

**The Regulation of Private Sector Participation in  
Urban Water Supply and Sanitation:  
Realising Social and Environmental Objectives in  
Developing Countries**

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# **The Regulation of Private Sector Participation in Urban Water and Sanitation: Realising Social and Environmental Objectives in Developing Countries**

Nick Johnstone, Libby Wood\* and Robert Hearne

## ***Abstract***

There has been a significant increase in private sector participation (PSP) in the urban water supply and sanitation (WSS) sector in recent years. However, even with increased PSP, public authorities will still have to: ensure that the service providers do not use their market power to exploit customers; internalise public health and environmental externalities; provide mechanisms whereby water consumption is sustainable and is allocated efficiently between alternative uses; and, serve as a guarantor of a level of service provision which is consistent with a basic standard of living. While there is considerable literature addressing the first of these four issues, the latter three are less adequately addressed. Through a review of five case studies (Abidjan, Buenos Aires, Córdoba, Mexico City, and Manila), this paper provides an overview of the issues involved and some of the mechanisms available to the authorities responsible for the regulation of the sector.

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# 1. Introduction

In recent years there has been a significant increase in private sector participation (PSP) in the delivery of urban water supply and sanitation (WSS) in developing countries. This is largely attributable to a perception that governments have been unable to manage the sector efficiently and do not have the funds required to undertake much-needed investments. However, due to the characteristics of the sector, the regulatory authorities will have to continue to fulfil the following functions:

- ensure that the service providers do not use their privileged position in the market to exploit their customers;
- internalise the externalities associated with adverse effects on public health and the environment;
- provide mechanisms whereby aggregate water use is sustainable and water is allocated efficiently between alternative uses;
- serve as a guarantor of a level of service provision, which is consistent with a basic standard of living.

While there is considerable literature addressing the effects of increased PSP on the first of these four issues, the latter three are less adequately addressed. This paper is not primarily about the relative merits of private versus public service provision in terms of the efficiency of service provision, but rather about how best to meet environmental and social objectives given increased private sector participation. Moreover, since it is the agency whose role has changed most significantly (indeed it may have only come into existence with the onset of PSP), the paper concentrates on the role of the sectoral “economic” regulator, rather than other public authorities that influence the sector.

The study is an overview report, drawn largely from five case studies (Manila, Buenos Aires, Córdoba, Mexico and Abidjan), prepared by researchers familiar with the sector in the respective cities.<sup>1</sup> While the individual reports provide more detail on the individual cases<sup>2</sup>, this paper attempts to draw together the experience in the five cities in order to highlight some of the potential opportunities and pitfalls presented by PSP in terms of the realisation of social and environmental objectives.

Following this brief introduction, Section 2 reviews the role of PSP in the sector. Section 3 provides a discussion of the need for public intervention in the sector on the basis of the potential for market failure with respect to social and environmental concerns and discusses the role of the economic regulator in ensuring that these social and environmental objectives are realised. Section 4 reviews some of the main conclusions based on the four case studies.

## 2. Private Sector Participation in the WSS Sector

Until very recently, the only countries with a significant degree of private participation in the WSS sector were France, the United Kingdom and the United States. Of all public utilities, WSS was the sector in which the formal private sector was least active and, in developing countries was almost non-existent. However, this is changing rapidly as many developing countries involve the private sector

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<sup>1</sup> The case studies were prepared by Cristina David (Manila), Martin Rodríguez Pardina and Sergio Mazzucchelli (Buenos Aires and Córdoba), Lillian Saade (Mexico City) and Ake N’Gbo (Abidjan). The project was funded by DANIDA and the full report will be published in due course. In the interim, mimeo copies of the report can be obtained from the corresponding author. Details on the publication of any of the case studies can also be obtained from the corresponding author.

<sup>2</sup> Details about the publication of any of the case studies can also be obtained from the corresponding author.

(usually European or North American firms in partnership with a local firm) in the provision of WSS in urban areas. Between 1990 and 1997, the cumulative new private sector capital expenditure on WSS projects in developing countries was \$25 billion, compared with \$297 million in the period 1984-1990. By 1997, a total of 97 projects had been implemented in 35 developing countries, ranging from management contracts to leases, concessions, divestitures and build-operate-own-transfer (BOOT) agreements (see Silva *et al* 1998).

The increase in PSP has been driven in large part by a desperate need for increased capital investment in WSS in many cities. In the majority of developing countries experiencing rapidly growing urban populations and a reduction in assistance for WSS from international development agencies, public sources of finance are no longer able to bear the costs of system rehabilitation and expansion. In addition, it is often considered that public authorities have been unable to manage urban WSS efficiently. A number of closely related reasons have been frequently cited in the literature as being responsible:<sup>3</sup>

- *Gamekeeper-Poacher Problems* - Public water and sewage utilities will tend to be inefficiently managed since governments have multiple objectives but limited financial resources. With the government as both owner and provider, the utility's management is subject to a number of conflicting influences which it may not be able to balance if clear priorities are not established.
- *Flexibility and Autonomy* - At the level of operations, public utilities are often constrained by bureaucratic requirements which do not affect private firms. For instance, there is often considerable inflexibility in the management of human resources within public utilities.
- *Absence of Competitive Discipline* - Since public utilities are not usually subject to the disciplines of the market they have fewer incentives to minimise costs (and maximise tariff collection rates) and provide services in the manner customers demand.

However, it must be recognised that there are numerous examples of efficiently managed public water and sanitation utilities in developing countries (see Ingram and Kessides 1994 and Nickson 1997). There are documented cases in countries as diverse as Ecuador, Chile, Zimbabwe and Botswana. In many cases, this has been attributable to the provision of a certain degree of autonomy to the service provider (municipality, parastatal, etc...), as well as the introduction of effective incentives to the provider and staff members (see Estache 1994).

“Government failure” is not, in itself, sufficient to justify private sector involvement in the sector. A private monopolistic service provider may well exacerbate the situation, taking advantage of its privileged position in the market at the expense of service users. Thus, perhaps an equally important motivation for the increase in PSP, is the fact that there is now a widespread belief that PSP need not result in monopoly profits. On the one hand, the consensus that water and sanitation services are natural monopolies has been called into question. While the entire chain of provision (raw water supply, water treatment, water distribution, wastewater collection and wastewater treatment) may exhibit economies of scale, individual aspects of the WSS system may not be characterised by decreasing costs, thus allowing for vertical “unbundling” of the sector with multiple providers at some stages. For instance, metering, operations and maintenance, billing, and a number of other aspects of service provision can be hived off from the core of the WSS sector. Similarly, firms can be given contracts to undertake significant investments in specific infrastructural areas such as wastewater treatment plants. On the other hand, it has been recognised that even if technological and economic characteristics are

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<sup>3</sup> See Nickson 1997, Ingram and Kessides 1994, Idelovitch and Ringskog 1995, and Mody 1996 for discussions.



such that monopoly provision is “efficient”, more comprehensive forms of PSP can still be introduced. Drawing on the work of Baumol, Panzar and Willig (1982) it has been pointed out that as long as a market is contestable (i.e. there is the potential for firm entry), a single provider will not necessarily behave monopolistically as long as there is competition *for* the market, if not directly *in* the market.<sup>4</sup> Thus, firms can be granted the right to provide all WSS services within a given area over a pre-defined period of time.

There are many different options for the participation of the private sector. These can be classified as follows<sup>5</sup>:

- *Service contracts* - are the simplest form of PSP, involving short-term contracts to provide limited services, such as reading meters, repairing leaks, and mailing statements for payment. These contracts entail carrying out specific duties and do not require any overall private sector responsibility for system operation. Small service contracts have existed in many cities for a number of years, but in recent years there has been a shift towards more comprehensive types of service contract.
- *Management contracts* - require somewhat greater private sector responsibility with the private company assuming day-to-day responsibility for system operation and maintenance. However, management contracts do not usually require any private investment, the private company does not assume commercial risk, and does not have any direct legal relationship with the consumer. The national or local government must maintain financial responsibility for the system and the capacity to plan and finance system expansion. The contractor does not get paid unless fees are collected from the consumers, and has an incentive to improve system management under the stipulations of the contract.
- *Leases* - allow a private operator to rent facilities from the public authority for a stipulated period of time. The public authority retains ownership and responsibility for system finance and expansion, but the private contractor is responsible for financing working capital and accepts some commercial risk in the day-to-day operation of the system. The private contractor is not responsible for any capital costs, and rental fees are often based upon the costs of debt service for capital costs. The contractor has a direct incentive to maximise fee collection since its returns equal revenue generated less operating costs and rental fees. Occasionally the relationship is reversed, with the private firm building a facility and leasing it back to a public provider.
- *BOOT contracts* - are mechanisms that allow a private contractor to *Build, Own, Operate, and Transfer* a specific capital investment such as a wastewater or potable water treatment plant. Usually, the investment is quite substantial and the contract period is long enough to allow for the recuperation of capital expenditure. Generally the public authority must guarantee a certain demand, such as a volume to be treated. The contractor accepts a risk if this demand is not met. There are numerous variants on this option, such as BOTs, “reverse BOOTs” and others.
- *Concessions* - are long-term contracts which require the private company to invest in the system. The concessionaire has overall responsibility for the system, including operations, maintenance, investment and expansion. The concessionaire receives payment directly from the consumer and accepts the risk that costs do not exceed revenues. The contract period is usually long enough to

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<sup>4</sup> Bidding procedures and contract design are very important in this respect. See full report for a discussion of these issues.

<sup>5</sup> For different taxonomies of PSP and private-public partnerships see Idelovitch and Ringskog 1995, Gentry and Fernandez 1997, and Brook-Cowen 1997.

allow the contractor to recover investment costs. Penalties may be imposed upon the contractor if specific targets or standards are not met.

- *Divestiture* - may be partial, allowing for shared government and private responsibility for service provision, through a separate corporate entity. Generally, a corporate agreement will stipulate private and public responsibilities, including representation on the board of directors and division of profits. Private finance may be facilitated by the establishment of a separate credit rating with support from the public authority. Less frequently, the provider may be fully private, with the government only serving a regulatory role.

In general, concessions are the most popular form of PSP in terms of both number and size of investment. BOTs (and variants thereof) are also common (see Table 1). Regionally, investment has been concentrated in Latin America and East Asia. Sub-Saharan Africa, on the other hand, accounts for less than 1% of total investment.

Type	Projects	Total investment in projects with PSP (1997 US\$ millions)
Concession	48	19,909
BOT/BOOT	30	4,037
Operations and management	13	n.a.
Divestiture	6	997
<i>Total</i>	97	24,950
<i>Source: World Bank 1998</i>		

The case studies analysed cover a number of these options. While Mexico has been one of the pioneers of the use of BOOT contracts (and variants thereof), Mexico City is an example of a service contract, albeit an exceptionally large one. Under a phased contract, the four international consortia which were awarded the contracts are to install meters, bill households and rehabilitate the distribution infrastructure within the Federal District. The last phase has been described as a *Rehabilitate-Operate-and-Transfer* contract. Given the scarcity of water resources in Mexico's Central Valley and the lack of information regarding the customer base, water consumption levels and network conditions, the primary objective of the contracts is to allow for better management of water resources, and perhaps more comprehensive forms of PSP.

Buenos Aires and Córdoba are concessions for the operation and management of the entire network. While part of a larger national strategy to privatise public utilities, the specific motivation for the involvement of PSP in the WSS sector was a recognition that the public service provider *Obras Sanitarias de la Nación* (OSN) had been under-investing in the service for many years and was not in a position to reverse this trend. The concessions, which are to last for 30 years, were awarded in 1993 on the basis of international bidding procedures. The main difference between the two concessions relates to coverage. In Buenos Aires, both water and sanitation are included, while in Córdoba the municipality has retained responsibility for the sanitation system.

Manila is also a concession, covering both water and sanitation. However, unlike in the cases of Buenos Aires and Córdoba, the concession has been split in two. The contracts were awarded in 1997 on the basis of an international bidding procedure, and are to cover a period of 25 years. It is hoped that the division of the contract will facilitate the task of the regulator, which may be important since far fewer resources were devoted to preparing the regulatory framework than in the Argentinian cases. Unlike many other arrangements, the contract makes explicit allowance for alternative service providers within the concession areas, but it is assumed that the two concessionaires will eventually monopolise service provision.

Finally, in the case of Abidjan, where experience with PSP is much greater than elsewhere, private sector participation has evolved from a lease arrangement, to joint ownership with the state, and eventually to a concession. The concession was awarded in 1987 for 20 years. At present, the private service provider has full responsibility for the provision of water services, and a separate service contract to maintain sanitation facilities. However, a concession contract is being prepared for the provision of sanitation services. Unlike in the other concessions, the regulatory regime guarantees a return of 5% on investment undertaken, significantly reducing risks (and incentives).

Firm empirical evidence of the relative merits of private and public management of the sector in the four case studies in terms of economic efficiency is limited.<sup>6</sup> Indirect evidence can be obtained through comparison of tariff rates before and after PSP. For instance, in the case of Buenos Aires, tariffs charged by the private consortium were 73% of those previously charged by the state utility, although they have since risen.<sup>7</sup> In Manila tariffs in the east and west of the city also fell, 25% and 57% respectively, relative to pre-concession rates. However, to the extent that these figures do not reflect the effects of accompanying reforms in the sector as well as changes in service quality, such evidence is not conclusive. Only in the case of Buenos Aires has there been a systematic study of the “efficiency” effects of private sector participation, and it is revealing that according to most criteria the sector appears to have performed relatively worse than other privatised utilities (see Crampes and Estache 1997).

### **3. The Potential for Environmental and Social Market Failures in Water Supply and Sanitation and the Role of the “Economic” Regulator**

In addition to the potential for market failure through monopolistic service provision, there are three other types of market failure in the sector which relate directly to environmental and social concerns: over-exploitation and misallocation of raw water supply; health and environmental externalities from wastewater; and the under-provision of basic needs for poorer households. This means that a significant degree of public intervention will always be necessary to ensure that provision is not only economically efficient, but also socially equitable and environmentally sustainable. However, in many senses public authorities’ regulatory functions will not have changed appreciably with PSP. Implementing agencies with direct responsibility for the realisation of social and environmental objectives may well have roles which are indistinguishable from those they fulfilled previously when public authorities had direct responsibility for service provision.

