WATER SUPPLY AND SANITATION SECTOR BOARD DISCUSSION PAPER SERIES

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Ten Years of Water Service Reform in Latin America: Toward an Anglo-French Model

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THE WORLD BANK GROUP

Water Supply & Sanitation Sector Board

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Vivien Foster is currently a Senior Economist with the Infrastructure, Economics and Finance Department of the World Bank in Washington DC. However, the material for this paper was compiled during her time as a managing Consultant with Oxford Economic Research Associates Ltd. in the United Kingdom.

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1 INTRODUCTION

During the 1990s, most countries in the Latin American region[1] undertook major reforms of their water supply industries. Chile was the first to attempt to modernize its water sector with new legislation passed as early as 1988. By 1991, both Argentina and Mexico were beginning to conduct a series of experiments with private sector participation (PSP). In a second wave, Peru, Colombia, and Bolivia enacted ambitious new legislation in the mid-1990s, and during the second half of the decade, reform began to take root in Brazil and Central America. By the end of the 1990s, nearly all countries had completed reforms, had major reforms in process, or were actively considering reforms. (See Table 1 for a country-by-country overview.)

Table 1: Regional Overview of Reform

	Regulation	PSP
Chile	100%[2]	86%
Argentina	88%	62%
Bolivia	100%	28%
Colombia	100%	13%
Ecuador	25%	25%
Mexico	19%	19%
Uruguay	17%	17%
Honduras	16%	16%
Brazil	24%	1%
Peru	100%	0%
Nicaragua	100%	0%
Panama	100%	0%
Paraguay	100%	0%
Costa Rica	100%	0%
Venezuela	3%	3%
El Salvador	0%	0%
Guatemala	0%	0%

Legend:
Dark blue – Major progress has been made.
Medium blue – Some progress has been made.
Light blue – In process or actively being considered.
Source: **Own elaboration.**

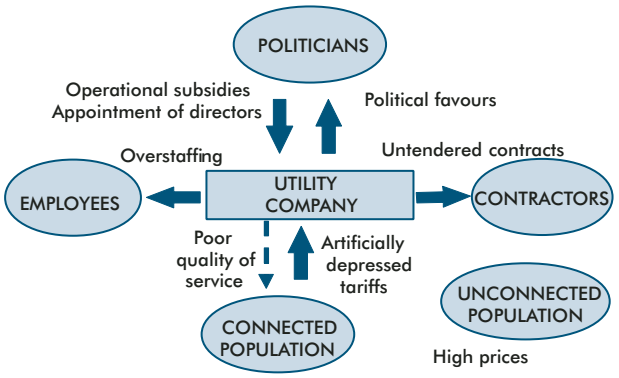
However, while the breadth of the reform process in Latin America is impressive, the depth of reform varies substantially across countries and unquestionably falls far short of what has been achieved contemporaneously in other infrastructure sectors (notably, electricity and telecommunications). More specifically, *regulatory reform in Latin America has gone significantly further than private sector participation* (PSP). Indeed, in some countries (for example, Panama, Peru, and, until recently, Chile), regulation has been introduced without privatization; in others (such as Bolivia and Colombia), regulatory reform has been nationwide, yet privatization has been confined to metropolitan areas or a handful of major provincial centers. Overall, it is estimated that although 41 percent of urban water consumers now enjoy regulatory protection, only 15 percent are serviced by private sector operators.

This widespread willingness to embrace reform was in large measure motivated by dissatisfaction with the traditional "clientilist" model of water service provision (Figure 1), according to which state-owned water companies were more often being treated as part of the political apparatus than allowed to function as efficient service providers. Politicians exerted their control over the sector through the appointment (and dismissal) of water company directors and by providing public subsidies to finance investments and to prop up ailing enterprises. In return for this

1 For the current purposes, "the Latin American region" is defined as all mainland Spanish- and Portuguese-speaking countries south of the Rio Grande River (that is, those countries listed in Table 1).
2 The percentage numbers refer to the percentage of the urban population that enjoys regulatory protection and receives its service directly from a private sector operator (excluding BOT projects).

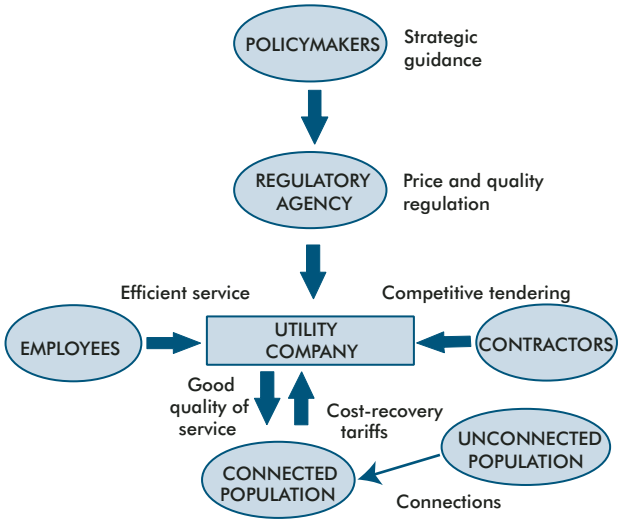
patronage, water companies were often obliged to supply political favors in the form of overemployment, artificially depressed tariffs, political targeting of new investments, and distribution of contracts based on political rather than economic criteria. The consequences of this regime have been spiraling costs, low quality of service, and precarious finances, while the scarcity of resources for investment has left substantial sections of the population unserved and therefore forced to rely on a range of expensive or inconvenient substitutes.

Figure 1: The "Clientilist" Model of Water Provision



Source: Own elaboration.

Figure 2: The Reformed Model of Water Provision



Source: Own elaboration.

The reform process aims to break this pattern by addressing the underlying institutional causes. Hence, a key feature of the reform blueprint (Figure 2) is the separation of the functions of policymaker, regulator, and service provider, which tend to be blurred under "clientilism." In the new model, politicians are confined to supplying strategic guidance to the sector. A regulatory agency is introduced with a view to insulating the utility company from political interference and requiring that its business be conducted in line with sound operational and financial principles. The regulator sets tariffs at a level that allows the company to recover the efficient costs of operation, as well as a reasonable rate of return, while at the same time monitoring the achievement of quality and coverage targets. The actual operation of water services is delegated either to the private sector or to a strongly corporatized public company.

The purpose of this chapter is to provide a synthesis and evaluation of the reform experience in the Latin American water supply industry during the eventful decade of the 1990s. To make the exercise tractable, the bulk of the discussion will focus on a "panel" of six countries—Argentina, Bolivia, Chile, Colombia, Panama, and Peru—chosen to represent a variety of approaches to the reform process. A comparative analysis of the reform in these six countries will be complemented by use of more detailed examples and case material. The chapter will consider three major components of reform in Latin America: (a) the extent to which the water industry has been restructured and companies have been subject to institutional transformation, (b) the ways in which different countries have redefined the role of the state by separating out the functions of policymaker and regulator, and (c) the sorts of instruments that regulators in Latin America have developed to support the day-to-day functioning of the regulatory process.

2 SECTOR RESTRUCTURING; OR THE BALKANIZATION OF WATER

For reform to be successful, there must be an underlying coherence between the form of regulation and the institutional nature of the regulated entities. This need for coherence manifests itself at two distinct levels. First, the political and geographical jurisdiction of the regulator must be compatible with that of the service providers. Second, the choice of regulatory instruments must be suitably adapted to the managerial incentives of the water operators.

As this section will illustrate, a number of Latin American countries have embarked upon reforms that lack this kind of overall coherence. Thus, in some cases, there have been radical decentralization and municipalization of service provision, accompanied by simultaneous moves to impose regulation and private sector participation from the center. In a number of other cases, there have been attempts to apply British-style incentive regulation—premised on the existence of the profit motive—to state-owned enterprises that ostensibly lack this kind of motivation.

