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"An assessment of water sector reforms in the Indian context: The case of the state of Maharashtra"

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prepared for the UNRISD Project on

"Commercialization, Privatization and Universal Access to Water"

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"Commercialization, Privatization and Universal Access to Water"

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UNRISD Project on "Commercialization, Privatization and Universal Access to Water"

"An assessment of water sector reforms in the Indian context: The case of the state of Maharashtra"

Vasudha Pangare, Neelesh Kulkarni, Ganesh Pangare

This paper contributes to the UNRISD project on "Commercialisation, Privatisation and Universal Access to Water". The paper deals with a historical perspective of the evolution of the water supply and sanitation sector in India, focusing on the urban context. Further the paper looks at the case of Maharashtra, a state in India, where progressive water sector reforms were initiated. With 42.4% of Maharashtra's population living in urban areas, there is an urgent need to improve the State's public sector performance in the water supply and sanitation sector and to look for sustainable investments that will address the needs of the urban population. Within Maharashtra, four cities have been studied where innovative measures were tried by the Municipal Corporations to improve the water supply mechanisms. Pune and Sangli are case studies of privatization and Nagpur and Thane are case studies of innovative approaches in systems improvement.

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Executive Summary

With enormous natural resources, a growing economy and the second largest pool of technical and scientific personnel in the world, India has emerged as an important developing nation. Two hundred and eighty five million persons or about 28% of India's population of over 1 billion live in urban areas spread over 5161 towns. Although the rate of urbanisation in India is among the lowest in the world, in terms of absolute numbers, the urban population is quite huge due to the large population of the country. The impact of urban growth has been adverse on urban infrastructure and services, which, in most cases fail to keep pace with the growing population.

India has achieved significant development of water resources and drinking water infrastructure since independence in 1947. Today between 69 to 74% of rural and 91 to 93% of urban population is 'covered' by installed water supply capacity. However, there are some basic problems in the water supply sector, which include those related to O&M, transmission and distribution, water quality, unequal distribution within the city, and unaccounted for water.

Since 1992, the urban water supply sector has been operating on the guiding principles of the New Delhi Declaration, which was adopted by the UN General Assembly in December 1990. The emphasis of the approach is on protection of the environment and safeguarding of health through integrated management of water resources, organizational reforms, community management of the services and sound financial practices. Supply of water is to be based on the principle of effective demand corresponding to the standard of services affordable to consumers.

Water supply is basically a municipal function, to be executed by the ULB (Urban Local Body), or municipal bodies. However, since water supply schemes are capital intensive, these are financed from the state budget, borrowings from financial institutions or the external funding agencies. The Government of India provides assistance through a few centrally sponsored schemes.

Urban local bodies (ULBs) are instruments of self-governance; they are elected bodies with tenure of five years, and are responsible for urban management and governance. There are two main sources of revenue for water utilities; water tax based on property values and water charges based on water consumption. Water tariffs are generally ridiculously low and revenue collection efficiency is very poor. Neither the tariff rates nor the revenue collection methods are guided by any definite principles. Different methods are used for collecting tariff, which range from flat rates, slab rates to volumetric rates. Few ULBs generate sufficient revenues, while most of the medium and small towns do not even cover operation and maintenance costs.The minimum tariff is set by the state and the ULBs have to seek the approval for all proposed increases. Some ULBs have initiated innovative cost recovery mechanisms such as advance registration charges, connection charges, water tax, application of general revenues etc., though such cases are few.

Urban India's population of 28% accounts for about 50% of the country's gross domestic product (GDP), and in the near future, is expected to be the boom centre of economic growth. For making water available for everyone by the year 2021, 324 million people would need to be

provided with services, and 115 million people would require augmentation of existing facilities. The water sector therefore is in urgent need of large-scale investment, which, it is felt can only come from the private sector.

For the past 10 years, the World Bank through their Water and Sanitation Programme (WSP) for South Asia has been working with the Ministry of Urban Development, Government of India, to formulate a set of guidelines for promoting private sector participation in urban India. Parallel to this process, private firms, local corporations and financial institutions initiated dialogues and contracts across the country. However, many contracts fell through during the discussion stage. About 25 big and small contracts were initiated and abandoned as deals fell through. Not a single project reached the implementation stage in these 10 years.

Maharashtra is the second largest state in the country in terms of population and third largest in terms of area. It is one of the most developed states of the country with high per capita income, which is 40% higher than the national average. Maharashtra is the second most urbanized state, with 42.4% people living in urban areas. However, the differences in terms of development and poverty ratio within the state are grave, with 26.81% of the urban population being below the poverty line.

Maharashtra is the first state in the country to prepare a White Paper on the state of the drinking water supply programme and to initiate institutional reforms with a view to improving the performance of local bodies that are responsible for provision of drinking water and sanitation facilities. The State Government has facilitated the reform process by bringing out enabling orders and actually implementing them in the field. Maharashtra state has both positive and negative experiences with private sector participation and private-public partnerships, in the water sector and other sectors as well. In order to encourage Urban Local Bodies (ULBs) to improve the efficiency of their water supply systems, the State Government provides incentives of capital grants and guarantees for loans for water supply schemes. In June 2001, the State Government issued guidelines for private sector participation in urban water supply and sewerage. The guidelines indicate that many aspects of the existing schemes could be managed more efficiently with PSP such as metering, billing, collection, and O&M.

