THE POLITICAL ECONOMY OF URBAN WATER IN INDIA AND SOUTHEAST ASIA

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Abstract

I compare the performance of urban water bureaucracies in 21 major cities in India with 18 major cities across Southeast Asia using survey data and political economy analyses. I find that water bureaucracies in Southeast Asia are substantially more effective and efficient compared with those in India. For instance, they are more likely to 1) be responsive in terms of water availability; 2) charge water tariff to cover cost of supply; 3) connect households and rely less on public taps; 4) apply user charges as indicated by metered connections; 5) have better operating ratios and staff per connection; 6) pay higher management salaries; and 7) have more progressive tariff structure. I suggest that this variation in performance can be explained by variations in the political economy and governance of urban water supply in India and Southeast Asia.

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INTRODUCTION

Public water bureaucracies in developing countries are often regarded as ineffective in meeting rising demand, inefficient in their operations and inequitable in their services. This characterization, in general, is often attributed to three inherent incentive problems associated with the political economy of public provision for water: populist pressures, conflicts of interest and perverse organizational incentives.

First, public water bureaucracies in developing countries often succumb to populist pressures – inherent in representative forms of government - to keep prices below cost even though these subsidies do not benefit the poor (Harris, 2003). Second, they are faced with conflicts of interest because the owner is also the same as the regulator and as a result, performance contracts cannot be credibly enforced (Shirley and Nellis, 1991). Third, they are faced with perverse organizational incentives arising from non-credible threat of

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bankruptcy, weak competition, agency problems, rigidities and performance measurement problems (Stiglitz, 1988; Weimer and Vining, 1998).

Developing countries have experimented with ways to improve the performance of public sector monopolies including the grant of financial autonomy, corporatization and performance management contracts. However, these experiments were largely unsuccessful (World Bank, 1995). Poor performance, deteriorating fiscal conditions and pressure from donors have forced many governments in developing countries to involve the private sector in the provision and financing of water supply.

However, in the case of urban water supply, privatization was not generally successful (Araral and Xun, forthcoming). From 1990 to 2001, only five percent of the total private investment in all infrastructure projects in developing countries went to water investments. Most investors prefer to invest in middle income countries (50%) compared to low income countries (18%) where the need for water investment is greater (Estache and Goicoehea, 2005). More critically, about 80% of all private investment commitments in the water and sanitation sector worldwide became distressed (or were cancelled or renegotiated) particularly those of the largest concessions (World Bank, 2006).

Given the failure of water privatization and the widespread role of public water bureaucracies in developing countries, a key policy question then is how to improve the performance of public water bureaucracies in developing countries. This paper is part of a series of research projects to answer this question. Its focus is to compare the performance of urban water bureaucracies in 21 major cities in India with those of 18 major cities across Southeast Asia using primary survey data. It then outlines some key lessons that India can learn from the experience of Southeast Asia.

The rest of the paper is organized as follows. The next section briefly reviews the political economy literature on public provision of urban water. This is followed by a discussion of the data and methodology and a discussion of findings. The paper ends with a concluding section and outlines the policy and theoretical implications.

THE POLITICAL ECONOMY OF PUBLIC WATER SUPPLY

This section briefly reviews the theoretical and empirical literature on inherent incentive problems associated with public provision: 1) a tradition of below cost pricing due to populist pressures; 2) non-credible enforcement of performance contracts in cases of regulator - owner conflicts of interest and multiple and conflicting goals and 3) perverse organizational incentives arising from non-credible threat of bankruptcy, weak competition, agency problems, rigidities and performance measurement problems.

The long tradition of below cost pricing among public water utilities in many developing countries can be traced, in theory, to two features of representative forms of government (Weimer and Vining, 1998; p. 166-190). First, concentrated interests – labor unions, urban poor groups, political parties - have strong incentives to monitor and lobby politicians to keep costs low. As a result, too much weight is likely to be given by politicians to these group's costs and benefits. Second and corollary to the first, because of electoral cycles, politicians maximize their electoral chances by pandering to populist pressures to keep prices below cost, particularly when the poor are affected. These two inherent features in a representative form of government in turn help sustain the tradition of below cost pricing.