2.1 Sector Structure

It is helpful to distinguish among three models of water industry organization: the national monopoly; the regional monopoly (based on political boundaries such as states or provinces or on hydrographic boundaries such as a water basin); and the local (typically municipal) monopoly (Table 2).

Prior to 1990, many Latin American countries (for example, Argentina, Chile, Colombia, Panama, and Peru) had chosen to organize their water industries as national monopolies under the direct control of the central government. Growing dissatisfaction with the performance of the national monopolies, combined with wider political pressure for devolution across all areas of government, created the conditions for a move toward decentralized control in the 1980s and 1990s. In countries such as Argentina, Colombia, and Peru, this entailed a sudden fragmentation of the industry into literally hundreds of small municipal providers (Table 2).

Table 2: Overview of Decentralization

	National	Regional	Municipal
Argentina	OSN (1912)	1,488 providers*	
Bolivia			Municipal bodies
Chile	SENDOS (1977)	13 companies (1990)	
Colombia	INSFOPAL (1950)		1,380 providers (1989)
Panama	IDAAN (1961)		
Peru	SENAPA (1981)		136 municipal bodies

*Of which 14 are provincial, 462 municipal, 990 cooperative, and 22 private.
Source: Own elaboration.

It is important to emphasize that, on the whole, decentralization was not a studied response to the specific problems of the water sector, but rather the byproduct of a wider reform of the state. Indeed, in a number of cases, decentralization preceded subsequent water sector reform by a number of years. This lack of synchronicity between structural and regulatory reform was unfortunate because it meant that regulatory reform had to be superimposed on an industry structure that was often far from optimal in the economic sense. In many cases, it was difficult to contemplate subsequent restructuring because of the foregoing political commitment to municipalization, which in some countries (notably, Colombia and Brazil) was even enshrined at the constitutional level (World Bank 2001a, World Bank 2001b).

A number of problems have consequently arisen. The first of these is the loss of scale economies. Work by Yepes (1990) suggests that the minimum efficient scale for water companies in Latin America is 100,000 connections. Aside from technological economies, the scarcity of human

resources may also make it undesirable to dilute technical capacity across a large number of service providers. Related to this is the questionable commercial viability of many of the small business units created (many of them serving low-income rural communities), which in turn leads to difficulties in attracting private sector investment (except to the largest population centers).

Finally, municipal control of the sector has made it difficult to subsequently drive regulation and PSP from the center. For political reasons, municipalities may be unwilling to relinquish their recently regained control of service provision to the private sector or to accept tariff rulings from a national regulator. Hence, in Peru, the regulator's power is limited to designing tariff rules and proposing tariff levels, while ultimate approval of tariffs must come from the municipalities (which are typically also the service providers). In Bolivia, owing to political pressure, the 1999 Water Law had to be modified within a few months of its promulgation to give municipalities (which are once again the service providers, by and large) a say in the process of tariff setting. These kinds of arrangements seriously risk undermining the basic principle of institutional separation between regulator and service provider. Even in the absence of opposition, the sheer fragmentation of a decentralized sector can paralyze the efforts of a central regulator. The most extreme example is Colombia, where the national regulator simply lacks the resources to monitor the operations of 1,380 municipal service providers.

One possible solution is to organize regulation at the provincial level, such as in Argentina, where 14 out of 23 provinces have created their own regulatory agency plus there is an additional one in the federal capital. While this is a valid approach, its cost-effectiveness hinges on the size of the states or provinces involved, because many of the costs of regulation are fixed in nature, generating significant scale economies. This effect is visible in Argentina, where provincial regulation absorbs up to 6 percent of industry turnover, compared with around 2 percent for many national-level regulators. However, state-level regulation is probably ideal for a country such as Brazil, where individual states may be more populous than those in many other Latin American countries (World Bank 2001a, World Bank 2001b).

Another approach to the problem is to try to promote ex post industry consolidation. For example, the 1999 Bolivian Water Law encourages *mancomunidad* (the creation of multi-municipal companies). Brazil offers a few examples of multi-municipal concession contracts, while a similar arrangement is currently under consideration in El Salvador. In Colombia, companies were legally required to prepare a study of financial viability and the regulator empowered to merge companies that were demonstrably not viable. However, in practice, the regulator did not take advantage of this opportunity for industry consolidation. Companies serving fewer than 8,000 customers (that is, those least likely to be viable) were exempted from the requirement to undertake the study of financial viability, and only those companies finding themselves nonviable were required to submit their conclusions to the regulator. It is hardly surprising, then, that only one company did so.

As noted above, municipalization is not the only possible response to dissatisfaction with monolithic national providers. In this respect, Chile provides an interesting and important exception to the pattern hitherto described. First, because the restructuring of the water industry in that country was undertaken as an integral part of the water sector reform process, rather than as part of a general thrust toward decentralization. Second, because the decentralization of the sector was limited to the regional rather than the municipal level; with the creation of 13 companies, most of which grew out of the pre-existing 11 regional directorates of the former national monopoly SENDOS. As a result, Chile has been able to avoid many of the difficulties described above.

Brazil is the only other country where state-level water companies are important, servicing about 80 percent of the population. However, these companies did not arise from the fragmentation of any national monopoly; rather, they were created as a result of voluntary agreements with municipalities that temporarily ceded their constitutional right of service provision to the state authorities in return for an attractive investment financing package under the PLANASA program. (In this sense, there is a parallel with England and Wales, where 11 regional water companies were created from the amalgamation of hundreds of municipal service providers in 1974.) However, the recent expiry of the PLANASA agreements has left a great deal of legal ambiguity regarding state versus municipal responsibility for the provision of water services, particularly in metropolitan areas (World Bank 2001a, World Bank 2001b), and is already leading to industrial fragmentation.

2.2 Private Sector Participation

Service providers can be organized according to a variety of institutional forms (Table 3). Prior to 1990, Latin American water utilities were almost universally state-owned, with varying degrees of corporatization. Moreover, in Argentina and Bolivia, cooperatives have also played a significant role.

Table 3: Models of Institutional Organization

	Ownership	Control
Direct provision	State	
Corporatization	State	Public corporation
PSP contracts	State	Private corporation
Mixed enterprise	State and private investors	Private corporation
Private enterprise	Private corporation	
Cooperative	Customers	

Source: Own elaboration.

The institutional form of the operator is important because it affects the incentives faced by managers. In particular, public sector managers will tend to be influenced by political pressures, although this will depend on the degree of corporatization. Corporatization strengthens the political autonomy of a publicly owned enterprise by making it increasingly self-sufficient financially (depending directly on tariff revenues, rather than on state subsidies) and introducing rules that protect directors and senior managers from being removed on political whim.

On the other hand, private sector managers—being motivated by profit—are more likely to be concerned with expanding sales revenues and reducing costs. Thus, in some respects, private operators are more easily regulated than public operators because it is possible to design regulatory instruments that make it financially attractive for a company to act in the interests of the consumer. Two key examples are the "price cap," which provides an incentive for managers to drive down costs, even in the absence of competition, and the use of fines to punish noncompliance with performance targets.

Water sector reform processes in Latin America have universally recognized the need to effect some kind of institutional transformation; however, private sector participation has proved difficult to implement. In larger urban centers, this is primarily for political reasons, while in smaller cities and rural areas, there is the additional problem of commercial viability. A common pattern is for

PSP to take place in the metropolitan area, preceded, followed, or both by a handful of provincial capitals (Table 4).

Table 4: Overview of PSP by Country

	Metropolitan	Interior
Argentina	Greater Buenos Aires (1993)	Since 1991, in 11 out of 23 provinces
Bolivia	La Paz (1997)	Cochabamba (in 1999, rescinded in 2000)
Chile	Santiago (1999)	Since 1998, companies serving Regions V, VI, and X
Colombia	—	Since 1991, Barranquilla, Cartagena, and 20 small towns
Panama	Panama City (suspended in 1999)	—
Peru	Lima (indefinitely postponed in 1995)	—

Source: Own elaboration.

