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MARKET REFORM AND EQUITABLE GROWTH IN LATIN AMERICA

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CHAPTER TEN

Reforming Former Public Monopolies: Water Supply

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Until very recently, urban water supply and sanitation were considered services both necessary and appropriate for governments to provide. The rationale was that water is a basic human need, that potable water is essential for life; its value in other uses is high as well, so that lack of adequate access to water is a defining characteristic of severe poverty (World Bank 1994, p. 20). Water and sewerage distribution services¹ also meet the most stringent definitions of a natural monopoly, including an almost complete lack of contestability. Natural monopoly, combined with the inelastic demand for water at low levels of consumption, imply that private monopoly in water and sewerage provision could lead to significant social welfare losses. These factors, combined with significant potential externalities, fostered the view that the public interest required the supply of water to be assured by government and provided by a public-owned utility, with government planning and coordination at the highest level even in very large countries.

The identification of access to water as a "basic human right" promoted the conviction that water tariffs should be set at levels "affordable" to the poor, with water expenditures "ideally" accounting for no more than five percent of a poor family's budget.²

These views, which may be termed "the public service delivery model," led to government policies whose effects were mixed, at best. On the one hand, most countries have experienced remarkable increases in access and service quality, despite rapid increases in urban population. In Brazil, for example, the proportion of the total population with access to safe drinking water increased from 55 percent in 1970 to 87 percent in 1990; other Latin American countries achieved impressive gains in water services coverage as well (World Bank 1994, Table A.2). In addition there were significant increases in the human resources and institutional capacity for water and sanitation services and regulation.

Unfortunately, the public service delivery model brought with it serious problems as well. The view that water is a basic human need or, in public finance terminology, a "merit good," created strong pressures for government-owned utilities to subsidize water tariffs so that poor and low-income families would not be priced out of the market. Indeed, the "social tariff" became a mainstay of the water sector in Latin America, practiced in virtually every country. The intent was benign, but in practice the social tariff yielded little benefit to the poor, and may actually have reduced their welfare.

In too many cases, even though the public enterprise suppliers' water tariff was low, piped service was inadequate and, in many cases, unavailable to poor and low-income families. This combination of low price and short supply was no bargain for the poor; it forced them to purchase water from vendors, to collect and carry water from distant sources, or to utilize unsanitary water available nearby. Water from vendors is vastly more expensive than piped water—ten to twenty-fold is a common ratio (World Bank 1994). Consumption of nonpiped water that does not meet standards of potability is also costly. If it is boiled before use, the considerable costs of boiling must be taken into account. Those costs can be very high; with the outbreak of cholera in Peru, the Ministry of Health urged all residents of Lima to boil their drinking water for ten minutes. But the expense of this would amount to 29 percent of the average household income in *pueblos jóvenes* (squatter settlements) according to Gilman and Skillicorn (1985). If water is not boiled and is contaminated, there can be devastating consequences associated with morbidity and mortality.

Despite good intentions, the real price of water under the social tariff regime was very high for many poor and low-income families, and probably higher than it would have been without a social tariff. The social tariff has usually operated in a manner that left the water utilities without financial resources to properly maintain existing delivery systems, much less to expand and upgrade coverage.³ Inevitably, services to the poor were the most seriously affected.⁴ The steep prices that poor and low-income families have paid for water because they lacked access to sanitary piped water, and the consequent high proportion of their income for water expenditures, suggests that real income inequality in Latin American countries has been greater than standard measures would indicate.⁵

In many cases, water tariffs were set below costs of production, often below short-run operating costs. Operating revenues were thus far below the level necessary to sustain an investment program. This meant that when government subsidies dried up, it was impossible to extend services to cover all. The outcome re-

Table 1. Income Level and Water Subsidies

Consumption quintile	Percent of total subsidy
0-20 percent	0
20-40 percent	12
40-60 percent	22
60-80 percent	27
80-100 percent	39

Source: World Bank calculations, based on Bazzanella 1993.

flected the "hydraulic law of subsidies"—those who get no services get no subsidy, and when there is rationing, the poor are always at the end of the line.⁶

The problem was exacerbated by the fact that the social tariff was not well targeted: in most cases, subsidized tariffs were extended to all consumers, not restricted to the poor.⁷ The financial burden of subsidized tariffs was thus greatly increased, whether the burden fell on the water utility or the government at some level. With all consumers receiving the subsidized price, those who used the most water (invariably the middle class, rather than the poor) received the highest level of subsidy:

The *de facto* inequality of the social tariff is well illustrated by the city of Belém in Brazil. As shown in the table above, those who benefit most from the social tariff are high-consumption, well-to-do families, while the poor, unserved families get nothing.

The service delivery model relied on huge resource transfers to the water utilities. In Brazil, they amounted to about US\$1 billion a year from the mid-1970s to the mid-1980s. For Mexico City alone, subsidies for water and sewerage amounted to US\$1 billion a year, or about 0.6 percent of Mexico's GDP (World Bank 1992). Such outlays placed a great burden on countries' efforts to balance government budgets and in many cases were simply unsustainable.⁸

The discussion to this point has focused on how the public service delivery model and associated social tariff have failed to address the problem of poor and low-income families' access to safe and affordable water. Similar problems occurred in the area of sewerage services, but here there was far less "success" in extending coverage. A study of Costa Rica, Uruguay and the Dominican Republic showed that because rationing of sewerage was more severe than for water, the inequity

was greater (Petrie 1989). Inadequate sewerage coverage contributed to the deterioration of the poor's access to safe water, leading to increased morbidity and mortality, as became evident when cholera returned to Peru and then to Latin America more generally. Even where sewerage systems exist, wastewater has rarely been treated, both due to management failures and because of inadequate investment in wastewater treatment and disposal facilities. In Latin America, only about 5 percent of household and industrial discharges are treated at all (Rivera 1996), and most sewage treatment plants constructed in Latin America perform very poorly. In Mexico, more than 90 percent of the municipal wastewater treatment plants are not functional (Briscoe 1993). The result is predictable—a sharp deterioration in the quality of surface and groundwater quality throughout the region.

The problem of inadequate sewage services under the public service delivery model has compounded Latin America's difficulties addressing the challenge of sustainable water resources management. Below-cost water tariffs and the associated heavy burden of providing subsidized water services have reduced the government funds available for investments in sewage treatment. This creates a vicious circle, in which inadequate sewerage facilities exacerbate the need for investments to provide potable water—both for those who are currently connected to the network and for those who are not. At the same time, water subsidies reduce the funds available for doing so. The situation on the Paraíba do Sul river in Brazil—both a sewer for São Paulo and the water supply for Rio de Janeiro—is a striking example of a widespread phenomenon.

Forces for Change

Over the past decade, several simultaneous and interconnected "revolutions" have taken place in Latin America. The state-driven development model ended, and a "market-friendly" model replaced it. There is greater concern about the effects of budget deficits. Other major changes include the democratization of political institutions, decentralization, and increasing attention to environmental issues. These changes have led to new thinking about ways that water and sanitation services can and should be provided. Although the process of transition from old to new is far from complete, some broad directions are clear, and some lessons have been derived from experience.

The new internationally accepted principles for sound water management have been widely adopted in the region.⁹ There are two central principles, one instrumental and one institutional. One is that water should be managed not just as a

social, but also as an economic, good. The other is that water should be managed by the government at the lowest appropriate level (the subsidiarity principle), with much greater involvement of the private sector and communities themselves.¹⁰ The first does not advocate a "pure market" approach, because the externalities involved in water use suggest the need for government involvement in some form. Rather, the new thinking supports the use of policies that recognize and benefit from economic incentives.

Different countries are taking various approaches to turn these principles into practice. This chapter presents a selective review of those approaches and derives some lessons from experience. The discussion centers on five key issues: 1) the water and sewerage needs of the poor; 2) "decentralized" provision of water and sewerage services provision; 3) how to regulate commercially oriented providers; 4) how the transition to commercially viable practices affects labor; and 5) sustainable water use and development.

Issue 1: The Needs of the Poor

The "social tariff" has not been an effective instrument for delivering water and sanitation services to poor and low-income families. Although high tariffs clearly impose a burden on these families, the social tariff approach often dooms the poor to no access to services at all—a far greater burden. Nevertheless, there are several promising approaches to meeting poor and low-income families' needs for water and sewerage services without abandoning considerations of affordability. Most of these approaches involve greater low-income community involvement in water and sewerage service provision.

"Marketing" is an important part of successful efforts to provide service to poor communities. Although largely ignored under the service delivery model, marketing has great potential for transforming poor communities from revenue sinks to revenue sources, simultaneously serving the needs of the communities and increasing funds available for infrastructure expansion and improvement.

Marketing encompasses a wide variety of activities. One of these is consultation with poor communities¹¹ to have them choose the price/service level combination they feel is optimal. Residents of poor and low-income communities may be unable to afford the full cost, or even a reasonable share of the full cost, of the water services that would be demanded by higher-income groups.¹² But the value they place on a less expensive and therefore affordable level of service may be far above the cost of providing it, and they can enjoy significant gains in welfare from having

a choice beyond all-or-nothing service. The Brazilian condominium sewerage system is an excellent example of how such choice mechanisms can operate in practice. Households are presented with a range of sanitation options, ranging from no improvement, to low-cost backyard sewers, to medium-cost sidewalk sewers, to high-cost conventional sewers. The choices made by households vary systematically and logically in accordance with income (de Melo 1985).

Marketing can also take the form of extending innovative financing arrangements to poor and low-income families. Financing connection costs has been a major impediment in less developed areas (World Bank Water Demand Research Team 1993); many utilities in Latin America have, sensibly, financed connection costs and recovered these via a surcharge. In Chile, the Santiago water utility (EMOS) realized that many potential customers were unable to pay for connection to a piped-water system on a lump-sum basis or on a short-term installment basis. In response, the company offered a variety of extended payment plans, some of which stretched repayment of connection costs over a period of years. In this way, the customers gained access to safe piped water at an affordable price, greatly reducing their overall costs for water, and the company increased its revenues in two ways—directly, by increased monthly revenues from customers, and indirectly, by reducing the amount of water diverted through illegal connections.

Marketing also involves community outreach programs. The experience of EMOS in Santiago, where the utility provided its poor and low-income customers with instruction on how to properly use water and sanitation services, demonstrates the benefits to both customers and utilities from such efforts. The instruction included matters such as estimating total monthly water use, how to pay bills, and what items can and cannot be disposed of in sewerage systems. The customers gained by avoiding large water bills due to immoderate use and the utility gained by reducing maintenance costs on water and sewerage systems and by reducing bills-in-arrears difficulties. In Santiago, Chile, where (as discussed later) poor families receive a water subsidy from the central government channeled through the municipal government, EMOS discovered that significant community outreach programs were necessary even to ensure that poor families registered to receive subsidies to which they were entitled.

"Marketing" activities directed at the poor may appear to suggest manipulation or exploitation of the vulnerable. Water utilities' marketing activities, however, should be viewed rather as a way of improving understanding of customers' concerns and of meeting their needs more effectively. Indeed, Chile's EMOS refers to its service users as "clients" rather than "customers," to emphasize that in spite

of the monopolistic nature of its business, the service users should be treated as if they had the option to abandon the company for a better one. In effect, EMOS views its marketing activities as part of the process of fulfilling the *commercial* potential of serving the needs of poor and low-income families.¹³ Clearly, when service users—including poor and low-income families—are paying for water service, and tariffs are such that the utility profits when providing it, the relationship between the utility and the customer assumes an entirely different character from the typical situation under the service delivery model in which each customer is just an additional drain on revenues.¹⁴

While it is “community outreach” or “marketing” of a different sort, the experiences of many Latin American utilities have demonstrated the benefits of forging close ties of communication and cooperation with local governments in planning and implementing the expansion of water and sanitation services infrastructure. This cooperation is particularly important for extending services to families that live in extralegal communities in periurban areas.

For some very poor families, monthly fees for piped water may create a financial burden that society regards as unacceptably high; in these cases, assistance must be provided. The critical problem is to find ways to provide that assistance in a very targeted fashion. If instead the subsidy becomes extended to all or to a large subset of customers,¹⁵ this will not only threaten the utility’s financial viability, but also forfeit the efficiency benefits of properly pricing water.

Chile’s response to this dilemma is instructive. Santiago’s water tariff system, in which water service charges are set to cover full costs, is politically and socially viable because of water subsidies. They are granted within the framework of the Chilean central government’s “overcoming poverty” program, which provides subsidies to poor families for water and sewerage services.¹⁶ Municipalities carry out surveys to determine the social condition of the families requesting the subsidy and classify them in order of priority, with poorest families receiving first priority. Once the central government transfers the amount for subsidies to the municipalities, the municipalities use them to pay their correspondent share of the water bill of the families that have qualified for the subsidy. The share ranges from 15 percent to 75 percent, with the poorest families receiving the highest subsidy shares. This payment is made directly by the municipality to the water utility. Annual subsidies for all water and sewerage services in the country are about US\$25 million and are given to approximately 450,000 families to cover, on average, about 50 percent of their water bill. In the case of EMOS, Santiago’s water utility, subsidies represent about US\$4 million per year, equivalent to 2.3 percent of its total billing.

An important advantage of the subsidy voucher approach is its flexibility. In particular, increasing or decreasing the number of people receiving subsidized water, or the size of the subsidy, does not have a direct impact on the revenues of the utility.¹⁷ Therefore, such a change need not require extensive negotiations, contractual adjustments or compensatory payments to the utility.

In countries where a Chilean-type subsidy approach is not feasible due to insufficient administrative or financial capacity, it becomes harder to find ways to meet poor and low-income families' water and sanitation needs. If we assume that the service-delivery approach is not only financially unsustainable but actually makes the poor worse off, then the poor could benefit from marketization of water and sanitation services, even if unaccompanied by targeted assistance to the poor.

But this may be viewed as too naive. And if the Chilean subsidy approach is considered impracticable, policymakers may look for some other method to reduce poor families' costs for water and sanitation services. One alternative method is a cross-subsidy scheme based on some form of nonlinear pricing; here, a minimal family consumption level is subsidized by above-cost charges to business customers or customers who have supra-average consumption or enjoy "special" service. But even if cross-subsidy schemes were feasible in some circumstances and could be sustained over long periods, they generally result in inefficient pricing from a resource allocation perspective. Efforts to reduce the cost of "minimal service" through cross-subsidization were a fixture of utility regulation in many countries, including the United States, and the role they played in the electricity, telephone, airline, and railroad sectors has been well-documented. Further, cross-subsidy approaches may encourage socially costly efforts to avoid the price discrimination upon which such schemes depend. Such efforts include both illicit behavior, such as corrupting meter-readers or diverting water before it is metered, and legal, but costly, behavior such as developing private wells and other independent sources of water supply.¹⁸

In addition to these problems, cross-subsidy schemes are not easily sustainable in nonmonopoly situations. Where competition is introduced, cross-subsidy schemes are extremely vulnerable to "cherry-picking" predation, in which competitors, by minimizing the extent to which they serve the subsidized market, are able to profitably undercut the prices to the subsidy-financing high-price consumers.

As a result of these inherent problems, cross-subsidy schemes often require heavy monitoring of customers and a heavy-handed regulatory approach. The former adds to direct costs; so does the latter, but more seriously, it tends to foster precisely the kinds of undesirable incentives and inefficiencies that have accompa-

nied the service delivery approach. Further research into ways of improving cross-subsidy schemes would be worthwhile, but in the meantime, this approach should be viewed with caution. The policy of offering customers a choice of several service/price offerings, discussed above, appears to be a superior method of meeting the needs of low-income consumers. It addresses both the need to provide affordable yet adequate service to low-income communities and the need to maintain incentives for utilities to serve them.

Another approach to serving the needs of poor and very low-income families is "coproduction" of services. Here, the residents of poor communities provide labor for installing and maintaining the "feeder" infrastructure, while the formal utility retains responsibility for production of the "trunk" infrastructure. This approach is controversial, and it is useful to consider its advantages and disadvantages.

The costs to families of *not* having any on-plot water service or sewerage infrastructure¹⁹ are high; therefore, coproduction can clearly be beneficial when families' and governments' financial and managerial constraints make it the only available option for providing water and sewerage services to the poor. In addition, coproduction activities can serve as a catalyst for development of political institutions in poor communities.

There have been some notable successes in community coproduction of water and sewer services, including the condominium approach first adopted in northeast Brazil and now elsewhere in that country, and a similar program that has brought low-cost sewerage services to hundreds of thousands in Karachi, Pakistan. When coproduction approaches are well-designed, the community members themselves have strong incentives to ensure that water and sewerage feeder lines are properly constructed and maintained, reducing water losses from accidents and illegitimate diversion of water (Briscoe 1995). "Low-tech" and labor-intensive techniques that generally characterize coproduction approaches can also serve as a means of providing employment opportunities for community residents. Finally, because improvements in water and sanitation services increase the attractiveness of residing in a neighborhood, such improvements can contribute significantly to the stability of communities. To the extent that community residents have some property rights to their homes, water and sewerage improvements can even increase families' real wealth.

The idea of giving users a range of price-quality options from which to choose, fits well with the social funds approach (Graham 1994). In the social fund model, communities essentially have block grants, and it is up to them to choose how

much they wish to spend on different types and qualities of services. Even when these grants are fully subsidized, communities face an opportunity cost and an associated incentive to make sensible choices.

There are potential disadvantages of the coproduction approach as well. In particular, it may create difficulties for utilities that must integrate "nonstandard" infrastructure into their own systems. For obvious reasons, this may complicate efforts to use incentive mechanisms to encourage efficiency, including privatization efforts.

The political response to promotion of coproduction approaches may also present a problem. The presumptive argument for community coproduction approaches involving nonstandard techniques is that the alternative is markedly inferior service, or, indeed, no service at all. If, however, the barrier to extending to poor communities the same level of service enjoyed by wealthy communities is not scarce resources, but rather a lack of political will or innovative management, then coproduction approaches utilizing nonstandard techniques may simply reduce the total expenditures on water and sewerage infrastructure in poor and low-income communities. The latter is clearly more of a possibility in wealthier middle-income countries such as Chile than in most developing countries, which are severely pressed for financial resources. In the poorer countries, insistence on a choice between top-of-the-line service or none at all will almost certainly harm the interests of poor and low-income families. This is even more true in light of the wider benefits of improved water and sanitation, including the new opportunities for microenterprise and small-scale business employment when good water and sanitation services are available in poor communities at a reasonable price.

Last but not least, in considering ways to meet the needs of poor and low-income families, we should note the potential contribution of democratic political institutions (Sen 1995; Ahsah, Laplante and Wheeler 1996). When the poor have a political voice, government agencies have a far greater incentive to find innovative solutions to meet their needs. The pressure to extend water and sanitation services to poor communities in São Paulo, Brazil, once democracy was introduced there, and the response to that pressure, is a testimony to what can be accomplished when the necessary political will is mobilized (Watson 1992). The democratization of Latin America is serving as a powerful catalyst for improvements in coverage and operational efficiency of water and sewerage services, and as incomes grow, for water-related environmental improvements as well.

Issue 2: Who Should Provide Services?

Government ownership and operation of monopolistic water and sewerage providers does not have to result in inefficient operation and suboptimal service, but it often has in the past (for examples, see Rivera 1996). And when there is inefficiency in the provision of water services, it is almost always the poor "at the end of the pipe" who suffer disproportionately. There are several reasons for the generally poor performance of public water utilities.

- Water and sewerage service is a natural monopoly, even more so than electricity generation or telecommunications services. As a result, customers cannot easily impose discipline on a utility that offers an inferior price/service combination by abandoning it for another provider who offers a superior one. For the same reason, relative performance comparisons for the purpose of encouraging efficient operation are difficult. Thus, both market and bureaucratic constraints on management inefficiency are weak.
- Government, as "owner" and operator of water utilities, has multiple objectives and no explicit approaches for making the appropriate tradeoffs between them. Even in the best of circumstances, this greatly complicates the tasks of managers and, a fortiori, the task of evaluating managerial performance.
- In public-owned firms, there is no person or group who gets the profits, no "residual claimant" whose overriding goal, subject to socially determined constraints, is maximizing the difference between revenues and costs. Therefore, absent a significant performance-based incentive system, there is no manager or officer(s) of the water utility whose income, or wealth more broadly defined, will be significantly increased through superior performance of the utility. The consequence of this under the old model was operational inefficiency. Many utilities were overstaffed, often with unqualified personnel, with between 10 and 20 employees per 1,000 water connections in 1991 in most Latin American utilities, compared to about 3 in Santiago²⁰ and between 2 and 3 in Europe (see Briscoe 1993). Levels of unaccounted-for water were also high, in some cases extraordinarily so—close to half the total water throughput. The latter was in part a consequence of leaks due to inadequate maintenance of infrastructure and in part due to "commercial losses" resulting from illegal connections, under-registering meters and inadequate billing and collection practices.