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<sup>6</sup> The role of ownership (rather than management *per se*) is better documented, but most of the evidence relates to the United States since it is one of the few countries with a mixed private-public sector. Crain and Zardkoohi (1978) found that the behaviour of public water utilities was much further from cost-minimisation than those owned privately, and concluded that most of the observed difference in efficiency was due to differences in labour productivity. Conversely, Feigenbaum and Teeple (1983) did not find that ownership played as significant a role in determining the relative efficiency of water and sanitation utilities as had been thought previously. This result may be explained by the fact that unlike previous studies, they included a number of supply-side variables which tend to vary systematically with ownership (i.e. source of raw water supply, population density of area served, etc...). They also distinguish between the characteristics of the service provided (i.e. treatment levels, reliability of service, etc...). Teeple and Glyer (1987) refined this analysis, using more general econometric specifications. They found that for the least restricted regression, ownership was statistically insignificant. Two other studies (Lambert and Dichev 1993 and Bhattacharyya *et al* 1994) have even found that public utilities are on average more efficient, albeit with much greater variability in performance.

<sup>7</sup> They remain 17% below the pre-concession rate, although the tariff structure has just been reformed once again. (See Jaspersen 1997 and de Yeregui 1997.)

As such, the discussion in this section concentrates on the “economic” or “sectoral” regulator since it is its role which changes with increased PSP. Indeed, in most cases the “economic” regulator will only come into existence because of PSP, mainly through concern about the potential of private sector providers to exercise market power. Through a variety of mechanisms (price regulation<sup>8</sup>, service quality standards, coverage targets, etc...), the regulator seeks to ensure that the service provider does not over-price or under-provide services. However, although often indirectly and unintentionally, the behaviour of the economic regulator may have very significant environmental and social consequences. Indeed, in some cases the role it plays may be even more important than that of the agencies with direct responsibility for environmental and social matters. These issues are explored in this section, with a focus on how conditions and incentives are likely to change with PSP.

### **3.1 Conservation and Allocation of Water Resources**

In general where water is scarce and valuable, access to water is characterised by high excludability (e.g. access to the resource can be restricted) and high subtractability (e.g. consumption by one agent reduces availability for others), and thus has many private good characteristics which allow it to be rationed efficiently through prices. However, despite these characteristics, water is rarely treated as a private good, and as a consequence it is often used excessively and allocated inefficiently (Dellapenna 1994).

From the perspective of urban service provision, two issues are of particular importance: the allocation of water between urban and other users in the river basin, and the allocation of water amongst users within the urban area. The allocation of water between urban and other users is especially important in situations where water is scarce and urban areas are growing in both income and population. In these cases a reallocation of water between different sectors can be expected, often leading to conflict (Hearne and Trava, 1997). Excessive consumption by urban users (residential, commercial and industrial) will impact adversely upon competing uses, such as water used for irrigation of agricultural land (the converse is, of course, also true). For instance, in the cases of Córdoba (Lago San Roque), Mexico (Cutzamala) and Manila (Angat Dam) urban households using water compete directly with users outside the city. This is not as true in the case of Buenos Aires which draws most of its water from the Rio de la Plata, for which there are no directly competing uses due to the river’s massive flow. Water scarcity is also less of a concern in Abidjan. In cases where raw water supply is scarce, the over-use of water will not only impact upon other water users, including industry and agriculture, but it will also reduce the water available for ecological services such as the maintenance of wetlands and fish populations.

Effective conservation and allocation of the use of groundwater is particularly problematic since it is very difficult to ensure excludability of users. Moreover, the volume of groundwater resources is often not known with any degree of certainty. The exact volume of aquifers is difficult to determine, and monitoring of withdrawals is often costly. For this reason, groundwater is often allocated indiscriminately on the basis of firms’ and households’ willingness and ability to invest in wells. Since aquifers span large areas, one withdrawal will have a negative external effect on others. Where groundwater extraction exceeds recharge, the negative external effects of pumping include the following:

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<sup>8</sup> This can either take the form of cost-plus regulation (which guarantees a level of profits for the provider) or price caps (which guarantees a price for users). While, the latter is usually advocated since it provides more incentives for efficiency improvements, cost-plus price regulation is more common. However, in practice the two systems of price regulation are quite similar

- 1) the scarcity value of the groundwater stocks is not taken into account, and withdrawn water is not available for other users in the urban area. With aquifers which span large areas or whose resources are transported great distances (e.g. Mexico City) this may affect users outside of the urban area;
- 2) the increased cost of pumping from an increased depth is imposed upon others. In Buenos Aires, groundwater from the upper strata is no longer potable, and households and firms are having to drill deeper wells (or put their own health at risk);
- 3) excessive groundwater depletion can even lead to land subsidence (Mexico City) and saltwater intrusion (Manila).

Given the externalities associated with unsustainable water consumption, it is important that the scarcity value of water be reflected in costs faced by service providers and service users. With private sector participation in the sector, the service provider's access to raw water supply is the first issue to be addressed since the incentive to ration and allocate water use *within* the urban area is dependent upon the scarcity of water being reflected in the provider's decision-making. In cases where water is allocated freely to an urban service provider (so that it does not have to account for the needs of other users), water will not be treated as a scarce resource by the provider. However, if the urban service provider's access to raw surface water supply is limited in quantitative or financial terms, then it will have an incentive to treat water as a scarce good and to ensure that its customers do so as well.

The introduction of PSP is potentially significant since it may change the incentives of the public authorities with responsibility for water resource management. Public authorities with responsibility for water resources may be more likely to charge for raw water supply when it is a private sector service provider which is the buyer than when it is another public authority. However, despite the opportunity presented by the introduction of PSP, this route is rarely taken. For instance, in Mexico City urban water service providers have not been required to pay the full scarcity value of water provided to the City from the Cutzamala system. The case of Manila, which draws much of its water from the Angat Dam, is particularly interesting. The service providers pay nothing for raw water supply and are given priority access to the dam's water. While the regulator rejected efforts by the concessionaire to allow for tariff increases due to water shortages during the drought which followed *el Niño*<sup>9</sup> - claiming that it was a recurrent phenomenon and thus should have been foreseen by the concessionaires - other users have fared even worse. For instance, no water at all was provided for irrigation. The treatment of such phenomena in the regulatory structure is important.

In general, there has been greater attention paid to introducing incentives for the users of services within the urban area. Despite the cost involved, a large number of contracts have included targets to increase metering of household connections. Along with the introduction of use-based tariffs (usually covering both water and sanitation), these measures provide incentives to conserve scarce water resources. Indeed, in the case of Mexico City, where water shortages are particularly acute, the first two phases of the contract were largely designed to help achieve this objective. Water consumption has subsequently fallen by as much as 10-20%. However, it must be emphasised that the nature of service contracts are such that incentives are weaker than in more comprehensive forms of PSP. Thus, perhaps more significantly, the phased nature of the contract may allow for the collection of information which will make future efforts to manage resources more effective. Understandably, in relatively "water-rich" cities, such as Abidjan and Buenos Aires, fewer incentives are included in the contracts to increase metering and use-based pricing. In the latter case, monthly water charges are

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<sup>9</sup> Water availability fell by 25%-30%.

adjusted by a variety of criteria which are supposed to reflect levels of household water use (e.g. dwelling surface area), but these do not provide marginal incentives to the individual household.

Many of the contracts have more direct provisions which impact upon water conservation. For example, many concession agreements have targets for reducing “unaccounted-for water” (UFW) through, for example, service rehabilitation. In Buenos Aires, UFW is targeted to drop from 45% to 25% by the end of the 30-year concession. In Manila, a reduction of UFW from 60% to 30% is required over a 25-year period. Other contracts include targets for the rehabilitation of the distribution system in order to reduce water leakage rates. This is one of the primary objectives of the third phase of the contract in Mexico City. While such targets are valuable, in many cases it may be more effective and less burdensome on the regulator to charge the service provider for the scarcity value of the raw water supply and let them determine what level of “leakage” is economically efficient. Imposing leakage reduction targets - while simultaneously providing free raw water to the concessionaire - is likely to be an economically inefficient and administratively costly means of conserving scarce water resources.<sup>10</sup>

### 3.2 Health and Environmental Externalities

Inadequate WSS provision may result in negative environmental and public health externalities due to unsanitary potable water supplies and inadequate wastewater collection and treatment. Waterborne diseases include diarrhoea, cholera, and typhoid. Diarrhoeal diseases alone can affect 700 million people annually and result in over 5 million deaths per year. Bilharzia can affect 200 million people annually (see Hardoy *et al* 1992 for a review). Significant reductions in morbidity and mortality, especially among children, can be achieved through:

- adequate access to safe, potable water;
- adequate access to water for washing and cleaning; and
- proper removal, treatment, and disposal of wastewater and effluent.

Households recognise the adverse health effects of these diseases and (if they can afford to do so) adjust the nature of their WSS provision accordingly. However, even if households recognise the health benefits of improved water and sanitation provision, they may not consider the external benefits of their own improved WSS facility on the health of the wider community. For instance, a household might choose to use a simple pit latrine which is perfectly sanitary in terms of immediate environmental consequences, but, depending upon soil conditions and housing density, it may result in externalities by contaminating the groundwater supply of the community. Even if the household itself draws water from this supply, there will still tend to be excess contamination since the household’s cost of avoiding it is likely to be greater than the household’s expected benefit from better quality groundwater arising from their own efforts. Thus, if on aggregate individuals only account for their personal preferences this service will be under-provided in qualitative terms. Groundwater pollution from inadequate sanitation facilities is a significant problem in Buenos Aires and Manila.

In many cases, dealing effectively with externalities from sanitation requires the provision of collective infrastructure to treat the wastewater that is collected. For instance, in the case of Córdoba, residential sewage discharges have contributed to the eutrophication of the Lago San Roque, from which the city also draws its drinking water. To a certain extent, pollution of surface waters due to inadequate treatment is of significant concern in all of the case study cities. However, the adverse effects of inadequate treatment will depend upon the characteristics of the receiving waters and their

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<sup>10</sup> However, in the case of Manila it may reflect a concern that increased water tariffs arising from pricing raw water supply may increase the tendency for households and firms to “informally” draw down scarce groundwater even further.

alternative uses. For instance, until the new Sudoeste treatment plant is completed only 5% of the wastewater collected in Buenos Aires will be treated prior to discharge. However, the city benefits from the huge assimilative capacity of the Rio de la Plata. In contrast, its two primary tributaries (the Matanza–Riachuelo and Reconquista) into which many industries and residential neighbourhoods discharge, are heavily polluted.

As with the treatment of the scarcity value of water, the urban water and sanitation service provider is affected by the regulation of environmental and health externalities, both as a user of raw water and as a provider of water and sanitation services. On the one hand, the service provider's costs of production and its ability to meet the public authority's objectives will be affected by the quality of raw water supply. On the other hand, the service provider will be affected by regulations on the quality of potable water and wastewater discharges. However, as with measures to efficiently allocate and conserve water resources, there is no *a priori* need for changes to these regulations with increased PSP. Nonetheless, PSP may necessitate the formalisation of regulations to mitigate environmental and health externalities, since private firms may have greater incentive to reduce treatment costs than public sector providers had. This can be one of the great benefits of PSP, making trade-offs between different objectives more explicit. If environmental standards increase service costs, then this will be more readily apparent.

With PSP, it is vital that there is co-ordination between the different authorities. For example, in the case of Buenos Aires, the concessionaire (Aguas Argentinas) argued that changes in regulations which prevented the dumping of sludge from wastewater treatment plants at sea were not foreseen when the tariffs were agreed upon. It has also been argued that the public authorities have not adequately regulated the quality of discharges into the sewerage system, also affecting the viability of the concession. Thus, the means by which environmental standards are treated in the regulatory regime is crucially important, particularly when prices are regulated through "price caps" rather than "rate-of-return" formulae. In the case of Abidjan, where "rate-of-return" regulations are used, the firm will always be able to pass on the cost of changes in standards.

Efforts to mitigate environmental and health externalities are often included directly in the contracts through which PSP is established. Most directly, this arises when specific quality objectives are incorporated into the contracts. For instance, concession agreements often include schedules for upgrading from direct discharge to primary treatment and eventually from primary treatment to secondary treatment (this is the case in Buenos Aires). Similarly, drinking water quality standards are also often incorporated directly into the contract. To some extent, these obligations may appear to be redundant in the presence of equivalent environmental regulations, enforced by environmental agencies. However, by attaching such obligations directly to commercial incentives, there may be an increased likelihood of targets being met. Moreover, as with water conservation objectives, the incentives of public authorities to enforce the regulations (or introduce stricter standards) may increase with PSP. Relative to standards prevailing under OSN, water quality variables such as turbidity, bacteriology, and free chlorine have improved markedly in Buenos Aires since the granting of the concession. WHO standards were achieved in 1996, and principal parameters conform to the standards required by the Argentine Ministry of Health.

In most contracts, failure to meet environment-related service quality standards can result in penalty payments, usually paid for out of a performance bond deposited with the regulator. However, it is important that the penalties provide appropriate incentives (i.e. be sufficiently high to affect firm behaviour) but also be credible (i.e. not be so high as to discourage their application). For instance, some contracts only allow for the "dissolution" of the contract, which is hardly likely to be appropriate or credible for minor infractions. Other contracts only allow for penalties which are of a lesser value than that of the infraction to the firm. Thus, the determination of penalties appears to be a delicate

balancing act. The use of performance bonds (as in Manila, Mexico City and Buenos Aires) helps to ensure that enforcement of penalties is credible, thus providing better incentives.

Perhaps the most significant effect of PSP on the realisation of environmental and health benefits arises from contractual targets for expansion of the wastewater collection system (or regulated on-site facilities). Since many on-site sanitation facilities have adverse effects for groundwater pollution and neighbourhood environmental conditions, expansion of the system will have important effects on the reduction of local externalities. In most cases the necessary financing requirements are agreed upon with the firm when such targets are established, with households usually paying for expansion costs through connection charges. However, in many cases this has been unrealistic. The inability of many households in Buenos Aires to pay the proposed \$US1,000 sewer connection charges resulted in delays in network expansion, and eventually re-negotiation of the contract with a revised tariff structure, whereby the costs of expansion were borne by all service users.