Where PSP has proved possible, the concession contract has proved to be the most popular vehicle (Table 5). However, service contracts and management contracts have sometimes been used as first steps toward a concession. At the same time, Colombia has created a number of "mixed enterprises," and more recently Chile has divested four of its regional water companies. A number of countries have also used Build, Operate, Transport (BOT) instruments to finance the construction of water and wastewater treatment plants. Indeed to date, the lease contract (*affermage*) is the only modality for PSP that remains completely untested in Latin America.

Table 5: Overview of PSP in Latin America by Modality

	Service Contracts	Management Contracts	Lease Contracts	Concession Contracts	BOT Contracts	Divestments
Argentina				✔		
Bolivia				✔		
Brazil		✔		✔	✔	✔
Chile	✔				✔	✔
Colombia		✔		✔	✔	✔
Mexico	✔	✔		✔	✔	
Panama				(✔)	✔	
Peru	✔					
Uruguay				✔		
Venezuela		✔		(✔)		

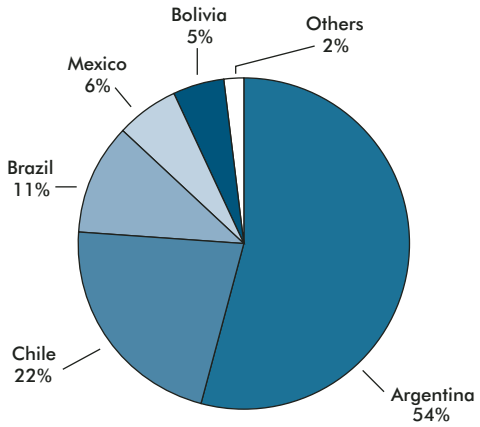
Legend: ✔= successfully undertaken; (✔) = unsuccessfully attempted.
Source: Own elaboration.

There have also been a considerable number of suspended or failed PSPs. For example, the attempt to award a concession for the city of Caracas in 1992 failed to attract a single financial bid, and in both Lima (Peru) and Panama City, bidding processes were suspended at the last moment because of political opposition. On two other occasions—in Tucuman (Argentina) and Cochabamba (Bolivia)—concession contracts had to be canceled after a relatively short period of operation. In both cases, the immediate cause was public opposition to the substantial tariff hikes

following the award of the concession, while the underlying cause was the large scale of the investment program required under the concession contract.

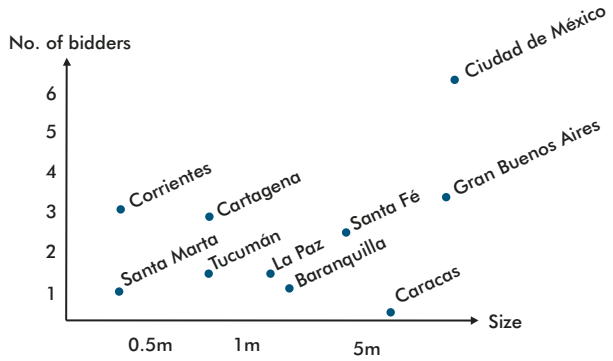
PSP transactions attracted a total US$14.7 billion of private investment in the Latin American water sector over the period 1990–99, equivalent to about half of total private sector investment in developing countries over the same period of time. However, these capital flows are highly concentrated in a small number of countries (Figure 3), with more than half going to Argentina. Nevertheless, it is noteworthy that a country as small as Bolivia, with a relatively high-risk rating, has been able to attract almost as much private investment as Mexico.

Figure 3: Distribution of Private Investment



Source: Based on World Bank PPI Database.

Figure 4: Degree of Competition for PSP Contracts



Source: Own elaboration.

The degree of competition for these transactions, as measured by the number of bidders, has been fairly limited. Figure 4 plots the number of bidders against the population of the city for a number of concession contracts bid during the 1990s. The record number of bidders for a Latin American water contract was six (in the case of Mexico City); otherwise, there appears to be the maximum number, and about half of the contracts considered attracted only one bidder (Barranquilla, Cochabamba, La Paz, Santa Marta, Tucuman).

Not only has the number of bidders for Latin American water contracts been comparatively small, but they have always tended to come from the same handful of predominantly French (and, to a lesser extent, Spanish and English) companies. Thus, the three most significant investors in the region are Suez Lyonnaise des Eaux, Aguas de Barcelona, and Vivendi (formerly Compagnie Générale des Eaux). For example, of the 20.2 million urban water consumers in Argentina served by private sector operators, about two-thirds receive their water from consortia headed by Suez Lyonnaise des Eaux.[3]

Despite the considerable amount of PSP in the Latin American region, it is important to recall that by the close of the 1990s, still only 14.8 percent of the urban population received water services from an operator under private sector control.[4] If one excludes Brazil and Mexico—the two largest countries in the region, where progress toward PSP has been relatively modest—the proportion rises to 25.1 percent, and if one takes into account failed and attempted privatizations, the proportion rises further to 33.5 percent. Nonetheless, these percentages are much lower than those for the number of urban water consumers affected by regulatory reform, which was 40.9 percent region-wide and rising to 66.9 percent if Brazil and Mexico are excluded. The relatively limited scope of PSP has not been for lack of available urban centers; as illustrated by Table 6, the vast majority of Latin American cities across all size ranges remain under public sector service provision.

3 Specifically, consumers covered by the contracts for Greater Buenos Aires, Cordoba, and Santa Fe.
4 Private sector control is here defined to be a management contract, a concession contract, or a privately owned company. Service contracts and BOTs are excluded because they entail private contracting for upstream services and do not give overall control of operations to the private sector.

Table 6: Overview of PSP in Latin America by Size of City

	Population Range (millions)			
	>5	1–5	0.5–1	0.1–0.5
Cities affected by PSP	3	4	12	71
Cities not affected by PSP	4	30	36	399
Total number of cities	7	34	48	470
Percentage of cities affected by PSP	42.9	11.8	24.0	15.1

Source: Own elaboration.

The difficulties associated with private sector participation have prompted many countries to embrace corporatization as a 'second-best' solution or (in the case of Chile) as an initial step in a slower-paced privatization process. In Bolivia and Colombia, corporatization of water utilities is required by law, while Peruvian law stipulates that operators in the larger urban areas must transform themselves into *sociedades anónimas* (that is, public limited companies).

Whether the service is provided by private or public corporations, most countries require operators to hold some sort of concession or license granted by the state. The authority that grants the concession differs across countries and may either be the executive branch (Argentina and Chile), the regulator (Bolivia), or the municipality (Peru). Such concessions invariably give the holder an exclusive right to operate in the designated area and moreover legally require consumers to connect to the network once it is made accessible to them. These measures have been justified in terms of the need to provide assurance to private investors that sunk investments in network expansion will yield the expected revenues; however, this comes at the cost of eliminating any competition.

An interesting exception is Colombia, where no concession is required to operate the service, and consequently there is no exclusivity. Theoretically, a rival company would be free to enter at any time, although in practice this has yet to happen. In Panama, users or potential entrants can apply to the regulator for a license to supply a sub-area of the incumbent's jurisdiction. These will be granted if the current service level is inadequate or the incumbent gives its approval. At the other end of the spectrum, in Buenos Aires (Argentina), exclusivity demands that new users actually close off previous alternative sources of supply (for example, personal wells).

3 REDEFINING THE ROLE OF THE STATE; OR THE QUEST FOR REGULATORY INDEPENDENCE

The two central functions of the state under the reformed model of the water sector are to define policy and to regulate the service providers. The precise allocation of responsibilities between policymaking and regulatory bodies remains an area of some ambiguity in Latin America. However, in principle, the policymaker should be responsible for the definition of long-term objectives for coverage and quality of the service, usually articulated in some kind of national plan. Furthermore, policy should define the broad strategy for meeting these objectives in terms of investment financing, subsidy requirements, and the appropriate role for the private sector.