However, these subsidies usually do not benefit the poor. Because of prohibitive costs of entry – i.e. connection fees – the poor are less likely to have piped connections and since they are excluded from the economies of scale of water networks, the poor end up paying more for water that are sold in retail by private operators. For instance, Bhatia and Falkenmark (1993) report that the ratio of water prices charged by water vendors to poor households compared with those charged by water utilities can range by a factor of 4 to 100 times (Table 1).

Table 1: Ratios of water prices charged by water vendors and public utilities

Country	City	Ratio
Bangladesh	Dacca	12–25
Colombia	Cali	10
Côte d'Ivoire	Abidjan	5
Ecuador	Guayaquil	20
Haiti	Port-au-Prince	17–100
Honduras	Tegucigalpa	16–34
Indonesia	Jakarta	4–60
	Surabaya	20–60
Kenya	Nairobi	7–11
Mauritania	Nouakchott	100
Nigeria	Lagos	4–10
	Onitsha	6–38
Pakistan	Karachi	23–83
Peru	Lima	17
Togo	Lomé	7–10
Turkey	Istanbul	10
Uganda	Kampala	4–9

Source: Bhatia and Falkenmark (1993).

In addition to the problem of below cost pricing, public provision in developing countries is also faced with a fundamental problem of conflict of interest when government acts as both the regulator and owner of public enterprises (Shirley and Nellis, 1991).

Consequently, public enterprises are faced with multiple and conflicting objectives – for instance balancing commercial with social and political objectives. However, too often, problems arise when these conflicting objectives are simultaneously pursued with a single policy instrument. For instance, many public water utilities in developing countries rely on general subsidies as a policy instrument supposedly to help the poor. However, more often than not, these subsidies benefit the rich more than the poor.

In addition, despite granting public water enterprises financial autonomy in exchange for performance targets, enforcement of performance contracts including threats of hard budget constraints are not credible for at least two reasons: 1) conflict of interest with the government being both the regulator as well as the owner of the enterprise; and 2) the economic characteristics of urban water – essential for survival and a local public good – creates populist political pressures that render threats of hard budget constraints not credible.

Many of the dilemmas faced by water bureaucracies – indeed by public bureaucracies in general – can be framed as a series of agency problems (Sappington and Stiglitz, 1987). Briefly, these problems arise because 1) principals do not exactly have the same interests as their agents; 2) it is costly for the principals to monitor their agents; and 3) agents have more information about their activities than their principals which allows them to pursue their own interests to some extent.

In addition, agents have very little stake in the social implications of their efforts since their compensation is divorced from their performance. The latter problem is pervasive. As Mookherjee (1997) notes, this can be observed in the relationship between the salaries of most tax collectors in relation to tax collection, pollution inspectors to air

quality, irrigation officials to water services delivered, forest officials to levels of deforestation, public school teachers to educational standards, urban water officials to the levels of water service and so on.

While the principal agent problem is universal in all organizations, several factors make them a more serious problem for public bureaus than private firms (see Weimer and Vining, 1998: p. 193). These factors include difficulty of valuing outputs and performance and the lack of competition among public bureaus. The difficulty of valuing outputs and performance makes it difficult to determine the optimal sizes of public bureaucracies which results into varying degrees and types of inefficiencies. The lack of competition gives public water agencies weaker incentives to innovate since - unlike private firms - they are not driven out of existence for failure to do so. This lack of competition eventually leads to varying degrees of dynamic inefficiencies. Under conditions of poor salaries and endemic corruption, these inherent incentive problems become compounded.

There is a large body of evidence to support these theoretical assertions about the inefficiencies and pathologies of public water bureaucracies in developing countries. For instance, in a study of 50 water utilities in 19 countries in Asia, the average non-revenue water (NRW), a widely used measure of efficiency, or water that has been produced but is eventually lost before it reaches the customers due to leaks, theft, unbilled consumption and inaccurate metering, stood at 60% (McIntosh and Yniguez, Ed., 1997).