In cases where the capacity of public authorities to regulate externalities is inadequate, it may be possible to design PSP in such a way as to overcome this problem, perhaps even expanding the scope of the contract in order to internalise incentives within the firm. For instance, by keeping sanitation in public hands in Córdoba it can be argued that an opportunity to internalise externalities directly through the contract itself was lost. With the sanitation service provider discharging wastewater into the water supply service provider's raw water supply (Lago San Roque), a contract which covered both services might have been easier to manage since the firm would have appropriate internal incentives. Paradoxically, in the case of Buenos Aires where water and sanitation is not a "closed" system, the concession included both services.

### 3.3 Basic Needs and Merit Goods

Access to adequate water supply and sanitation facilities are usually described as basic needs. This implies, amongst other things, that lower-income households will tend to spend a large proportion of their disposable income on water and sanitation. Moreover, their expenditure on water and sanitation will be proportionately much greater than that of richer households.<sup>11</sup> For instance, in Mexico, the lowest decile spend just over 5% of their total expenditure on water services, relative to just over 1.5% for the highest decile. In Manila, the lowest income bracket spends 8.2% of income on water services, while the highest spends just 0.6%.<sup>12</sup> These differences between rich and poor in the proportion of total expenditure allocated to water are not primarily a consequence of decreasing proportional consumption levels, but rather, are mainly due to the inequality in access to public facilities. In Buenos Aires, only 19% of households in the lowest socio-economic classification have household water

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<sup>11</sup> Bahl and Linn (1992) review a number of country-level studies of water demand in developing countries and find estimated income elasticities ranging from 0.0 to 0.4. This is confirmed by cross-sectional evidence, indicating that the income-elasticity of water consumption is in the region of 0.3 (Anderson and Cavendish 1993). However, it should be emphasised that if the nature of the service provided by the good changes with income then the demand function may exhibit changing elasticities. For instance, higher-income households in which a significant proportion of water is used for recreation and aesthetic purposes (e, swimming pools, gardening and car washing) may have highly price-responsive demand. Thus, not surprisingly it has been found that the *price* elasticity of demand for water differs with income levels, with elasticities being much lower for poorer households (see Anderson and Cavendish 1993, Bahl and Linn 1992 and Idelovitch and Ringskog 1997). For related reasons *income* elasticities may also differ by income level.

<sup>12</sup> Relative costs and expenditure on sanitation facilities are more difficult to compare since the variation in service quality is so wide. A number of alternative low-cost on-site facilities provide relatively inexpensive and adequate alternatives to off-site collection systems. For instance, in many cases on-site sanitation facilities will be preferable (in environmental, health and even convenience terms) than some types of off-site sanitation facilities, even though they may be technologically less sophisticated and considerably less costly (see Mara 1996 and Cairncross and Feachem 1993). However, as population density increases the number of feasible on-site options becomes more constrained.



connections, while 86% of the richest households do. The comparable figures for sanitation are 13% and 79%. Only 20-25% of “low-income” households in Manila have household water connections. Since the cost of vended water can far exceed network water, non-connection itself can be one of the most important determinants of disposable income for poorer households (see Table 2 for a comparison of the cost of vended water relative to “network” water in Abidjan and Manila).

<b>Table 2: Price of Water by Source in Abidjan and Manila</b>		
	<b>Abidjan (FCFA/m<sup>3</sup> in 1996)</b>	<b>Manila (P/m<sup>3</sup> in 1995)</b>
Vended	1,000 - 2,000	21.80 - 71.93
Network Water	324	5.53 <sup>13</sup>

Water and sanitation facilities have been characterised not only as basic needs, but also as “merit” or “beneficial” goods (Mody 1996, Roth 1987 and Franceys 1997). This implies that society as a whole values private consumption by individuals above and beyond those benefits reflected by personal preferences and external health and environmental benefits. Merit goods have two characteristics. First, they are fundamental to a person’s capacity to function in society (see Sen 1983). Access to affordable water and sanitation facilities are thought to constitute one such case since they are unarguably fundamental to the realisation of a basic standard of living (see Franceys 1997 and Fass 1993). Second, there are significant information failures in the provision of water and sanitation facilities. Households do not have access to (or are not able to use) all of the information necessary to make informed choices regarding consumption. Such preference failures are particularly important in demand for WSS, given the complexity of health effects from the consumption of too little water or water of inadequate quality, and from the use of inadequate sanitation facilities.<sup>14</sup>

Thus, even without the existence of health and environmental externalities of the sort described above, in the presence of “preference” failures, households may consume too little water or water of inadequate quality. The combined effect of these two characteristics of WSS imply that there is a significant demand-side potential for under-provision (in both quantity and quality) even in the absence of supply-side market failures and health and environmental externalities. However, as with the other market “failures” cited above, state provision is not necessary to ensure that the basic needs of poorer households are met. Rather, the state must serve as a guarantor of a certain level of affordable provision. It can do so by direct means, such as providing public subsidies for water and sanitation services to poorer households and neighbourhoods. “Free” water points would be one such example.

In most cases these programmes do not materially affect the service provider, whether public or private. However, there are a variety of ways that social objectives can be realised through the contract itself. One of the most common ways of attempting to realise social objectives in WSS is through a price regulation regime which mandates a tariff schedule with positive distributional consequences. Thus, rising block tariffs are applied in Abidjan and Manila. In other cases (e.g. metered households in Buenos Aires and Córdoba), a lifeline tariff is used, with a certain level of consumption being free.

However, with private service providers, there is a danger that cross-subsidisation of this form will provide disincentives for service providers to expand into poorer neighbourhoods. Since consumption is (moderately) income-elastic, private firms may find that their profit rates are higher if they serve higher-income areas first, where consumption per connection (and thus average tariff rate) is likely to be higher. Thus, the dynamic distributional consequences in terms of service expansion rates may be

<sup>13</sup> Households with sewer connections paid 8.52 P/m<sup>3</sup>.

<sup>14</sup> Roth (1987) cites an example from Thailand.

negative since unserved areas are disproportionately poor. Conversely, the success of cross-subsidisation in static terms may be undermined where there are multiple-household dwellings, shared water points or public water taps. In such cases, rising block tariffs may have perverse distributional consequences since poorer households are more likely to rely upon sources with multiple users. This appears to be the case in Manila. To some extent, in the case of Buenos Aires this problem has been addressed by adjusting the lifeline tariff for multiple household dwellings.

Even in cases where consumption is not metered, other means are often used to cross-subsidise consumption for poorer households. For instance, Córdoba applies “zone” coefficients, in which households in poorer neighbourhoods pay slightly more than 50% of the monthly charge of wealthier neighbourhoods. In Buenos Aires, a variety of proxies which are thought to be related to household wealth (construction date and “type” of dwelling) are also applied at the level of the household for the determination of monthly charges. However, there is likely to be a trade-off between the administrative costs and the effectiveness of progressive pricing in reducing inequities. Zone coefficients and other dwelling-related proxies are unlikely to be very good guides to relative wealth, while “means-tested” measures are likely to be costly unless they can be “piggybacked” onto other social programmes with wide coverage.

The spatial definition of the concession area can also be socially significant since it will determine the potential scope for cross-subsidisation. In most cities (e.g. Buenos Aires and Abidjan) single tariff schedules are applied across the entire city, resulting in cross-subsidies from low-cost areas to high cost-areas.<sup>15</sup> Depending upon the relationship between the costs of service provision and the distribution of poorer households this can have significant social implications. However, if concession areas do not cover a reasonable proportion of wealthier neighbourhoods it will be difficult to cross-subsidise poorer households. As noted, in Manila, the concession has been split in two, with tariff rates in the East Zone less than 50% of those in the West Zone. Although such a split eases the regulatory burden through enabling ‘yardstick’ comparisons to be made, it may limit the potential for cross-subsidisation if one of the zones contains an insufficient proportion of wealthy households.

The means by which expansion costs are financed is also important. As noted above, the terms of many contracts have required private sector service providers to finance network expansion out of connection fees. This has often resulted in unaffordable connection fees for many poorer households with little or no access to savings or credit. Indeed, in many cases the costs will be even greater in poorer neighbourhoods since they may have been developed in an unplanned manner, located far from the existing network, or be situated in areas with difficult topographical conditions. One possible solution is to provide finance for credit schemes which effectively convert connection fees into monthly payments. In Buenos Aires, the concessionaire has to provide two-year financing for connection charges.

Alternatively, it may be preferable to finance expansion costs from charges imposed on all users and not just new users. This is likely to be more equitable since in many cases users of the existing network did not pay for access when they were connected. The Buenos Aires case, where a surcharge on all users has been applied, is illustrative in this regard. In Abidjan, an investment fund is financed out of a special water tax, effectively reducing connection charges for new users. In addition, a number of free “social” connections are provided for poorer households. Since these are financed through the water tax, this means that the “social” connections are cross-subsidised by all connected users. Finally, another alternative which avoids this problem is the use of in-kind labour inputs as a

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<sup>15</sup> Indeed, the same rate applies to all of Côte d’Ivoire, with low-cost Abidjan cross-subsidising other areas.

substitute for financial payments in exchange for connection. Such a strategy has proven to be successful in Buenos Aires, actually accelerating service expansion rates.

However, it is important to remember that even if the terms of the contracts are met, full water and sewerage coverage will not be attained in some neighbourhoods for up to thirty years. Since the costs of provision are often higher and demand lower in poorer neighbourhoods, it is likely to be the most disadvantaged that find themselves in such a position if the firm is allowed to determine the spatial pattern of expansion. This raises the question as to whether or not the obligations of the agreement should be prioritised by area, since poorer households may not have the financial resources required to adopt alternative measures which do not generate externalities. Unlike many other contracts, the Manila concession provides targets at a relatively decentralised level, although it is not clear that socio-economic criteria were used for prioritisation. In other cases it may be preferable to differentiate services by neighbourhood, reflecting differences in the ability and willingness to pay for WSS services. In the case of Buenos Aires the concessionaire has worked with NGOs and local communities to try to devise alternative sanitation systems which are more consistent with households' ability and willingness to pay. However, in such cases it is important that the services provided actually reflect demand and that tariffs reflect the lower level of service provision.

In a related vein, it may be necessary to mandate "interim" measures in the terms of the concessionaire's contract. For instance, the concession could include obligations for latrine and septic tank maintenance, as well as the provision of public water points or trucked water. The Manila concession includes obligations of this kind, requiring the concessionaires to provide and manage public standpipes and septic tanks in areas where household water connections and sewerage are not scheduled to be introduced in the near future. Analogously, in peri-urban areas of Abidjan, SODECI, the concessionaire, works with licensed retailers to supply water to low-income households who have not yet been connected to the system. However, this licensed resale has resulted in higher unit costs than for direct network customers. More controversially, since many poorer households are dependent upon "illegal" sources of water (directly and indirectly), it will not be equitable to close all illegal connections immediately upon granting monopoly rights of provision to a private firm (Manila introduced an "amnesty" on illegal connections when PSP was introduced). The same holds true for unregulated and unlicensed groundwater abstraction, which is a persistent problem in many of the case studies.

### 3.4 Conclusions

Although the primary responsibility of economic regulators is to ensure that private sector service providers do not over-price and/or under-provide services, the means by which they regulate the sector can also have significant environmental and social implications. Indeed, in some cases their role may be even more significant than those public authorities that have direct responsibility for environmental and social concerns. Table 3 reviews some of the measures, described above, which have been important in the five case studies examined.

<b>Source of Market Failure</b>	<b>Measures</b>	<b>Examples</b>
Merit goods and preference failures	<ul style="list-style-type: none"> <li>• Lifeline tariffs</li> <li>• Rising block tariffs</li> <li>• Credit/financing schemes</li> <li>• Social connections and preferential tariffs</li> <li>• Service Differentiation</li> </ul>	<ul style="list-style-type: none"> <li>⇒ Buenos Aires, Córdoba</li> <li>⇒ Abidjan, Mexico</li> <li>⇒ Buenos Aires</li> <li>⇒ Abidjan and Córdoba</li> <li>⇒ Manila and Buenos Aires</li> </ul>
Raw water conservation and allocation	<ul style="list-style-type: none"> <li>• Use-based water pricing</li> <li>• Metering targets</li> </ul>	<ul style="list-style-type: none"> <li>⇒ Manila, Córdoba, Abidjan</li> <li>⇒ Mexico</li> </ul>

	<ul style="list-style-type: none"> <li>• Leakage targets</li> <li>• Rehabilitation contracts</li> <li>• Withdrawal fees/permits</li> </ul>	<p>⇒ Manila, Buenos Aires, Mexico</p> <p>⇒ Mexico</p> <p>⇒ Mexico, Córdoba</p>
Environmental and health externalities	<ul style="list-style-type: none"> <li>• Quality targets</li> <li>• Treatment upgrading targets</li> <li>• Coverage/expansion targets</li> <li>• “Interim” Measures<sup>16</sup></li> </ul>	<p>⇒ Buenos Aires, Abidjan</p> <p>⇒ Buenos Aires, Manila</p> <p>⇒ Buenos Aires, Manila</p> <p>⇒ Manila, Abidjan</p>

However, as with ensuring that efficiency objectives are realised, in order to ensure that social and environmental objectives are realised, the economic regulator must be effective. This means overcoming three potential barriers to the regulator’s effectiveness:

- *Insufficient technical expertise.* Regulatory offices are often staffed by employees of the previous public provider. Since the skills required are very different, this can prove to be a significant constraint on effective regulation.
- *Rent-seeking.* While this problem exists in all countries (see Helm 1994 for a discussion of the UK case), regulators may be more susceptible to rent-seeking in countries where the gap in pay between the regulatory office and the service provider is great.
- *Regulatory capture.* The potential for regulatory capture increases in conditions where information is scarce. Since the introduction of PSP has often been undertaken very quickly and with limited preparatory work, regulatory capture is quite likely.

As has been discussed elsewhere, overcoming these barriers can be exceedingly difficult, particularly in poorer countries with limited financial resources and which have only recently reformed their sectors (see Mody 1996 and Kerf and Smith 1997). Perhaps more importantly, the service provider will be subject to different forms of regulation from the environment ministry, the health ministry, the rivers and/or coastal waters authority, municipal housing agencies, and land use and planning agencies. This raises the potential for “common agency” problems, whereby a number of regulatory agencies or ministries are involved in the operating conditions of the utility and there is insufficient co-ordination between them (see Sappington 1996). Resolving these two sets of problems is key to the realisation of economic, social and environmental objectives.

## 4. Conclusion

PSP in urban WSS is likely to continue to increase in importance in developing countries in the coming years. For this reason it is vital that PSP is consistent not only with efficiency objectives, but also with the realisation of social and environmental objectives. On the basis of the case studies examined, it would seem that the experience thus far has been mixed. In many cases, there have been clear and important benefits, with positive environmental and social consequences: service networks have expanded into poorer neighbourhoods, users often have more appropriate incentives for more prudent water use, wastewater treatment levels are improving; and, in some cases measures are being adopted to make services more affordable. However, there is still a great deal to be done. The following are particularly pertinent:

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<sup>16</sup> In the case of Buenos Aires a number of interim measures have been introduced but these were not explicitly included in the contract.

- The technical specifications of the contract must be consistent with household preferences and their ability to pay for services. Expansion targets cannot be met if services are unaffordable and/or inappropriate. In some cases it may be preferable to differentiate services by neighbourhood. This will usually require considerably more preparatory work - including household surveys, and not just technical feasibility studies - prior to initiating the bidding process.
- Even in cases where the ultimate objective is universal coverage of a standardised level of service provision, the sheer level of under-investment in the past means that this may take many years. Thus, it is important to introduce measures which help poorer households realise some of the benefits of PSP in the short- and medium-term. In some cases this may involve explicit prioritisation by neighbourhood, or the inclusion of interim forms of service provision explicitly in the contracts. Measures that increase access to credit and the provision of alternative payment schemes (including in-kind inputs) may also be used.
- While it is important that lower-income households have access to affordable services, it is also important to ensure that efforts to realise this objective through service pricing do not result in unintended and even perverse effects. For instance, providing various subsidies to connected lower-income households may result in reduced service expansion rates, and thus be unintentionally regressive in the longer-run. Similarly, tariff structures that penalise households that rely upon multiple-use connections or public water points must be avoided.
- It is important to design contracts in a way that places the least burden possible on regulatory authorities. There are numerous aspects of PSP contracts that have been designed to meet environmental and social objectives, but which are economically inefficient and/or administratively costly. For instance, setting targets to reduce leakage rates while providing raw water at zero cost places a significant burden on the regulator, and may not be efficient.
- There must be a high degree of co-ordination between the different agencies that have an impact upon the regulatory environment of the sector. One of the advantages of PSP is that it makes choices and trade-offs between alternative objectives explicit, particularly since there can be important trade-offs between the realisation of environmental and social objectives. For instance, excessively stringent technical specifications for wastewater treatment quality may increase service costs or result in delays in expansion of the system into poorer uncovered areas. Thus, responsibilities need to be clearly established at the outset.
- Finally, it is important to remember that, with some exceptions, experiences with PSP in the sector have been concentrated in countries with considerable administrative capacity. However, in the coming years it is likely that PSP will grow in importance in countries which have more extreme levels of urban poverty, are faced with greater environmental constraints, and possess less regulatory capacity. The benefits of different forms of PSP need to be weighed against the potential costs if the public authorities are not able to intervene effectively. Thus, a more pertinent issue than whether or not there should be PSP, is the precise form which such PSP should take, given existing economic conditions, sectoral objectives and domestic regulatory capacity.

This last point needs to be emphasised. In general, the complexity of dealing with environmental and social objectives complicates the role of the regulator, particularly in developing countries. Where information is scarce - and it is particularly scarce with respect to household preferences and supply conditions in poorer neighbourhoods and with respect to environmental conditions and trends in standards - the regulator must be particularly effective. Since it will be very difficult to identify appropriate forms of service provision *ex ante* and since environmental regulations and conditions are changing quickly in developing countries, some degree of flexibility may have to be introduced in the

contract in terms of the technical specifications of the services provided, management of collective systems (including neighbourhood inputs), and the tariff structure. However, it is important that this does not undermine the enforceability of the contract. Balancing trade-offs between the flexibility needed to ensure that environmental and social objectives are realised and ensuring that private service providers meet their contractual obligations is one of the most pressing concerns arising from PSP.

## 5. References

- Altaf, M. J. 1994. "The Economics of Household Responses to Inadequate Water Supplies". *Third World Planning Review* 16(1):41-53.
- Anderson, D. and W. Cavendish 1993. *Efficiency and Substitution in Pollution Abatement*. World Bank Discussion Paper No. 186. The World Bank, Washington D.C.
- Bahl, R. W. and J. F. Linn 1992. *Urban Public Finance in Developing Countries*. Oxford University Press, Oxford.
- Bhattacharyya, A. et al. 1994. "An Examination of the Effect of Ownership on the Relative Efficiency of Public and Private Water Utilities". *Land Economics* 70(2):197-209.
- Brook-Cowen, P. 1997. "The Private Sector in Water and Sanitation: How to Get Started". *The Private Sector in Infrastructure: Strategy, Regulation, and Risk*. The World Bank, Washington D.C.
- Cairncross, S. and R. Feachem. 1993. *Environmental Health Engineering in the Tropics*. Wiley, Chichester.
- ECLAC. 1996. *Progress in the Privatization of Water-Related Public Services: A Country-By-Country Review for Mexico, Central America, and The Caribbean*. Economic Commission for Latin America and the Caribbean. Santiago, Chile. (mimeo available <http://www.cepis.org.pe>)
- ECLAC. 1997. *Regulation of the Private Provision of Public Water-Related Services*. Economic Commission for Latin America and the Caribbean. Santiago, Chile. (mimeo available <http://www.cepis.org.pe>).
- Chisari, O., Estache, A. and C. Romero. 1997. *Winners and Losers from Utility Privatization in Argentina*. World Bank Policy Research Working Paper 1824. The World Bank, Washington D.C.
- Chogull, C. L. and M. B. G. Chogull. 1996. "Towards Sustainable Infrastructure for Low-Income Countries" in C. Pugh (ed.) *Sustainability, the Environment and Urbanisation*. Earthscan, London.
- Crampes, C. and A. Estache. 1997. *Regulatory Tradeoffs in Designing Concession Contracts for Infrastructure Networks*. World Bank Policy Research Working Paper 1854. The World Bank, Washington D.C.
- Crain, W. M. and A. Zardkoohi. 1978. "A Test of the Property Rights Theory of the Firm: Water Utilities in the United States". *Journal of Law and Economics* 21:395-408, October.
- Crane, R. 1994. "Water Markets, Market Reform and the Urban Poor: Results from Jakarta, Indonesia". *World Development* 22(1):71-83.
- David, C. and A. B. Inocencio. 1998. *Understanding Household Demand for Water: the Metro Manila Case*. EEPSEA Research Report Series, January 1998. The Economy and Environment Program for South East Asia, Singapore.

- Dellapenna, J. 1994. "Why Are True Water Markets Rare or Why Should Water be Treated as Public Property" in M. Haddad and E. Feitelson (eds.). *Joint Management of Shared Aquifers: The Second Workshop Nov.27-Dec. 1, 1994*.
- Estache, A. 1994. "Making Public Infrastructure Entities Commercial". *Finance and Development*, September: 22-25.
- Fass, S. M. 1993. "Water and Poverty: Implications for Water Planning". *Water Resources Research* 29(7):1975-1981.
- Feigenbaum, S. and R. Teeple. 1983. "Public vs Private Water Delivery: A Hedonic Cost Approach" *Review of Economics and Statistics*. 65(4):672-678.
- Franceys, R. 1997. *Private Sector Participation in the Water and Sanitation Sector*. UK Department for International Development Occasional Paper No. 3. DfID, London.
- Gentry, B. and L. O. Fernandez. 1997. *Evolving Public-Private Partnerships: General Themes and Urban Water Examples*. Paper delivered at the OECD Workshop on Globalization and the Environment, Paris, 13-14 November, 1997.
- Haarmeyer, D. and A. Mody. 1998. *Worldwide Water Privatisation: Managing Risk in Water and Sanitation*. Financial Times Business Ltd., London.
- Hardoy, J., Satterthwaite, D. and D. Mitlin. 1992. *Environmental Problems in Third World Cities*. Earthscan, London.
- Hearne, R. and J. Trava.. 1997. *Water Markets In Mexico: Opportunities and Constraints*. Environmental Economics Programme Discussion Paper 97-01, International Institute for Environment and Development, London.
- Helm, D. 1994. "British Utility Regulation: Theory, Practice and Reform". *Oxford Review of Economic Policy* 10(3).
- Idelovitch, E. and K. Ringskog. 1995. *Private Sector Participation in Water Supply and Sanitation in Latin America*. The World Bank, Washington D.C.
- Idelovitch, E. and K. Ringskog. 1997. *Wastewater Treatment in Latin America*. Directions in Development, The World Bank, Washington D.C.
- Ingram, G. and C. Kessides. 1994. "Infrastructure for Development". *Finance and Development* September:18-21.
- Jaspersen, F. 1997. *Agua Argentina, The Private Sector and Development: Five Case Studies*. IFC, Washington D.C. (<http://www.ifc.org/main/html/pubbuy.htm#lessons>).
- Kerf, M. and W. Smith. 1996. *Privatizing Africa's Infrastructure: Promise and Challenge*. World Bank Technical Paper No. 337, Africa Region Series. The World Bank, Washington D.C.
- Kessides, C. 1997. *World Bank Experience with the Provision of Infrastructure Services for the Urban Poor*. Transportation, Water and Urban Development Department, The World Bank, Washington D.C.



- Laffont, J.-J. and J. Tirole. 1993. *A Theory of Incentives in Procurement and Regulation*. MIT Press, Cambridge, Massachusetts.
- Lambert, D. K. and D. Dichev. 1993. "Ownership and Sources of Inefficiency in the Provision of Water Services". *Water Resources Research* 29(6).
- Lewis, M. and Ted Miller. 1987. "Public-Private Partnership in Water Supply and Sanitation in Sub-Saharan Africa". *Health Policy and Planning* 2(1):70-79.
- Lyonnaise des Eaux. 1998. *Alternative Solutions for Water Supply and Sanitation in Sectors with Limited Financial Resources*. Lyonnaise des Eux, Nanterre.
- Mara, D. 1996. *Low-Cost Urban Sanitation*. John Wiley, Chichester.
- Mody, A. 1996. "Infrastructure Delivery: New Ideas, Big Gains, No Panaceas" in A. Mody (ed.) *Infrastructure Delivery: Private Initiative and the Public Good*. Economic Development Institute, The World Bank, Washington D.C.
- Morales-Reyes, J., Franceys, R. and K. Sanson. 1998. *Mexican B.O.T. Experience and World Comparison, Analysis and Recommendations*. WEFTEC '98, Workshop 109.
- Nickson, A. 1996. *The Role of Government in Adjusting Economies: Urban Water Supply Sector Review*. Development Administrations Group, School of Public Policy, The University of Birmingham, UK.
- Panos. 1998. *Liquid Assets, Is Water Privatisation the Answer to Access?* Media Briefing No. 29. The Panos Institute, London.
- Rees, J. A. 1998. *Regulation and Private Participation in the Water and Sanitation Sector*. Global Water Partnership, Technical Advisory Committee, Background Paper No. 1.
- Rivera, D. 1996. *Private Sector Participation in Water Supply and Sanitation: Lessons from Six Developing Countries*. Directions in Development, World Bank, Washington D.C.
- Roth, G. 1987. *The Private Provision of Public Services in Developing Countries*. Oxford University Press, Oxford.
- Saade, L. 1998. *Participación del Sector Privado en los Servicios de Agua Potable y Saneamiento: Un Balance de Metas Económicas, Ambientales y Sociales*. Mimeo.
- Sen, A. 1983. "Poor, Relatively Speaking" *Oxford Economic Papers* 35:153-169.
- Silva, G., Tynan, N. and Y Yilmaz. 1998. "Private Participation in the Water and Sewerage Sector - Recent Trends" in World Bank Note No. 147 *Public Policy for the Private Sector*. The World Bank, Washington D.C.
- Teeple, R. and D. Glycer. 1987. "Cost of Water Delivery Systems: Specification and Ownership Effects". *Review of Economics and Statistics* January 1987:399-408.

World Bank. 1993. *Water Resources Management*. The World Bank, Washington D.C.

World Bank 1998. *World Bank Viewpoint*, Note No. 147. The World Bank, Washington D.C.

**Private Sector Participation in Water Supply &  
Sanitation:  
Realising Social & Environmental Objectives**

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**Summary of Proceedings of  
Workshop  
held in London on 26-27 November 1998**

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*Organised by*  
**Environmental Economics Programme  
International Institute for Environment and Development**

*Edited by*  
**Libby Wood and Nick Johnstone**

## A.1 Introduction

Due to a widespread perception of public mismanagement of urban water supply and sanitation systems (WSS), there has been a substantial increase in “formal” private sector participation (PSP) in the sector in recent years. A World Bank database lists 97 different cases where private sector firms have taken on a major role in WSS provision in Africa, Asia and Latin America. Between 1990 and 1997 the cumulative new private sector capital expenditures in WSS projects in these regions was \$25 billion, compared to \$297 million in the period 1984 to 1990. (World Bank, 1998).

Despite the increase in investment by private sector firms and continued efforts on the part of public authorities, a large proportion of the urban population in developing countries remain unserved. The UN estimated that, in 1994, close to 300 million urban dwellers were not served by water supplies and close to 600 million were without sanitation. Many international agencies have reduced their budgets for WSS since the end of the International Drinking Water Supply and Sanitation Decade (1981-1990). Over the next ten years, the World Bank estimates that \$500 billion will be needed for WSS projects. Many are turning to the private sector as the solution.

