before converting to a concession. A lease contract for water supply was introduced in Guinea in 1990, with support from the World Bank. The operating company is a mixed enterprise owned by two French water companies and the Government of Guinea and has met with some success, improving collection efficiency from 20 to 70 percent.

Box 1

Affermage Contracts in France

France has the best developed lease arrangements for water supply and sewerage services. Private operators provide about 75 percent of the country's water and 32 percent of its sewerage service. Affermage contracts generally run for 10 to 15 years, during which the lessee operates and maintains the municipal water system, finances working capital, and assumes commercial risk. Contracts are negotiated directly between the private contractor and the municipality. Even when there is competition, the incumbent contractor usually has an advantage over potential competitors.

Tariff levels are monitored by the Ministry of Economy and Finance at the regional level. Tariffs typically cover the full cost of water, including depreciation. Sewerage is usually subsidized. Water resource management is carried out under the Ministry of Environment, which is also responsible through local authorities for setting charges for pollution and abstraction rates. Drinking water standards are set and enforced by the Ministry of Health.

Source: T. Triche, "Seminar on Privatization of Water Supply in the U.K. and the Role of the Private Sector in France, September 1991: Summary of the Two Approaches and Discussion of the Issues." April 1992. The World Bank, Washington, D.C.

3.4 Build, Operate, and Transfer (BOT) Models and Concessions

Private sector concession agreements require the concessionaire or private sector partner to provide investment capital as well as working capital, thus increasing the capital stock in the sector.

BOTs and BOOs

Build, operate, and transfer (BOT) and build, operate, and own (BOO) arrangements are fairly recent innovations in financing public sector infrastructure.⁸ Private interests build and operate projects under both arrangements, but with BOTs assets are transferred to the public authority after a specified contract period, whereas under BOOs assets remain with the private company.

Build, lease, and transfer (BLT) schemes are useful where, for instance, a country's constitution prohibits private (and especially foreign) firms from operating plants considered critical for national sovereignty. Under a BLT scheme, private sponsors build a plant, lease it

⁸ Some economic historians argue that large infrastructure projects developed during the colonial era, such as the Suez Canal, displayed the main elements of BOTs, including private sector financing and public/private risk sharing.

to the government to operate, and transfer it to the government when the lease expires. Mexico is one example where BLT schemes are suitable because of constitutional prohibitions. Another arrangement is the lease, rehabilitate, and operate scheme (LRO) under which the government does not wish to sell its critical infrastructure but wants to benefit from private sector resources. The options most common for water supply and wastewater are BOT and BOO.

In typical BOT and BOO arrangements, the capital works are built, owned, and operated by a project company of investors that may include a major international engineering and construction company, one or more equipment suppliers, perhaps a project management company, and usually a local business or local equity group. The project company negotiates the project with the government, determines its feasibility, obtains the bulk of the project financing, arranges for machinery and equipment, builds the project, owns it, and operates it. (An example is given in Box 2.) In a BOT, the project company operates the facility for a period of 15 to 30 years and then transfers the fixed assets to the public authority. During this concession period, the company is able to recoup its investment. Most private investors, however, prefer to recoup an investment within a 20-year period. BOO operates in the same way at the outset, but assets are not transferred. Both models ensure investors an adequate rate of return.

So far the BOT arrangement has had limited worldwide success, although a number of schemes currently in preparation could make the concept more popular if they succeed. Of several hundred projects initiated in developing countries, only about a dozen are operational. One of the most important under way is the Hub River thermal power station in Pakistan. Construction of the \$1.8 billion project was begun in September 1992 by a group of European, American, and Japanese firms, and one from Saudi Arabia. The group has considerable equity in the scheme and will build and operate the power station for an interim period, selling power to Pakistan's national grid. Other successful, though smaller, BOT projects in Asia are the Navotas gas-turbine power station in the Philippines and power plants in southern China's Shenzhen Special Economic Zone.

Likewise there are some examples of working BOTs and BOOs in the water supply sector. The most notable successes have been in Asia. Three successful BOTs have been arranged in Malaysia, in Ipoh, Sabah, and on the island of Labuan. The Umbulan Springs proposal for the development of a large spring and pipeline to Surabaya is a classic BOT arrangement. To date almost all the investment in water supply BOTs has focused on source development and treatment systems, not distribution systems. All include the element of take-or-pay, where the purchaser, in most cases the municipality, assumes most of the commercial risk. The construction risk is usually borne by the BOT company.

One of the largest attempts at private construction of municipally owned drinking water systems is in Sydney, Australia. The local water board is evaluating bids by five international consortia for four filtration plants. The successful bidder(s) will finance, build, own, and operate the plants, then transfer them to the board after 25 years (see Box 2).

Box 2

Privatization and Water Supply in Sydney, Australia

In Sydney, Australia, the city's water board is turning to the private sector for the design, financing, construction, and operation of four water-filtration plants costing more than \$450 million. International consortia are bidding on three 25-year contracts: a \$250 million, 950-mgd Prospect Reservoir plant; a 100-mgd Macarthur plant; and the combined 50-mgd Avon Dam and 50-mgd Woronora plant. The new plants will serve 3.5 million people.

The approach illustrates how municipal governments can build large-scale water supply systems quickly and with little up-front capital. By structuring the project on a pay-as-you-go basis, the water board will not incur debt, and construction and performance guarantees under the turnkey arrangement ensure that the facilities will be built on time and operated efficiently.

The key elements of this approach are:

- A long-term government commitment to purchase treated water from the facility
- Capital for construction provided by private investors and secured by the nonrevocable revenue stream generated by the completed project
- Tying the construction loan to guarantees that the project will be constructed and placed into service within budget and on time.

Source: American Water Works Company, Inc., *Public/Private Partnerships in Water Supply*. Voorhees, N.J. 1992.

A BOT for wastewater treatment and reuse by industries has been successfully implemented in Vallejo, Mexico (see Box 3). The system rehabilitation was totally financed by the private sector, which is the main user of the plant. The local government's arrangement with the private sector was to provide the distribution system linking the industries to the treatment plant.

BOTs and BOOs are highly innovative and complex schemes but, when successful, can serve as models to attract additional private investment. They have been plagued by regulatory and legal problems and the lack of guarantees for private investors, and it will take time and experience to refine them as an important source of private finance in the future. In the short term, they will probably provide only a fraction of the needed infrastructure. Chapter 4 provides further discussion on private sector requirements for BOTs.

Box 3

Vallejo Wastewater Treatment Project

Faced with rising water prices and potential water shortages in 1989, a group of companies in the Vallejo area of Mexico City, the largest industrial area in Mexico, sought an alternative to municipal water supplies. About the same time, the Mexican government decided to involve the private sector in water supply and wastewater treatment.

As a result, 26 Vallejo companies organized a new, for-profit company, Aguas Industriales de Vallejo (AIV), to rehabilitate and operate an old municipal wastewater treatment plant, the Planta del Acueducto de Guadalupe. The renovated plant began operations in late May 1991. The number of operating personnel has declined from 26 under public management to 17 under the private sector arrangement. Many of the companies involved in the Vallejo project use the water for cooling or processing, and the government uses it for irrigation and to wash government vehicles at a central facility. Participating companies are conscious of the need to minimize water usage.

Each shareholder company contributed equity based on its water usage (approximately \$8,000 for each liter/second of water required). Total equity provided by the 26 companies for renovation and plant operation was 2,600 million pesos (about \$900,000). No debt has been incurred, and shareholders expect to recover their initial investment in less than three years.

The Departamento del Distrito Federal (DDF) built the distribution network to link participating companies to the plant at a cost of 3,500 million pesos (about \$1.2 million). DDF is responsible for maintaining the network.

The plant receives mostly residential wastewater. It provides secondary-level treatment, which is sufficient for industrial purposes. However, as of October 1991, the government is requiring treatment of sludge. AIV plans to add sludge treatment capability within the next 18 months.

AIV operates the Guadalupe plant under a 10-year, renewable concession from the DDF. Under the concession agreement, AIV provides treated water to shareholder companies at a price equivalent to 75 percent of the price charged by the government. As the government's price increases, AIV's price rises automatically to maintain this relationship. In November 1991 the government charged 2,900 pesos/m³ (about \$0.95), and AIV users paid 2,175 pesos/m³ (about \$0.71), including pumping costs. A price increase is expected.

Users receive treated water under a "take or pay" agreement. Companies are billed monthly and have eight days in which to pay. To date, there have been no problems with collections, and cash flow has been positive. AIV currently has a waiting list of companies wanting to join the project.

The plant is scheduled to be doubled and additional companies will be permitted to join the venture. However, new equity shares will cost twice what the original shareholders paid. AIV has also been requested by the government to replicate the project at two more municipal wastewater treatment plants.

Source: International Finance Corporation. *Investing in the Environment: Business Opportunities in Developing Countries*. Washington, D.C.: IFC, 1992.

Concessions

Concessions are more comprehensive than BOTs and BOOs because they transfer complete operational and financial responsibility for a system. In some leased systems (concessions are sometimes referred to as long-term leases), capital investment is common and extensions of the system are seen as a logical adjunct to managing the existing capital assets. Although these assets are owned by the municipality, the private investor has wide-ranging powers over the operation and finances of the system. BOTs and BOOs can be considered a subset of concessions.

Concession terms vary with the service area and the natural resource being exploited. Concession legislation is most common in the extraction of minerals where, for example, oil companies are granted drilling rights or concessions for a given period. In the Seychelles, a private company was given the right to develop a facility to bottle water from a mineral spring. In Indonesia, a private consortium was granted a concession to develop a natural spring. Concessions also apply where the government, either by contract or statutory authority, grants a private company the exclusive right to provide a service in a defined area. The company assumes responsibility for the delivery of the service for the length of the concession, which may be granted for a fixed period or in perpetuity. The latter is called a franchise in the United States and is granted under enabling state legislation.

Private investment in capital assets is made in several ways. There are partial concessions in which existing facilities are leased to the contractor, who assumes responsibility for future expansion. Under a BOO arrangement, the investor simply owns all assets and operates the facility for a specific purpose, say an industrial park or housing estate. In developed countries, these arrangements are common but come under tight regulatory supervision. In developing countries, they are usually ad hoc and operate almost independently, without regulatory supervision.

Water supply and sewerage concessions are fairly common in France and Spain. In the United States, the most usual type is franchising, which is a concession in perpetuity, given satisfactory performance by the operator.

The most exciting development in concession operation and financing for water supply is currently under negotiation for Buenos Aires, Argentina. The city's entire water supply (for over 10 million people) will be turned over to one of three bidders made up of consortia from France, the United Kingdom, Spain, and Venezuela. Several local companies are also part of these consortia. The private sector is being offered a concession because the public authority was not able to cope with increased demand or correct severe system inefficiencies, particularly overstaffing. The number of employees is expected to drop by 30 percent from 9,000 to just over 6,000.

A concession for urban water supply in Cote d'Ivoire was recently arranged following 25 years with lease contracts. Under this arrangement, the current operating company, SODECI, is responsible for all new investments in urban water supply in the country and will receive no operating subsidies. All new investments will be self-financed.

3.5 Divestiture

In complete privatization of a water supply or wastewater system, all assets are transferred to private ownership. The competition is provided through the stock market. If a water company fails to maintain efficiency comparable with the rest of the industry, it loses profits and its shareholders suffer. The recent privatization of water supply services in the United Kingdom is the best example. Here the primary objective was to transfer responsibility to the private sector for a price of \$50 billion to bring the services up to EEC standards for potable water and effluent. Box 4 outlines the British Government's reasons for the change.