In India, as this paper will show, water provided by public utilities is available on average for only 5 hours a day in 21 major cities. In Latin America, a survey of six publicly owned and operated water utilities in major cities showed that NRW goes up to as much as

51% (Shirley and Menard, 2002) while in Lagos, Nigeria, it runs up to as high as 90%. (For a debate on the use of NRW as a measure of efficiency, see Allan Lambert, 2003).

As this paper also empirically illustrates, the valuation of outputs and performance of urban water bureaucracies make it difficult to determine their optimal sizes which can lead to varying degrees and types of inefficiencies. These inefficiencies eventually translate into unnecessary costs to consumers, a waste of taxpayer's money from unproductive investments and a loss of a valuable resource where water is scarce (Asian Development Bank, 2003). It also critically affects the ability of these utilities to finance the expansion of their operations. Financing problems are often cited as a key reason why one billion people in developing countries worldwide still lack access to safe drinking water.

DATA AND VARIABLES

Data for this study was taken from a survey commissioned by the Asian Development Bank of 21 major urban water utilities in India and 18 from Southeast Asia. The report for India was commissioned under the auspices of the Ministry of Urban Development and undertaken in 2007. The methodology used in data collection is discussed in more detail in McIntosh and Yniguez (Eds) (1997, 2007) and the list of utilities included in the study is provided in Annex 1.

In this paper, I compare the performance of water bureaucracies from India and Southeast Asia in terms of two parameters:

- Effectiveness in supplying water as indicated by 1) availability of water in a 24 hour period; 2) the percentage of the area of responsibility of the water utility with

water service; 3) production per population; and 4) extent of reliance on public taps to deliver water.

- Efficiency as indicated by 1) percentage of water connection that are metered; 2) average tariff; 3) the ratio of operating costs with operating revenues (also known as operating ratio); 4) number of staff per 1000 connections; 5) management salary; and 6) extent to which tariff structure is progressive.

FINDINGS AND DISCUSSION

Overall, I find that - compared with India – urban water bureaucracies in Southeast Asia are more effective and efficient in supplying water. Figures 1 to 9 summarizes the key comparative descriptive statistics. Specifically, I find that – compared with India - water bureaucracies in Southeast Asia are:

- more responsive in terms of availability of water (Fig 2);
- more likely to charge higher water tariff (Fig 3);
- more likely to connect households instead of relying on public taps (Fig 4);
- more likely to apply user charges as indicated by metered connections (Fig 5);
- more operationally efficient in terms of operating ratio (Fig 6) and staff per connection (Fig 7);
- more likely to pay higher management salaries (Fig 8);
- more progressive in terms of tariff structure (Fig 9).

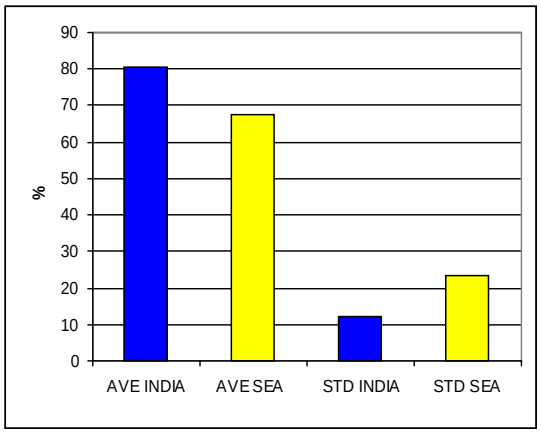

Fig 1 Water supply coverage (%)

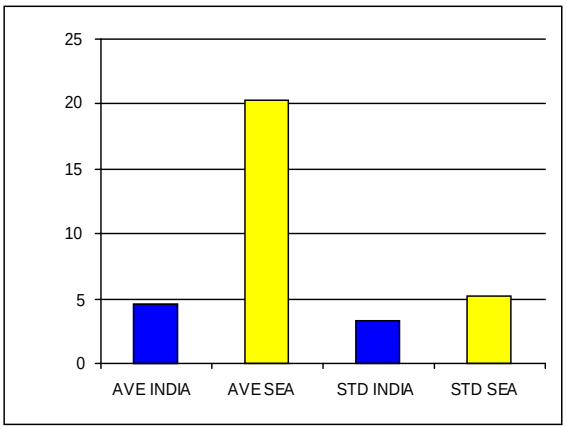

Figure 2 Water availability (hrs/day)