For this paper, the ULBs of four cities in Maharashtra were studied where efforts were made to improve water supply systems. These cities are Pune, Sangli, Nagpur and Thane. All four cities have relatively well managed civic bodies, and have involved the private sector in some aspects of water supply and distribution, and O&M. In addition, in Pune and Sangli, attempts were made to issue contracts for privatization of the entire distribution system. In Nagpur and Thane, innovative measures were taken to improve the existing systems.

The experiences in Maharashtra have clearly indicated that an atmosphere of openness and transparency along with the demystification of privatization is required to make it acceptable to the consumers. It is clear that local political opinion and support is necessary for PSP to succeed, particularly since water supply is being managed by local self-government bodies. The process of private sector participation in addition to being made transparent, also requires a mechanism for involving the community as monitoring and regulatory bodies. The contracts and bidding process results as well as action plans for implementation need to be made available in the public

domain and access to them by citizens needs to be made easy and convenient. Attempts at privatization failed mainly due to lack of transparency, unequal access to water in different parts of the city, exclusion of the poor slum communities from the coverage and projected high water tariffs.

PSP experiences in all four cities have shown that ULBs can increase the efficiency of existing systems by contracting or leasing out certain functions like O&M, billing and collection, water treatment, conducting repairs and also upgrading of infrastructure. These options may be more viable and will certainly have greater political and local support from the citizens than privatization of entire distribution systems where decision making and control is taken away from the ULBs who, because they are elected bodies, have some degree of accountability to the citizens.

The present institutional arrangements for water supply are not citizen friendly. More space for participation by the community in design and implementation and O&M needs to be created. This can be achieved by setting up platforms for dialogue with all stakeholders where the progress of the water supply scheme can be discussed on a continuous basis. In these meetings, issues related to equitable distribution, taking into consideration all sections of the society especially urban poor, revision of tariff structure and problems in O&M can be discussed so that meaningful solutions can be found. This process of dialogue will also help in building a feeling of ownership amongst the citizens about the water supply facility in their city.

Although the private sector tends to look at failed contracts as "failed opportunities" to increase efficiency of water supply systems, what is encouraging is that one of the reasons why these proposals did not gain popular and political support was that they did not address the needs of the poor. In India, where democratic processes plays a strong role in influencing decision making at the local level, private sector interventions in implementing water supply systems will have to take into account the needs of the poor if they are to receive political and local support.

Finally the lack of an independent regulatory body to monitor regulations and tariff fixing reduces the accountability of any service provider, whether private or government, to maintaining a high standard of service. Regulatory bodies which include representatives from the local communities would need to be set up if information and decision making is to be kept transparent.

1.0. Introduction

India is the seventh largest country in the world and the second largest in Asia with a total landmass of 3.29 million sq. km and population of 1,027,015,247. The country is divided into 30 states & 5 union territories. With enormous natural resources, a growing economy and the second largest pool of technical and scientific personnel in the world, India has emerged as an important developing nation. However, the fast growing population and wide disparities between various states in the country, as well as urban and rural areas, are some of the reasons why it ranked a low 124th among 173 countries in the United Nation's Human Development Index of 2002. (Dams, Rivers & People, July-August 2003:27).

1.1. Water Supply and Sanitation Sector: Historical Perspective

India has achieved significant development of water resources and drinking water infrastructure since independence in 1947. The water supply and sanitation sector has been steadily developing with primary focus on 'coverage[1]' or providing drinking water and sanitation facilities to a maximum population. Today between 69 to 74% of rural and 91 to 93% of urban population is 'covered' by installed water supply capacity. In spite of relatively wide coverage, there are a few basic problems with the sector, which account for India's poor performance in drinking water evaluation by the United Nations in 2003. India ranked as low as 120th (third lowest) in water quality and 133rd in water availability among 180 countries.

Water supply and sanitation were added to the national agenda during the first five-year plan, although sanitation was hardly given any importance. In 1954, the first national water supply programme was launched as part of a health plan of the Government of India wherein the central and state governments provided equal funding for the water supply schemes. Achievements were limited due to lack of qualified staff and resources at the state level for planning and implementation of the water supply schemes. Each subsequent five-year plan allocated funding for the development and strengthening of state public health engineering departments.

The first four Five Year Plans lay emphasis on the urban sector, with an allocation of 65% of the total amount spent on water supply and sanitation. During the Third Five Year Plan (1961-66) period, the states were expected to set up Water Boards in urban areas for the purpose of executing water supply schemes. In 1968, the state governments were granted financial authority (within specified limits) to sanction rural water supply schemes. With this, the emphasis began to shift towards the needs of the rural areas.

[1] The term 'coverage' basically means installed water supply capacity and does not necessarily include actual operating capacity of the system, quantity or quality of water supplied, regularity or duration of the water supply or the financial sustainability of the system. There is wide disparity within a city or between cities in quality and quantity of the water supplied. Urban poor in most cities are not covered.

Although the Sixth Five Year Plan (1980-85) highlighted the poor status of the rural and urban water supply facilities, very low priority was given to this sector in the national planning process. One of the main reasons was that the provision of drinking water and sanitation was the responsibility of the states, who themselves lacked finances to invest in this sector.

The 1987 National Water Policy emphasised domestic water supply, protection of groundwater sources and water quality monitoring & mapping

Greater progress was made during the Eighth Five Year Plan (1992-97), which comprehensively identified inherent problems in the sector and put forward a reform and restructuring agenda, which identified water as a commodity that needed to be managed "just like any other resource". Some of the reforms advocated were encouraging private sector participation in construction and maintenance of drinking water supply, freeing urban local bodies to fix an appropriate tariff structure for water supply and sanitation facilities, making rural and urban bodies responsible for the operation and maintenance of installed systems and establishing linkages between water supply and sanitation.