In December 1989, shares in the 10 public water authorities that provided water and sanitation services to most of the country were sold to the public after a considerable amount of legal and financial preparation. This included complex asset evaluations, new accounting procedures, and a rigorous asset management plan, which specified and costed investments that would need to be undertaken over the next 10 years.

The new companies are expected to maximize profits by increasing efficiency. Regulation must reinforce this profit incentive while ensuring that efficiency gains are passed on to consumers in the form of better services and lower prices. In turning to the stock market, the British Government sees it as a mechanism for enforcing the principle of natural selection that will ensure the survival of the most efficient. Where there is a monopoly such as water, market forces at least will guarantee it is efficiently run. The key assumption is that stock prices accurately reflect operating efficiency. Takeovers result when a company's poor performance leads to lowering those prices. Once new, efficient management takes over, the company's share prices and capital gains rise.

Divestiture required the creation of a regulatory authority to control water prices and ensure that the new companies had sufficient funds for investment. Customer service committees and an environmental regulatory framework were also established.

In addition to providing greater freedom to raise capital and greater incentive to operate efficiently, the British model also exposes the industry to competition. Although competition for water supply in itself may be limited, competition through the stock market's ever-present threat of corporate takeovers provides an important deterrent to poor management. An interesting sidelight is that British water companies and their subsidiaries are actively competing for BOT-type contracts in a number of developing countries including Malaysia, Indonesia, and Mexico.

Box 4

Reasons for Private Ownership of Water Authorities in the United Kingdom

- The authorities will be free from government intervention in day-to-day management and protected from political pressure.
- The authorities will be released from the constraints on financing which public ownership imposes.
- Access to private capital markets will make it easier for the authorities to pursue effective investment strategies for cutting costs and improving standards of service.
- The financial markets will be able to compare the performances of water authorities with each other and with other sectors of the economy. This will provide the financial spur to improved performance.
- A system of economic regulation will ensure that the benefits of greater efficiency are passed on to customers in the form of lower prices and better service.
- Private companies will be better able to compete in the provision of various commercial services, notably in consultancy abroad.
- Private companies will be better able to attract high-quality management from other parts of the private sector.
- There will be the opportunity for wide ownership of shares both among employees and local customers.

Source: "Privatizing Infrastructure: Options for Municipal Water-Supply Systems." D. Haarmeyer, The Reason Foundation, October 1992.

4

ISSUES IN PRIVATE SECTOR PARTICIPATION

4.1 Rationale for Private Sector Participation

Since the mid-1980s, there has been greater attention to using private sector resources, management, and capital to support infrastructure development in Asia and, to some extent, in Latin America's newly industrializing economies (NIEs). The newly independent states (NIS) of the former Soviet Union are also likely to pursue private sector ventures in infrastructure. The appeal of private-public partnerships is that they are able to ease the burden on overstrained government resources.

The benefits of private sector participation in water supply and wastewater management pertain to both funding and operations. When a government reaches a ceiling on debt, private infrastructure projects are a way to expand and improve services while available government resources are concentrated in areas that do not offer the private sector any profit margins. Private sector participation can increase both the availability and reliability of services and pass on to consumers part of the gains in efficiency in the form of reduced tariffs or user fees.

Any government contemplating the use of private resources should be clear about the two main advantages: efficiency gains and capital formation. The private sector promotes efficiency gains through competition, the application of which in a natural monopoly like water supply is discussed below. For each of the sector services, as set out in Table 2, private sector participation is expected to produce more efficient use of sector resources.

The second advantage of private sector participation in many developing countries is attracting new capital assets. BOT/BOO (concessions) and divestiture add to the capital stock of the water services sector without the infusion of government funds. Gains in efficiency will result in better use of both human and capital resources, but these gains come about from an increase in capital assets, a desirable goal of many developing country sector institutions.

4.2 Efficiency Gains: Rewards and Risks

Research on the financial impact of private participation in government services (Steven, 1984; Savas, 1982; Touche Ross, 1987) has found evidence of considerable savings, principally in labor costs. Private contractors improve labor efficiency in three ways: through more flexibility in the use of labor; through a more attractive package of incentives; and through greater concentration on results and accountability. Savings are achieved without a decline in service and result from better management and the use of superior technology. Table 2 sets out the range of these savings.

Table 2**Range of Savings from Contracting to the Private Sector—U.S. Examples**

Savings Ranges		
Services	Lower Limit (Percent)	Upper Limit (Percent)
Solid Waste Collection	22	30
Wastewater Treatment	8	30
Roads Maintenance/Repair	25	50
Fleet Management Maintenance	20	40

Source: Clarkson and Fixler (1987), adapted from Donahue, John D. *The Privatization Decision: Public Ends, Private Means*. Basic Books, Inc. New York, NY, USA. 1989.

Water supply and sanitation services can be provided very efficiently by private contractors who cover a number of cities and thereby achieve economies of scale from specialized equipment and a larger inventory of spare parts. In fact, surveys in the U.S. (Touche Ross, 1987) show that smaller cities and municipalities are likely to achieve greater savings from contracting out than larger cities that already enjoy economies of scale.

There also is evidence that the private sector tends to increase its own productivity by investing in research and development to improve performance. Public agencies rarely have the resources for experimenting with innovative technology.

However, privatization is not without some pain. For instance, counterbalancing the savings are the negative effects of privatization on workers, who often face a reduction in wages or unemployment. Understandably, opposition to private participation often comes from public sector workers or managers.

4.3 Capital Formation: Rewards and Risks

Among the types of private sector participation discussed, only the build, operate, and transfer approach creates capital assets.

The BOT or BOO option is attractive to public agencies for a number of reasons. First, the capital to build the facility comes entirely from the private sector. This increase in infrastructure or in services, defined as "additionality," would not have taken place without private sector resources, most likely in the form of equity and the debt financing it attracts. Second, construction and maintenance provided by the private sector add to the performance of the

public sector agency or utility as a whole. Finally, with the BOT model, the public sector owns the facilities at the end of the concession period, adding to its own capital asset stock. The BOO model is preferred in cases where the private sector owns the facilities in perpetuity. (The relative benefits of these two options were discussed in the previous chapter.)

Private sector investment in a water supply project provides a benchmark for sectoral performance as well as confidence that the project is financially viable. Investors would be unlikely to make a long-term commitment to a project that was unsound. Most investments in utility projects like water supply are in “greenfield” sites or new construction and are associated with the development of source works and specialized distribution networks, serving, say, a few factories or tourist facilities. The development of municipal distribution networks is usually funded with public resources.

The main drawback of private ownership is the government’s loss of control over assets during the concession period. Regulations that protect consumer interests, assure standards of quality and supply, and address environmental issues can remedy this. Enacting regulatory procedures at the beginning of private sector involvement is an expense that the operating authority or central government should not underestimate.

A related issue is that the private investor will always be attracted to those projects or those parts of the sector offering the highest profit margins. The water supply sector has a tendency to base its rate structure on cross-subsidies from industrial to domestic consumers, from big users to small. But the private entrepreneur invited to build and operate a water project is likely to target areas with the greatest profit potential, leaving the public water authorities to provide services that are not self-financing. This will reveal the real cost of providing a range of water supply and wastewater services that in many cases may have been hidden by cross- or direct subsidies. The public sector will receive additional revenues from general taxation of the new service firms or BOT company, but these revenues will not be specific water sector revenues. This may raise problems of directed subsidies from central or municipal sources. In Indonesia, for example, the water supply enterprises transfer a substantial part of their profits direct to municipalities. Private ownership could change that drastically by using profits or retained earnings for investment or as dividends to shareholders. Corporate taxes would be much less than the current direct transfer of profits.

A point sometimes made against private sector investment is that it raises the overall cost to the consumer. This is because of the perceived risks reflected in the cost of commercial rates of project financing versus sovereign loan arrangements available to governments and public agencies. It is likely that any substantial private sector investment in public utilities will involve some type of public guarantee or “comfort,” the cost of which must be taken into account. Hidden costs of government support defeat the purpose of “additionality” in private sector investment. A more complete discussion of private sector risks is set out in Chapter 5.

4.4 Competition and Regulation

4.4.1 Competition and Natural Monopolies

Water supply and sewerage services are natural monopolies and tend to become more efficient as they grow and capture a greater share of the market. As a result, there is little scope for competition, a fact that traditionally has led to public regulation of these services. Competition provides the incentives to maintain quality and minimize costs, and the more competition there is, the less the regulation needed. But a more appropriate concept when discussing public services may be market contestability. A market is considered contestable if it has no barriers to entry. The theory is that a market need not have many participants to be competitive; the threat of entry is enough to discipline a monopoly into remaining efficient. Indeed, many perceptions about the natural monopoly character of public services are being reconsidered. This is demonstrated in the privatization in the U.K. and the concession agreements in France discussed in the previous chapter.

Nevertheless, private participation in competitive or potentially competitive sectors that produce "tradables," such as industry and retail operations, is easier than privatization in noncompetitive sectors, such as natural monopolies like water supply. These natural monopolies tend to be larger enterprises in which the stakes are higher and where there are more complicated regulatory issues and social constraints, e.g., public health issues.

4.4.2 Necessity of Regulation

Whether operated publicly or privately, water supply and sewerage services require irreversible investments. Because of these investments, entry and exit are costly, making direct competition problematic. No rental market exists for the product assets, and customers are captive to the utility.

Two types of regulations can correct these market failures.⁹ One type deals with regulating

⁹ "Market failures" for water resource-related activities have been detailed by Eckstein (1958). The following is adapted from Rogers (1990).

1. *Increasing returns-to-scale* on the production side are prevalent in water projects. For example, inland waterways and municipal water and wastewater services are natural monopolies because of the large economies of scale in the provision of the infrastructure. Many water-related investments tend to be very large in order to take advantage of these economies of scale.
2. *Externalities* due to physical interdependence among production processes are inherent in many water activities. The externalities of both water quantity and water quality are experienced spatially between upstream and downstream users, and in a temporal sense between different seasonal releases of stored water, common pool effects on groundwater, and the export of pollution.
3. The classic model assumes that the *income distribution* in a given setting is optimal. However, in development work it is rarely accepted that the income distribution in a particular country is the best one, and

price, output, quality of services, and consumers' risk, and requires a good knowledge of the firm's technology, of demand conditions, and of the market structure. The second type deals with enforcing standards and monitoring the public or private agency's compliance. In both cases, the amount and availability of information are critical to the regulatory agency. Information is essential for effective regulation, and the structure and procedures of the regulatory agency should be fashioned to draw it out. As Cisse¹⁰ observes, in general a private company knows more about its costs and technology than a public sector regulator and will tend to exploit this knowledge to its own advantage and sometimes to the detriment of the consumer. It is unlikely that a private company will totally disclose its operating practices unless there is rigorous oversight or strong public pressure.

4.4.3 Location and Models of Regulation

Location and Organization

Governments use a variety of methods for regulating public services. Some use centralized powers, others delegate power to the municipal or local level. Sometimes regulatory authority is split according to specific regulatory concerns. In the U.S., for example, state public utility commissions (PUCs) ensure that the service provider satisfies demand, delivers a product that meets safety and quality standards, and levies fair prices on consumers. But water quality is regulated by the federal Environmental Protection Agency (EPA), while tariffs are set by the PUCs.

In most countries, the authorities that regulate industries and utilities are located in the executive branch of the national, regional, or local government. One of the main problems of such an organization is coordinating regulatory policy.

many water projects are specifically aimed at changing a maldistribution of income

4. When not all producers are small relative to the market, the *marginality* conditions for the existence of economically efficient solutions are violated. When government is involved, it is often as the *only* producer in the market. In this case the water supplied will make large changes in the local price of water, thus undermining the assumption of marginality inherent in benefit measurements.
5. The resources are not necessarily *mobile*. Typically, capital resources are relatively mobile but labor resources are not. Pockets of poverty and unemployment exist and many water projects (like the Tennessee Valley Project, TVA) were originally designed to address this lack of resource mobility. In addition, restricted water rights often impede the ease of transfer of water from one use to another.