- The lack of a residual claimant, or senior managers whose income is strongly performance-determined, also means there is often no one with a strong incentive to vigorously resist political plunder of the utility, which can take place through patronage employment, appeasement pricing,²¹ or through corrupt procurement and billing practices.

The problems described above were frequently compounded by government's dual role as producer and regulator. The lack of private owners or powerfully motivated managers reduced utilities' resistance to regulators' or politicians' pressures to reduce tariffs. An IDB study (Foster 1996) shows that in Latin American countries for which data are available, tariffs in the early 1990s were only about 27 percent of operating costs.²² The revenue consequences of this situation contributed to utilities' failure to make adequate investment in infrastructure expansion and maintenance. Though the government, as regulator, may have kept prices low, it failed to provide the means, the incentive, or the regulatory pressures to achieve high levels of service in terms of coverage and reliability of service. But even here the matter is not uncomplicated. As long as the utilities were objects of political plunder, any increase in revenues that might have resulted from higher tariffs would probably have been dissipated rather than used productively. In this circumstance, even a well-intentioned regulator (or the public) may see little benefit in raising tariffs to more fully cover costs.

This is yet another example of a vicious circle; at the same time, it suggests a way out. The Buenos Aires concession (Idelovitch and Ringskog) is relevant here. In the first two years of operation, this private operator has increased water production by 27 percent, increased the population served by water and sewerage by 9 percent and 6 percent, respectively, and reduced response time for repairs by 73 percent. The company has also undertaken a tenfold increase in investment and managed to reduce the tariff by one-quarter. The keys to this impressive performance are greatly improved operational efficiency (the number of employees per thousand connections has fallen by 43 percent, and the number of meters in service increased by 460 percent). More generally, if utilities do begin to operate efficiently, and revenues are used to improve service, resistance to tariff increases may be much less than previous experience might suggest.

One clear lesson from Latin American experience is that lack of separation between the regulating and regulated entities made it extremely difficult for either to function effectively and contributed to the failure of the service delivery model. Outlined below are some positive changes taking place in the provision of water and sewerage services.

New approaches. Separating responsibilities for production and regulation (separating "poachers from gamekeepers") is a necessary, but not sufficient, change in policy. Experience to date shows the significant benefits from transforming water utilities into commercially oriented entities that embody strong incentives for technically efficient and economically viable operation. In some cases, this can occur within the context of public water authorities; indeed, the Latin American experience, with EMOS and SANEPAR (of Paraná in Brazil) prime examples, shows that under the right circumstances it is possible to successfully commercialize water utilities that remain government-owned. In these cases, subcontracting to the private sector is used extensively. There are numerous options for private sector participation, many of which can be used in combination.

Private sector participation. Private sector participation is perhaps the most widely discussed element of the "new thinking" with regard to provision of water and sewerage services. There is a broad range of experimentation taking place in Latin American countries, with varying degrees of private sector participation. Here we provide a few examples that will give a sense of what is being attempted and with what results.

Service contracts. Service contracts refer to contracting with private firms to carry out all or part of the activities involved in providing water and sewerage services. The "contractors" bid for the service contract, which, depending upon the nature of the activity being contracted out, might specify price, quality parameters, operational objectives and other terms.

The purpose of service contracting is to increase efficiency in provision of some activity or set of activities. It is the least difficult form of private sector participation to implement, because the public-owned utility retains overall operational responsibility and responsibility for financing fixed assets (Idelovitch and Ringskog 1995).

Service contracts with relatively short duration (frequent rebidding) can be an effective instrument for introducing competition and its derivative efficiencies into some aspects of water and sanitation services. In order to ensure appropriate incentives, contract renewal should depend on both price and performance, and efforts should be made to attract new bidders whenever contracts come up for renewal. If the technical characteristics of the activity permit it, there is probably some benefit to starting out with two or more firms receiving service contracts at the outset, rather than allowing one to have the contract and then in theory leaving the door open for competition later. This allows for performance comparisons and also, by expanding the number of experienced firms, increases the likelihood that any given service contract will change hands when it comes up for renewal. This helps prevent any particular contractor from developing an entrenched position.

(Absent this, the door to new competition may be left closed long enough for the hinges to rust.)

EMOS, in Santiago, Chile, has successfully contracted with the private sector to provide a wide variety of activities related to its status as provider of water and sanitation services.²³ These include planning and economic studies, research studies, construction and rehabilitation, repair and maintenance of infrastructure, computer services, billing, payroll, cleaning and maintenance of buildings, transport, meter reading, meter repair and maintenance, cutting and reinstallation of services, public relations, industrial relations services (including training and collective bargaining assistance), and some legal and audit services. Putting all these services out for contract has led to lower costs and greater efficiency and has allowed management to focus on management per se and on core activities. EMOS does not contract out activities that it can perform internally at lower cost, nor does it contract out services that might put at risk service delivery or confidential information.

Putting services out for contract is not, by itself, a sure route to efficiency. Utilities that are not well-managed themselves are unlikely to effectively administer either the awarding of contracts or the monitoring function necessary to ensure contractual compliance. One implication of this is that reform of public-owned utilities may have to precede efforts to improve efficiency through service contracts.²⁴

Management contracts. This is a form of service contract in which a private firm assumes responsibility for the whole range of day-to-day management and operations for part or all of the geographic area served by the utility. Management contracts typically tie compensation to performance, including both quality of service and success in collecting payments from customers. In principle, this can lead to improved service and operating efficiency; however, if the contract itself, the means by which it is awarded, or general institutional conditions in the country are such as to undercut the private management's incentives for efficiency, the actual benefits will be far below potential. If management lacks real autonomy or if contract continuity is heavily dependent upon political factors, management is unlikely to succeed in resisting politicians' pressures for patronage employment, concessional rates for particular customers, and other impediments to efficient operation (World Bank 1994). On the other hand, if properly designed and implemented, management contracts can substantially improve the functioning of public-owned utilities and set the stage for greater levels of private sector participation.

Mexico City has experimented with a limited form of private sector participation, dividing the city into four quadrants with a limited management contract for each. The results have been disappointing, demonstrating that even relatively simple forms of private participation depend upon government political will for their success.

Lease contracts (affermage). In a lease, or *affermage* contract, the public-owned firm retains ownership of the firm, is responsible for all existing debts, all new capital investments not maintenance-related, and generally is responsible as well for setting tariffs. The lessee is responsible for operation, maintenance, and management.

Lease arrangements typically have an extended duration, usually of 10-15 years. This has the advantage of encouraging expenditures on maintenance of infrastructure, provided of course that the lessee feels that government contractual obligations will be honored and that any periodic tariff revision procedures will not operate in a manner that effectively appropriates all profits. Because the profits of the lessee depend upon the difference between tariff revenues and costs, incentives for efficient operation of the utility are strong. The primary disadvantage of lease arrangements is the lack of fully compatible incentives with respect to investment and operating expenditures.