Regulation, on the other hand, should be primarily concerned with ensuring that the chosen strategy is implemented. In many cases, the overarching function of the regulatory body is to

enforce the sectoral law. The more detailed functions typically ascribed to the regulatory body include monitoring compliance with the legal and contractual obligations placed upon operators, determining tariff levels, and resolving conflicts between regulated companies and their customers.

3.1 Institutional Framework

Both policymaking and regulation are rendered more complex by the convergence of three different areas of strategic concern in the water sector. First, there is the economic perspective of the sector as a key public service and a component of urban infrastructure. Second, in a developing-country context, provision of potable water and adequate sanitation has traditionally been viewed as a central public health concern. Third, more recently, the environmental dimension of the water and sanitation sector has begun to be recognized, with the concomitant need to regulate abstraction of water and discharge of effluent.

This multifaceted character of water typically means that several different ministries will have an interest in the sector (Table 7). While the health and environmental aspects of the sector are typically assigned to the corresponding ministries, the agent responsibility for the public service aspects of the sector varies considerably across countries. In some cases, the economic aspects are subsumed within the public health (Panama) or environmental (Venezuela) dimension. More commonly, however, these issues are the jurisdiction of a third ministry, be it public works (Argentina and Chile), economy (Colombia), or housing (Bolivia). Only in the case of Panama is a single institution (the Ministry of Health) responsible for all three aspects of policy, and even this is acknowledged in the relevant legislation as a stopgap measure while the necessary environmental institutions develop.

Table 7: Overview of Ministries Responsible for Policymaking

	Economic	Public Health	Environment
Argentina	Public Works	Health	Environment
Bolivia	Housing	Health	Environment
Chile	Public Works	Health	Public Works
Colombia	Economy	Health	Environment
Panama	Health	Health	Health
Peru	Presidency	Health	Agriculture

Source: Own elaboration.

At the regulatory level, there have been greater attempts to try to integrate these three different dimensions of social concern (Table 8). One practical explanation for this is that the development of separate agencies charged with implementing the public health and environmental policies of government lags behind the creation of agencies for economic regulation. For example, it is not unusual for the economic regulator to have some responsibility for monitoring the quality of drinking water, although this responsibility is sometimes shared with the Ministry of Health. In some cases, the economic regulator also monitors the quality of effluent discharged from sewers. However, the issuing of licenses for the abstraction of water is almost always handled separately by the environmental authorities.

The existence of multiple political interests in the sector calls for some degree of coordination, a fact that has not yet been widely recognized in the design of regulatory frameworks around the

Table 8: Overview of Regulatory Bodies

	Economic	Public Health	Environment
Argentina*	ETOSS		
Bolivia	SIRESE-SSB		SA
Chile	SSS		SSS (CONAM)
Colombia	CRA	SSPD	MINMA (CAR)
Panama	ERSP	ERSP (MINSA)	
Peru	SUNASS	SUNASS (MINSA)	CONAM (MINAG)

* Refers only to Greater Buenos Aires.
Note: CAR, Corporación Autónoma Regional; CONAM, Consejo Nacional del Medioambiente; CRA, Comisión Reguladora de Agua; ERSP, Ente Regulador de Servicios Públicos; ETOSS, Ente Tripartito de Obras y Servicios Sanitarios; MINAG, Ministerio de Agricultura; MINMA, Ministerio de Medio Ambiente; MINSA, Ministerio de Salud; SA, Superintendencia de Agua; SIRESE, Sistema de Regulación Sectorial; SSB, Superintendencia de Saneamiento Básico; SSPD, Superintendencia de Servicios Públicos Domiciliarios; SSS, Superintendencia de Servicios Sanitarios; SUNASS, Superintendencia Nacional de Servicios Sanitarios.
Source: Own elaboration.

region. In particular, policy decisions about suitable quality objectives for potable water and sewerage effluent can have major cost implications for water service providers and will need to be reflected in tariffs set by the economic regulator. The need to obtain abstraction licenses from the environmental regulator may represent a barrier to entry or service expansion. There is some evidence that these factors are increasingly being taken into account. In Colombia, the Minister of Environment has recently been incorporated in the commission responsible for economic regulation, where he sits alongside the Ministers of Health and Economy. In Bolivia, the economic regulator is required to coordinate with the natural resources regulator over the granting of concessions for service provision and water abstraction.

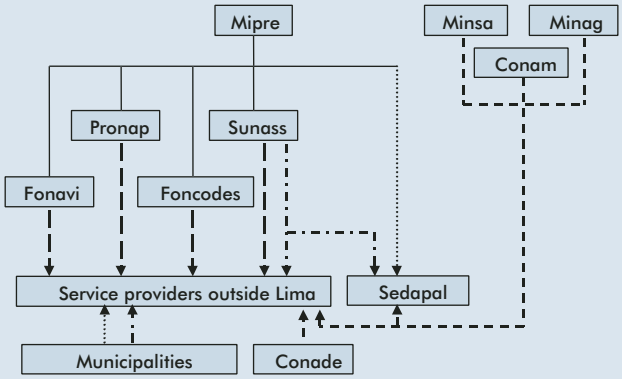
The institutional framework for the water sector in Peru is summarized below in Box 1.

3.2 Regulatory Structure

Perhaps the single most important consideration in designing a regulatory institution is that of maintaining an appropriate balance between independence and accountability. A certain degree of institutional independence is required if the regulator is to be able to function effectively as an arbitrator among the competing interests of the customers, the investors, and the state (Guasch and Spiller 1999). However, as a public entity, the regulatory agency must also be accountable for its decisions. All of the regulatory design issues to be considered below will contribute to the enhancement of either regulatory independence or accountability. For example, independence can be enhanced by means of financial autonomy and mechanisms to prevent day-to-day political interference in regulatory decisions. The accountability of the regulator will depend on the establishment of an effective appeals process and the creation of vehicles for consumer participation.

Regulation tends to be organized at the national level, except in federal states such as Argentina or Brazil (Table 9). The sectoral jurisdiction of the regulator varies substantially among countries. Only Panama has introduced truly cross-sectoral regulation, with responsibility for water, electricity, and telecommunications vested in a single agency (ERSP). Although Bolivia has created a cross-sectoral regulatory institution (SIRESE), in practice it operates as a loose association of single-sector regulators. In Colombia, the regulatory process is divided into two tiers; namely, the

Box 1: Institutional Framework for the Water Sector in Peru



The institutional framework for Peru illustrates just how complex the water sector can become, as well as the problems that can arise with the allocation of roles between governing bodies. For example, the municipalities are both owners and regulators of the municipal water companies, having the final say over tariff levels and participating in quality-of-service regulation. Also, MIPRE has the power to appoint and remove both the superintendent of the regulatory agency and the director of SEDAPAL (which is by far the largest of the regulated companies). In both cases, this introduces scope for political interference.

In addition, SUNASS has been charged with both regulating the sector and providing technical assistance to the regulated companies, two roles that are clearly incompatible. In practice, the highly fragmented and financially precarious circumstances of the service provider have meant that the role of provider of technical assistance has, in many cases, proved more appropriate than the role of regulator.