¹⁰ Cisse, Amadou. An Investigation of the Structure and Practices of Regulation of Public Utilities in the U.S. and other Industrialized Countries. Some Lessons for Latin America and the Caribbean Region, August 1991 (unpublished draft, World Bank).

In the U.K., there are three major regulators in the water and sewerage sectors: the Secretary of State (water quality), the National Rivers Authority (environment), and the Office of Water Services, OFWAT (economic regulation and consumer affairs).

In France, water supply is under the supervision of more than 36,000 municipalities and distribution is provided by about 14,000 utilities. Regulation is fairly complex, as the system is overlaid by strong state control agencies at the national, regional, and local levels as well as six Catchment Basin Authorities. The French system is very responsive to local and environmental demands.

In the U.S., the federal government and independent state PUCs both regulate public utilities. Most PUCs are vested with the authority to issue licenses, franchises, and permits to construct or transfer PU facilities. They also intervene in rate determination and regulatory reviews, and control quality in coordination with EPA. PUCs are particularly vigilant over financial matters. They ensure the uniformity of accounting systems and regulate financial decisions to uphold the interests of both shareholders and bondholders.

Successful private sector participation in noncompetitive public agencies like water supply requires a regulatory framework that sets up tariffs, establishes service standards, and develops cost control goals under a regulatory agency. This mechanism clarifies the "rules of the game" and creates an organized operating environment for private investors. In the U.K., it took at least five years of preparatory work to develop an adequate regulatory framework to ensure that divestiture would increase efficiency without harming consumer interests.

Financing Policies

An importance difference between American and European utilities is that in the United States financial statements are reviewed by the PUC and tariffs are adjusted to keep the rate of return within 10 to 15 percent after taxes. The utility company is able to charge enough to cover operating expenses, taxes, and depreciation, and recover a fair return on investment. This rate of return (ROR) pricing ensures the financial integrity required to maintain a good credit standing, to attract capital, and to provide earnings comparable with enterprises taking similar risks. However, ROR pricing is sometimes faulted because it tends to lead to overcapitalization and overinvestment.

As noted by Haarmeyer¹¹, transforming public water supply systems into stand-alone government commercial enterprises may be politically difficult but less so than divestiture. There are a number of large urban water systems operating as financially and politically independent authorities. In the U.S., these activities still do not pay taxes and continue to have access to tax-exempt financing. This dilutes incentives for full-cost pricing, and efficient investment and maintenance programs remain absent.

¹¹ See Haarmeyer, David. *Privatizing Infrastructure: Options for Municipal Water-Supply Systems*. Reason Foundation, October 1992.

In France, water rates are determined at the outset of a contract and water companies are motivated to increase productivity because they are allowed to retain most of the efficiency gains realized during the contract period. Price-capping arrangements with such incentives predominate in the U.K. and are slowly being introduced in the U.S.

5

THE PRIVATE SECTOR PERSPECTIVE

The three main players in private sector participation in the supply and delivery of water and sanitation services are the private sector, the public sector, and the consumer. Of these the most recent is the private sector.

In developing countries, the public sector often expects the private sector to become heavily involved in service delivery and investment. Yet, it is difficult to tell how successful or comprehensive the move to private sector participation will be. There is great uncertainty on both sides and there are many models to follow. Some of these are localized, the product of traditional practice and legal systems, and it is unclear whether they can be replicated or transferred to other countries.

This chapter presents the perspective of the private sector contractor and investor.

5.1 The Private-Public Partnership

Privatizing water and wastewater services does not eliminate all the responsibilities of the public sector, whose role is now changing from day-to-day operational management to regulation and oversight. The institutional transformation this implies is profound.

5.2 The Public Sector

As a first step, governments may need to change existing laws or pass new ones to ensure legal status for private sector initiatives. Next, they must do a considerable amount of preparatory work before entertaining private projects. They must develop sector plans, identify areas where the private sector is welcome, and establish clear engineering and performance standards. Thorough preparatory work is essential because, once a concession has been let and long-term agreements have been signed, a government loses its freedom to determine strategy for the duration of the concession. Moreover, it is during the preparatory stage that a government can draw up the criteria for evaluating bids and selecting the best proposal.¹²

There are advantages and disadvantages to having a government take equity shares in BOT or BOO companies. One advantage is that part of the profits go back to the public sector. Government involvement may also facilitate negotiations and expedite the completion of the

¹² In solicited proposals, prequalified sponsors must meet the specifications and requirements laid down by the government authority. In unsolicited proposals, negotiations between a sponsor and the government are conducted one-on-one. As a rule, development costs are higher for unsolicited than for solicited proposals.

project. The chief disadvantage is that business decision-making can become unwieldy and subject to political pressure. In Indonesia, a survey of potential investors revealed that they would prefer not to enter into partnerships with the current autonomous water agencies. The government has the responsibility for providing sovereign guarantees on borrowing, on obligations on foreign exchange earnings, and on repatriation of profits. These issues are discussed in more detail later in the chapter.

Governments and public entities are often the sole or main customers for bulk water supplies or bulk water treatment contracts. The government is also the only regulator and monitor of the services provided.

5.3 The Private Sector

Private companies working in the water supply and sanitation sector in all parts of the world can provide every kind of technical, managerial, financial, operational, and legal service. Some countries may have more of these entrepreneurs than others. But infrastructure services customarily have been the domain of the public sector, where either central or municipal authorities have financed and managed most water supply and sanitation systems.

Consequently, private sector participation in the provision of WS&S services is not large, as was discussed earlier. Private companies need to be informed of such opportunities as the installation and maintenance of water meters, for example, which would offer them a profitable market.