Lease arrangements do not require the operator to acquire the assets of the utility, and therefore lease arrangements can be attractive in situations where private financing would be a problem or in situations where past insecurity of property rights makes investors reluctant to invest large amounts in immovable assets. If all goes well, a lease operation can pave the way for deeper forms of private sector participation (PSP) such as concession contracts or even full privatization in the future (Idelovitch and Ringskog 1995). This form of PSP is widely used in France and in a number of African countries, including Cote d'Ivoire, Guinea and Senegal.

Concessions. A concession is similar to a lease arrangement, except that here the concessionaire, the holder of the concession, is responsible not only for operations and management but also for capital investments for infrastructure expansion. The public water authority's fixed assets remain in public hands and provisions are made for compensated transfer of the concessionaire's unamortized new investments to the public authority at the end of the concession period, which are typically 30 years long.

Concession arrangements have all the advantages of lease arrangements but can yield greater efficiencies because the concessionaire has responsibility for both investment and operations, thus avoiding the incentive incompatibility problems that arise when these tasks are the responsibility of separate entities.²⁵ Concession arrangements require more complex contracts than lease arrangements because the concessionaire puts more at risk; as a result, more time and resources are required to lay the groundwork for bidding on concessions.

Argentina's experience with the water utility concession in Buenos Aires provides clear lessons for others considering concession arrangements for water and

sanitation services.²⁶ The impetus for private sector participation was the dismal performance of the public water utility, Obras Sanitarias de la Nación (OSN), which suffered from excess personnel, an unaccounted-for water rate of 45 percent, unreliable service, poorly maintained facilities and high levels of political interference in its operations. In addition, there were insufficient public funds available for necessary investments in infrastructure expansion, improvement and maintenance.

After some false starts during which progress was impeded by OSN management's lack of enthusiasm for real reform, in 1991 the decision was made to privatize OSN. The private concession did not begin to operate the system until roughly mid 1993, and the length of time required for the process gives a good picture of the complexity of the task. A full description of the process is outside the scope of this document, but some aspects require at least a brief mention.

First is the role of legal and other institutional prerequisites to private sector participation. In Argentina, the legal code prohibited cutting off a customer's water for nonpayment.²⁷ Without a change in this law, potential concessionaires would probably have found the project too risky. Similarly, financial risks were reduced by permitting free convertibility of currency.

Next, substantial effort was necessary to lay the basis for the bidding process. An important activity was hiring a trusted, independent consulting firm to gather and organize the kinds of information necessary for preparation and evaluation of bids. This included detailed assessments of the condition of OSN's physical plant, financial analysis, determination of technical and operational objectives for the concession, and a thorough review of the legal and tax environment within which the concession would operate. This was a lengthy process and not an inexpensive one—World Bank technical and financial support played an important role here. Subsequent events proved the value of thorough prebidding preparation.

Preparation of the bidding documents was also a complex and time-consuming task. The bidding documents, which specified the criteria for awarding the concession, also provided information on the physical and human capital assets of OSN as well as OSN's financial liabilities, specified concession service standards, and defined the regulatory framework, including details of dispute resolution mechanisms. The bidding and bidding evaluation themselves involved processes that required significant time and expertise.

The private water and sewerage concession created for Buenos Aires is the largest such concession in the world. It specifies ambitious performance targets rather than investment targets, covering such factors as water and sewerage coverage, water and water service quality, percentage of wastewater receiving primary

and secondary treatment, and unaccounted-for water, including a target-attainment timetable that extends over the 30-year life of the concession. By contract, water tariffs are to be reassessed periodically.

The performance targets imply high levels of investment, in the range of US\$4 billion (\$4,000,000,000) over the 30-year life of the concession, with about \$1.2 billion in the first five years alone. Potential concessionaires, including the winning bidder, apparently were reluctant to commit to investing this heavily with their own resources in the early phases of operation; much of this investment is expected to be financed from operating revenues and loans from multilateral agencies and commercial banks. This has two important implications.

First, multilateral agencies can play an important role in getting concession (or full privatization) initiatives off the ground. In particular, if agreements are structured so that any government contract violations that significantly harm the concessionaire must necessarily jeopardize the multilaterals' investments, such violations become unattractive from the government's perspective. Thus, the multilateral's involvement serves to reduce concessionaires' perceived (and actual) "political" risk even beyond the direct impact of reducing the concessionaire's at-risk capital. In effect, in Oliver Williamson's terms, the government's concern with maintaining good relations with the multilateral agency provides a "hostage" (Williamson 1983) that alleviates concessionaires' concerns regarding opportunistic behavior on the part of the sovereign government.²⁸

Second, the concession process was complicated because of having to overcome mutual concerns regarding good faith. To the extent that countries and companies have more (positive) experience with concessions and other forms of private sector participation, and as political and institutional stability become more the norm in Latin America, the difficulties of constructing mutually acceptable contracts should decline.²⁹

Early indications of the "success" of the transfer of OSN's operations to the concessionaire are encouraging. There have been major improvements in both reliability and quality of water service; sewage treatment has improved as well; and water tariffs are substantially lower than they were prior to award of the concession. There was a significant increase in efficiency accompanied by a very substantial reduction in workforce from 7,600 to 4,000, the latter involving implementation of two voluntary retirement programs, one financed by the central government at a cost of US\$40 million prior to the concessionaire assuming responsibility for operations, and the other, financed by the concessionaire at a cost of US\$50 million, occurring after the concessionaire took over operations.

The experience of the Buenos Aires water and sewerage concession in its first year of operation also provides a good lesson in the problems and potentials of incomplete contracts, which are inevitable because of the need for contractual flexibility or because of contractual ambiguity, both intentional or unintentional. In the beginning of the second year of the concession, ETOSS, the regulating entity, granted the concession an extraordinary rate increase of 13.5 percent, because of the concession's demonstrated need for funds to speed the investment program to solve some urgent water quality and sewerage problems, and because of high-than-anticipated labor costs. At present, this flexibility appears to have permitted an outcome superior to all stakeholders, although clearly ETOSS cannot permit a situation to develop in which the concessionaire is unable to credibly resist excessive labor demands for higher wages.

Contractual flexibility or ambiguity can also lead to unnecessary disagreements between regulatory authorities and concessionaires. Apparently, differences in ETOSS' and the concessionaire's interpretation of the contract and disagreements over whether ETOSS should regulate performance-related outcomes or the means to achieving them have led to tensions between the two. One lesson that may be drawn from this is that, because it is impossible to write complete contracts in an uncertain and changing environment, and because, as we have seen, flexibility can be beneficial, effective dispute resolution mechanisms must be an integral part of the initial contract let out for bid.

It is evident that the Buenos Aires concession was an important icebreaker in Latin America. Recently a major concession contract was concluded for the city of Limeira in São Paulo State in Brazil (Financial Times 1996), with the concessionaire being a joint venture of a major Brazilian construction company with an international water operator, a combination that is likely to become the norm in Latin America.

BOTs and BOOTs. Build-operate-transfer (BOT) or build-own-operate-transfer (BOOT) agreements offer an attractive method for securing private investment for construction of bulk water and sewerage services infrastructure. Private construction may also be less expensive than public construction in situations where public-financed construction will be encumbered with political interference or union wage or work-rule requirements that elevate costs well above competitive levels. Assuming that the relevant contracts have appropriate incentive structures, private operation of the plants constructed under BOT or BOOT agreements may yield efficiency improvements relative to public operation as well.

BOT or BOOT-built plants in most cases must interface with the public authority's system. Where the utility is run efficiently, BOTs can play a useful role. For example, most of the massive upcoming investment in wastewater treatment in Santiago will be by BOTs. Where the public water authority is not well managed, however, the outcome can be catastrophic because it can result in ever greater losses of water and revenue. A second concern is with the assignment of risk; if the operator does not assume contractually a fair share of the commercial risk, consumers can end up paying for the operator's poor performance. This was the case in Mexico's disastrous experience with toll roads, where the government "guaranteed" traffic that did not materialize.

Full privatization. The United Kingdom is the only country in the world with significant experience with full privatization of water and sewerage services. After thorough consideration of global experience with various forms of PSP in delivering water and other forms of infrastructure, Chile is now moving ahead with full privatization of some regional utilities. General issues regarding regulation of private entities will be discussed in the next section.

In summary, the various approaches to involving private sector participation offer great promise for improving delivery of water and sanitation services in Latin America. Obtaining the benefits of private sector participation will not be an easy process, however; it will take time, money, and political will. Where public water authorities retain an important role in water services provision, commercialization and reform of those entities should be considered a prerequisite for successful private sector participation.

One very promising implication of the Latin American experience with water utility reform to date is that the potential efficiency improvements are enormous. In some cases, it may be possible to have water tariffs that cover full costs without having to raise water tariffs that much above current levels—or even to reduce them, as in Buenos Aires. In other cases, the efficiency gains will not be large enough to offset reductions in subsidies and the need for additional funds to finance essential maintenance and expansion of infrastructure. In these latter cases, particular care must be taken to ensure that tariff increases do not engender a political backlash against water utility reform, as occurred, for example, in Aguascalientes, Mexico, in 1995 (Rivera 1996), the United Kingdom, and elsewhere.

Issue 3: What Are the Regulatory Options?

Some have argued that the greatest benefit from the insertion of the private sector into the water sector is that it brings the provision/regulation issue to the surface.³⁰ But major questions remain on how to regulate, and indeed, how to introduce effective regulation when the institutional history in many Latin American countries is such that business and government entities are to some degree mutually suspicious—business entities, because property rights and legal institutions have been fragile in the past, and government entities, because business practices have not been perceived as sufficiently sensitive to the public interest.³¹

When “commercialization” occurs through management and performance contracts, leases, concessions, or BOTs and BOOTs, contracts rather than regulatory entities provide the mechanism for setting the parameters of providers’ behavior. This is one great advantage of these approaches. If contracts are well-crafted, each party’s obligations and expectations are clearly articulated and understood, and the opportunities or disputes are reduced (though not eliminated). And when both parties find their interactions under contractual situations to be satisfactory, it can help to create conditions that will make other regulatory approaches feasible. This is important, because regulation generally operates in a manner that is not fully defined by the enabling legislation, creating uncertainties for both regulators and regulated entities that can lead to dysfunctional outcomes in situations of mutual distrust.

Interesting policy issues arise when a municipality has a very poorly functioning public water authority with poor prospects for reform, but also no effective regulatory body currently operating or able to operate in the short term. Water and sewer services are natural monopolies and are likely to remain so. This is in contrast to other sectors, such as electricity generation and telecommunication services, where the underlying technologies are changing and making the market more “contestable,” and where, as a consequence, permitting a (temporary) monopoly to function unregulated might well produce an outcome superior to that of an inefficient public provider (see Bradburd 1995). The natural monopoly characteristic of water and sewer services, in combination with issues of public safety and environmental externalities, make them poor candidates for unregulated operation.

The above factors might seem to suggest that some regulation, even if imperfect, is better than none. But caution is necessary here. In the absence of institutional safeguards, the power to regulate is the power to expropriate, and if regulatory power is wielded in this manner early on in the process of involving the pri-

vate sector, future private sector participation, with all the advantages it may offer for efficiency and nongovernmental sources of funding, may be jeopardized. In this situation, regulation by contract may be the best option until regulatory capabilities, both in terms of personnel and appropriate social institutions, are in place.

If the decision is made to regulate by means of a regulatory agency rather than by means of contracts, the regulating entity's powers must be carefully delimited. The purpose of commercializing water and sewerage service is to take advantage of market-based incentives for efficiency in operations and investment, while not abandoning water quality and quality of service objectives. If regulators attempt to recapture all the profits that accrue from superior performance, the incentive to participate and perform well is undercut. Similarly, attempts to implement regulatory micromanagement of water utilities are likely to prove counterproductive both in the short and long run. The regulatory approaches of Argentina and Chile are instructive here. The Argentinean regulatory perspective has been characterized as being fundamentally suspicious of business motives. There, access to private funding rather than the advantages of market-based incentives seems to have been the rationale for permitting private sector involvement in water and sanitation services. The Argentinean regulatory approach, which significantly circumscribes managerial autonomy, reflects the underlying lack of trust in business behavior. This approach is not likely to be effective in the long run. In contrast to this, Chilean regulators have adopted the view that firms, given appropriate incentives to guide their behavior, will function in a manner consistent with the public interest. Decisionmaking is left in the hands of management. To date, the Chilean model seems to be functioning quite well; nevertheless, possible adjustments to the legal framework are being studied as a prerequisite to full privatization.

Regulatory regimes, once established, tend to become resistant to change. This regulatory rigidity derives from several sources, including government reluctance to change the rules, for fear that doing so might harm its reputation for making credible commitments to the private sector. Private entities may be reluctant to see change in systems under which they receive economic rents, and regulatory personnel may resist changes that would reduce the value of their experience-based human capital.³²

Given the forces that promote regulatory rigidity, and given that the optimal form of regulation at any moment depends upon parameters whose values are likely to change with economic growth, it would appear wise to avoid creating regulatory systems that are elaborate and complex. The lighter the regulatory touch, and the more transparent the system, the easier it will be to change when it is nec-

essary to do so. Similarly, policies that have built-in mechanisms that encourage growth of regulatory agencies are likely to create regulatory inefficiency and inflexibility in the long run. In Buenos Aires, for example, the regulatory agency is funded in effect by a surtax on consumers' bills that is set at 2.7 percent of total water billings (Idelovitch and Ringskog 1995). Not only does this represent an extremely high financial burden, but it also sets the stage for development of a bloated regulatory bureaucracy.

Clearly, one of the great policy challenges is to find ways to adapt the Buenos Aires-type concession model so that the administrative complexity and burden of that model is reduced. This may involve permitting greater managerial autonomy as well as making use, at least during the short run, of external administrative and technical auditing expertise.

Issue 4: Will PSP Reduce Demand for Labor?

In many countries, organized labor is a potent force opposing greater involvement of the private sector in public utilities, with the argument being that "privatization will mean fewer jobs." The Buenos Aires case provides some interesting insights into the dynamics of labor in a reforming utility.