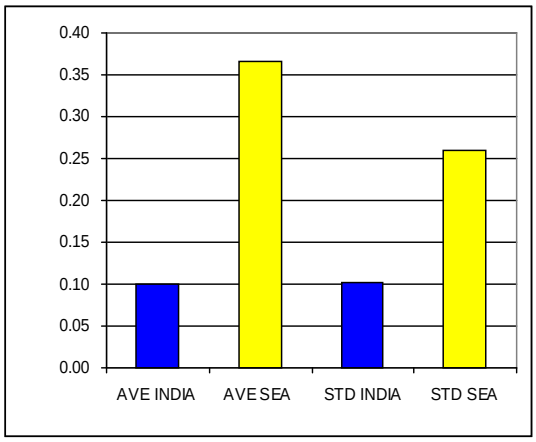

Fig 3 Average tariff (USD/cu. m)

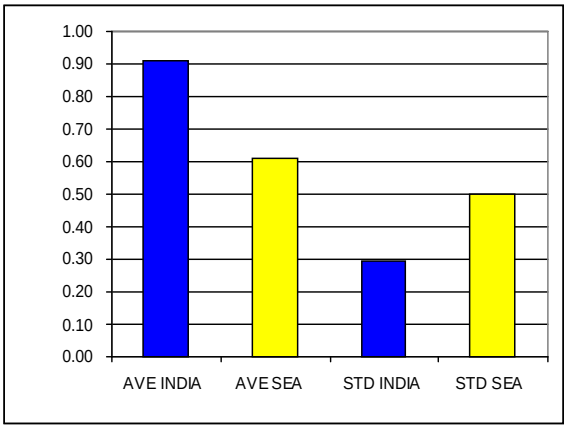

Figure 4 Provision for public taps

Source: Author's calculations from ADB survey data on water utilities

Note: AVE = average; STD = standard deviation; SEA = Southeast Asia; USD = US$; cu.m = cubic meter

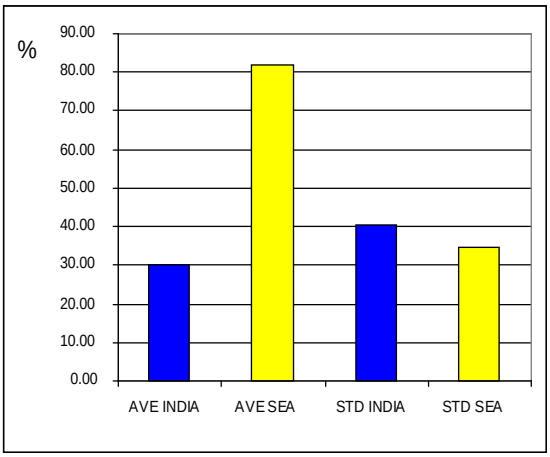

Fig 5 Metered connections (% of utilities)

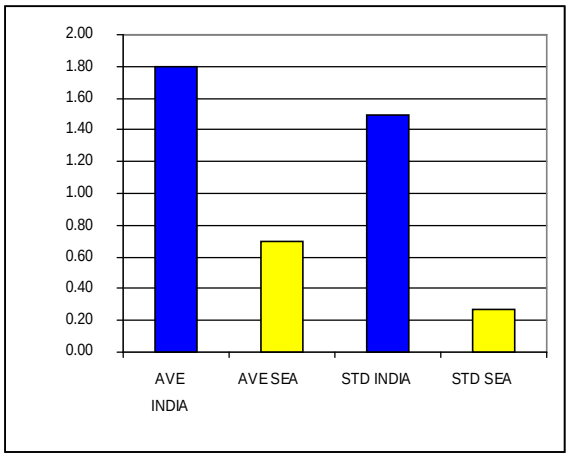

Fig 6 Operating ratio (O&M cost / revenue, USD)