5.4 Project Opportunities: Contracting and Investment

The two principal reasons for inviting private sector participation are efficiency gains and equity investment for capital formation. But it is important for the public sector to understand the motivation, risks, and rewards that influence a private company's decision to commit resources.

Contracting

Contracts with the private sector cover all arrangements that do not involve investment or equity participation. Contractors interested in providing a service generally consider four factors: the length of the contract; the size of the market; contract confidence; and political risk.

Length of Contract

As a general rule, a contract should be long enough for the contractor to recover capital expenditures on equipment and to train personnel to perform the required tasks. The simpler the contracting mechanism, the shorter the contract period. Service contracts are the simplest and do not require the contractor to assume any commercial or operating risks. Payment may

be on a time, lump-sum, cost-plus, fixed-fee, or piece-rate basis, say, for the number of meters serviced. These contracts are usually for less than five years.

Management contracts entail some risk, as the contractor assumes responsibility for the entire operation and maintenance of the system, except for the replacement of major equipment. The contractor usually collects revenues but does not set tariffs. Management contracts usually run for three to five years.

Leasing contracts call for more resources and therefore more risk. They attract private companies with a track record in the sector, mostly French, Spanish, British, and other European firms. The lessee must provide working capital and replace capital items with a short economic life, and assume the financial risk for operation and maintenance. Usually the lessee keeps a portion of sale revenues as reimbursement and pays the rest to the authority as a rental fee. These contracts are common in Europe and run for at least six years, and possibly up to 20 years with renewals.

Size of Market

The size of the market is an important consideration. If a contractor can spread the costs of capital and overhead across operations in several cities and thus achieve economies of scale, the opportunities are more attractive than in serving a single municipality. For example, a contract to provide billing and collecting services for one municipality, unless it was extremely large, would not be as attractive as a contract to provide the same services for an entire region or country.

Contract Confidence and Political Risk

Confidence in the contracting party's solvency and ability to pay is the next factor affecting a contractor's willingness to participate. Water and sanitation services usually are under a municipal or regional agency. These agencies do not enjoy the financial status of a national organization, which can sometimes attract sovereign guarantees and subsidies to support operating revenues, as in the power sector. Electric utilities usually are national agencies with centralized decision-making powers.

The water and sanitation sector, particularly water supply, is considered socially sensitive because of public health and welfare considerations. Water supply is often considered a right more than a service, and the political necessity of providing water may override prudent management decisions. A contractor may seek an assurance of support before deciding whether to participate.

Investment

Increased efficiency is one of two reasons for considering private participation in water and sanitation services. The other is equity investment.

As noted earlier, the two main types of investment are divestiture and BOT or BOO. In a BOT or BOO project, international lenders would expect the construction and project performance risks (see below) to be guaranteed by the developers and operators, and arrangements would have to be carefully negotiated between the parties. Of course, very large firms might have the resources to finance projects entirely on their own or on the strength of their own guarantees. It is still likely, however, that international lenders like the World Bank would be involved, not necessarily for financing and risk-sharing but to give investors greater confidence in the government's willingness to honor its contractual commitments. Lenders will back any project as long as the rate of return and the risks are acceptable. Investors in water supply and sanitation projects must be convinced that their vested interest is safeguarded.

5.5 Government Commitment and the Regulatory Environment

International investors want assurances of a sound and stable regulatory environment (beyond project specific arrangements and guarantees) and of a government commitment to meet its contractual and financial obligations. Thus, a recent WASH study on private sector investment in Indonesia concluded that the absence of a clear regulatory framework was a major concern for private investors and was likely to discourage their participation.

Firms may be reluctant to enter a market where the government tries to influence private business arrangements by interfering in the allocation of profits among foreign and local participants. However, they would want to have government set and enforce professional standards in public health and safety. In a particularly promising environment, private firms might be willing to offer advice on policy or to undertake small-scale demonstration projects for a fee, provided there was a good prospect of followup business. But few companies would be willing to reveal proprietary technology without a definite contractual agreement. Planning and design usually do not exceed 5 to 10 percent of the total cost of infrastructure projects.

In concession or BOT/BOO agreements, governments must be ready to protect the interests of investors in matters beyond the operational or commercial risks they assume. In the case of a water supply or wastewater treatment project, this might mean a commitment to allow the investing company to increase tariffs periodically on the basis of an indexing formula specified in the concession contract; to refrain from building a competing facility within the service area; to encourage use of alternative facilities, such as wells, and provide funding for their use; and to guarantee convertibility of local currency revenues required for debt service.

5.6 Project Risks

Risk allocation is the key to successful private sector investment, whether in concessions, BOTs, or BOOs, and can differ from project to project and from country to country. The general principle is that each risk ought to be assumed by the party whose control over it is most evident. Thus, the government would assume the risks from inflation and foreign exchange fluctuations, whereas the private investor supplying and operating the plant and equipment would assume the operational and performance risks. Certain risks, like those considered acts of God, are outside the control of both parties and can be insured privately but would increase project costs. Often governments agree to shoulder these risks.

5.5.1 Financing Risks

Institutions offering long-term commercial debt and equity financing want assurances that the host country has adequate borrowing capacity and a satisfactory credit standing, and that there is an acceptable contract with an appropriate government authority or a credible private user guarantee on loans.

BOT projects generally are preferred by equipment suppliers, construction companies, consulting engineers, and management companies, and BOO projects by long-term investors. A BOO format is simpler and requires less complicated negotiations and contractual arrangements.

The BOT format is also suitable for countries with little or no access to international financing and weak domestic capital markets for longer-term (over seven years) borrowing. BOT financing is known as non-recourse financing, which means it has no direct unconditional guarantor for servicing of project loans. Recourse is limited to the project company and its assets, including the real estate, plant and equipment, contractual rights (say, the use of a particular water source for a number of users), and any guarantees and insurance. The lenders' only recourse for nonpayment by the project company is against what is specified in the contract.