Notes:
(1) The framework described in Box 1 is as of the year 2000, as institutional arrangements were subsequently altered.
(2) The interpretation of the acronyms is as follows (in alphabetical order): CONADE (Consejo Nacional de Desarrollo); CONAM (Consejo Nacional de Medioambiente); FONAVI (Fondo Nacional de Vivienda); MINAG (Ministerio de Agricultura); MINSA (Ministerio de Salud); MIPRE (Ministerio de la Presidencia); PRONAP (Programa Nacional de Agua Potable); SEDAPAL (Servicio de Agua Potable de Lima); SUNASS (Superintendencia Nacional de Servicios Sanitarios).
Source: Own elaboration.

determination and the enforcement of regulatory rules. First-tier activities are the responsibility of a regulatory commission (CRA), while second-tier activities are undertaken by a multisector superintendency (SSPD) that enforces the dictates of the water, energy, and telecommunications commissions, as well as providing a one-stop shop for customer complaints. In some provinces of Argentina, water and electricity regulation are jointly undertaken. Elsewhere (Chile and Peru), water regulation is organized on a single-sector basis.

Regulatory agencies in Latin America typically report to a "parent ministry," rather than to the president or the legislature. The relationship with the parent ministry is probably at its closest in countries such as Chile and Peru where a single-sector regulatory body reports directly to the ministry responsible for policy formulation in the sector. In countries with cross-sectoral agencies (such as Bolivia and Panama), the ministry to which the agency reports is not necessarily the ministry charged with policy formulation for the water sector, thereby creating greater distance between policymaking and regulation.

A description of the cross-sectoral jurisdiction in Bolivia is given below in Box 2.

Table 9: Overview of Design of Regulatory Agency

	Institutional Locus	Geographical Jurisdiction	Sectoral Jurisdiction
Argentina	Under Ministry	Provincial	9 provinces: water only 6 provinces: water plus electricity
Bolivia	Under Ministry	National	Water, energy, telecoms, and transport
Chile	Under Ministry	National	Water only
Colombia	Under Ministry	National	Commission: water plus garbage superintendency: water, energy, telecoms
Panama		National	Water, electricity, telecoms
Peru	Under Ministry	National	Water only

Source: Own elaboration.

Box 2: Cross-Sectoral Jurisdiction in Bolivia

The Bolivian cross-sectoral regulatory agency, SIRESE, was originally designed to be a hybrid between single-sector and multisector regulation.

The benefits of single-sector regulation would be achieved through the creation of five sectoral superintendencies—for telecommunications, transport, electricity, hydrocarbons, and water—each with its associated staff of technical specialists. The sectoral superintendents have full decisionmaking autonomy in their respective jurisdictions.

The benefits of cross-sectoral regulation would be achieved by integrating the five sectoral superintendencies into a single system with a common legal framework and placing a general superintendency at the center of the system.

The superintendent general performs three main statutory functions:

- First, he or she acts as an appeals body for disputes that cannot be resolved by the individual sectoral superintendencies.
- Second, he or she is required to monitor the performance of each of the sectoral regulators by issuing an annual statement on the efficiency and efficacy of regulation in each sector.
- Third, he or she is responsible for approving the budgets of the sectoral superintendencies and presenting the institution's consolidated budget to Congress.

Over time, the SIRESE has begun to function increasingly as a collection of single-sector agencies, rather than as a cross-sectoral body, partly because of the desire of the sectoral superintendents to assert their own independence and partly because the superintendent general's function as arbiter makes it difficult for him to act in a coordinating role.

Source: Own elaboration.

3.3 Regulatory Leadership

Regulatory bodies are typically headed either by an individual director or by a commission of several directors. A commission arguably lends greater stability to the regulatory process, by both bringing to bear a variety of perspectives and avoiding sudden changes of leadership (for example, by staggering terms). It is also sometimes argued that a group of individuals may be less susceptible to "regulatory capture." On the other hand, the search for consensus among a group of commissioners may blur and retard the decisionmaking process.

In Latin America, there appears to be a clear geographical divide on this question (Table 10). Countries west of the Andes (Bolivia, Chile, and Peru) have their regulatory agencies headed by superintendents, whereas countries east of the Andes (Argentina, Colombia, and Panama) have opted for commissions or directorates comprising between three and seven members. The commissioners typically elect a president in rotation from among themselves. The regulatory commission from Buenos Aires is an interesting case because the six members of the directorate represent the three levels of government with an interest in the metropolitan area: the federal government, the government of the province of Buenos Aires, and the municipal government of the federal district.

Table 10: Overview of Regulatory Leadership

	Leadership	Duration of Term	Appointed by	Criteria for Removal
Argentina*	6 directors	6 years (renewable twice)	Executive	Only with just cause
Bolivia	Superintendent	5 years (renewable once)	President (via Senate)	Conflict of interest or legal conviction
Chile	Superintendent	Unspecified	President (via Minister)	Unspecified
Colombia	7 commissioners (3 experts plus 4 ministers)	3 years	President	Unspecified
Panama	3 directors	5 years	Executive (via Legislature)	Conflict of interest, legal conviction, or bankruptcy
Peru	Superintendent	Unspecified	Minister	Unspecified

* Refers only to Greater Buenos Aires.
Source: Own elaboration.

Most countries prescribe the duration of term for the leadership of the regulatory agency, which lies in the range of three to six years, although in Chile and Peru there is no legally identified limit on the superintendent's term of office. In the case of Panama, the appointment of directors is staggered to ensure that the entire commission is not reappointed simultaneously. In some countries, the legal framework prevents directors from being reappointed to office more than once (Bolivia) or twice (Argentina). It is sometimes argued that these kinds of restrictions serve to enhance the independence of regulation because the regulator stands to gain nothing from humoring his political masters.

To be able to function as an effective arbitrator among the competing interests of the operator, the consumers and the government, the regulator must enjoy a certain level of security of tenure. In Latin America, the appointment of regulators is usually done through the executive branch of government, either by the responsible minister or directly by the president (Bolivia, Chile, Colombia). Only in Bolivia and Panama does the legislature participate in the appointment of regulators. In the case of Bolivia, the senate provides a short list of three candidates from which the president must select the future superintendent. In the case of Panama, the legislature must give its approval to the candidate nominated by the executive.

In most cases, the law specifies technical criteria that must be met by the appointee. These vary in their breadth and rigor; however, they often include restrictions on nationality, age, years of professional experience, and nature of previous professional experience. Just as important as the criteria for appointment are the criteria for removal, since it is these that protect the regulator from arbitrary dismissal in areas where they may come into conflict with their political masters. No such conditions are specified in the case of Chile, Colombia, and Peru, making the regulator particularly vulnerable. The regulatory framework for Buenos Aires includes the rather vague stipulation of a "just cause" for dismissal, while those for Bolivia and Panama are more explicit in citing conflicts of interest (such as commercial interests or blood ties), legal convictions, and bankruptcy. In Panama, the removal of a regulatory director requires the approval of the supreme court.

While Latin American legal frameworks are often exemplary in the degree of protection they provide to regulators, the reality can be very different. In particular, it is not possible to legislate against "voluntary resignations" by regulators, and in a public sector culture where political patronage is central, regulators have often been known to resign (more or less) "voluntarily" in the immediate aftermath of elections or at times of political upheaval. Experience indicates that the typical life expectancy for a Latin American water regulator has been of the order of two to four years (compared with legal terms of five to six years). Indeed, only in the countries that have regulatory commissions have some of the regulators succeeding in serving their full legal terms.

3.4 Regulatory Resources

The principle of financial autonomy for regulatory agencies is almost universal in Latin America (Table 11). Regulatory financing is by means of a percentage levy on the turnover of the industry. In the case of national agencies, this percentage tends to fall between 1 and 3 percent. An interesting exception to this pattern is the Chilean water regulator, which because of its early establishment predates the movement toward financial autonomy and hence continues to fund its regulatory agency through a general tax. The levy for financing water regulation is often higher than that for other regulators (such as electricity and telecommunications). This simply reflects the fact that the water sector tends to have a lower turnover than these other industries, yet similar (or indeed more complex) regulatory requirements.