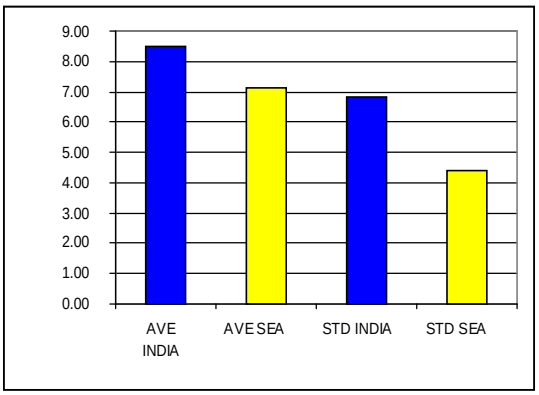

Fig 7 Staff per 1000 connections

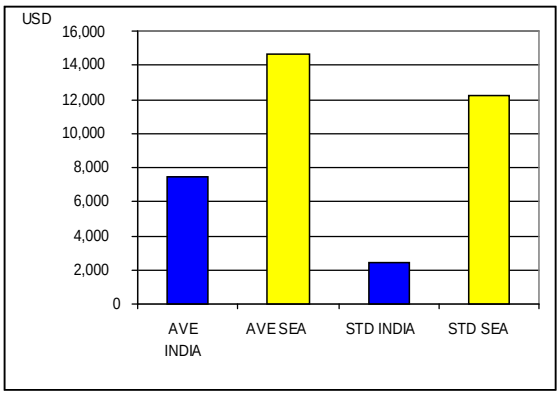

Fig 8 Management salary (USD/yr)

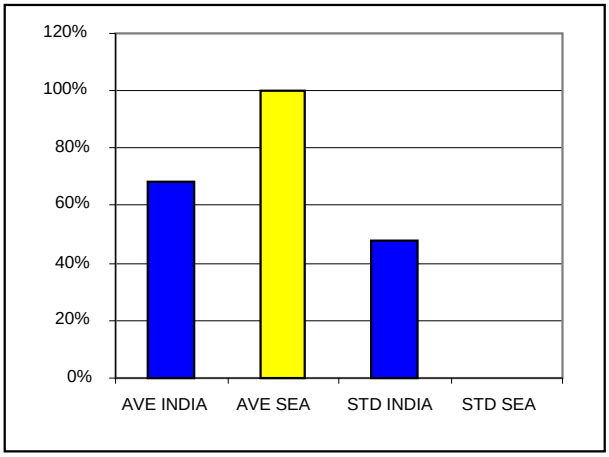

Fig 9 Utilities with progressive tariff structure (% of utilities)

Note: AVE = average; STD = standard deviation; SEA= Southeast Asia; O&M = operation and maintenance

Source: Author's calculations from ADB survey data on water utilities

Effectiveness

Figures 1 to 4 provide some indicators to measure the effectiveness of urban water bureaucracies. Figure 1 compares the water supply coverage which is measured as the percentage of the total population in the water utilities' area of responsibility that is served with household connection and access to public tap. While India has a slightly higher water supply coverage (figure 1), most of this is due to access to public taps instead of household connections (figure 4). This figure in fact can be misleading for it does not reflect the quality, regularity, affordability or convenience of water services. In addition, water utilities in India supply water for only about 5 hours a day on average, a far cry from the average of 20 hours in SE Asian cities. Even the best performing utility in India – Amritsar – can only manage to supply water on average for 11 hours a day.

Not surprisingly, the ability of utilities in SE Asia to provide for more stable, reliable and longer water service is associated with a higher price – 2.5 times more for water tariff – compared with India (figure 3). Average tariff (US$/cu. m) was measured as the total annual billing (USD) divided by total annual consumption (m^3). The conventional ideological reasoning has been that water is a basic good for human survival and therefore should be provided with price subsidies.