As discussed earlier, OSN's workforce of about 7,500 in the preconcession period was trimmed to 4,000 by the combined efforts of the public water authority and the concessionaire. This was accomplished by two retirement buyout programs, one prior to, and one following, the concessionaire's taking over operations. Both programs were voluntary, which clearly reduced opposition to, and frictions associated with, reductions in staffing. Although use of the retirement buyout option was facilitated in the Buenos Aires case by the high proportion of workers over the age of 50 (roughly 30 percent),³³ the Argentinean example suggests that labor buyout programs can be usefully applied elsewhere.

Another instructive aspect of the Buenos Aires transition from a public water authority to a concession is that the reduction in the within-company workforce has been more than offset by the large number of jobs created by the increase (from US\$10 million a year to US\$125 million a year!) in the water utility's investment program. The concessionaire estimates that over 8,000 jobs have been created via contracts in the process, far more than were lost through staff reductions. Those public-owned water authorities that are most inefficient will require the largest staff reductions to reach acceptable norms of operating efficiency; however, these are likely to be the very companies who will need the greatest expansion of invest-

ment for expansion, improvement, and maintenance of infrastructure in the postreform period, with the attendant need for labor.

Workers losing positions due to operating staff reductions may not have the skills to benefit from increases in new employment opportunities. Worker retraining programs may be a useful option here. In any event, provided that financing can be found, buyout programs that lead to a significant decrease in the present value of personnel expenses, or that overcome political resistance to reform, may be a sound investment. (For this reason, the World Bank, which previously would not finance labor-reducing programs, will now consider doing so.)

Issue 5: How to Secure Reliable Bulk Water Supplies and Improve Environmental Quality

Securing reliable bulk water supplies and reducing degradation of surface water and underground aquifers is a critical task for Latin American countries. As indicated earlier, the "water and sanitation agenda" is not just an agenda of the provision of household services, but also one of management of water resources in an environmentally and financially sustainable way. This is a task that few industrialized countries have successfully met, even with the comparatively great financial resources at their disposal.³⁴

Treating water as an economic good, and taking advantage of the policy options that this suggests, can reduce the financial burden of sustainably meeting water needs. In recent years a number of arid countries and regions have made major advances in the use of water markets to facilitate the voluntary transfer of water from low-valued uses (typically agricultural) to higher-valued uses (mostly urban and industrial water supply, but also high-value agriculture and environmental purposes). A wide variety of types of markets has emerged, ranging from the successful single-season water bank of California (Howitt et al. 1992) to the permanent transfer of rights, as in Australia. In Latin America, the longest and most interesting experience with formal water markets is in Chile, where, since 1981, water rights have been separated from land rights and can be traded. Major issues still need to be addressed in the Chilean water rights system (particularly the interactions between consumptive and nonconsumptive rights, and the need for a market-friendly river basin management system). From the perspective of urban utilities in Chile, however, the water markets have been a great success. They enable cities to both lease and purchase water rights from nearby farmers (who make a handsome profit), rather than having to incur the (much higher) costs of developing new sources (Briscoe 1995 and Pena 1996).

Along with efficiency effects, water-market policies have a distributional equity impact to which policymakers must be attentive. We have argued above that the "social tariff" approach failed to deliver adequate services to the poor, and that commercialization of water and sanitization services may not exacerbate, and may actually reduce, inequality.³⁵ Nevertheless, as Carter and Coles argue in Chapter 6, establishing property rights and market-friendly institutions, and allowing laissez-faire functioning of those markets may work to the disadvantage of the poor in markets where significant information and capital market imperfections remain. Three comments on the Chilean experience are in order. First, water rights were relatively well-distributed because of an earlier land reform in Chile. Second, tradable water rights have contributed to the growth of agricultural production and thus of employment. Third, there was insufficient effort to ensure that indigenous people registered their traditional water rights, a problem that is now being redressed. Thus it may be important to search for inequality-reducing policies within the context of market-oriented approaches. One approach might be to undertake institutional reforms that would improve poor and low-income families' ability to benefit from marketization of water. For example, establishing poor families' titles to their homes, as suggested by Hernando de Soto (1997), would improve their access to credit markets and reduce the capital-market-access advantage of large landowners when water rights are marketed.

A second potential strategy is "water reform," which in the context of marketized water could affect income inequality in much the same way as land reform. The effect of this could be significant: water is already a scarce commodity in some areas and is likely to become increasingly so over a wider geographic area in the future. At this point, before clear property rights have been established and water fully marketized, there is a unique opportunity to engage in water rights redistribution. First, water reform can be presented as part of a package from which upper-income families will gain; and second, resistance to redistribution will only increase over time, as growing water scarcity elevates the scarcity rents associated with that resource.

Establishing water markets is only one of many policies that can be pursued to improve water resource allocation. The size and complexity of the challenge suggests that the full range of options be explored. One example of the promising developments is the implementation of French-type river basin management in southeast Brazil (Rio Doce, Paraíba do Sul). The core of this approach is to have all stakeholders participate in setting policies, and to ensure that they weigh costs and quality simultaneously.

Conclusion

Marketization of water and private sector participation are important, but are not a panacea. Ensuring a safe, secure and sustainable water supply in Latin America—where currently only a very small proportion of the sewage is collected and treated—will ultimately require a huge financial investment, and market-oriented policies alone will not alter that fact. For example, in Santiago, Chile at present, only 2 percent of sewage is treated. To achieve total (100 percent) coverage, EMOS has estimated that an investment of about US\$600 million will be required in the next 10 to 15 years. And Brazil's Tietê clean-up project has an estimated bill of \$1,500 million. Clearly, many countries will be hard-pressed to find the resources required to achieve this very important part of the policy agenda.

Private sector participation and commercialization of public water authorities can certainly help to address Latin America's need for safe and reliable water. Also required will be institutional changes that encourage the development of water markets; better-targeted water subsidy schemes; and community involvement and outreach/educational programs. There are still other mechanisms to promote efficient development and use of water resources, such as development of BOTs and other innovative initiatives. But none of these initiatives will provide a free lunch, or, more to the point, a free drink. Whatever approach is ultimately adopted, the costs will be very large. Unfortunately, the costs of *not* meeting sustainable water use objectives are even greater.

Endnotes

¹ The natural monopoly condition is strongest in distribution of water and collection of household wastes, rather than collection of water (either from surface sources or underground aquifers) or water treatment. However, legal, administrative and contracting costs render even the latter activities substantially less than fully competitive. If legal institutions can be developed to reduce the contracting costs associated with multiple participants in water supply and waste removal and treatment, these markets may become open to competition "in the market" as opposed to just "for the market."

² World Bank Water Demand Research Team 1993, p. 48.

³ In Cartagena, Colombia, for example, the public utility providing water and sewerage had made no investments in the 11 years prior to its turning operations over to the private sector (Rivera 1996, p. 23).

⁴ In addition, the inadequate sanitation infrastructure, due in part to utilities' financial pressures resulting from the social tariff approach, has had environmental impacts that were particularly harmful for the poor. This is because untreated wastewater (from both residential and industrial sources) frequently is shunted away from higher-priced land around high-income areas and directed to low-value land, where the poor are likely to reside.