However, financial autonomy tends to be balanced by some degree of financial accountability. In most cases, the budgets of the regulatory agencies must be integrated into the general public sector budget, and they require government approval through the usual channels. In Bolivia, approval comes internally from the superintendent general. A number of countries make the stipulation that surplus funds should count against the budget of the following year. However, Colombian law exceptionally allows surpluses to be transferred into central government funds.

Table 11: Overview of Regulatory Resources

	Staff	Pay Scale	Finance	Budget (US$m)	Approval Process
Argentina*	70	Public	Levy of 2.7%	7	Unspecified
Bolivia	20	Private	Levy of 3%	2	General superintendent and executive branch
Chile	80	Public	Tax revenues	2	Executive branch
Colombia	20	Public	Levy of 1%	3	Executive branch
Panama	n.a.	Public	Levy of 1%	n.a.	Executive branch
Peru	100	Public	Levy of 2%	4	Superintendent

* Refers only to Greater Buenos Aires.
Source: Own elaboration.

In making comparisons between overall budget and staffing levels, it is important to bear in mind that the sectoral, geographical, and technical jurisdictions of these various agencies differ quite significantly. Budgets for the regulatory agencies tend to lie in the range of US$2 million to US$4 million. The regulatory agency for the Buenos Aires concession, ETOSS, stands out as having a budget that at US$7 million is substantially larger than that of any of the other countries reported in Table 11. One explanation for this is that in Argentina, regulatory agencies have sometimes been regarded as a vehicle for the re-employment of staff laid off from the utility as a consequence of privatization.

With regard to human resources, there is essentially a divide between countries such as Argentina, Chile, and Peru that have relatively large regulatory bodies (more than 50 employees) and those such as Bolivia, Colombia, and Panama that have relatively small agencies (less than 50 employees) and rely on subcontracting services. In almost all cases, the staff are remunerated in line with civil-service pay scales. A notable exception is Bolivia, where salaries are legally required to keep pace with trends in the privatized companies subject to regulation; however, in practice, this has proved to be a bone of contention with the executive branch.

3.5 Regulatory Accountability

The opportunity to appeal regulatory decisions is an important counterbalance to regulatory independence. Given the shortcomings of the judiciary across Latin America, many countries have opted to complement judicial appeal with some form of administrative appeal to the executive branch of government. Administrative appeal processes tend to be more agile and, in some instances, better equipped to deal with the complex technical issues underlying regulatory disputes.

Administrative appeal takes a wide variety of different forms across countries (Table 12). At one extreme, in Peru, the regulator's decision is final, with no administrative appeal at all. In Panama, appeals may be made to the regulatory body, but there is no subsequent channel for administrative appeals. In Argentina, appeal is to the minister responsible for the sector. Chile provides an interesting exception in that administrative appeal is replaced by independent arbitration. Disputes arising in the tariff-setting process are settled by appeal to a commission of three experts: one selected by the regulated company, one by the regulator, and a third by mutual agreement between both parties.

Table 12: Overview of the Appeals Process

	Administrative	Judicial
Argentina	Executive branch	Direct judicial appeal
Bolivia	Superintendent general Superintendent	Direct judicial appeal Supreme court
Chile	Independent arbitration	Direct judicial appeal
Colombia	Executive branch	Direct judicial appeal
Panama	Regulatory agency	Supreme court
Peru	None	Direct judicial appeal

Source: Own elaboration.

With regard to judicial appeal, the picture is more uniform. Most countries allow direct judicial appeal through the standard court system. In some cases, appeal to the supreme court is also possible. For example, in Panama, the supreme court is the only route for judicial appeals.

The Bolivian regulatory appeals procedure is summarized in Box 3.

Box 3: The Bolivian Regulatory Appeals Procedure

The Bolivian regulatory framework incorporates a three-tier appeals procedure

- In the first instance, those dissatisfied with regulatory decisions can appeal directly to the sectoral superintendent, who must respond within 30 days. In 1997, 86 of 1,286 regulatory decisions were appealed.
- If dissatisfied with the result of this appeal, they may go on to appeal to the superintendent general, who must respond within 90 days. In 1997, 22 of 86 appeals were passed on to the superintendent general.
- If dissatisfied with the result of this appeal, they may go on to appeal to the supreme court. In 1997, 3 of 15 resolved appeals were passed on to the supreme court. As of early 1999, none of these cases had been resolved.

It is important to note that the first two layers of the appeals structure are administrative while the final layer is judicial. The reasons for creating an administrative appeals procedure are to speed up the process and to provide a specialized appeals body.

Of all appeals to the superintendent general, 9 were initiated by consumers and the remaining 91 by regulated companies. This suggests some imbalance in the use of the appeals mechanism, probably due to the absence of consumer bodies. In 80 of appeals made to date, the superintendent general has upheld the original decision of the sectoral superintendent

Source: Own elaboration.

A well-designed regulatory framework should give consumers—as well as operators—an opportunity to express their concerns. It is now commonplace in Latin America for regulatory agencies to have offices to deal with customer complaints (Table 13). The regulator effectively acts as an appeals body for customers whose complaints have not been adequately resolved by the regulated companies. The Bolivian experience with consumer complaints offices is detailed in Box 4 below.

Table 13: Overview of Consumer Involvement in Regulation

	Complaints Office	Public Hearings	Consultative Committees
Argentina	Yes	None	None
Bolivia	Yes	Optional	None
Chile	Yes	None	None
Colombia	Yes	None	Comités de Desarrollo y Control Social
Panama	Yes	Optional	None
Peru	Yes	None	Comités Consultivos Regionales

Source: Own elaboration.

Box 4: The Bolivian Consumer Complaints System

The Bolivian regulatory framework establishes a system known as ODECO (Oficina del Consumidor) for dealing with consumer complaints. Regulated companies are required to establish ODECO offices in their premises throughout the country to attend to consumer complaints. All of the sectoral superintendencies are obliged to establish the ODECO system, although the process is currently most advanced in the electricity sector. There are plans for the different sectoral superintendencies to share regional ODECO offices, thereby economizing on regulatory costs and simplifying the complaints procedure for customers.

For example, in the electricity distribution sector, 56 ODECO offices have been established throughout the country. In 1997, these offices received 27,518 complaints from consumers, of which the majority relate to disputes about incorrect billing or meter reading. Most complaints are registered by telephone, although some 20 percent of them are made through personal visits to the local ODECO office. Some 99 percent of these complaints are satisfactorily resolved by the companies themselves, while the remaining 1 percent (equivalent to 112 cases) are referred to the regulatory agency's own ODECO office. Of those cases referred to the regulator in 1997, 53 percent were resolved in favor of the consumer, and the remaining 47 percent in favor of the operator.

Source: SIRESE, 1998.

Where there has been a great deal less progress is in the establishment of wider avenues for customer participation in regulatory decisions and debates. The mechanism of public hearings, for example, has received relatively little use in the Latin American water sector. In both Bolivia and Panama, the regulatory framework provides the option for public hearings; however, there have been no actual instances of its use to date. Nor have there been many attempts to set up consumer associations or consultative committees, either under the auspices of the regulatory agency or elsewhere.

An interesting exception is Peru, where the regulations require the creation of a consultative committee comprising representatives of the superintendency, the water companies, and the municipalities (who are supposed to represent the customer viewpoint). When the committee was set up, representatives of APIS (Asociación Peruana de Ingenieros Sanitarios) and ASPEC (Asociación Peruana de Consumidores y Usuarios) were also included. While the Peruvian case represents an important attempt to create a forum for regulatory consultation, the composition of

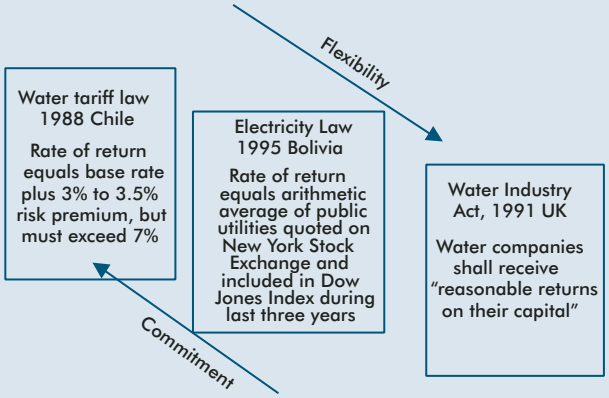
the consultative committee seems to provide greater representation to the service providers than to the consumers. Given that the municipalities are invariably the owners of the water utilities, it is questionable whether they can really be relied upon to represent consumer interests. The implication is that out of the 10 members of the committee, only 1, the ASPEC representative, provides an independent consumer perspective on regulation.