However, the experience thus far of large formal private sector service providers helping poor households gain access at reasonable cost is decidedly mixed. Although many concessions include explicit contractual arrangements for expansion of the system to unserved areas (where many of the poorest households live), in most cases little consideration is given to what households want and can afford, to local supply conditions and to the viability of existing systems and how these can be integrated with changes in the sector as a whole. As a consequence, conventional forms of WSS may be offered which are inappropriate and unaffordable in poorer neighbourhoods. Private companies may not pursue alternative forms of provision because they have insufficient understanding of them or are prevented from doing so due to contractual obligations.

The role played by private sector firms in improving environmental conditions is closely tied to their ability to meet social objectives. If poorer households do not have access to adequate and affordable water and sanitation, then surface and groundwaters are vulnerable to pollution, and raw water resources may be exploited unsustainably. There are other important factors that determine the environmental consequences of PSP. There is little question that some cities have seen improvements in wastewater treatment levels and quality as a result of the contractual obligations which companies have been required to meet. However, in many cases improvements remain potential rather than actual. Regulatory capacity is key.

This document contains a summary of the proceedings of a workshop held in London on 26-27 November 1998.<sup>1</sup> The purpose of the workshop was to consider efficient and practical ways to realise social and environmental objectives in light of the increased PSP in urban WSS. The workshop brought together a range of professional experience and perspectives, with representatives from private firms, regulatory authorities, network managers, municipalities, development assistance agencies, NGOs and universities. All those concerned are on a very steep learning curve: European firms are working in neighbourhoods and in environmental conditions with which they are often unfamiliar; public authorities are adjusting to becoming “indirect” providers rather than direct managers of WSS systems; and, development agencies and NGOs are attempting to understand how best to protect the interests of their intended beneficiaries. Because it is a fast-changing and diverse area, nobody can claim to have a full understanding of the issues. There is considerable opportunity to learn from each other.

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<sup>1</sup> We are grateful to the financial assistance for the workshop provided by the UK Department for International Development (DFID) and the Economic Development Institute (EDI) of the World Bank. The Swiss Development and Cooperation Agency (SDC) also provided valuable funding for the case studies.

The first day consisted of presentations of the four case studies (Manila, Buenos Aires/Cordoba, Abidjan, Mexico City). Each of these were followed by comments from designated discussants, who were familiar with the cases presented. More general discussion of the specific cases followed. Because of their length, the case studies have not been included in the proceedings. However, short summaries have been included to provide a context for the comments and discussions which follow. Copies of the full report can be obtained from Nick Johnstone or Libby Wood at IIED.

On the second day, four round-table discussions on more specific issues of particular importance for the realisation of social and environmental objectives were held. These comprised:

1. Service differentiation - Opportunities and constraints for service differentiation were discussed including user preferences, existing informal service providers, technological and managerial issues and tariff structures.
2. Management systems in low-income neighbourhoods - This session looked at alternative management systems in light of service differentiation and the particular characteristics of low-income areas. In particular, it considered potential relationships between the private company and user associations/community organisations, NGOs and local government structures, as well as opportunities for alternative systems of sub-contracting, billing and credit facilities.
3. Regulation - The third session examined the roles and tasks of the regulatory authority in the presence of social and environmental objectives, common agency problems and information constraints.
4. Bidding procedures and contracts - The final session considered contractual design and bidding procedures from the perspective of different stakeholders in low income countries.

Each session was introduced by participants who were familiar with the issues. There was, of course, considerable overlap between the sessions.

These proceedings cannot hope to reflect the full richness of the discussions at the workshop. While there was considerable disagreement around a number of key issues - which is not surprising given the complexity of the subject matter and the varied backgrounds of participants - contributions were uniformly constructive. Rather than attributing individual points (other than those made by the case study authors and discussants in the course of their presentations), an overview of discussions on some of the main points is provided.

Beyond its more general objectives, the workshop had two very specific objectives. First, it provided an opportunity for the authors of the case studies to obtain feedback from other experts. Second, it helped the researchers to get a feel for what types of research project would be seen as valuable by firms, regulators, other public authorities, and, most importantly, the communities affected.

Section A.2 contains a summary of the proceedings and outlines ideas for further research. Section A.3 summarises the case study presentations and records the discussions that arose from them. Section A.4 provides an overview of the round-table discussions on specific issues of particular importance for the realisation of social and environmental objectives. A list of participants and their contact details is contained in Section A.5.

### **A.2 Workshop Summary**

Discussion throughout the course of the workshop was lively, with all participants making important contributions. While there was disagreement on a number of points, some general conclusions were reached on how best to deal with social and environmental concerns when there is PSP in the sector.

### A.2.1 Regulatory Issues

- The regulatory requirements implied by the form of PSP adopted should not exceed regulatory capacity.
- With PSP the role of government changes from provider to decision maker, necessitating a new regulatory framework for the sector. The contractual relationships and roles of different agencies have to become more transparent.
- The expectations of public authorities and customers are often raised, resulting in demand for improved environmental performance and increased access for poorer households.
- Many initiatives to introduce PSP are being undertaken with insufficient attention given to regulation - governments are relinquishing their role as provider, but are not fulfilling their new role as regulator.
- There are trade-offs in the number of regulatory agencies involved in WSS. Although multiple agencies are able to focus on their specific areas of expertise, common agency problems frequently occur. Rather than having one decision maker, having one decision-making process may be the best approach.
- If regulators are not able to operate independently the wrong incentives may be offered.
- Irrespective of the regulatory framework, regulators and firms will be faced with incomplete and inaccurate information, particularly with respect to environmental matters and service provision in poor areas. The regulatory framework needs to be flexible enough to deal with this.
- In order to facilitate the regulatory process, there is a strong argument for the integrated management of WSS.

### A.2.2 Bidding Procedures & Contract Design

- Social and environmental concerns should be on the agenda at the beginning of the process when clarifying objectives, gathering information and designing the contract. Currently, poor communities tend to be an afterthought and provision for them within the contract badly planned.
- The criteria on which contracts are awarded - such as the lowest tariff rate, the largest payment to public authorities or the greatest levels of investment - are considered by some to be too simplistic. However, introducing more complex formulae can result in a loss of transparency in the decision-making process and adds to the cost of the bidding procedure.
- Bidding systems based on minimum cost may discriminate against the poor since they do not leave surplus investment money to deal with unforeseen costs in irregular settlements.
- While many countries are seeking PSP in the sector, before an international firm will even consider involvement in a developing country, a number of economic and political preconditions must be met. Similarly, the firm will want to ensure that it is satisfied with contractual details such as technical objectives, tariff policies and other terms and conditions before it submits an offer.
- Since uncertainty increases risk and therefore the offer price, it is in everybody's interest to ensure that the process is transparent, and reliable information (where it exists) is available.
- With current bidding procedures, it is often the company that makes the most optimistic evaluation of the business that wins the contract. This has resulted in frequent renegotiation of contracts.
- Since the transaction costs involved in bidding are high, failure to comply with contractual promises tends to result in the renegotiation of contracts. Renegotiation is becoming more commonplace and threatens to undermine the bidding process.

### A.2.3 Levels of Service Provision

- There are often clear benefits to be derived from supplying formal WSS to previously unserved areas. The important thing is to ensure that the private company has an incentive to do so by coming up with viable institutional, technological, organisational and financial alternatives. Coverage targets by themselves are not sufficient.

- When incorporating service differentiation as part of a system's expansion plans it is important that the service levels provided reflect actual household preferences and budgets, and not the priorities of the regulators or firms. Moreover, different levels of service provision should be reflected in tariffs paid.
- In many cases household connections are not feasible. The reasons for this include inability to pay or to access credit, insecure land tenure, or technological constraints.
- If service differentiation is being considered as part of PSP it is important that this does not undermine the integrity of the system as a whole, or result in environmental and health externalities.
- It is important to understand the dynamics of existing forms of WSS provision since these can provide valuable lessons for future developments.
- Service differentiation must allow for upgrading of technologies in order to cater for increased demand for improved service provision over time.
- Firms may be reluctant to provide the types of service with which they are unfamiliar in neighbourhoods where they have little experience. Working with other groups (municipal authorities, NGOs, development agencies) familiar with service provision in low-income neighbourhoods may be necessary.
- In some cases firms may find that their comparative advantage is to supply services up to a certain point, with communities then taking responsibility for financing and operating onward connections.

#### **A.2.4 Management of WSS in Low Income Areas**

- Where possible, communities in low-income areas should be involved at all stages (design to management) of WSS to develop a sense of ownership, ensure its sustainability and curb illegal practices such as water tapping.
- While it is often argued that urban neighbourhoods are unlikely to cooperate in the management of WSS due to greater instability and heterogeneity relative to rural settlements, this may be overstated, particularly if there is a widely perceived common interest in cooperating.
- Examples of "formalised" alternative management systems for WSS in low-income urban areas are limited. However, there is a large number of "informal" management systems. While many of these may be exploitative (e.g. vendors with local "monopolies" on service provision), others have proved to be effective.
- Firms with coverage targets incorporating low-income areas should consider alternative management systems. Responsibilities such as tariff collection may be easier with delegated management structures. In addition, where a common raw water source is shared by the formal and informal sectors (or where raw water quality is affected by inadequate sanitation), the firm will have a strong incentive to enter into a contractual relationship with the communities represented by the informal sector.
- The management of the point where the formal service provider meets the informal service provider raises important contractual questions. For example, it is important to be clear about the point at which the firm ceases to bear responsibility for water quality and reliability.

#### **A.2.5 Further Research**

Drawing on discussions held during the workshop, a number of ideas for further research were identified.

##### *WSS for Poor Urban Households in Low Income Countries: Assessing Demand*

It was clear from discussions that there is a need for empirical work on demand for WSS amongst poor urban households/neighbourhoods. The key objectives for such a study are to:

- determine whether or not recent discussions about "service differentiation" are based more on the priorities of public authorities and private firms, or on the preferences of households themselves; and

- examine what already exists in terms of WSS service provision before proposing improvements since in many cases existing forms of service provision can provide the institutional (and occasionally technological) basis for service expansion.

### *The Integration of Formal and Informal Private Sector Water and Sanitation Provision in Urban Areas*

A study to assess how best to incorporate the needs and preferences of lower-income households when encouraging formal PSP in WSS provision would be useful to all stakeholders. In particular, the study should take into account the opportunities offered by:

- contractual arrangements;
- financial incentives and the possibility for cross subsidisation;
- low-cost technologies; and,
- alternative institutional arrangements.

### *Designing Private Sector Participation in Water Supply and Sanitation in Light of Regulatory Constraints*

In many countries, regulatory capacity (independence, information, experience) will not be sufficient for effective regulation of PSP in WSS. While undoubtedly important, concerted effort from national and international policy makers is unlikely to overcome all of these inadequacies. In many cases it may be more realistic to design PSP in light of these constraints in order to reduce the importance of inadequate regulation and internalise the incentives. This includes more appropriate forms of PSP, bidding procedures, contract design and regulatory frameworks.

## **A.3 Proceedings - 26th November**

### **A.3.1 Manila, Philippines**

#### **Presentation of Case Study Paper by Christina David (Philippine Institute for Development Studies, Makati City)**

In 1997, the Metro Manila Water and Sewerage System (MWSS) was put out to tender. The decision to introduce PSP was motivated by a commitment to improve the efficiency of MWSS operations, raise financial resources for investments and end government subsidies. Prior to privatisation, the MWSS service was characterised by low water pressure, high rates of non-revenue water, intermittent supply and low coverage rates. MWSS services accounted for approximately 60% of total water usage in Manila. The remaining supply has been obtained from privately-owned wells, causing problems of groundwater depletion.

The form of PSP chosen was a 25-year concession agreement. In order to promote competition and generate yardstick information, the service area was divided into East and West zones and concessions were granted to two different companies. A residual MWSS was retained to carry out limited management and facilitation roles. In addition, a separate Regulatory Office was established. Prior to privatisation, the MWSS raised water tariffs to increase the likelihood that the average tariff would be lower after privatisation and thus make the shift more acceptable to the public. The two concessions were granted to those companies who promised the lowest tariff levels. Since different rates were submitted, a higher bid price had to be accepted in the West zone and consequently the price of water differs substantially between the two zones.

The concessionaires are required to expand coverage of water supply, sewerage, and sanitation services and to provide a 24-hour supply to all connections by the year 2000. By 2006, a 96% coverage is expected. In low-income areas, the concessionaires are obliged to establish one public



standpipe per 50 households. Sewer connection coverage is scheduled to increase from 7% to 62% by 2021. In the meantime, a sanitation service (desludging of septic tanks every five to seven years) will be used. The costs of expanded sewerage will be passed on to the consumers.

In addition to increased efficiency, PSP's potentially major contributions to environmental objectives relate to its attempts to internalise the externalities caused by water consumption through full cost recovery pricing. Cost recovery will also provide users with incentives to reduce water consumption. In addition, there will be stricter enforcement of environmental standards related to WSS because the environmental regulator is sufficiently funded and dedicated to this cause.

However, there are a number of shortcomings in the concession agreement relating to social and environmental objectives, in particular:

- Coverage targets exclude those who obtain water from privately-owned wells and waterworks located in areas where the MWSS water service is unreliable/non-existent. In addition, the agreement does not specify whether or not coverage includes commercial and industrial establishments.
- The concessionaires have initially adopted the MWSS increasing block tariff structure. This system penalises many of the poor who share water connections. Moreover, the higher water tariffs for commercial and business establishments promote self-supplied groundwater pumping, thereby exacerbating its depletion.
- It is suggested that water demand projections have been underestimated. If this is so, it is likely to be the poor who will not gain access. This again will lead to increasing reliance on privately-owned wells or waterworks and a worsening of groundwater depletion.
- The pricing policy does not take full account of the opportunity cost of water or the cost of externalities in water production and consumption. There is no bulk water fee charged on the raw water use despite competing uses among irrigation, urban use and electricity generation. As such, the policy is likely to lead to a misallocation of water resources in favour of lower valued uses, a worsening of groundwater depletion and wasteful usage of water.