The Ninth Five Year Plan (1997-2002) took this agenda forward by advocating the decentralization of the distribution system to local bodies and the private sector, including management of capital works. The focus on private sector participation in construction, financing and maintenance of water supply in urban and rural areas was strengthened. There was greater emphasis on demand driven participatory efforts to set up and manage the water supply systems.

The National Water Policy 2002 emphasised coverage, quality of surface as well as groundwater and regulation of groundwater use.

The Tenth Five Year Plan (2002-2007) proposes major shift and advocates the change in the role of the government from a direct service provider to that of a facilitator. The plan envisages 100% coverage of rural and urban areas through institutional reforms, efficient operation and management, and equitable distribution. The Tenth Plan recognizes the challenge of providing water supply and sanitation to a rapidly growing urban population and lays emphasis on urban water supply and sanitation by highlighting the problems and suggesting measures for alleviating them. Some of the measures advocated are restructuring of the Water Boards and other local institutions involved in water supply and achieving sustainability through effective operation and maintenance such as discouraging excessive water use by the charges being levied and by imposing penalties, by prohibiting the use of potable water for other purposes, by implementing rain water harvesting, and by monitoring the exploitation of ground water in urban areas.

Important landmarks in this development process have been summarized in the table below.

Table 1: Landmarks in development of water supply and sanitation sector in India

Water Supply and Sanitation: Sector Development	
Main Stages	**Focus**
First Five-Year Plan (1951-56)	Water Supply & Sanitation added to national agenda. Sanitation did not receive any importance and was barely mentioned under Water Supply
1954	First National Water Supply & Sanitation programme launched as part of Health Plan. Equal funding provided by centre & state for rural piped water supply schemes and also for wells & borewells. Rural schemes provided to population units of less than 5000.
Second Five-Year Plan (1956-61)	The sector did not figure at high priority level, but funding provided to develop & strengthen state public health engineering departments
Third Five-Year Plan (1961-66)	'Problem villages' identified as those without any drinking water source within distance of 1.6km, those endemic to water-borne diseases and those where water sources contain excess salinity, iron, fluoride or toxic elements
1968	States given financial authority to sanction rural water supply schemes, which were expanded to include population units less than 20,000. Priority given to villages with acute scarcity of drinking water.
Sixth Five-Year Plan (1980-85)	Importance given to the sector increased.
1985	Rural Water Supply Scheme, which was under Ministry of Urban Affairs & Employment, was handed over to Department of Rural Development under Ministry of Agriculture
1987	National Water Policy drafted by the Ministry of Water Resources with emphasis on domestic water supply, protection of groundwater sources and water quality monitoring & mapping
Eighth Five-Year Plan (1992-97)	Problems with the sector identified and reform agenda put forward. Emphasis on treating water as commodity, privatization, local bodies for operation & maintenance, proper linkage between water supply & sanitation.
Ninth Five-Year Plan (1997-2000)	Aimed to achieve 100% water supply coverage in urban & rural areas, 60% sanitation coverage in urban areas and 30% in rural, emphasis on decentralization and privatization, both in rural & urban sectors
2002	National Water Policy-priority to providing drinking water to humans & animals, regular monitoring of surface & ground water quality, regulating the use of ground water.
Tenth Five-Year Plan (2002—07)	100% coverage of urban & rural population, water to be managed as commodity, change in the role of government from direct service provider to facilitator leading to privatization. Focus should not be only on investment requirements, but on institutional restructuring, better services, people's participation, and managerial improvement.

1.2. Status of Urban Water Supply Sector

Although the primary responsibility of providing drinking water and sanitation facilities lies with the state governments, the Central Government ensures that funds for water supply and sanitation are allocated in state budgets. Since the Eighth Five-Year Plan, the urban water supply sector has been operating on the guiding principles of the New Delhi Declaration, which was adopted by the UN General Assembly in December 1990. The emphasis of the approach is on protection of the environment and safeguarding of health through integrated management of water resources, organizational reforms, community management of the services and sound financial practices. Supply of water is to be based on the principle of effective demand corresponding to the standard

of services affordable to consumers. The focus is on the issues of management such as managerial improvement, better and equitable services, sustainability and private/community participation, rather than merely coverage. The tenth five-year plan aims at augmenting the services, higher reliability of supply, better water quality, high standard of operation and maintenance and meeting the needs of the urban poor. Most importantly, it aims to fully recover operation and maintenance (O & M) costs.

Two hundred and eighty five million persons or 27.8% of India's population live in urban areas spread over 5161 towns. The decadal urban growth during 1991-2001 has been 31.2%, compared to 17.9% rural growth. However, the decadal growth has been steadily declining from 46.1% in 1971-81 to 36.4% in 1981-91 to 31.2% in 1991-2001. The degree of urbanisation in India is among the lowest in the world. However, in terms of absolute numbers, the urban population is quite huge due to the large population of the country.

The impact of urban growth has been adverse on urban infrastructure and service, which, in most cases fail to keep pace with the growing population. Of the 393 Class I[2] cities, only around 77 cities have 100% water supply coverage. Around 203 of the 401 Class II towns have low per capita supplies of less than 100 lpcd (Government of India, Planning Commission 2002:30-31). As per the National Sample Survey (NSS), about 70% of urban households receive water by tap and about 21% by tubewell or handpump. About 59% households share a public source. 66% of households have sources of drinking water within their premises, while 32% have it within 0.2 km (Tenth Five-Year Plan: 634). Further, there are significant gaps between demand and supply of water in almost all urban centers.

Box 1.