In Colombia, the creation of Comités de Desarrollo y Control Social at the local level is supported by the superintendency. The role of these committees is to collect information on customer satisfaction and lodge any resulting complaints with the companies and the regulators; however, to date, very few such committees have been created.

4 DEVELOPING REGULATORY INSTRUMENTS, OR THE MISSING RULES OF THE GAME

Establishing a regulatory system is not only about creating the new institutional players but also about defining the rules of the game. Such rules are typically laid down in a series of legal norms comprising instruments of public law (legislation, regulations, and decrees) and instruments of private law (concessions and licenses). Some of these instruments (such as legislation) are much harder to modify than others, and hence their use entails a higher degree of regulatory commitment. This may be appropriate for establishing the fundamental principles of regulation, while areas requiring greater flexibility should be covered in instruments that are more readily amended (such as regulations or decrees). At the same time, public law is best suited to covering matters of universal application, while private law enables these to be applied to specific cases.

Box 5: Comparison of Rate of Return Rules across Countries



A key issue for potential private investors is the rate of return to be secured on investments. For countries with a high degree of investment risk, it may therefore be important to signal a high degree of commitment to providing an appropriate rate of return by specifying the level quite carefully in legislation that is difficult to amend. The diagram above illustrates three very different approaches to specifying the rate of return in regulatory legislation, exhibiting different balances between commitment and flexibility.

At one extreme, the Chilean water tariff law of 1988 states that the rate of return will be equal to a specific number, while at the other extreme the UK Water Industry Act 1991 gives only a very vague indication of what returns the regulator will allow. The Bolivian Electricity Law 1995 illustrates an intermediate position where the law is extremely explicit about the methodology to be used to calculate the rate of return, without fixing the number in advance.

Source: Own elaboration.

4.1 Legal Framework

The most common pattern is that followed by Chile, Panama, and Peru, which each began with water sector legislation and went on to flesh out the details of the regulatory framework through a series of regulations leading on to the issuing of concession contracts for individual service providers (Table 14). This sequencing allows the regulatory framework to evolve in an orderly and logical manner. At the other extreme, Buenos Aires (Argentina) is also of interest because of the absence of sectoral legislation of any kind, a situation that is also to be found in the telecommunications and transport sectors in Argentina. A regulatory body created by decree rather than by legislation is clearly more vulnerable to political change.

Table 14: Overview of Legal Instruments

	Multisector Legislation	Sector Legislation	Regulations	Concessions
Argentina*				1993
Bolivia	1994	1999		1997
Chile		1988→	1989→	
Colombia	1994		1994→	
Panama		1997		
Peru		1992→	1994→	

* Refers only to Greater Buenos Aires.
Source: Own elaboration.

Only Bolivia and Colombia have enacted water reforms via cross-sectoral legislation affecting all of the utilities. However, in the case of Bolivia, it has subsequently proved necessary to flesh out the cross-sectoral framework with sector-specific laws. This may owe something to the fact that the Bolivian Ley SIRESE is much briefer and more general than the Colombian Ley de Servicios Públicos. Moreover, Bolivian experience indicated that the cross-sectoral law was not always an adequate basis for establishing regulatory authority in any particular sector. Another interesting feature of the Bolivian experience is the fact that the concession contract for water services in the metropolitan area was issued prior to the sectoral law and regulations, which are still in process. This is creating considerable regulatory uncertainty because of a number of points on which the sectoral law contradicts the concession contract.

4.2 Tariff Regulation

One of the most fundamental aspects of the regulatory framework is the procedure for determining and reviewing price controls. Latin American water laws typically declare their allegiance to a number of basic tariff-setting principles that include allocative efficiency,[5] productive efficiency,[6] financial sustainability, social equity, and administrative simplicity (even if they differ in the degree to which they recognize and address the inevitable conflicts that arise among these objectives).

The central focus of tariff regulation in Latin America has been the definition of so-called *fórmulas tarifarias*, which state the mathematical relationship between tariffs and underlying costs. These

5 Allocative efficiency is achieved when prices provide consumers with accurate signals of the marginal cost of the service so that an efficient level of consumption takes place.
6 Productive efficiency is achieved when the service is provided at the minimum feasible cost.

generally take the form of present-value formulae based on cost and demand projections discounted at the estimated cost of capital. The main objective of these formulae is to ensure that water tariffs are set at a level compatible with financial sustainability. In most countries, the formulae reflect average-cost-pricing principles, although, in the interests of allocative efficiency, Chile and Peru have espoused some degree of marginal cost pricing. The concept of financial sustainability includes a reasonable return on new investments. In Chile, the allowed rate of return has been set as 3.0 percent to 3.5 percent above the base rate, with a floor of 7 percent; in Colombia, the regulator has used an indicative range of 9 to 14 percent in tariff setting.

Water sector tariffs are rarely cost-reflective from the outset of a reform process. Hence, in countries such as Colombia and Peru, a convergence period has been established. Peruvian legislation is particularly lucid in defining three stages of tariff convergence. In the first 18 months following the legislation, described as the *etapa preparatoria*, tariffs must cover operating expenditures while water companies work on defining their investment plans. There follows a five-year *etapa de mejoramiento*, during which tariffs should rise progressively to the level of long-run marginal cost, where they remain in the *etapa definitiva*. In Colombia, the regulator has come under political pressure to slow the rate of tariff increase, with the result that tariffs are currently lagging behind their legally envisaged convergence path.

While financial sustainability is an essential first step, tariff formulae that simply pass on current cost levels to customers provide no guarantee of productive efficiency. In many cases, the legal framework stipulates that tariff setting should be based on efficient rather than actual costs. In reality, only Chilean law provides an explicit methodology for assessing efficiency. The Chilean approach to efficiency adjustment is extremely sophisticated, but perhaps in some respects unduly complex (Box 6). One reason for the complexity is that for legal reasons, it is necessary for the regulator to identify the exact nature of any inefficiency and is not at liberty to impose general efficiency targets. More modest steps toward efficiency analysis are being taken in other countries; for example, in Colombia, operating costs reported by companies are adjusted downward to reflect a "benchmark" level of 30 percent leakage. However, other sources of inefficiency are not taken into account.

Regarding tariff review procedures, there has been a widespread acceptance of the British-style "price cap" approach across Latin America. The review cycle tends to be every fourth or fifth year, although in many cases, as in the United Kingdom, extraordinary reviews are permitted. Where the regulated company is privately operated, the price cap mechanism should provide adequate incentives for costs to be reduced over time, allowing the associated efficiency gains eventually to be passed back to customers. In this context, at least, the absence of efficiency targets in price setting merely slows the pace at which customers benefit from efficiency improvements. However, when the price cap is (more commonly) applied to a publicly managed company, no such incentive arises, so that the need for externally imposed efficiency targets becomes particularly critical.