### **Comments by Reynaldo Vea (Metropolitan Waterworks and Sewerage System, Regulatory Office, Quezon City)**

#### *Tariff Adjustments*

It was pointed out that while the timing was fortuitous the tariff adjustments which took place in Manila prior to privatisation were made in order to comply with the requirements of loan covenants on the return on the base rate, not to make privatisation politically acceptable.

#### *Non-revenue Water*

In terms of operational efficiency, the single biggest issue confronting the concessionaires is that of non-revenue water (NRW). No targets were set for a reduction in NRW in the concession agreement; it was felt that this was not necessary since it would be in the concessionaires' interests to reduce it. Moreover, the competitiveness of the bids depended on each bidder's confidence in their capacity to address the problem.

Immediately prior to privatisation, NRW stood at 57%. It is unofficially estimated that a 5% reduction in NRW was achieved in the first year of privatisation. The two concessionaires have deployed twice as many leak repair teams as the old MWSS, eliminating the backlog of leak repair works within a few months of take-over and improving response times to complaints regarding leaks. They have also made progress in regulating illegal connections.

#### *Service Expansion*

The extent to which the urban poor will benefit from privatisation primarily depends on the attainment of overall coverage targets. However, the agreements do not reveal how service to the urban poor will be prioritised. Targets are only expressed at the level of the municipality and the concessionaires are left to plan the expansion of distribution networks. It is felt that the concessionaires, in trying to meet their targets, are likely to prioritise the most densely populated areas. The ultimate objective is that of “almost universal” coverage aimed for by the year 2006. If this is achieved almost everyone, regardless of their socio-economic status, will have access to safe potable water at adequate pressure at all times of the day.

#### *Groundwater Depletion*

The concession agreement does seek to address the issue of groundwater depletion, a persistent problem under MWSS. Prior to privatisation, MWSS supported applications for the construction of deep wells in areas where MWSS was not able to provide water. Such applications were supported on the condition that when the MWSS service did become available, the deepwells would be shut down. This was accepted because MWSS water, which is mainly drawn from surface waters, was usually less expensive and of better quality. The same approach has been adopted in the concession. It is felt that since the concessionaires have exclusive rights over water distribution in Metro Manila and since coverage targets include those areas currently using deepwells, the concession agreement will satisfactorily address the problem of groundwater depletion.

#### *Service Coverage and Water Supply*

It is forecast that present capacity of the system of 3,200 megalitres will double by 2005. (This does not take into account the additional water to be made available by the reduction in NRW). It is expected that this should cover demand arising from increased service coverage.

### **General Discussion**

Privatisation was generally well accepted by the public because of the perceived benefits to be gained. The significantly higher tariff rate charged in the Western concession zone caused annoyance at the outset. However, this annoyance subsided as people realised they were still paying less than previously. From the regulator’s perspective, once the offers were submitted, the differing bid rates and resulting tariff prices could not have been avoided without damaging the integrity of the bidding process.

### **A.3.2 Buenos Aires, Argentina**

#### **Presentation of Case Study Paper by Sergio Mazuchelli (IIED - América Latina) and Martín Rodríguez (CEER - Instituto de Economía)**

After decades of inadequate and inefficient public sector provision, private sector firms were invited to bid for water and sanitation concessions in a number of Argentinean cities in the early 1990s, including Buenos Aires and Cordoba. In the case of Buenos Aires, a 30-year concession for the provision of WSS was won by a consortium of nine companies, ‘Aguas Argentinas’, led by Lyonnaise des Eaux. In Cordoba a concession was won by a similar consortium, but does not include sanitation services. Local firms play a minority but important role in both consortia. Regulators have been set up, bringing together representatives from different levels of government.

Amongst other objectives (i.e. reduced public deficits, increased investment levels, increased service efficiency) it was hoped that the involvement of private sector firms would result in the attainment of a number of environmental (improved wastewater treatment, reduced unaccounted-for-water, reduced groundwater contamination and depletion, etc...) and social (improved access to affordable water and sanitation for lower-income households and neighbourhoods) objectives which the public sector provider had been unable to achieve satisfactorily. While it is still early days, it would appear that

progress has been made towards reaching a number of these objectives. For instance, the proportion of unaccounted-for-water is falling, the system is expanding into poorer neighbourhoods, and wastewater treatment volumes and levels are improving.

However, there has been a number of significant shortcomings. It is clear that a golden opportunity to reform an administratively cumbersome, economically inefficient and (to a certain extent) socially inequitable tariff structure has been lost. In addition, there has been a lack of co-ordination between a number of the public authorities concerned (local municipalities vs higher levels of government, environmental regulators vs economic regulators), particularly with respect to wastewater collection, treatment and disposal. More generally, concerns have been raised about the capacity and independence of the regulatory authorities.

Significantly, in some cases improvements have been achieved in spite of the design of PSP, rather than because of it. For instance, plans for service expansion into some of the “villas miserias” would have involved connection charges of \$1,000. Belatedly realising that this was not feasible, Aguas Argentinas has been working with other groups to develop alternative technological and management systems which will better meet the demands of the households concerned. Recently, tariffs have been reformed with the connection fee for new users being replaced by a surcharge on all users. None of this was in the design of the technical and financial parameters of the concession and nor was it foreseen by the provider in drawing up its investment plans. Addressing these problems at the outset requires better information and better co-ordination, but is likely to result in more credible concessions which better reflect the priorities of the users.

### **Comments by Francois Kaisin (Aguas Argentinas)**

#### *Accuracy of the Data*

During the short time (three months) which was available to prepare the offer in 1993, Aguas Argentinas did the best job possible with the technical knowledge available at the time and with the information provided by the Argentinean government. However, during the five years that followed the signing of the contract, Aguas Argentinas learned, both from experience and from a large number of studies, that it was not possible to continue the contract as initially agreed.

The main lesson learned by Aguas Argentinas is the importance of checking the accuracy of the information available at the offer stage. For example, it was agreed with the government that people in many of the areas covered by service expansion could pay for water and sewerage connections. However, it soon became evident that these were not affordable to a large proportion of the population and that alternative instruments would have to be used.

Similarly, Aguas Argentinas were not warned of all relevant forthcoming legislative changes. For example, it was agreed in the contract that sludge could be dumped during the first 20 years of the Concession. However, shortly after the contract was signed, the legislation changed such that all the sludge management had to be carried out on land through incineration, landfill etc... The implications of this were that Aguas Argentina were faced with higher investment and operating costs than they had initially envisaged.

#### *Dialogue with Stakeholders*

Another difficulty experienced by Aguas Argentinas was that there was not as much dialogue as they would have liked between the various parties involved, including the public authorities, residents, NGOs. This was likely to cause a number of problems during the evolution of the concession. Aguas Argentinas has, nevertheless, noted some progress in this respect, but recognises that there is still a long way to go.

### **Comments by Miguel Otero (Municipalidad de San Fernando, Buenos Aires)**

Officials in the Municipality of San Fernando feel there has been insufficient consultation with local authorities and residents and that this has led to a number of misinformed judgements in the formulation of the WSS Master Plan.

According to the Plan, a wastewater treatment plant was to be built in San Fernando despite significant environmental and technical problems regarding construction of the plant and the laying of pipes from neighbouring districts. In addition, the Plan prioritised those areas which were best placed to pay for the service. According to the Plan only 18,000 out of 150,000 inhabitants in San Fernando were to be served in the first ten years of the concession. The municipality is not satisfied with this target, believing that full coverage of their area could be attained in seven rather than 15 years. In particular, they argue that residents in the area are currently paying up to \$100/month for sanitation because they have septic tanks and have to pay for emptying by truck once or twice a month. The municipality believes that residents would end up paying far less if they had proper connections. Through discussions with Aguas Argentinas and the regulatory authority (ETOSS), the municipality has been able to increase the number of households to be connected from 3,000 to 15,000 in the first five years.

### **General Discussion**

#### *Incentives*

It was pointed out that the Buenos Aires contract does not allow for direct competition in the market for service provision, although this is true of most concessions in the sector. However, this is compounded by the fact that ETOSS is not generally seen to be an effective regulator and the contract is not considered to be well-designed. It was argued that more effective incentives could be built in to the contract, making regulation less cumbersome.

### **A.3.3 Mexico City, Mexico**

#### **Presentation of Case Study Paper by Lilian Saade (IHE, Netherlands)**

In 1992, the Federal District Water Commission was created with the task of engaging PSP in the Federal District of Mexico City through multiple, multi-stage service contracts for water supply. The policy adopted in 1992 by Mexico's Federal District authorities focuses on two main strategies aimed at reducing lapses and deficiencies in the provision of water services: to implement universal water metering for the assessment of customer bills, and to significantly improve the water distribution infrastructure. Financial problems had resulted from the system of fixed and highly subsidised tariffs, the lack of a payment culture and high levels of leakage. These problems were in turn leading to insufficient investment in infrastructure and to a deterioration in water services. Moreover, excessive demand was rapidly drawing down the aquifer under the city, causing the city centre to sink by several meters.

Given the lack of information regarding the customer base, water consumption levels and network conditions, a phased approach to PSP was considered most appropriate. The Federal District was divided into four contractual zones and 10-year general contracts awarded to four separate consortia following an international bidding process. The tasks of the consortia were to be accomplished in the following three phases:

*Phase I:* Carry out a census to identify and register customers, install meters and produce network plans;

*Phase II:* Read and maintain the installed meters; design and implement customer billing systems; calculate, print and distribute water bills; set up new connections; and

*Phase III:* Operate, maintain and rehabilitate the water distribution and drainage networks.

The responsibility for water is shared by a number of public organisations. Having so many entities involved in the running of water operations causes certain problems and although in theory each agency has a distinct role to play, in practice duplication and overlap often occur. Moreover, there is a poor flow of information, which presents a potentially serious financial problem.

The transition to PSP has achieved several goals. Although some users associate PSP with higher tariffs and therefore oppose it, the change to metered consumption is one of the most significant achievements. In addition, substantial improvements have been made with the customer database, metering and billing. The staged approach allows some flexibility for mistakes to be corrected and adjustments made to cater for unexpected situations. Dividing the city into four zones has reduced the risk of private investment monopoly.

Although service contracts have been successful, they have not achieved some important performance improvements and there have been delays in their implementation. In general, PSP in Mexico has tended to rely upon *ad hoc* arrangements.

### **Comments by Robert Hearne (CATIE, Costa Rica)**

#### *Water Supply and Demand*

Given its location, ensuring an adequate water supply for the residents of Mexico City is problematic. There are large transfers of water from outside the valleys and from other users. Water demand management through the introduction of metering (as stipulated in the WSS contract) should bring important environmental benefits to Mexico City. Prior to PSP, there was little incentive to limit water.

#### *Wastewater Reuse*

Concerns were expressed about the use of wastewater in selected irrigation systems. It was pointed out that strict controls had to be applied to ensure that health effects (particularly cholera) were avoided. Crop choice was also considered to be important.

#### *Financial Management*

A shortcoming of the Mexico City contract is that too many organisations are involved in managing the financial aspects of water services. Revenue is collected by one agency, deposited in the Central Treasury and then used by another agency. This reduces the financial incentive to improve the quality of the service since the link between payment and service is lost.

#### *Competition and Regulation*

The division of Mexico City into four zones under the responsibility of four companies should in the long run help public authorities regulate the sector effectively.

#### *Unforeseen Events*

The constitutional changes (with a democratically elected government now in power) and violent currency fluctuations have significantly affected the plan for private sector involvement. Although these events cannot be predicted, it was argued that the requirement that there be domestic investors is a good risk aversion strategy since it provides a degree of protection against unforeseen local events.

### **General Discussion**

#### *Wastewater Reuse*

Members of a research group from the London School for Tropical Hygiene and Medicine have been carrying out epidemiological studies of the wastewater reuse system in Mexico for the past ten years.

These studies have found that the principal health risk is faced not by consumers but by agricultural workers and their families. (Contact Sandy Cairncross).

### *Social Impacts*

The contract area of the concession does not include millions of poorer people who live in adjoining parts of the State of Mexico, many of whom depend on inadequate WSS services. Unless complementary investments are undertaken, by excluding this area PSP will not address many of the problems associated with providing services to poorer households.

## **A.3.4 Abidjan, Côte D'Ivoire**

### **Case Study Report by Ake N'Gbo (CREMIDE, University of Abidjan)<sup>2</sup>**

Since independence, water distribution in Côte d'Ivoire has been carried out by private company, SODECI. In 1974 SODECI was granted a 15-year lease contract for the entire country giving it responsibility for distributing water and collecting revenue on behalf of the State. The State remained responsible for investment decisions but soon ran into financial difficulties. In 1987, in an attempt to overcome these difficulties, SODECI was awarded a 20-year concession for the country's water supply networks. The new convention improved the co-ordination between investment and operating needs with SODECI administering the investment funds itself. SODECI does not have investment obligations but can carry out smaller investments. The Government also pays royalties to SODECI for maintaining sanitation facilities. A concession contract is currently being prepared in which users will pay SODECI directly for sanitation services.

Water, sanitation and the environment fall under the authority of a number of different ministries who intervene in devising water policy, controlling the concession and financing works. Regulation of the water sector is divided between the Water Division and the Ministry of Economy and Finance. A new environmental code was implemented in 1996 and a National Water Law is currently being drafted. A shortcoming of the regulatory framework is the lack of co-ordination between the different ministries and the environmental and water policies.

The water tariff is uniform throughout Côte d'Ivoire. A proportion of water revenue goes towards the National Water Fund (intended to reimburse loans to the benefit of the water and sanitation sector) and the Water Development Fund (administered by SODECI and used to finance social connections, renewal works, extension and new investments). SODECI's revenues are calculated on the basis of operating costs with a contractual margin of 5% for the operator.

Approximately 90% of SODECI's service subscribers could be categorised as economically disadvantaged and consume very low volumes of water. The Government, in conjunction with SODECI, has implemented a socially equitable rate structure. In some cases social connections are free. The number of subsidised connections has increased from 14,681 in 1987 to 30,334 in 1997. However, a proportion of the population remains unconnected to the water network since they cannot afford the connection costs or are unable to save with the regularity required for the three-monthly billing system. In peri-urban areas SODECI works with retailers who supply water to low income unconnected consumers. Retailers pay a deposit to SODECI and subscribe for an industrial use connection (this effectively represents the privatisation of resale). In general, the retail price is higher.