Coverage statistics do not reveal actual operating capacity of the water supply system, adequacy of the system, equity of distribution, regularity and duration of supply, financial sustainability of the system, unaccounted for water, treated and untreated water, unauthorized connections and tariff structures.

Table 2: Difference between demand and supply in four metros in India

City	Percentage gap between demand and supply of water
Kolkata	13.33 %
Chennai	63. 5 %
Delhi	24.94 %
Mumbai	22.36 %

Source: Times of India, Pune: 13.06.04

[2] Cities are classified into different categories as per the population (World Bank-Government of India-DFID 1999:2).
Class I City: population more than 1,000,000
Class II City: population ranging from 100,000-1,000,000
Class III City: population ranging from 50,000-100,000
Class IV City: population ranging from 20,000-50,000

Some of the major constraints in the delivery mechanism and infrastructure of the water supply sector are:

- Operation and maintenance: The existing systems are not operated and maintained to their full capacity by most cities. The capacity utilization has been less than 50% in 40% of the towns and less than 75% in another 20% of towns. It is feared that a few cities may slip back to lesser levels of water supply due to poor maintenance and depletion of sources. Unless something is done, per capita availability of water may go down by 2020.
- Transmission and distribution: The transmission and distribution networks are largely of poor quality, outdated and are badly maintained. This causes higher operating costs. Physical losses are high, ranging from 25 to over 50%. Low pressures and intermittent supplies lead to back siphoning resulting in contamination in the distribution network. Water is generally available for only two to eight hours a day in most cities.
- Water quality: Many towns lack treatment facilities and wherever the facilities are available, these are often not used or used without quality control or testing.
- Disparity within the city: The urban poor, constituting one-fourth of the urban population and the slum dwellers, ranging from one third to half of the population in some cities, are not covered or only partially covered.
- Unaccounted for water: A common problem in most Indian cities is large quantity of unaccounted for water. There is a wide gap between the amount of water supplied and the amount of water charged. A large floating population and disparate distribution network lead to unmetered and unauthorized water connections and stealing. No accurate figures for this unaccounted for water are available for any city.

1.3. Urban Local Bodies and Water Supply:

Water supply is generally managed and executed by the state public health engineering division, which is either a state level Department, or Board or Corporation. Water supply is basically a municipal function, to be executed by the ULB (Urban Local Body), or municipal bodies. Urban local bodies are instruments of self-governance; they are elected bodies with tenure of five years, and are responsible for urban management and governance. The 74th Amendment of the Constitution of India (1992) broadened the traditional role of the municipal bodies to include all aspects of development, civic services and environment in the cities, going beyond the traditional role of providing basic amenities of civic life. However, most ULBs are financially very poor, and are unable to take any initiative in improving or upgrading the infrastructure. Many times more than one body is involved in different aspects of water supply leading to unhealthy overlapping of responsibilities and dilution of responsibility. Further, these bodies have little autonomy on personnel and financial matters. The minimum tariff is set by the state and the ULBs have to seek the approval for all proposed increases. Some ULBs have initiated innovative cost recovery mechanisms such as advance registration charges, connection charges, water tax, application of general revenues etc., though such cases are few.

1.4. Financing Urban Water Supply

Since water supply schemes are capital intensive, these are financed from the state budget, borrowings from financial institutions or the external funding agencies. The Central Government provides assistance through a few centrally sponsored schemes. The following are two of the important schemes:

- **Accelerated Urban Water Supply Programme (AUWSP)**: This programme was initiated in 1993-94 to provide safe and adequate water supply facilities to the entire population of towns having population less than 20,000 as per 1991 Census. Under the scheme, Government of India matches the funds provided by the State Government for funding of the water supply schemes.
- **Mega City Scheme:** This Scheme was initiated in 1994-95 for big cities like Mumbai, Kolkata, Chennai, Bangalore and Hyderabad, wherein the funds are provided by the Central and State Governments at the ratio of 25:25 and the balance 50% is to be met from institutional finance, through financing institutions and capital market. Borrowing could be either by the nodal agency or by the implementing agencies such as Water and Sewerage Boards, Municipal Corporations etc. The nodal agency would provide project-related finance for urban infrastructure including water supply, sewerage, drainage, sanitation, city transport networks, land development, slum improvement, solid waste management, etc.

At the municipal or city level, only a few ULBs in large cities generate sufficient revenues, while most of the medium and small towns do not even cover operation and maintenance costs. The percentage of revenue generation to O & M cost in cities of Kolkata, Nagpur, Pune, Ludhiana, Lucknow and Kanpur was 14, 48, 49, 40, 50 and 78 % respectively in March 1998. But in some cities like Hyderabad, Mumbai and Chennai, the revenue generation is more than 100%. There is wide gap between revenues generated and expenditure incurred. There are two main sources of revenue for water utilities; water tax based on property values and water charges based on water consumption. Where property tax is concerned, tax can be levied only on registered property, leaving about 60-70 % outside the tax net. Where charges based on water consumption is concerned, faulty and non-functional meters where they exist and un-metered connections make it difficult to quantify water consumption.

Water tariffs are generally ridiculously low and revenue collection efficiency is very poor. Neither the tariff rates nor the revenue collection methods are guided by any definite principles. Different methods are used for collecting tariff, which range from flat rates, slab rates to volumetric rates. As a result of such poor financial position, most water supply bodies are highly subsided by the central as well as state governments. This has led to a vicious 'subsidy culture' wherein consumers do not agree to pay higher tariffs resulting in poor services since low tariffs cannot provide better services.

1.5. Water Pricing and Affordability

Water tariffs are fixed by government bodies whose decisions are largely influenced by political motivation. Current water tariffs in India are well within the WHO affordability criterion of 5%

of household income. An average poor household of five with a metered connection spends on an average 0.3 to 1.2 percent of its monthly income, while the family without metered connection spends about 2 percent of its income. (Water Tariffs and Subsidies in South Asia, A Scorecard for India: 7-8). A 1995 study conducted in Baroda, a city in Gujarat state indicated that a poor household with yearly incomes below Rs 18,000 ($400) spent about Rs 43 ($0.95) as water tariff per annum, while households with annual incomes ranging between Rs 54, 000 ($1200) to Rs 72,000 ($1600) spent about Rs 200 ($4.44) per year (Willing to pay but unwilling to charge Do 'willingness-to-pay' studies make difference? 1999).

Table 3. Water Tariffs in India

Criterion	Evaluation	Comments
Cost recovery	Poor	Average prices are much below costs of service provision
Economic efficiency	Poor	Nearly half of the customers lack meters and leakage is high
Affordability	Good	For subsistence consumption of 10 cubic meters per month, the monthly expenditure for households on poverty line is 1.1% to 2.2%

Source: Adapted from Water Tariffs and Subsidies in South Asia, A Scorecard for India: 8

Studies such as those mentioned above are based on data available for consumers with piped water supply from municipal corporations. No substantial studies have been done on households that have to purchase water by the bucket because they are not covered by piped water supply. Poor localities and habitations that exist on the outskirts of towns and cities which are not connected to piped water supply spend much more on water than those who are connected to piped water supply. These households either purchase water collectively or individually from local water vendors who supply water through water tankers either to a common source shared between households or to private storage tanks. The percentage of household income spent on purchase of water is estimated to be higher for those households not connected to piped water supply schemes, but no substantial data is available.

1.6. Initiation of Private Sector Participation in Urban Water Supply

India has responded to globalization and the changing world economy by adopting financial reforms since 1991, which have also influenced the social sectors such health and education. During the last five decades since independence, the concept of the welfare state has been so predominant, that people, both in rural and urban areas, have been completely dependent on government agencies even for providing most basic amenities. As the pressure of the population increased, sectors such as health, education, water supply found themselves unable to cope with providing adequate and efficient services, and slowly the concept of private sector participation came into focus.

Privatisation is an instrument referring broadly to the transfer or outsourcing of some or all of the traditional water service functions such as water distribution and treatment, wastewater collection and treatment, customer services and in some cases, ownership of infrastructure assets and water resources, from government to a private body for a certain period of time under conditions set in contractual agreements (Memon and Butler 2003: 2). There are many facets of Private Sector Participation (PSP) such as outsourcing for specific functions, long-term operation and maintenance contracts, long-term licensing contracts, project specific public-private partnership, long-term concession contracts etc. (Memon and Butler 2003: 2-3)

In the last decade, governments in over 93 countries have introduced varied levels of privatization in water sector management, which accounts for 6% of the world population catered through private operators (Memon and Butler 2003: 4)

Urban India's population of 28% accounts for about 50% of the country's gross domestic product (GDP), and in the near future with a population of nearly 350 million, is expected to be the boom centre of economic growth. For making water available for everyone by the year 2021, 324 million people would need to be provided with services, and 115 million people would require augmentation of existing facilities (Das 2002). The water sector therefore is in urgent need of large-scale investment, which, it is felt can only come from the private sector. It is expected that limited PSP can bring about changes in the system, by managing aspects like operation and maintenance or billing.

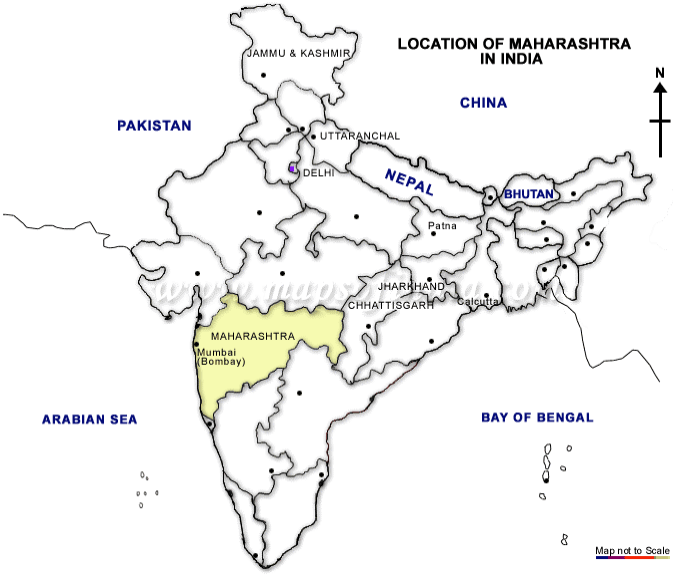
For the past 10 years, the World Bank through their Water and Sanitation Programme (WSP) for South Asia has been working with the Ministry of Urban Development, Government of India, to formulate a set of guidelines for promoting private sector participation in urban India. Parallel to this process, private firms, local corporations and financial institutions initiated dialogues and contracts across the country. However, many contracts fell through during the discussion stage. About 25 big and small contracts were initiated and abandoned. Not a single project reached the implementation stage in these 10 years. Among these contracts, only a few smaller contracts for operation and maintenance (O&M) like a 10 million litre per day treatment plant in Chennai or the O&M of a plant in Ajmer are being managed by private firms on contract basis. The privatisation of the Bangalore Water Supply and Sewerage Board (BWSSB) in Karnataka state as a showcase project was initiated as early as January 1999. To manage supply in two pilot areas comprising one million populations each, two French companies – Vivendi and Ondeo have been roped in. The Karnataka government has signed a memorandum of understanding with the French government through which the two private firms get a management contract for five years.

2.0. Case Study of Maharashtra State

Maharashtra is the second largest state in terms of population and third largest in terms of area. The geographical area of Maharashtra is 307,713 km² with a population of 96,752,247 constituting 9.42% of India's population. It is one of the developed and richest states of the country with high per capita income, which is 40% higher than the national average. Maharashtra is the second most urbanized state, with 42.4% people living in urban areas. In terms of absolute

number of people in urban areas, Maharashtra leads with 41 million people in urban areas, which is about 14% of country's urban population. Despite a high level of economic growth and being one of the high-income states, its Human Development Index (HDI) is low. Maharashtra ranked 14th among the 30 states in 1999. It has the largest urban slum dwelling population. 31.7% of the 33.6 million people living in 62 towns and cities are slum dwellers. The differences in terms of development and poverty ratio within the state are grave. 26.81% of the urban population is below poverty line.

Map 2



Maharashtra is the first state in the country to prepare a White Paper on the state of the drinking water supply programme and to initiate institutional reforms with a view to improving the performance of local bodies that are responsible for provision of drinking water and sanitation facilities. The State Government facilitated the reform process by bringing out enabling orders and actually implementing them in the field. Maharashtra state has both positive and negative experiences with private sector participation and private-public partnerships, in the water sector and other sectors as well.

2.1. Maharashtra's Water Resources

Maharashtra is basically a hilly region with tall ridges forming an important climatic divide, causing a rain shadow effect to its eastern side from the predominant west to east monsoon winds. About 85% of rainfall in Maharashtra is normally received during the period June-September. Rainfall is highly variable between years and droughts are recurrent. Wet and dry spells are noticeable where rainfall was generally above average (e.g. 1970s and 1990s) or below average (e.g. 1980s). One third of Maharashtra falls in the rain shadow zone, and about 40% of the State falls under heavy rainfall zone, which is dominated by steep gradients and excessively permeable rock cover implying poor water retention during non-monsoon months.
Maharashtra therefore faces a difficult water resources problem each year due to its physical and geological features. There is very limited natural storage available due to steep and undulating topography, which encourages high run-off, spatially variable rainfall and drought influencing

rain shadow effects. All these factors dramatically impact on the sustainability of drinking water sources, which have to be carefully assessed and managed.

The major river basins are Godavari, Krishna, Tapi and Narmada, apart from westerly flowing rivers in the Konkan Coastal Strip. Groundwater constitutes a large part of water supply, especially in rural areas of Maharashtra, where over 50% of the total rural water use comes from groundwater. Currently, out of the total number of water supply arrangements, almost 90% depend upon groundwater.

The water resources in the State are managed through various ministries and departments. The surface water resources, as allocated to the State, are managed by the Irrigation Department, except for where the usage by users other than Irrigation is more than 15% of the water available. Ministry of Irrigation then allocates the resources to its various users, viz. irrigation, drinking water and sanitation, and industry. In the event of other users requiring more than 15% of the water resource, a committee, headed by the Chief Minister, does the allocation. The groundwater resources are regulated and monitored by the Water Supply and Sanitation department. (Government of Maharashtra-World Bank: 6).

2.2. Institutional Arrangements for the Water Supply Sector

The following institutions at various levels are responsible for water supply and distribution in the State.

Table 4: Institutional set-up for water supply in Maharashtra state

Institutional set-up	Area of functioning
WSSD (Maharashtra Water Supply and Sanitation Department)	State-level institution. Formulates and implements policies, operates and maintains regional water supply schemes in both rural and urban areas
MJP (Maharashtra Jeevan Pradhikaran)	Most important government body for urban water supply. Formulates and executes schemes and determines tariff structures, though its objectives do not encompass financial sustenance.
GSDA (Groundwater Survey and Development Agency)	Implements schemes based on groundwater resources mostly in rural arrears. However, since many periurban areas without piped water supply are increasingly being dependent on groundwater, role of this organization is becoming important
MIDC (Maharashtra Industrial Development Corporation)	Established 40 years ago to promote industries in the state, the organization eventually undertook development of water works. Though not a regular agency for domestic water supply, it does supply water to a few towns
PHD (Public Health Department)	The state level division of the department executes water supply and sanitation works
ZP (Zilla Parishad)[3]	Mainly responsible for rural water supply schemes
ULB (Urban Local Body)	Elected municipal body or institution of self-government for comprehensive development of urban areas, responsible for provision of civic amenities and economic development.

[3] Elected District Council

2.3. Policy Framework

2.3.a) Maharashtra's White Paper on Drinking Water

Maharashtra is one of the first states to prepare a White Paper on drinking water aiming at sector reforms. The White Paper primarily addressed the issues of disparity in water supply and water availability, level of service and depleting groundwater. A few recommendations were made in the report concerning water supply in rural as well as urban areas, enforcing various legislations and stressing upon more effective management of water supplies. Important recommendations included decentralization and proposed involvement of private sector agencies for O & M.

2.3.b) Groundwater policy

Following the groundwater depletion problem addressed in the While Paper, the *Maharashtra Groundwater Act, 1993* was aimed at protecting public groundwater supplies (mainly drinking water and domestic uses), while the *Draft Legislation, 2000* for Groundwater in Maharashtra was aimed at regulating and controlling the development and management of groundwater resources within the State. The new legislation was based upon the broad principle that groundwater is the property of the State and the State has the right to regulate its use. Private wells / bore wells / tube wells would have to be registered with the State Government. Further, the legislation imposed restrictions on the depth of wells, bore wells, and tube wells and established protection zones, especially around sources of drinking water

2.3.c) Impact of subsidies in other sectors

Rural people consider that the terms of trade between rural communities and urban centers are biased against them and, in particular, that constraints imposed by Government of Maharashtra limit the revenue they are able to earn from the sale of agricultural produce. To compensate, successive governments have promoted the development of irrigated agriculture by providing cheap (subsidised) power and virtually unrestricted access to water. They have also provided rural communities with many essential services either free of charge or at very low cost. As a consequence, a culture of paying a realistic price for services (RWS, irrigation or power services) does not exist and this has been encouraged at both the national and state level. Untangling the complex web of subsidies and constraints on rural/urban trade and activities is likely to prove difficult, slow and controversial.

2.3.d) Incentives to increase efficiency in urban water supply

In order to encourage ULBs to improve the efficiency of their water supply systems, the State Government provides incentives of capital grants and guarantees for loans for water supply schemes. The most recent financing pattern of the Incentives Grant set up for the period 2002-2005 was declared in November 2001. As per this financing pattern, the state will provide a grant of 75 % of the costs of conducting a water audit, energy audit and leak detection survey. These studies are to be carried out within two to three years. The 25 % share of the ULB has to spent first, after which the state releases its 75 % amount in installments, based on periodic reviews. The state has provided a list of approved technical consultants whose services may be used by

the ULBs. These consultants are also expected to assist in the preparation of a rehabilitation plan for the water supply system. The state provides a grant of 23-25 % to the ULB for implementing the rehabilitation plan. The remaining amount is to be raised by the ULB from loans, its own revenues or from the market.

2.3.e) Guidelines for private sector participation

In June 2001, the State Government issued guidelines for private sector participation in urban water supply and sewerage. The guidelines indicate that many aspects of the existing schemes can be managed more efficiently with PSP such as metering, billing, collection, and O&M. The guidelines suggest that the most suitable of the following three types of contracts may be considered by the ULB:

- Management contract: This contract is for a period of 3-5 years. The private operator is expected to manage the existing water supply system and employees and payments are linked to performance. The ULB is responsible for making investments and rehabilitating the system.
- Lease contract: This contract is for a period of 6-10 years. The private operator incurs expenses for O&M, repairs, collection of water charges and minor equipment and pipeline replacements. The ULB is expected to fix the tariff before entering into the contract. The operator pays a lease fee for operating the water supply system. New investments are made by the ULB.
- Concession contract: This contract is for a period of 20-30 years. The private operator is responsible for new investments and O&M. The mechanism for setting the tariff is laid out in the contract.

2.4. Status of Urban Local Bodies (ULBs) in Maharashtra

There are a total of 248 ULBs in Maharashtra, including Municipal Corporations and Municipal Councils. Out of them 22 are the municipal corporations. These local bodies are totally dependent on the state government for financial investments to create new infrastructure. The fiscal health of all these bodies is poor as revenue income is much lower than the expenditure. Most ULBs' expenditure on O&M is more than the revenue earned from water tariffs. About 50-60 % of the operational costs are for energy, i.e., for electricity and fuel to pump water from the source, through the treatment plant, and into the distribution system. An important reason for this deficit is unaccounted for water (UFW), which in Maharashtra ranges from 50-65 %. Leak detection surveys, water audits and energy audits are some of the tools used to assess the situation and make plans for improving the systems.

Some urban local bodies have made various efforts to improve the quality of water supply either by improving the existing system, or through privatization. ULBs of four cities in Maharashtra were studied where efforts were made to improve water supply. These cities are Pune, Sangli, Nagpur and Thane. All four cities have relatively well managed civic bodies, and have involved the private sector in some aspects of water supply and distribution, and O&M. In addition, in

Pune and Sangli, attempts were made to issue contracts for privatization of the entire distribution system. In Nagpur and Thane, innovative measures were taken to improve the existing systems.

Pune has been known as the Oxford of the East. Known for its educational institutions, Pune, the seventh largest city in the country, has a fast growing population due to the growth of industry and the IT sector. At one time Pune had the fastest growing suburb in Asia. Pune has recently included 35 adjoining villages within its corporation boundaries, an indication of the rapidity with which the city is expanding.

Nagpur, known as the second capital of the state (after Mumbai, the official capital) is uniquely situated in the geographical centre of India. Rich in agriculture and horticulture produce, Nagpur is famous for its oranges and is also known as 'Orange City'. Emerging as an important urban and industrial centre in the state, Nagpur has to grapple with a rapidly increasing population

Thane is located close to Mumbai, the business capital of India. Thane is a fast growing industrialized city. Besides, a large number of people working in Mumbai prefer to live in Thane, where the living costs are much less than in Mumbai. Thane therefore has its own growing population due to industrialization, but also has to deal with floating populations that come to Mumbai in search of work.

Sangli is the southern most district of Maharashtra with Sangli city as its district headquarters. Sangli is known for its sugar industry and the cooperative movement. In 1999, Sangli and the two adjoining towns of Miraj and Kupwad were brought together to form the Sangli-Miraj-Kupwad Municipal Corporation.

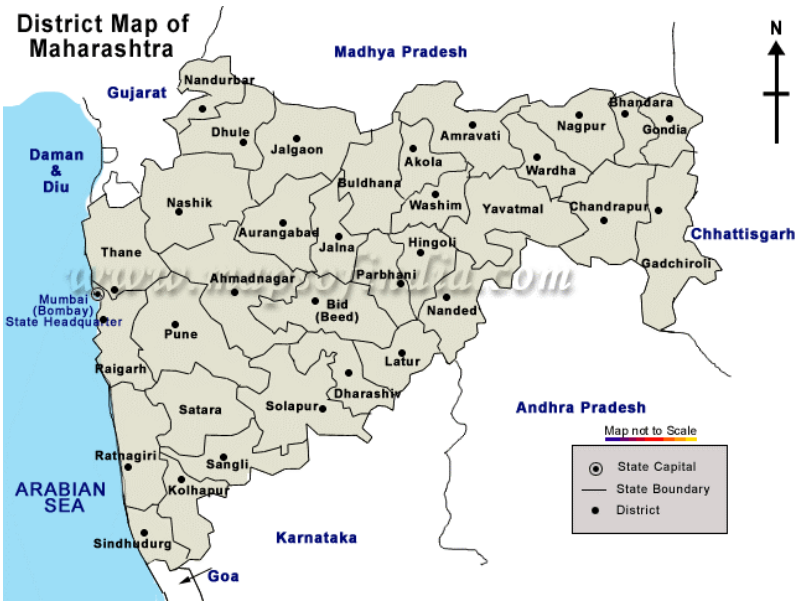


Table 5: Urban water supply coverage norms in India and Maharashtra state.

Type of Towns/Cities	Minimum per capita water supply levels
Towns with piped water supply but without sewerage system	70 lpcd
Cities with piped water supply and existing or planned sewerage system	135 lpcd
Metropolitan and megacities with piped water supply and sewerage	150 lpcd
Public standposts	40 lpcd

Source: Tenth Five Year Plan 2002-2007: 636

Table 6: Status of water supply in 4 cities in Maharashtra

	Pune	Nagpur	Thane	Sangli
Population	28,00,000	22,00,000	12,61,000	4,37,000
Growth rate	55.45% (decade)	60% (decade)	80% (decade)	50% (decade)
Total Urban Poor	9,00,000 persons	6,70,000 persons	92,706 Households	412 Households (as per the Corporation record)
Piped Water Supply Coverage	80%	85-90%	60%	65%
Sewerage Coverage	70%	80%	70%	50%
No. of Hours of Water Supply	1/2 hour to 12 hours	2-5 hours per day	15% get 24 hours, 85% get 4-12 hours	4-8 hours
Number of Connections	More than 2,50,000	About 2,00,000	75,920	41,412
Number of Public Taps	6000 (approx)	5630 stand posts	450	560
Use of Ground- water	Exact figure not available	10 mld. Per day	Not available	Domestic through private well owners
Tanker Supply	100 tankers per day in the fringe area at the time of scarcity(every year march to June)	80-90 tankers per day with a capacity of 2000 to 3000 litres, each making 6 trips in the scarcity period	Not available	Nil
Wells/Bore Wells used	More than 500	100 Bore Wells	Not available	Domestic through private well owners
Current Storage Capacity/Number of Reservoirs	250 mld	42 reservoirs 1/3rd of the total demand	35.745 mld.	182.50 mld
Total Water Supplied	750 mld	470 mld	356.13 mld.	47 mld.
Quantity of Water Treated	750 mld	470 mld	356 mld.	47 mld.
Water Losses	About 35%	40%	About 30%	About 40%
Number of Metered Connections	30,762 for commercial	1.60 lakhs	None	41,412
Domestic Water Use (lpcd)	50-200 lpcd. Average 100	60-200 lpcd. Average 100	282.42 lpcd.	107.64 lpcd
Water Tariff Structure	Domestic - Rs 3.00 Per 1000 litres - Commercial- Rs 16 per 1000 litres	Residential - Rs 3.00 4 per 1000 litres - Non-residential - Rs 12 per 1000 litres Commercial - Rs 20 per 1000 litres	Private - Rs 105 Per month Slums - Rs 52 per month Commercial - Rs 40 per 1000 litres Organisation - Rs 25 per 1000 litres	Private Connections - Rs 4.50 per 1000 litres Commercial - Rs 8.00 per 1000 litres Industrial - Rs 20.00 per 1000 litres
Length of Network	More than 2,500 kms	2000 kms	210.60 kms. approx	Not Available

Source - Secondary data collected from all four Municipal Corporations

On an average, about 100 lpcd of water is supplied in Pune, Nagpur and 107.64 lpcd is supplied in Sangli. In all three cities the quantity supplied is less than the norm for urban water supply as prescribed in the country as well as the state, (see Table 4) for cities with piped water supply and sewerage system. In Thane the amount of water supplied is higher than the norm. Water losses are high in all four cities.

2.5. Monitoring Quality of Drinking Water in the State

Quality of drinking water is regularly monitored through a network of Public Health Laboratories. Water samples found to be contaminated and unfit for drinking are reported immediately to the concerned authorities. In urban areas monthly sampling is undertaken on the basis of size of population. There is limited facility in the state to test drinking water for pollution by less common organic and inorganic pollutants (fertiliser, pesticide and industrial effluent based).

Sampling of drinking water sources by Public Health Laboratories across the state shows an alarming level of bacteriological contamination. In 2003, from January to August, seven districts in the state were found to have bacteriological contamination in over 40% of the samples taken. A sample survey of 10% of drinking water sources carried out in 2002 indicate chemical contamination by excess fluoride, iron, nitrate and total dissolved solids (TDS) to various degrees across the state. