

Public-Private Partnerships and Urban Water Security: Issues and Prospects in Mumbai, India

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Abstract

This article analyzes the literature, developments and challenges in public-private partnerships (PPPs) in the case of the water sector in Mumbai, India. Owing to an apprehensive approach towards private sector participation in the water sector, it is important to look at the history of private sector participation in water and other utilities. It has been much debated as to whether water should be privatized since it is a public good and a utility essential for life. The ability of the public sector to provide efficient services has also been questioned, resulting in the proposal of public-private sector privatization. Such partnerships are deemed to be a perfect, balanced method for tackling the shortcomings of the public sector and the profit-oriented private sector, which can provide financial back-up. But as we take a closer look at the literature, it is apparent that the private sector is no exception to complicated market mechanisms. The private sector can face the same fate in the absence of good regulatory operations. The solution for each region is location-specific and unique to its situation and background.

Keywords: India, public-private partnerships, privatization, water security, water supply.

Introduction

Recently many efforts towards solving various water related problems have been witnessed across the world. The brunt of water crises is borne by developing countries, which, incidentally, house the majority of the planet's population. Thus, there has been much attention focused on devising reforms, policy changes and experiments in the water sector. Often at the centre of this crisis is private sector participation.

The most serious problem facing developing countries today is a simultaneous high rate of urbanization and rapid population growth, which places extreme pressure on the infrastructure of urban and surrounding areas. Traditionally, the public sector has been responsible for the management of water services, but in recent times, it has been argued that they lack the capability that is needed to provide efficient services in a time of increasing demand. This article focuses on the case of water services in Mumbai, India, and the role of public-private partnerships (PPPs) in resolving the water crisis that it is currently facing.

Background

India has a huge abundance of water resources: it is not only surrounded by water bodies, but is also bestowed with vast amounts of groundwater, many rivers and several lakes, while the great Himalayas in the North are a huge storehouse of water in its solid, frozen form. But out of all these sources of water, only a quarter of this water is potable (Gupta and Deshpande 2004) and India is plagued by environmental issues, such as “water pollution from raw sewage, and run-off from agricultural pesticides” (Sharma, 2005 cited in Mercado, n.d.) According to the Central Intelligence Agency (CIA) World Factbook (online source), tap water is also not potable, creating another major problem throughout the country, with many Indians queuing up everyday at public taps for water instead.

Currently, the situation is such that, while urban areas are being provided with enough water to fulfill their maximum requirements, it is often at a cost to rural regions (Shiva 2002). In addition, while most of the problems facing India’s water supply can be avoided through the implementation of well-known solutions such as better water infrastructure, like many developing countries, it faces major financial hurdles that render the problems unavoidable. As such, the entry of the private sector can bring in the capital needed, but unfortunately, it can also add its own set of problems, particularly in regards to water resource management. This can include price hiking due to the incoming investment, and commoditization of water (Budds and McGranahan 2003: 6).

The city of Mumbai has six lakes serving as freshwater resources. Water is treated at two facilities, located at Bhandup and Panjrapur, after which it is stored in the 17 reservoirs situated in the city. Once it reaches the pipelines, however, the resource is only made available four hours out of each day, creating a huge gap between supply and demand.¹ Intermittent water supply is not the only issue facing the city either: poor water quality and contamination, equitable supply issues, and poor customer service from the city municipal corporation regarding community issues create further complications (Brihanmumbai Municipal Corporation et al. 2007).

Public-Private Partnerships and Water Security: Definition and Context

The United Nations Economic and Social Council’s Committee on Human Development and Civil Society (2005) defines PPPs as “the combination of a public need with private capability and resources to create a market opportunity through which the public need is met and a profit is made.” Crosslin and Robert (1991) define PPPs as “contractual arrangements in which private companies assume a greater responsibility and/or risk, especially through concession contracts” (cited in Budds and McGranahan 2003: 89). ADB’s Public Private Partnership Handbook clearly distinguishes between PPPs, Private Sector Participation (PSP) and Privatization based on their nature and mechanisms; although it also mentions that they have been interchangeably used (ADB 2008).