The SODECI experience appears to have been a success and indeed has come to represent a model for the rest of Africa. Significant gains in efficiency and coverage have been recorded and PSP has

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<sup>2</sup> Ake N'Gbo was unfortunately unable to attend the workshop.

led to an increase in the number of subsidised connections. However, a number of shortcomings can be identified:

- The uniform tariff rate will lead to a misallocation of resources (to the detriment of the residents of Abidjan where water supply is cheapest) and may have negative environmental impacts.
- Cost-plus regulation can lead to difficulties since it does not always offer an incentive to reduce costs and is expensive to regulate (resulting in increased costs to consumers).
- The social tariff is effectively a block-tariff system. As noted in the Manila case study, block tariffs penalise those low-income households who are dependent on collective water supply.

### **Comments by Djouka Anzeni (Directeur de L'Eau, Abidjan) and Mamadou Sakho (Directeur-Adjoint de L'Eau, Abidjan)**

With regard to WSS provision, the Government would like to see the following developments:

- Improvement of the administrative and tariff setting procedures
- Decentralisation of decision making, including public water education programmes
- Greater co-ordination between the different institutions involved in WSS
- Finalisation and introduction of a water law

### **General Discussion**

SODECI is not subject to competition in the market and may not even be subject to competition when the contract expires. When the contract was put out to international tender in 1987 all the major French companies showed initial interest but withdrew when they realised how well-placed SODECI was. In addition, since the 5% profit margin is already declared at the outset, there is no competitive tendering over tariff pricing.

## **A.4 Proceedings - 27th November**

### **A.4.1 Social and Environmental Implications of Service Differentiation**

Service differentiation implies the provision of different levels and types of service within a single network. For instance, some households may be served by household connections, while others are served by yard taps or collective water points. One of the motivating factors for service differentiation is the difference in costs between different levels of services. For example, it is evident from WHO and UNICEF data that the average per capita investment and maintenance cost of household connections is 50% greater than for public tap connections. Similarly, alternative on-site sewerage systems are often far cheaper than conventional systems. If these differences are reflected in costs borne by the household, then service differentiation may reflect households' preferences.

### **Introduction by Sandy Cairncross (London School of Hygiene & Tropical Medicine)**

Domestic consumption of water differs according to the type of service available. For example, it has been found that up to a point, water consumption increases as its source is brought closer to the home. However, between 100 yards and a kilometre, consumption is relatively constant and then increases sharply when water is provided to the house or in very close proximity to the house. This increase in consumption in close proximity to the house has important distributional and health implications.

Many low income households already rely on the private sector for their water supply, purchasing it from private vendors. Although there is very limited information available on the size and nature of the informal sector, vended water is known to be often more expensive and the total revenue collected higher, than in the formal supply network.

If service differentiation is being considered as part of PSP, it is important to understand the dynamics of the existing informal water markets. For example, a number of studies have found a very inelastic demand for water. This implies that if the availability of water is increased, the price will decrease substantially. Moreover, the income elasticity of water is also generally found to be low. Since expenditure on water represents a very high proportion of total expenditure for poorer households, a decrease in the price of water will result in an increase in financial resources available for food, bringing about important nutritional benefits.

In terms of sanitation, service differentiation is more complicated since a broad array of technologies can be used, ranging from conventional sewerage to on-site systems which dispose of the sewerage into a pit or soak-away system. Different systems will place very different demands on water supply.

While water provision tends to be in the public domain, the relationship between the private and public spheres is particularly complicated in the case of sanitation. Since many forms of sanitation employed by poorer households can be provided privately, it tends to be more difficult to generate demand for public sanitation programmes. This is problematic since the public environmental and health benefits of effective service provision and drainage are considerable. However, household benefits including those relating to privacy, social status and health benefits do make sanitation a private good for which people are willing to pay.

## General Discussion

### *Standardised or differentiated services?*

In recent years there has been a shift in thinking in policy circles, with the case for service differentiation (rather than standardisation) being made quite forcefully. However, service differentiation necessarily implies differing levels of service convenience, quality, etc... Thus, when advocating service differentiation it is important that it is a reflection of authentic differences in households' preferences and their willingness to pay for different services. The introduction of service differentiation should not arise from a desire to protect the vested interests of NGOs to promote "collective" solutions, from the priorities of public authorities to reduce externalities, or from the private firms to meet their expansion targets. Assessment of users' demand is vital.

However, since in many cases it is not feasible to provide household connections and since many households will not be willing to pay for the costs involved, it is important to acknowledge the significant benefits to be derived from alternative solutions, such as public taps, relative to the *status quo*. In WaterAid's experience in rural areas, women will realise tangible benefits if public taps are provided in safe areas close to the home. In urban areas, although a number of factors other than distance affect people's preferences, providing public taps in sufficiently close proximity to homes is even more feasible given the higher population density relative to rural areas.

The issue of household connections versus standpoints is not limited to willingness to pay; other factors such as land tenure and the ability to officially connect irregular areas to the main network are also important. For example, in areas where land tenure is relatively secure, people are more likely to fund their own household connections. In Dhaka, where land tenure is insecure and it is politically unfeasible for household connections to be made, people are paying for the capital investment and running costs of public tap stands on a credit basis.

In terms of sanitation, it was argued that public/communal latrines are not a satisfactory solution to inadequate access in many areas. Communal sanitation cannot be used by children, elderly people or women at night. Households need something in or near their dwelling.

### *How to provide efficient WSS services in poor areas*



Moving into lower-income neighbourhoods is a complicated and expensive business for water companies, not only because of the cost of service provision but also because of additional complications such as land tenure issues, non-payment of bills etc... Moreover, there may be disincentives for a firm to provide services in a neighbourhood where the majority want water points but a few households want private connections. Special regulatory functions and other measures will be needed to ensure these difficulties are effectively overcome. If there are clear benefits to be derived from supplying water to areas which were previously unserved, the most important thing is to ensure that the private provider has an incentive to do so.

The following suggestions were made for overcoming constraints and increasing the efficiency of WSS in low-income areas:

- Land tenure - The financial problems of accessing credit are usually at the core of difficulties in ensuring access for the poor. In particular, insecure tenure can pose difficulties since legal tenure of land is often interpreted as an indicator of credit worthiness. Moreover, households with tenure are able to incorporate the costs of connection into their own capital rather than investing in someone else's property. Mechanisms should be explored which allow community groups in illegal settlements to secure access to credit to pay for the capital costs of service provision.
- Institutional - Rather than dealing directly with households, in some neighbourhoods it may be necessary to establish what types of groups with whom the private providers are able to develop commercial relations, e.g. NGOs, user groups, the municipality.
- Organisational - The idea of concentric circles (household, city and beyond) was considered a useful conceptual tool. There are examples of authorities or private companies supplying up to a certain point with communities taking responsibility for financing and developing services beyond. Rather than being a direct provider, the company may have to have some oversight capacity. The regulator's role may also be affected.
- Understanding demand - It is essential that the preferences of poorer users are understood if they are to be provided for efficiently. Unfortunately, this does not tend to be the case at present. For example, in Manila, the concession contract states that one public standpipe per 50 households should be provided and that households should not be charged for the connection costs. This arrangement is not ideal since the concessionaires will meet their minimum requirements rather than taking households' preferences into account. Households may well be willing to pay for more standpipe connections to save the cost of the inconvenience of having to queue for a standpost shared by 50 households.
- The heterogeneity of poor areas (from wealthy merchants to the unemployed) should be exploited. Cross-subsidy arrangements within areas can be set up, related not just to the water tariff but also to the connection charge. For example, the richest traders can pay for the main piping, with others paying for the secondary distribution network, and poorer households just having to pay connection fees.
- Collection of payment - Provided that appropriate institutional mechanisms are in place, cost recovery is no more of a problem in poor urban areas than in rich. For example, in La Paz, Bolivia, a cost recovery rate of 98% has been achieved in poor areas. Non-payment is often attributable to the fact that low household consumption rates in poor areas means that the cost of installing a meter, checking the reading, preparing and sending the bill and recovering the money for one poor household is often not viable. However, this can be overcome. For example, one way of dealing with the problem of small bills is to move from household to community billing and to leave communities to manage billing internally.

- Allow for upgrading - Improvements in living standards over time will result in the demand for improved services. The infrastructure built will therefore need to be such that it can be upgraded to cater for future demand. The current manner in which the private sector is involved does not always provide incentives to build excess capacity.

#### **A.4.2 Management Systems in Low Income Areas**

In this session two projects in low-income areas (Nairobi and Port-au-Prince) were explored to review the potential for alternative forms of service management, particularly those in which poorer households and neighbourhoods play an active role.

##### **Case of Nairobi Presented by Munguti Katui Katua (Community Management & Training Services, Nairobi)**

In 1997, under the umbrella of a larger World Bank project, a water project aimed at creating a supply network began in a slum settlement in Nairobi. By the end of the project, it is expected that valuable lessons will have been learned for providing water supply to the slum settlements in Nairobi. The project involves co-operation between Nairobi City Council, a private consulting firm, a private contractor and community management services.

The settlement is probably the largest in Nairobi and has a high population density with 700,000 people living in 25 hectares. It has no formal water supply but is surrounded by high-income areas serviced with household connections. The main constraint to formal supply within the slum area is insecure land tenure which makes it politically unfeasible for Nairobi City Council to provide services since in doing so they would legalise the settlement. As a consequence, members of the community rely on illegal tapping of water from neighbouring areas up to two kilometres away.

The slum area was not initially included in the larger project. However, it was soon realised that if the informal sector were not involved in water supply improvements, water would continue to be tapped illegally. As an afterthought to the project, an “alternative management system” has been set up involving extensive consultation with the community. It was felt that this had to recognise people’s ability and willingness-to-pay for services. Thus, inhabitants of the slum area are expected to pay for water and determine the appropriate management systems for organising supply within the area.

Discussions are currently underway to decide how best to link up this alternative management system with the authorities. However, negotiations are complicated by the fact that the Government administration does not want to participate because of the issue of title deeds for the land. As a starting point, a measure of ownership within the community was created through community participation in the surveying process. The community assisted in identifying suitable areas to lay pipes and in decisions concerning those structures that were obstacles. It was decided that all work carried out by the contractors within the slum area must involve local labour (selected by the community).

Nairobi City Council, as owner of the project, wants to streamline operations such as licensing and monitoring. Other issues also need to be resolved such as where the “master meters” will go, how they will know whether the meters are functioning and how they will link up to operators from outside the slum area. The intention is to create village committees comprising people they trust who will be involved in the processing of applications and liaising with the City Council. Through discussion groups, the community are deciding who should be responsible for managing the system within the slum area, including defining the role of different interest groups e.g. women’s groups, water kiosk owners, landlords with water points and the local accepted leadership.

The design is now complete, and nine of the anticipated 27 kilometres of pipeline in the slum area has been laid. However, tapping through illegal connections is continuing despite these developments. As soon as the new water supply is connected, all the existing lines - legal and illegal - will be disconnected and everybody will have to apply anew through committees. The community would like tariffs to be determined by market forces and they believe that they will be below the existing rate.

### **Case of Port-au-Prince Presented by Bernard Collignon (Hydro Conseil, France)**

Port-au-Prince is the capital of Haiti and has a population of two million. Haiti is the poorest country in the Americas and over the past 40 years much of the country's service infrastructure has disintegrated. Public water supply is lacking and the majority of the people in low-income areas obtain water from private operators or rivers.

In Port-au-Prince a long chain of private operators are involved in the supply of water; managers of private boreholes supply water to trucks who then carry it to private standpipes. The price at the end of the chain is high (\$3 per cm), water quality is poor, and service is sporadic. With support from the community, Hydro Conseil have looked at ways of improving the water supply in Port-au-Prince restoring some kind of regulation.

Since any attempt to supply water formally through household connections comes up against land tenure problems, alternative supply solutions were sought. The key issue was to find a way to connect Port-au-Prince with the formal water network supplying the city to eliminate the need for trucks. For this it was necessary to build new water tanks inside the slums and to improve the existing piping in the community.

The solution has involved dividing the management of the network into two parts - the main pipes which run very near to the Port-au-Prince slums and community-managed distribution pipes - with a master meter located between the two.

Although the communities have different needs and preferences, they cooperate since they share the common interest of obtaining more and better water for the slum. The communities decide amongst themselves who is going to represent them, although this is not necessarily through democratic means. Water is distributed to standpipes which are managed by private resale. If price, quality and operating hours are not accepted, the community has the right to remove the management team. There was no real economic basis to tariff setting; a reasonable price was simply decided upon. It was originally set at \$3 per m<sup>3</sup> but in three years has decreased to \$1.5- \$2 per m<sup>3</sup>.

With assistance from donors, the programme is now operating in 20 slums covering approximately 400,000 people. Moreover, the system has been operating for three years with no financial problems and the bills charged by the public utilities have been paid. The programme has successfully introduced a degree of regulation to the market. Although many people rely on public resale rather than the standpipes, the prices are similar. This form of management - private standpipe resellers alongside those who manage the system at the level of the slums - does have problems. Ideally there should be some form of oversight of the entire management process by a local council.

An unanticipated benefit of the project is the increasing confidence and support from the public utility towards the programme. Previously, the authority was very sceptical about the feasibility of working in the slums.

### **General Discussion**

*Implications of community management for formal PSP*

Examples of the type discussed above, where poor urban areas are integrated with the formal systems through community management, are limited in number. However from the firm's perspective it is something they must consider since all firms with coverage targets are going to come into contact with existing systems and will need to have an idea of how they will deal with their positive and negative elements. From the communities' perspective, they need to consider how they are going to interact with the firm.

Moreover, the inequity of the fees paid for water by the poor versus the rich in urban areas is largely a consequence of the mark-up charged by informal vendors for the transportation, metering and distribution of water. Large companies are able to benefit from economies of scale with regard to the provision of transport, but face difficulties in metering and receiving payment for water in poor areas. In many cases, the optimal solution would appear to be for firms to bring water to a certain point and then to legally subcontract someone to distribute the water beyond that point, and manage operations and payments.