To ensure that tariff revisions are coherent with the operator's technical targets and the underlying investment program, many countries have developed quinquennial planning instruments. In the cases of Argentina, Bolivia, and Peru, although the plans are explicitly technical in content, the regulatory framework explicitly stipulates that they should be synchronized with the tariff-setting procedure, with tariff revisions usually following on once the technical planning process is concluded. However, in the case of Colombia, there is a notable absence of coordination between the *Planes de Gestión* (management plans), which contain efficiency and output targets and are approved by the ministry, and the tariff formulae, which are calculated as part of a separate process and are approved by the regulatory agency.

Box 6: The Chilean Empresa Modelo

The Chilean regulator has developed a unique approach to regulatory tariff setting that is based on the concept of a model company (or *empresa modelo*). The model company is an extreme application of the concept of yardstick regulation, whereby the regulator creates an idealized benchmark specific to each regulated company and uses comparisons between the two to gauge the extent of any inefficiency.

Unlike more conventional forms of yardstick regulation, the model company combines two forms of efficiency:

- Engineering efficiency – in the sense of undertaking an analysis of the optimality of the physical configuration of the infrastructure
- Economic efficiency – in the sense of applying least-cost functions to determine the cost of operating the optimized infrastructure.

Furthermore, the process of analyzing the model company takes place at a highly disaggregated level, with the 13 regional companies being broken down:

- Horizontally into 320 water supply and 270 sewerage systems, which are grouped into 37 similar types to facilitate the calculation of tariffs
- Vertically into four distinct stages of production: water production, distribution, sewerage collection, and treatment.

The model company is used to produce two parallel estimates of the tariff, based on average and marginal cost. The latter is adjusted in the light of the former to ensure the financial viability of the company.

4.3 Regulation and Social Policy

While water is regarded as a socially sensitive sector throughout the Latin American region, few countries have attempted to provide a clear definition of their social policy objectives or to evaluate the efficacy of the instruments traditionally chosen to achieve them (Estache, A., Foster, V. and Wodon, Q. 2002. *Accounting for the Poor in Infrastructure Reform: Learning from Latin America's Experience*, World Bank Institute Development Studies, Washington DC).

The central concern of Latin American social policy in the water sector has been to ensure the affordability of the service to low-income households. This issue has typically been addressed through a complex array of cross-subsidies that include a rising block tariff structure and the application of substantial surcharges to industrial tariffs. More recently, in the context of sector reform, attention has been turning to the inadequacy of service coverage among poor households. The standard approach to this problem has been to incorporate legally binding connection targets into concession contracts. In return for expanding the service into commercially unattractive areas, the operator receives the right to oblige local residents to connect to the network and to levy a substantial connection charge. The Buenos Aires (Argentina) and La Paz (Bolivia) concessions provide examples of this approach.

However, the accumulating evidence suggests that this standard blueprint for social policy carries a number of significant flaws. On the one hand, the existing cross-subsidies often do more to

benefit the middle classes than the poor. For one thing, the poorest families tend to be those that remain unconnected to the network and are hence unable to benefit from cross-subsidies. For another, the criteria used for allocating the cross-subsidies do not always correspond with the economic condition of the recipient. In the case of rising block tariffs, "subsistence consumption" thresholds are often set so high that they wind up benefiting the vast majority of domestic customers.

On the other hand, the charges levied for mandatory network connections have sometimes been set so high as to be well beyond the means of the poor households they were intended to benefit. The classic example is the Buenos Aires concession, where infrastructure charges of US$600–$800 led to widespread civil unrest and threatened the financial equilibrium of the concession contract until a compromise solution was found by spreading the costs of network expansion across all water consumers.

Chile and Colombia provide interesting exceptions to this broad pattern in that both countries have developed more scientific approaches for identifying poor households to improve the targeting performance of their subsidy schemes. In Chile, targeting is based on a socioeconomic score derived from a wide-ranging household interview, while in Colombia, targeting follows a nationwide socioeconomic classification of neighborhoods, based on the physical quality of local housing and amenities.

4.4 Output Regulation

Quality-of-service regulation is a necessary complement to price regulation. Without it, regulated companies may have an incentive to compromise the quality of service as a cost-cutting measure.

Progress toward an operative system of quality-of-service regulation has tended to be much more significant in cases where private sector participation has taken place. The general tendency has been to define quality-of-service parameters in lower-level legal instruments (such as concession contracts) rather than in the general sector law. Typical parameters include potability, pressure, and continuity. A common approach is to classify the various types of potential noncompliance according to a hierarchy and then to establish a range of fines for each level in the hierarchy. The fines are sometimes expressed in monetary terms and sometimes as percentage of revenues. Within these ranges, the regulator is given a certain amount of discretion in determining the exact value of the fine to be applied in any particular instance, depending on the gravity of the offense. However, while fines have proved to be an effective sanction for private sector operators, they have not had so much of an impact in motivating public sector managers.

In Colombia, the quadrennial *Planes de Gestión* are the primary vehicles for output regulation. The plans specify objectives for a range of key managerial and technical parameters over a short-, medium-, and long-term planning horizon. The indicators include financial efficiency (billing and collection ratios, execution of investments); technical efficiency (leakage, labor productivity); and quality of service (service and metering coverage, continuity, potability). In practice, it has proved difficult to find effective sanctions for noncompliance with these targets where state-owned enterprises are concerned. Fines, which are supposed to be deducted from employees' salaries, have tended to become paralyzed in the judicial appeal process. Attempts to motivate management by means of publicizing good and bad performance, using honors and awards, have not been very successful. However, the government has proved unwilling to impose the ultimate sanction of restricting access to credit by poor performers.

4.5 Regulatory Information

The fundamental problem of regulation is one of asymmetric information between the regulated company and the regulatory agency. The regulated company will have a strong incentive to abuse this strategic advantage by undersupplying information or distorting the information supplied. It is therefore critical that the regulatory framework establish the obligation of the regulated company to supply information to the regulator in the form required.

Where PSP has taken place, information requirements are usually specified in some detail in the concession contract. They typically include detailed periodic reporting of both financial and technical performance, as well as the maintenance of detailed registers of operating assets and customer records. All information must be audited before it is submitted to the regulator.

However, such information cannot be readily interpreted unless it is prepared in accordance with clearly specified regulatory accounting guidelines, which often go far beyond standard accounting requirements. A number of countries have been working on the development of such guidelines (for example, Colombia's *Plan Único de Cuentas*); however, much remains to be done in this sphere.

5 Conclusions

The scale of water service reform in Latin America has been truly impressive and unparalleled in any other part of the world. By the close of the decade, just about every country in the region had undertaken (or was actively considering) sector reform measures. However, the real transition for most water consumers has not been from public to private operation, but rather from *unregulated centralized* public provision to *regulated decentralized* public provision.

The reformed sector model that has emerged in the Latin American region might well be described as an "Anglo-French hybrid." On the one hand, it takes from the British model the creation of a centralized regulatory agency relying on incentive-based regulatory instruments, but rejects the equally British notion of regionally consolidated and fully privatized water operators. On the other hand, it takes from the French model the notion of a decentralized, municipally based industry relying on concession contracts as the primary vehicle for PSP, but rejects the equally French notion that regulation can be confined to municipal monitoring of contracts.

The combination of these two approaches has created tensions that tend to undermine the functioning of the new model. These include the problems entailed by imposing regulation and PSP from the center on a sector that is often legally under municipal control, as well as the difficulty of attracting private investment into a highly fragmented sector. While the attempt to regulate state-owned water utilities using incentive-based instruments—which are premised on the existence of a profit motive—has unsurprisingly not proved to be very effective.

To escape this impasse, the region faces one of two possible options. The first option is to try to consolidate the structure of the industry by promoting the creation of larger regional companies, as is now the case in Chile and has been the case in Brazil. Depending on the country context, this might be achieved voluntarily (by *mancomunidad*), through financial incentives (such as PLANASA), or by fiat (as in England and Wales). The second option is to rethink the way in which regulation is done, adapting it to the requirements of a fragmented and still largely state-owned sector. Either way, it promises to be a challenging task.

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