The water sector has two main types of PPPs: the first is the English type of complete privatization, in which management and ownership are private; the second is the French type, in which management is delegated (eg lease and concession contracts) and combines public and private management, while ownership is public (Ouyahia 2006). The World Bank favors the French example, which has been widely promoted and adopted

¹ The figure excludes the amount of water supplied to the Airport Authority Chatrapati Shivaji Terminus, which receives 24 hours of water supply: (Brihanmumbai Municipal Corporation 2007).

in both developed and developing countries in diverse forms (Ouyahia 2006).

It begins with a service contract, in which some parts of the operation and maintenance of the water utilities are handed over to the private sector. Next is the management contract, where the technical and administrative sections are covered by the private sector, with some responsibilities over operation and maintenance included. The next type is Leasehold, or Affermage, which is similar to a management contract but with added responsibilities, such as commercial responsibilities shared by both the parties. This is followed by a concessions contract, which is considered the best among all the contract types, as they are mid-way between complete privatization and complete public ownership. Concessions contracts have assets owned by the public sector while investment, risks and operation and maintenance are handed over to the private sector. Additionally, the responsibility of the water utilities is owned by the private sector for the duration of the contract, and can also contain within them various other types of contracts, such as Build-Own-Operate, and Build-Operate-Transfer, etc. Last is the Divesture contract, which is equivalent to complete privatization (Hubert 2008).

The capital is usually provided by the private entity involved, however, it is also the case that taxpayers are sometimes called upon to fund the new capital instead (Loxley 1999: 8). This can become a drawback for those promoting PPPs. If the taxpayers, who are in fact the consumers, are the ones who fund the capital, then questions can be raised as to why the private sector should then be benefiting from the whole process. After all, its capability to input capital is more often than not the reason for inviting it into such a project in the first place.

To date, water security has not been accurately defined in literature, though there have been certain attempts. The Framework for Action and the Ministerial Declaration of The Hague in March 2000 first raised the concept of water security. The declaration discussed what challenges lay ahead in achieving water security. One point mentioned is the collaboration among all levels, including consumers, providers and international organizations. Hasan et al. (2004) conceptualize water security as the threat to a water supply and distribution system by terrorist attacks and other externalities. Hoffmann (2006: 7) defines it “as the ability to access sufficient quantities of clean water to maintain minimal standards of food and goods production, sanitation and health.”

Trends and Changes in Public-Private Partnership and Water as a Public Good: A Literature Review

At the end of twentieth century, an upswing in industrialization in the West created additional stress on management of water and sanitation services. In an attempt to constrain the situation and ascertain the reasons why investments in infrastructure were not showing expected levels of development, international organizations, such as the United Nations (UN) and the World Bank (WB), began to evaluate the reasons for the gap between the provision of services at the supplier end and their receivership on the consumer end. In the resulting World Development Report (1994), the World Bank recognized the failure of the public sector in its role of resource management, characterizing it as inept, lacking competition in world markets and corrupt, and so devised the method of PPP implementation. Although PPPs were not new to other industries, such as energy and health, it was from here that the trend of PPPs in infrastructure projects and the provision of public goods began.

The UN's reasons for encouraging private sector activity in the provision of water services included making the sector more responsive to consumers and sustaining efficiency and technological expertise (Jones 2005).

International organizations such as the World Bank and the Asian Development Bank promote privatization, claiming that it can result in effective and efficient use of water as a declining resource (ADB 2001; World Bank 1994). Loxley (1999: 2) advocates that in the time since PPPs have been implemented, they have been shown to "deliver infrastructure and services more efficiently and at a lower cost than traditional methods." However, the veracity of this is debatable, and has been one of the major challenges to those advocating PPPs. Budds and McGranahan (2003) define PPPs as arrangements made between the private companies and public providers. The term "partnership" implies a mutual agreement of "shared objectives and working arrangements that go beyond the fulfillment of any contractual agreement" (Budds and McGranahan 2003: 89).

While in some cases the private sector has indeed provided more efficient services, the cost claims have not always added up. An empirical study by Ouyahia (2006: 3), which compared the efficiency of the private and public sector, suggests the results are mixed. In developing countries, or transition economies, the most important need is the investment input to rehabilitate the existing infrastructure. Since they lack the capital to renovate these infrastructures, they are inclined to lean towards PPPs. As noted by Ouyahia (2006: 17):

Once the PPPs are implemented, they need to be regulated, provide incentives to the private sector, and to protect the consumers from monopoly abuse ... Private companies need to be assured of the return on investments, because investments in the water sector are high and irreversible.

According to Estache and Goicoechea (2005; in Araral, 2008: 4), the majority of investors like to invest in middle-income countries (50 per cent), rather than low-income countries (18 per cent).

In the water sector competition, more than type of ownership can provide better results in terms of efficiency (Ouyahia 2006: 2). Not only does a lack of information, transparency, and accountability deter fair competition, so too does political constraint, a lack of support from non-governmental organizations (NGOs) and other organizations, and unnecessary and lengthy auctioning and bidding processes. The nature of investments in the water sector is irreversible (Ouyahia 2006: 17). This can deter investors and thus reduce competition. Also because of the presence of a few dominant private water companies, there is little space for local private providers. The fact can be ignored that these local private providers do not have the financial capabilities to invest (Budds and McGrahan 2003: 104–105).

Another drawback is the different interests of the stakeholders in this process. The government, or the public sector, is committed to the socio-economic goals related to the provision of these services and infrastructure. The private sector is committed to the recovery of costs and turning a profit on its investment. The NGOs are concerned with proper provision to the community, and raise issues related to that provision, such as its environmental impact. Thus the different interests of the stakeholders create friction and conflicts (Ouyahia 2006: 17).

Externalities lie in the whole process of water supply, from extraction to storage

and treatment, to distribution to the end-user. Since water extraction, storage, treatment and distribution are all either stationary processes or located underground, it makes the water supply process all the more difficult to handle. Costs are thus increasing the investment risk. This is one of the reasons why there is less private sector involvement in water infrastructure. The end of the 1990s, especially 1998-99, observed a reduction in the number of private sector participation projects in the East Asia and Pacific (World Bank 2009). The rationale being forwarded was that they were either highly risky or not considered profitable enough. It was speculated that the private sector was not operating in rural areas due their location, and as these areas are also heavily subsidized, the returns on the investment would be too low (Ouyahia 2006). If the private sector decided to become involved in the rehabilitation of infrastructure, the water tariffs must be aligned with the underlying cost (Kessides, 2004 cited in Tan J., 2008). Hence as Kessides (2004) mentions (cited in Tan J., 2008) private utility operators over the world are struggling with the finances needed for maintaining and expanding the service, and it must be noted that subsidies and grants play an important role in financing, especially in developing countries. As Talbot J.F., Chairman and CEO of SAUR International observes, there is “[The false] belief that any business must be good business and that the private sector has unlimited funds [...] The scale of the need far outreaches the financial and risk taking capacities of the private sector” (Budds and McGrahan 2003). Thus no matter how much it is discussed that the private sector gives leverage in financial matters, the private sector can also face the same wrath as the public sector, especially in the case of failed regulatory operations.

But the following empirical studies have a story to tell. One study which focuses on the cost function of water utilities states that whether public or private sectors manage water services, they try to minimize costs (Crain and Zardkoohi, 1978; Bruggink, 1982; Raffiee et al., 1993; Bhattacharyya et al., 1994; Saal and Parker, 2000 (cited in Ouyahia 2006). Citing the studies of Morgan (1977) and Crain and Zardkoohi (1978) Ouyahia (2006) found that “private water utilities on average have lower costs.” In contrast, Ouyahia (2006) notes that Bruggink (1982), Feigenbaum and Teeple (1983), and Teeple and Glyer (1987a, 1987b) “found either no cost difference or that public utilities have lower costs.”

Two studies conducted by Lynk (1993) and Bhattacharya et al. (1995) (cited in Ouyahia 2006) found that, because the public sector charges close to the average minimum cost when compared to the private sector, it is identified as being more efficient. Hence, it is more common to find the private sector operating in those areas where these costs are higher, and this is aligned with the private sector’s cost recovery and profit generation motive.

But costs also depend on other factors, such as the amount of investment and the generation of revenues. Maximum productivity has to be achieved with maximum efficiency to give maximum output, in the ideal conditions. But the fact that this is within *ideal conditions* must be stressed: ideal conditions can rarely be followed. Also, topography, population density, and externalities have to be considered in the case of productivity and performance (Ouyahia 2006).

To reduce budgetary deficits, increase economic growth, develop capital markets and improve services was the rationale under which privatization was introduced in Asia (Ouyahia 2006: 14). However, private investment commitments to water projects still only make up 5 percent of the total investment share in developing countries (Ouyahia 2006:

13). A careful analysis should be undertaken as to which forms of private participation are most suitable. However, there is also a need to analyze the environmental impacts of the projects being carried out before and after the private sector becomes involved in water operation. This should be done mainly because the urban areas are fed with water from the neighbouring regions, while these neighbouring regions suffer from water scarcity.

Water companies have exhibited an apprehensive approach towards investing in Asian and Latin American nations. As Budds and McGranahan (2003) note, companies' main motives for investment in projects are profit and returns. Their objectives have little to do with the targets and provision of services. Low-income areas do not present a viable market for investment from private water companies (Budds and McGranahan 2003: 109). Water demand in poorer areas is also usually lower, and the record of payment is poor (Schusterman et al. 2002 in Ouyahia 2006).

Research Analysis: The Water Distribution Improvement Project (Mumbai)

The primary reason for choosing the city of Mumbai for this case study is because of its dense population: the Municipal Corporation of Greater Mumbai (MCGM, online resource) estimated that 13 million people were living in the city in mid-2006. Additionally, Mumbai is a major contributor to the developing economy of India, and as such, reveals many of the social and environmental pitfalls a city faces when dealing with urbanization and population migration. The question must be raised as to how the city, with such a large and rapidly growing population, can cater for all its inhabitants' needs, and in turn, how those needs can be met sustainably without causing lasting damage to the surrounding ecosystems and environment. In order to achieve this, the city officials have to integrate water resources from neighbouring regions.

Part of MCGM's solution to these problems was to introduce a PPP scheme, with the view of improving the water system's efficiency and management. They initiated the "Water Distribution Improvement Project" in the locations of the K-East Ward. The New Zealand based group, Castalia, which had previously worked with the World Bank and the Public Private Infrastructure Advisory Facility (PPIAF), was called in as a consultant to the project. They reported that, although the ward had an acceptable quantity and quality of water, with the exception of a few areas and in times of monsoonal conditions, the customer service, equity of supply, and intermittent supply were still major issues that hampered the water's delivery (Brihanmumbai Municipal Corporation et al. 2007).

The slum population in the ward, which is estimated to be 290,000 people, is also a major constraint on the city's water supply. This is mainly because of the services have to be provided to them at the minimal rates. Also the issues of illegal connections make it more difficult. Additionally, according to the Tata Institute of Fundamental Research (TIFR, online source), some of the city's water infrastructure is over 100 years old, which creates further problems in the maintenance of the system. Pipe leakages and bursts are a regular occurrence. Lastly, the intermittent supply of water causes contamination, inconvenience and inequity in distribution.

Castalia reported that the creation of a consistent water supply could solve many of Mumbai's water system problems (Brihanmumbai Municipal Corporation et al 2007). Out of the 540 million litres per day (mld) of water input to the ward, 110 mld are lost in leaking and burst pipes, billing errors and illegal consumption. The company devised the "Integrated Water Loss Reduction Project," which proposed technical solutions, such

as installing meters, pressure zoning, zone-by-zone management, and active water loss reduction. Another solution was the Slum Network Upgrade Project, which focused on the rehabilitation of the infrastructure in the slum area, so as to improve equality in water supply, quality and quantity supplied. The final major area that needs overhauling is customer service. At present, there has been no staff dedicated to handling consumer complaints. In addition to this, the system for registering the complaints is done manually, which makes customer complaints difficult to monitor.