Where illegal tapping is prevalent or a common source is shared by the formal and informal sectors, the firm will have a strong incentive to enter into a contractual relationship with the communities represented by the informal sector.

#### *Master meters*

The issue of the master meter - the point where the formal meets the informal system - raises important questions about privatisation. For example, what are the implications of a private company deciding that rather than having a contractual relationship with individual households it is preferable to have a contractual relationship at the master meter with whatever authority has management responsibility? Does this imply that the private company is not responsible for anything that happens beyond the master meter? It is quite likely that they would be held liable, for example, for agreements made regarding water pressure and quality.

A discussion ensued about the appropriate means of setting tariffs at the master meter. For example, in Haiti, the price charged at the master meter is 20% lower than the price charged to households.

### **A.4.3 Economic Regulation**

Regulation of a concession should theoretically be straightforward because all of the terms, conditions and standards should be included in the contract. The role of the regulator is simply to ensure that these are met. If for any reason they are not, there is usually a performance bond which puts pressure on the company to make sure that they do not infringe those conditions in the future. However, in practice, as is clear from the following discussion, a number of factors may undermine the regulatory process.

#### **Introduction by Dominic Moran (Ove Arup, UK)**

PSP in WSS involves transferring the risk from the public to private sphere. As soon as a privatised operator is introduced it necessitates the presence of an independent operator to regulate and protect the private and common interests of users and of the private operator.

WSS was privatised in England and Wales in 1989. Prior to privatisation, Regional Water Associations and smaller water companies had been responsible for setting prices and dealing with environmental considerations. The system had its shortcomings and its performance in terms of investment and environmental protection was not as good as it could have been. However, the system did allow for economies of scope to arise from integrated river basin management.

Post-privatisation, the National Rivers Authority (which in 1994 became the Environment Agency (EA)) was established as the environmental regulator in charge of abstraction licensing, discharge consents and water quality. Economic and social regulation (including pricing and yardstick competition) became the responsibility of the Office for Water Services (OFWAT) as a separate statutory body. Problems have been experienced in trying to integrate the OFWAT agenda with the EA agenda and in reconciling the objectives of two regulators.

### **Introduction by Michael Massey (Environment Directorate, UK Department for Trade and Industry)**

One of the motivations behind privatisation of WSS in England and Wales was to separate the 'gamekeeper' from the 'poacher' and to form an independent regulatory body. Water in England and Wales is characterised by a series of *de facto* local monopolies. Consequently, although a certain degree of competition has been introduced, there are severe limitations on its extent. Alternative mechanisms are therefore needed to replace the incentive disciplines that would operate with greater competition.

After the first few years, it was felt that the regulatory system was working well from an economic perspective, but was not dealing adequately with the social and environmental impacts of the WSS utilities. As a consequence a number of changes will be made. The regulator's duty will be changed to focus primarily on consumers. In addition, while the importance of having an arms-length relationship between the regulator and government was recognised, a method was needed to ensure that the regulator met social and environmental objectives. Through extensive public consultation, it was decided that the primary focus of the regulator would remain economic but that Government would give guidance to the regulator. The regulator would have a statutory duty to take this guidance into account. Thus it was decided that social and environmental objectives were for the government, and not OFWAT, to set.

### **General Discussion**

#### *Impact of PSP*

In many cases in developing countries, there is simply no established regulatory framework able to oversee a sector in which private firms are active. Where a framework exists, it may not be coherent and may be in a transitory state. One thing that privatisation has done - for better or worse - is to have forced several important issues to be discussed seriously, where previously the public sector had fudged issues and muddled along. The contractual relationships and roles of different agencies have had to become more transparent in terms of who is doing what and how they relate to each other.

The expectations of regulators and customers changes with PSP. Both are more likely to tolerate a poor service from government rather than from the private sector. For example, from a regulatory perspective, in England and Wales while WSS was publicly managed restrictions on pesticides in the EU drinking water directive were ignored on the basis that they had no epidemiological basis. However, once WSS services were privatised, firms had to give an undertaking that they would implement these even though, at the time, the technology did not exist to achieve these standards.

Similarly, in Argentina, PSP precipitated an increase in the stringency and enforcement of environmental regulations, resulting in greater obligations being placed on the private sector than had been the case for the Government.

On balance, the regulatory system contains in-built checks, because on the one hand PSP offers the regulator the opportunity to be the champion of the environment, knowing that it can leave the responsibility of carrying out these improvements to the private company. However, on the other hand,

the regulator does not want to be responsible for increasing the cost of the whole process since this will be passed on to customers in their bills.

#### *Common agency problems*

In some countries, a large number of regulatory agencies, dealing with specialised issues (e.g. economic, environmental, public health and housing), are involved in the sector. In others, there is just one agency responsible for all functions. There are advantages and disadvantages with both systems. While multiple agencies are able to focus on their specific areas of expertise, common agency problems may arise. Separating regulatory duties provides no guarantee that the different bodies will carry out their duties effectively - they may be under-resourced or their focus may be too narrow. For example, the environmental regulators who see themselves, first and foremost, as guardians of the environment may fail to take account of the costs and benefits of the measures introduced. On the other hand, given the unfortunate experiences of some 'super bodies' which have a multitude of functions but are not very effective in any of them, an argument could be made for keeping regulatory functions separate. There are trade-offs to be made. Rather than having one decision maker, having one *decision making process* may be a better approach.

The experience of England and Wales provides an example of common agency problems. Legislation allows for environmental improvements to be made and for the costs to be passed on to the consumer. However, the existence of two regulators - environmental and economic - can cause problems in relation to this. For example, a number of companies have been forced by the Environment Agency to improve water quality, without being granted increased customer tariffs by OFWAT. From the private companies' perspective, it is far simpler to limit regulatory responsibilities to one body. In Mexico City, problems have also arisen because there are too many interested organisations. The regulator is sometimes obliged to consult up to 20 different vested interests, making agreement very difficult.

#### *Independence of the regulator*

Common agency problems can also result in a lack of regulatory independence. For example, in a special economic zone in the Philippines there is a joint venture between the responsible authority and a private water company to supply WSS. If the company wants to change the tariff, it has to seek approval from the authority in charge of the economic zone. There is a clear case of conflict of interest here.

In Argentina, the regulator is attached to the Environment Secretary. As a consequence, any administrative complaint made against the regulator goes directly to the Environment Secretary. This creates anomalous incentives since one regulator is overseeing the other.

#### *Lack of information*

Irrespective of the regulatory framework, the regulator and private company will be forced to operate in a situation where information is incomplete and unreliable. Unfortunately, the greatest information deficits are likely to relate to social (since little is understood about WSS in neighbourhoods which have never had formal services) and environmental (partly because the environmental regulatory agencies are just coming into existence) aspects of service provision. Because of this information deficit, contracts are necessarily going to be incomplete. The contract and regulatory framework need to be flexible enough to deal with this, while still allowing the regulator to enforce the contract.

#### *Incentives*

In order to facilitate the regulatory process, there is a strong argument to be made for the integrated management of water supply and sanitation. If the concession covers both water and sanitation, this will internalise the incentives for wastewater treatment to the firm since the firm will bear some of the

costs of inadequate treatment through water purification. This will ease the burden on regulatory capacity.

With integrated management comes the need for integrated regulation. It is far more difficult to coordinate integrated planning where there are different groups in charge of different aspects of sectoral regulation, particularly in developing countries where administrative bodies are often relatively weak.

#### **A.4.4 Bidding Procedures**

As with regulation, bidding for contracts should theoretically be a relatively straightforward procedure. However, in reality, problems such as lack of information on environmental conditions, costs of provision and service demand for low-income households complicate the design of bidding procedures.

##### **Introduction by Derek Jamieson (Thames Water Utilities, UK)**

###### *Pre-requisites for privatisation from the private company's perspective*

Before a water company will even consider involvement in a developing country, certain fundamental conditions must be met, including:

- A stable political regime with little risk of privatisation being revised;
- The ability to repatriate capital and profits;
- A convertible currency with some degree of exchange rate stability;
- A reasonable assurance of payment, backed where appropriate by export guarantees; and,
- The contract must be of sufficient duration to recoup the investment costs.

Once these conditions have been met and the company is considering bidding for a contract, it will take the following into account:

- All terms and conditions relating to price, quantity and quality should be specified in the contract, leaving little discretionary power with the regulatory authority.
- Creditable procedures for the fair resolution of disagreements should be available through either a trustworthy judiciary or international arbitration.
- Technical objectives should be carefully specified and credible. (Often technical specifications are out of kilter with expectations in terms of price).
- Government tariff policies should support the principle of full cost recovery. Since it is easier to get money from customers than from the Government, water companies would prefer to take their chances with the former.
- Tariff adjustment formulae should reflect changes in costs, inflation and exchange rates.
- There should be some historical evidence that consumers are willing to pay for the services provided. (In many countries the cost of WSS is absorbed by the public sector and the idea of payment for WSS is therefore alien).
- Provision should be made for adequate protection from non-payment (e.g. disconnections, social subsidy etc...)
- There should be a willingness to review/amend public worker laws, contract law, accounting practices etc... where necessary.
- Bidding procedures should not be expensive or bureaucratic since it takes substantial time, effort and money to put a bid together. For example, Thames Water and its partners spent \$6 million on the bid in Buenos Aires.
- Adequate provision should be made for debt management. Often the State will expect the private company to absorb all of the historic costs. This does not present a difficulty as long as it is explicit in the process

More detailed considerations also include the size of the contract and expected profit margin, arrangements for the protection of existing staff, the flexibility of labour laws, and the state of labour relations.

#### *Bidding process*

Bidding consortia have three to six months to make an assessment of the state of assets, including factors such as the amount of non-revenue water. Since uncertainty increases the offer price, it is in everybody's interest to try to ensure that the process is transparent and that information is made available to reduce the degree of uncertainty.

It is important that the international company involved has local office representation since it is extremely difficult to conduct business from a great distance. Moreover, companies need to have a proper understanding of the local culture before they are in a position to bid for some contracts.

### **General Discussion**

#### *Local ownership*

Many contracts, for example that for Mexico City, require majority local ownership of the private company.<sup>3</sup> The proportion of local ownership is not necessarily fixed but can change over time. For example, in one concession in Malaysia, Thames Water have an arrangement whereby they initially have a 70% shareholding and the local company has 30%. Over a ten-year period, ownership is transferred such that the local company has a 70% stake and Thames Water 30%. Overseas companies do not perceive local ownership to be a problem.

#### *Selection criteria*

Often the criteria on which offers are judged are very straightforward. In some cases offers are judged on proposed tariff rates. In others different criteria are used. For example, in Guyaquil where low income neighbourhoods are prioritised, the company that promises the highest number of new connections wins. However, single criteria are seen by some as too simplistic. Moreover, it is felt that the number of connections is really a political matter that should be specified in the terms of reference and the bid should then be judged on how companies say they are going to achieve these goals and what the cost of these will be.

Criteria other than price can be included. However, including additional criteria and entering into more complex formulas can result in a loss of a large part of the transparency of the process, making it more prone to corruption. Moreover, stipulating more sophisticated criteria would add to the cost of already expensive bidding procedures.

#### *Social objectives*

Bidding systems where contracts are awarded according to lowest cost criteria effectively discriminate against the poor since the resulting tariffs tend not to include any surplus which could be used for social objectives. In this respect, it would be preferable if the bidding process were based on value for money. For instance, technical criteria might include the capacity of the firm to deal innovatively and effectively with service provision for lower-income households and neighbourhoods.

At present, poor communities tend to be an afterthought, and provision for them within the contract is poorly planned. For example, in Argentina it was only realised well into the contract that people could not afford to pay for their initial connection as a result of the technical criteria specified. In the Philippines, revenue for the planned community standpipes was through block tariffs which, as is

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<sup>3</sup> This requirement is not restricted to the WSS sector. For example, in Mexico, the requirement for at least 51% Mexican ownership is stipulated in the more general Foreign Investment Law.



widely known, increases the price paid by the poor who often rely upon communal or shared water points.

The opportunity for addressing social and environmental concerns should be taken at the very beginning of the process when clarifying objectives, gathering information and designing the contract. Sufficient examples now exist of different models for providing WSS to poor areas including the options for service differentiation and alternative management systems as discussed.

#### *The 'winner's curse'*

Under current bidding procedures, it is often the most over-optimistic company which makes the worst evaluation of the business that wins. Moreover, since the transaction costs involved in bidding are so high and since investments in the sector are sunk costs, over-optimistic forecasts tend to be dealt with through renegotiation of the contract rather than through calling for new bids.

#### *Renegotiation*

It was argued that in most Latin American countries, it has generally been the case that the companies that win have the lowest tariffs. Moreover, it is often the case that companies are aware at the time of bidding that they will not always reach the goals they promise but know that they will be able to renegotiate. It was noted that in Latin America, 90% of concessions for WSS have had to be renegotiated. In Mexico, the contract for the Federal District was also renegotiated, although this actually led to companies lowering their prices.

It is very uncommon for a company to actually lose its concession as a consequence of failing to meet its obligations, because the costs of non-agreement are very high for both parties. If renegotiation becomes common practice, the entire bidding process is undermined.

#### *Risk bearing*

Generally, the cost involved in obtaining accurate demand forecasts is borne by the private company. Water companies and other private consultancies often provide assistance to governments in formulating the terms of reference and contract prior to the bidding process. After being involved at this stage, the water company cannot then participate in the bidding process. This assistance could extend to surveys to improve the database before the bidding process gets underway. If such information were made public prior to the process, the government would bear the risk and the private company would not need to reflect this risk in the price charged to consumers. Moreover, if more comprehensive information were made available, the risk would be lowered.

Joint ventures are preferred by many private operators, partly because they reduce the risk. Joint ventures involving formal public/private relationships are more flexible than concessions because all of the information required - from both the private and public partner - is transparent. For example, the private sector partner will inform the government of information that would otherwise be confidential. Because of this transparency, plans can be adjusted accordingly as the programme proceeds. However, the joint venture approach does not allow for bidding based on price.

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