⁵ See Chapter 2 for a discussion of income inequality in Latin America.

⁶ This is another example of the costs of income inequality. Absent such inequality, pressures to provide subsidized services—the benefits of which often go largely to the nonpoor—would be easier for governments to resist.

⁷ This outcome is not surprising. Once any group is designated by the government as "deserving" some preferential treatment, another group may claim that its presubsidy circumstances were not materially different from the designated "deserving" group (a horizontal equity argument), or that the postsubsidy welfare rankings differ unfairly from the presubsidy rankings, leading to pressures to extend the subsidies (Owen and Braeutigam 1978). The political connections and strategic political importance of the middle- and upper-income groups can lead to subsidies being extended eventually to all consumers. In the absence of metering, possibilities for arbitrage may also complicate efforts to price-discriminate in favor of the poor in providing water services.

⁸ See Chapter 4 for evidence on the extent of macroeconomic volatility in Latin American countries. This volatility, and the pressures it put on government budgets, made it impractical to rely on large government general-revenue subsidies to operate and expand water and sewerage systems.

⁹ See the International Conference on Water and the Environment 1992: The Dublin Statement and Report of the Conference, World Meteorological Organization, Geneva.

¹⁰ The "subsidiarity" principle also implies that the government and public enterprise utilities should reserve for themselves only the functions that are not of private sector interest.

¹¹ A recent World Bank multicountry study (World Bank Water Demand Research Team 1993) has developed an effective method for assessing the demand for improved water services. The study included three sites in Latin America: Haiti (Whittington et al. 1990) and northeast and southeast Brazil (Briscoe et al. 1990). This study confirmed some broad hypotheses: willingness to pay was systematically related to the socioeconomic situation of the family, and to the relative attractiveness—distance, quality and reliability—of the new and existing supplies. In performing this marketing task, it is essential that women be adequately represented in the community liaison group, both in numbers and in opportunities to freely express their views. Because of traditional household labor division, the costs of inadequate or inconvenient water supplies often fall on female household members. See Rathberger (1995) and Zwartveen (1995) for a discussion of this issue in the African context.

¹² Underestimating the limits of affordability and the price elasticity of demand can wreak havoc with commercialization efforts. In Conakry, Guinea, a lease contract for water supply resulted in greatly expanded (public) investment in water supply infrastructure. That increased the quality of water available and the number of connections, as well as raising the proportion of *metered* household connections from 5 percent to 95 percent. To cover costs, the price of piped water was raised from 24 cents per cubic meter in 1989 to 90 cents in 1995. This proved too high for such a low-income area: almost a third of all connections are now inactive because of nonpayment, and financial losses are large (Rivera 1996).

¹³ See Alfaro (1996a).

¹⁴ Note the similarities here to the Birdsall and Londoño “horizontal model” of social service provision (Chapter 5). In particular, they emphasize the impact of transforming social service recipients into consumers, whose consumption decisions provide producers the incentives and information that are the basis of efficient allocation in market-based systems.

¹⁵ Here is another area where sensitivity to affordability, service level, and price may have a payoff. In low-income countries, where targeted subsidies to the poor may not be an option, an alternative may be to offer a menu of service/price packages. The offered packages can be structured so that consumers with different income levels “self-select” into the option intended for them, with little leakage due to well-off consumers choosing the package intended for the poor. See Srinagesh and Bradburd (1989).

¹⁶ Subsidies are also provided for health, housing and education services.

¹⁷ It could have an *indirect* impact, because total household expenditures on water are influenced by the level of the water subsidy. The impact would presumably be smaller if subsidies are reduced as a result of reductions in poverty. Studies indicate income elasticities of demand for water consumption of between .1 and .5 and price elasticities for residential consumers in the range of -.3 to -.6 (Rivera 1996, citing Cestti, Yepes and Dianderas 1996).

¹⁸ In Cancún, Mexico, water tariffs become very high at consumption levels above 15,000 cubic meters per month, and some hotels are investigating the possibility of disconnecting from the system and obtaining water from desalinization plants (Rivera 1996).

¹⁹ Externalities loom large here. The costs of nonprovision of sewerage services to an individual family, depending on topography and hydrology, may not be that large; the costs to families, as a community, of inadequate sewerage are high.

²⁰ EMOS in 1993 had about two employees per 1,000 water connections. Taking into account contractors' personnel, the figure is still below three.

²¹ By appeasement pricing, we mean extending subsidized prices to middle- and upper-income groups.

²² The social tariff is not the only causal factor here: inefficiency has played a large role as well. If water utilities in Latin America were operating on the efficiency frontier, current tariffs would cover a much higher percentage of operating costs. We discuss this issue further below.

²³ See Alfaro (1996b).

²⁴ See *World Development Report 1994: Infrastructure for Development* (Washington, D.C.: World Bank, 1994, p. 37) for a more detailed discussion of this issue.

²⁵ See Idelovitch and Ringskog (1995) for a more complete discussion of concession arrangements, as well as other forms of private sector participation such as BOT, BOOT, reverse BOOT, and joint ownership arrangements.

²⁶ This section draws heavily on Idelovitch and Ringskog (1995).

²⁷ This is an example of how the "social good" characteristic of water may have led to well-intentioned policies that thwarted efficient functioning of a market for water, ultimately working to the detriment of the poor whom the policies were presumably intended to protect.

²⁸ Rodrik and Zeckhauser (1988) discuss sovereign government's difficulty in making credible commitments not to "change the rules of the game." Multilaterals' involvement in the project facilitates the government making such a credible commitment.

²⁹ By the same token, if political shifts cause frequent abrogation of contracts, the viability of private-financed investment in water and sewerage sanitation is likely to be threatened. Problems of this sort have arisen in Tucuman Province, Argentina and Puerto Vallarta, Mexico. Indeed, in Caracas, Venezuela, private investors have been discouraged from bidding for concessions because they lacked faith in the political commitment to the process of private participation (Rivera 1996).

³⁰ Only in rare cases—Santiago is one—has there been an explicit regulatory framework for public sector utilities in a developing country context.

³¹ It should be noted in this context that "hit-and-run" behavior on the part of firms is encouraged when property rights are not secure. Presumably the institutional changes occurring in Latin America will serve to discourage opportunistic behavior on the part of private business entities.

³² See Bradburd (1996) for a more detailed discussion of the roots and consequences of regulatory rigidity.

³³ See de Yeregui (1996) for greater detail on this issue.

³⁴ The approach in industrialized countries has generally been to "set the standards and then think about raising the money." The shortcomings are apparent in Europe (where it will take Germany, at current investment levels, over 40 years to meet current EU wastewater standards) and in the United States, where the "unfunded mandates" debate has become a major one.

³⁵ A similar argument is articulated in Chapter 9 by Estelle James. James argues that reforms of traditional social security systems do not necessarily entail a sacrifice in equity in pursuit of efficiency, largely because the traditional systems were less equity-oriented than the public perceived them to be.

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