In Castalia's management-level solutions, Multiple Small Contracts, Single Medium-Term Outsourcing Contracts, Management Contracts, Lease Contracts, and Concession Contracts have all been proposed. However, they do not recommend total privatization, as they do not see this route as providing Mumbai with optimal solutions to its problem. Additionally, all too often privatization creates controversy within the community and social groups and NGOs who oppose it. They do recommend, though, the "corporatization" of whole departments as one of the other possible solutions.

Challenges facing the Project

It is unfortunate that, to date, the "Water Distribution Improvement Project" has faced many obstacles, despite Castalia's recommendations. There has been little information sharing between the public (MCGM) and the private (Castalia) sector, and although the latter carried out statistical analysis of the K-East ward in Mumbai prior to the project's implementation, it is only possible to retrieve information with the help of MCGM. Additionally, it is difficult to access accurate figures, due to the challenges the study had gaining samples for water quality testing and information on illegal connections in the context of understanding unaccounted-for-water figures.

To add to these issues, Castalia, being relatively new to the project area, has the obstacle of unfamiliarity to deal with when gathering data, especially when regulatory and implementation mechanisms have not been made clear.

As the K-East ward website has not been updated since 2008, this study would benefit from a field study, if its merits are to be better understood.

Recommendations

Considering the delicate role of water in our daily lives and the dependence the entire globe and its ecosystems have on this resource, the ownership and management of water should be an intermediary process involving both the public and private sectors, which embrace the best possible characteristics of both mechanisms. The community should also be involved in the process from the outset.

In order for PPPs to be effective, an attractive environment has to be created, wherein the key roles and responsibilities of the actors/institutions "are separated, clearly defined, and allocated among all actors," both in the public sector – at the national and local levels – and in the private sector (UNESCO 2003: 12). Strong regulatory frameworks are also needed, in order to maintain coordination and efficiency.

The UN Center for Human Settlements (1996) claims that the private sector can be effective in servicing low-income consumers also, but it needs to operate within a regulated environment that simultaneously allows service provider authorities to manage the utilities with greater autonomy. Fischer and Frohlich (2001) mentioned public and private sectors in the "conceptual themes of innovation systems" (cited in Amjad n.d.).

Competitive advantages are achieved by “the interaction between the generation, use and diffusion of new and economically useful knowledge” (Fisher and Frohlich 2001, cited in Amjad n.d.). Having said all this, it finally depends on the region where these partnerships are being executed, and what the situation may be before and after the project’s implementation. The root of the problem lies in the operation and maintenance of the water utility, not necessarily in the water supply (Dumol 2000).

Finally, an assessment needs to be undertaken based on six main criteria: “efficiency and cost savings; financial risk transfer; environmental risk and quality; issues of accountability and transparency; the impact of a project on workers and the community; and the economic development benefits” (Loxley et al. 1999).

It is indeed possible that PPPs can offer solutions for the management of water resources, particularly in the areas of efficiency, loss reduction and the provision of a continuous, equitable supply of water to the community. However, certain questions still remain, such as:

- 1) Should water be priced?
- 2) If it is priced, what price should be levied if the poor cannot pay?
- 3) Should water be priced in a way that encourages people to acknowledge the true value of this finite resource?
- 4) Is achieving a continuous water supply even viable, given water’s finite nature?
- 5) Can a continuous water supply actually solve other supply-related problems (as suggested by Castalia)?

The objectives of this article were to review the literature, history and background of public-private partnerships in relation to the context of privatization, since it is impossible to discuss PPPs without mentioning privatization and also examining the case of K-East Ward under the same context of PPPs. Much has been written about and discussed in the literature, but as Ouyahia (2006) mentions, there is “no one-size fits all” solution. Each of the regions or municipalities have to first clearly set out their objectives, and analyze the checklist needed for a certain kind of private sector participation.

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