In developing countries, non-recourse financing is commonly used for privately owned projects in the industrial, manufacturing, oil and gas, or mining sectors, because the goods produced can be sold in the world market for foreign currency. This makes financing much cheaper and easier to organize. Water and wastewater are not commercial goods and except in unusual cases are not exportable.

A recent survey of international investors¹³ indicated a low level of confidence in the viability of water supply and sanitation projects in lower-income countries (with a per capita income below \$1,000). Non-recourse lenders would expect revenue streams to be guaranteed by the government rather than they should depend on cash flow from billings. Some private investors

¹³ See Nyrjesy, Frances in Annex 6 "U.S. Investment Potential Analysis," Newbery, David M. *The Role of Public Enterprises in the National Economy* Draft for discussion at the Institute for Policy Reform. May 1992

and international lenders, however, are uncomfortable with projects that rely on government budget allocations for revenues and maintaining debt service, preferring projects that offer cost recovery direct from users. In Indonesia, a planned BOT for municipal water supply for Surabaya will be based on a take-or-pay agreement with the regional water enterprise, the PDAM. Financiers and investors are not looking for guarantees of the revenue stream of the consortium that will produce the bulk water for sale; they want a government guarantee of the solvency of the purchaser of the water, the regional water enterprise.

The Cost of Additionality

Water supply and sanitation projects traditionally have been financed by government grants and sovereign borrowing (loans backed by government guarantees) from development banks and multilateral lending institutions. These loans are made at favorable market rates because, with their excellent record of repayment and very high credit rating, the multilaterals are able to raise funds in the global capital market at very low rates.

Private investment is sought when sovereign lending is not available. In principle, the less recourse there is to government assistance, the greater will be the element of additionality in the investment. However, in practice, there is as yet no BOT project of any significant size in a developing country that is without substantial financial commitments, at least in secondary financing guarantees, from the host government. Assurances of the financial performance of the state-owned entities that are partners in commercial arrangements are what project financiers require from the government.

Public sector capital costs are less than what the private sector can arrange because the public sector can use its sovereign guarantees to obtain lower interest rates, especially for water and sanitation projects, which generally are municipal, not national, projects. Assuming that the public and private sectors are equally efficient in construction and construction management, private sector participation through a BOT or BOO is likely to be more expensive than public sector production. For example, the amortized annual cost of a \$125 million project would be about \$20 million, assuming a 20-year repayment period and a 15 percent interest rate as the cost of capital. If through efficiencies of design and construction management the private company could reduce capital costs by 10 percent, the annual amortization on the same borrowing terms would be about \$18 million, or \$40 million less over the life of the project. However, if instead the private company had to pay 2 percentage points more, or 17 percent per annum, the amortization costs would be the same as for the public sector, despite the 10 percent reduction in the cost of construction. Nonetheless, since private construction and operation are more economical by virtue of competition, private investment may make possible facilities whose sizes yield economies of scale that outweigh the higher financing costs. Thus, the BOT/BOO arrangement could provide better water and wastewater services at the same or lower cost.

5.5.2 Investment Risks

There are four risks that increase project costs and that the private sector takes into account in considering an investment: completion risk; performance and operating risk; convertibility and exchange-rate risk; inflation risk.

Completion Risk

Of the two phases of a project—construction and operation—the first is of greater concern to lenders and equity investors because of the risk of delays caused by poor site conditions, tardy deliveries of materials, and shortages of funds and manpower. These delays increase construction costs and funding requirements, as do cost overruns. If a BOT/BOO project company defaults before project completion, there is no ready market for a partly built water treatment plant or pipeline.

The cost of a project rises if the contractor is protected against completion risk. The World Bank and others report that commercial lenders, bilateral lenders, and export credit guarantee agencies are reluctant to assume this risk. Several BOT projects have been able to proceed only because the host government has made subordinated loans to the project company to guarantee senior debt service until project completion.

Having the host government provide credit guarantees is a cheaper alternative to commercial credit. Commercial subordinated debt financing means high interest rates and commitment fees, as in the case of venture capital, and this “comfort” reduces the additionality of private sector involvement.

Performance and Operating Risk

Once a BOT/BOO project is operating, there are certain characteristics of the cash flow, income, and dividends that must be considered. The early years of operation feature higher interest payments and lower principal repayments from the revenue stream. Water revenues build up over time as population grows and more people receive service. But interest and principal repayments are at greatest risk in the early years, since most of the cash flow goes toward paying operating and management costs.

The interest of equity investors or sponsors such as construction companies or equipment suppliers in BOTs or BOOs stems from the long payback period on equity, the peculiar nature of the business, the inability to spread the risk over other parts of the new company, and the difficulty of selling shares in the initial years of operation. By contrast, lenders, or debt financiers, do not have a special interest in water supply and sanitation projects since their funds are fungible across a range of investments. They must be convinced that the projects are financially viable and will repay their loans. Several mechanisms have been developed by BOT/BOO companies to protect lenders. One of these is an escrow account maintained by an independent agent that receives funds directly from project revenues. This escrow account is usually a cushion for senior debt service and for six to 12 months of debt repayments. Another mechanism is a benefit trust that makes lenders the beneficiaries of insurance contracts

that the BOT/BOO company enters into. Default guarantees giving lenders the right to take over the company and bring in new management in the event of financial or technical default may also be established.

Convertibility and Exchange-Rate Risk

The relatively long lead time for adequate returns on investments in BOT/BOO water supply and sanitation projects exposes investors to exchange-rate risks. This is true for both foreign and local investors.

During construction, large sums of foreign currency are generally needed to import equipment. In Indonesia, investors have suggested the use of the "swap" market as a hedge against foreign-exchange risks. Foreign-exchange requirements are brought forward, using the swap market for the period of construction, and held in a convertible currency. Because this period is only three years, the risk is not unduly large. In a similar situation in Malaysia, the government provided a 17-year external risk undertaking to the BOT company to cover increased costs from adverse foreign-exchange and interest-rate movements on foreign loans.

A parallel concern is the conversion of the foreign sponsor's profits. The BOT/BOO company will be paid in local currency for the water and wastewater services it sells. Depending on the financing arrangement, it is most likely that lenders and investors would want to recoup their investment in their own currency. In Turkey, payments were required in a basket of currencies that matched the payments of foreign lenders and investors. In the Philippines, a foreign-exchange surcharge was applied to power tariffs to reflect the devaluation of the local currency against the U.S. dollar. In this way foreign-exchange costs were passed directly to consumers.

Inflation Risk

The usual protection against inflation is a price escalation clause in the long-term purchase contract. Periodic adjustments in the water tariff or bulk-water charge are made either on the basis of a local index of inflation or by means of a tariff increase over the rate of inflation. Tariff increases, however, usually lag behind actual inflation and other measures may be necessary to ensure adequate revenue.

5.5.3 Project Size

International financiers are rarely attracted by water supply and wastewater projects requiring less than a \$50 million investment. This is a realistic figure based on worldwide experience. Given the significant organizational and management costs of putting together a BOT/BOO project, it may be advisable for governments to combine several projects as a single investment opportunity that financiers would consider worthwhile.

6

GUIDELINES FOR PRIVATE SECTOR PARTICIPATION

6.1 Overview

The foregoing discussion has shown that, where capital resources are limited and efficiency improvements are sought in the water supply and wastewater services, the private sector has a role to play. It has explained that the benefits of private sector participation are tempered by the natural monopoly character of the sector, and that therefore competent oversight and a regulatory framework are essential. It has described the motives that would lead private investors to enter this specific market. It has also emphasized that even with total divestiture, the most extreme form of privatization, the public sector is still responsible for seeing that services are of adequate quality and delivered at a reasonable cost.

6.2 Guidelines for Private Sector Participation

The following guidelines in determining the suitability and extent of private sector participation are organized according to the four phases of a project: planning and policy; development; implementation and operation; and evaluation.

Planning and Policy Phase:

- The policy must stipulate which parts of the water supply and sanitation sector are open to private sector participation and be clearly supported at the highest decision-making levels.
- The more specific the objectives for private sector participation, whether for efficiency gains or increases in capital, the greater the likelihood of a successful partnership.
- Once the objectives have been clarified, the private sector option most likely to meet them must be identified.
- In general, contracts designed to achieve efficiency gains pose few risks for both private and public sector parties.
- Investment options that create capital are concessions (BOO and BOT) and divestiture. Concessions are common in water supply and sanitation, divestiture is rare.
- Effective regulation of private sector participants must cover the monitoring of every aspect of their work. Improper regulation can hurt consumers and reduce public support for private sector participation.
- The costs, location, and authority of the regulatory agency must be carefully considered.

- Labor need not be adversely affected by the entry of the private sector if there is attention to easing the social costs of dislocation.

Project Development Phase:

- All parties (ministries, consumer groups, etc.) affected by the introduction of the chosen private sector options should be briefed to avoid project delays.
- There should be no restrictions on the entry of competitors. Both foreign and local participants should be entitled to the same consideration, and a level playing field should be ensured for all.
- Project approval should be hastened to minimize development costs. Clear procedures and guidelines will facilitate this.
- All risks must be identified and each one allocated to the party best suited to cover it. Risks beyond the control of the private sector, such as convertibility, must be covered by guarantees.

Implementation and Operation Phase:

- Competitive procurement procedures and performance specifications should be drawn up, and the award of contracts should be open.
- The regulatory authority for evaluating bids and monitoring performance should be adequately staffed and funded to ensure proper oversight of the project company in the delivery of consumer services.
- The regulatory authority should have financial and political autonomy.

Evaluation Phase:

- The public authority should have performance standards for evaluating the project company.
- In comparing private and public performance, the true cost of sector services should exclude government subsidies.

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World Bank Policy Research Bulletin, Vol 3, No 4, August-October 1992.

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THE WASH PROJECT

With the launching of the United Nations International Drinking Water Supply and Sanitation Decade in 1979, the United States Agency for International Development (A.I.D.) decided to augment and streamline its technical assistance capability in water and sanitation and, in 1980, funded the Water and Sanitation for Health Project (WASH). The funding mechanism was a multi-year, multi-million dollar contract, secured through competitive bidding. The first WASH contract was awarded to a consortium of organizations headed by Camp Dresser & McKee International Inc. (CDM), an international consulting firm specializing in environmental engineering services. Through two other bid proceedings since then, CDM has continued as the prime contractor.

Working under the close direction of A.I.D.'s Bureau for Science and Technology, Office of Health, the WASH Project provides technical assistance to A.I.D. missions or bureaus, other U.S. agencies (such as the Peace Corps), host governments, and non-governmental organizations to provide a wide range of technical assistance that includes the design, implementation, and evaluation of water and sanitation projects, to troubleshoot on-going projects, and to assist in disaster relief operations. WASH technical assistance is multi-disciplinary, drawing on experts in public health, training, financing, epidemiology, anthropology, management, engineering, community organization, environmental protection, and other subspecialties.

The WASH Information Center serves as a clearinghouse in water and sanitation, providing networking on guinea worm disease, rainwater harvesting, and peri-urban issues as well as technical information backstopping for most WASH assignments.

The WASH Project issues about thirty or forty reports a year. *WASH Field Reports* relate to specific assignments in specific countries; they articulate the findings of the consultancy. The more widely applicable *Technical Reports* consist of guidelines or "how-to" manuals on topics such as pump selection, detailed training workshop designs, and state-of-the-art information on finance, community organization, and many other topics of vital interest to the water and sanitation sector. In addition, WASH occasionally publishes special reports that synthesize the lessons it has learned from its wide field experience.

For more information about the WASH Project or to request a WASH report, contact the WASH Operations Center at the above address.