Efficiency

Figures 5 to 9 provide some comparative measures of operational efficiency among utilities in India and SE Asia. Figure 5 indicates the percentage of households in the service area of the water utility with connections that are metered. In SE Asia, at least 80% of all connected households are metered compared to only 30% in India. This point is important

as the financial viability of the water utility – and hence its ability to meet rising demands and improving service – hinges in large part on its financial condition.

It is not surprising that better water service in SE Asia is closely associated with the extent of metered connections and the charging of appropriate water tariff that covers the cost of water service. In addition, utilities in SE Asia are operated more efficiently as indicated by their operating ratios (figure 6), the ratio of the cost of operation and maintenance against the operating revenues. Utilities from SE Asia have operating ratios that are 2.7 times lower compared with those of India.

Another measure of operational efficiency is staff per 1000 connection. As figure 7 shows, utilities in SE Asia have lower ratios. For a utility in a major city with a connection of a million households, this could easily mean a difference of 1,500 staff. Not surprisingly, a large sized water bureaucracy drains substantial resources that could have otherwise been used to expand and upgrade water infrastructure. Note, however, the large standard deviation in India indicates a large variability in the size of the utilities – for instance in at least six utilities, they have a staff size above the average the average of SE Asia with some utilities having a ratio of 20 staff per 1000 connections.

Another distinguishing feature of utilities from SE Asia is that while they have lower staff to connections ratio, they also pay their management higher salaries, on average 2 times more compared to India. Again, that utilities in SE Asia are performing much better has to do with the quality of their management which in turn is a function of their compensation. However, to be able to pay better salaries, water utilities would first have to improve their financial condition – through better management of unaccounted for water,

metering, user pay principle, water tariff that covers cost of water service and more efficient operations, among others.

A key to the improvement of the financial condition of water utilities is the adoption of progressive water tariff structure. Figure 9 provides a comparison of tariff structures among utilities in India and SE Asia. It shows that all of the utilities in SE Asia covered in the survey have some form of a progressive tariff structure i.e. water tariff progressively increases after a certain block of consumption. However, this is not the case for India.

CONCLUSION AND IMPLICATIONS

The subject of providing for affordable and clean water supply in developing countries is an important and pressing issue. At present, an estimated 1.1 billion individuals worldwide do not have access to safe water supply. Based on a comparative political economy analysis, this paper has outlined a number of reform measures that India can learn from the experience of SE Asia to improve the performance of its water utilities.

In summary, I find that water bureaucracies in Southeast Asia, compared with India, are 1) more responsive in terms of water availability; 2) more likely to charge water tariff to cover cost of supply; 3) more likely to connect households and rely less on public taps; 4) more likely to apply user charges as indicated by metered connections; 5) more operationally efficient in terms of operating ratio and staff per connection; 6) more likely to pay higher management salaries; and 7) more progressive in terms of tariff structure. I

argue that the variation in performance between India and SE Asia can be explained by the variation in the political economy of urban water in these two regions.

This study suggests that in order to improve the effectiveness and efficiency of urban water utilities in India, there is a need to rethink its policies in terms of 1) getting water tariff right; 2) improving the coverage of water metering; 3) improving operating ratios; 4) improving staff per connection ratios; and 5) rethinking management salaries. Getting water tariff right is a key solution to many of these problems. It suggests, among others, the observance of the following principles of tariff setting as suggested by Whittington, Boland and Foster (2002):

- Cost recovery principle – tariff rates should generate enough revenue to cover the financial cost of water supply;
- Economic efficiency principle – prices should provide signals for efficient actions by consumers, suppliers and investors;
- Equity principle – consumers with similar characteristics should be treated similarly;
- Affordability principle – given its importance to health, water should be provided at a minimal cost to poor people through well targeted subsidies, if needed.

Theoretical Implications

This study has number of theoretical implications as well. In order to more systematically explain the variation in the performance of urban water bureaucracies in India and SE Asia, two theoretical hypotheses are put forward:

H1: Populist pressures hypotheses. We are more likely to see below cost pricing in political systems with proportional voting rules. When there is a large concentration of poor households, proportional voting rules generate and sustain populist pressures to keep

water tariff below cost. Populist pressures arise also because of the political characteristics of water: it is essential to life and health and hence its affordability to the entire population are of enormous political importance.

H2: Credible enforcement dilemma. The effectiveness of performance contracts as an instrument to improve water utilities performance is limited by 1) conflicts of interest when governments are both the owner and regulator of the water utility; 2) non-credible threat of bankruptcy of the utility given the political characteristics of water; and 3) problems of weak competition, water supply being a natural monopoly as well as problems of agency rigidities and performance measurement problems.

These two hypotheses – populist pressures and credible enforcement dilemma – have broader policy and theoretical implications to policy analysis beyond the case of urban water in India and SE Asia. For instance, it suggests that policy analysis ought to be informed by an understanding of 1) the characteristics of the "policy good" – in this case the unique characteristics of water supply which attracts a particular kind of politics; 2) the beliefs of the stakeholders with respect to the "policy good" – in this case the belief in India that water should be a subsidized commodity; and 3) the role of institutions in shaping the behavior of stakeholders.

As the case of case of India has shown, the tradition of below cost pricing is due to populist pressures resulting from a proportional system of voting; the non-credible enforcement of performance contracts arising from regulator - owner conflicts of interest and multiple and conflicting goals; and, finally, the perverse set of organizational incentives arising from non-credible threat of bankruptcy, weak competition, agency

problems, rigidities and performance measurement problems associated with public provision in developing countries.

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Annex 1

List of urban water bureaucracies included in the study

Country	City	Name of Utility
Cambodia	Phnom Penh	Phnom Penh Water Supply Authority
Indonesia	Bandung	PDAM Kodya Dati II Bandung
Indonesia	Jakarta	PDAM DKI Jakarta
Indonesia	Medan	PDAM Tirtanadi Medan
Lao PDR	Vientiane	Nam Papa Lao
Malaysia	Johor Bahru	Syarikat Air Johor Sdn., Bhd. (Johor Water Company)
Malaysia	Kuala Lumpur	Selangor Waterworks Department
Malaysia	Penang	Pihak Berkuasa Air Pulau Pinang (Penang Water Authority)
Myanmar	Mandalay	Mandalay City Development Committee
Myanmar	Yangon	Yangon City Development Committee
Philippines	Cebu	Metropolitan Cebu Water District
Philippines	Davao	Davao City Water District
Philippines	Manila	Metropolitan Waterworks and Sewerage System
Thailand	Bangkok	Metropolitan Waterworks Authority
Thailand	Chiangmai	Provincial Waterworks Authority (Regional Office No. 9)
Thailand	Chonburi	Provincial Waterworks Authority (Regional Office No. 1)
Viet Nam	Hanoi	Hanoi Water Business Company
Viet Nam	Ho Chi Minh City	Ho Chi Minh City Water Supply Company
India	Ahmedabad	Ahmedabad Municipal Corporation
India	Amritsar	Municipal Corporation, Amritsar
India	Bangalore	Bangalore Water Supply and Sewerage Board
India	Bhopal	Bhopal Municipal Corporation
India	Chandigarh	Municipal Corporation, Chandigarh
India	Chennai	Chennai Metropolitan Water Supply & Sewerage Board

India	Coimbatore	Coimbatore City Municipal Corporation
India	Indore	Indore Municipal Corporation
India	Jabalpur	Jabalpur Municipal Corporation
India	Jamshedpur	Jamshedpur Utilities & Services Company Limited
India	Kolkata	Kolkata Municipal Corporation
India	Mathura	Mathura Municipal Council
India	Mumbai	Municipal Corporation of Greater Mumbai
India	Nagpur	Nagpur Municipal Corporation
India	Nashik	Nashik Municipal Corporation
India	Rajkot	Rajkot Municipal Corporation
India	Surat	Surat Municipal Corporation
India	Varanasi	Varanasi Jal Sansthan
India	Vijayawada	Vijayawada Municipal Corporation
India	Visakhapatnam	Greater Visakhapatnam Municipal Corporation
India	Calcutta	Calcutta Municipal Corportation (Water Supply Department)
India	Delhi	Delhi Water Supply and Sewage Disposal Undertaking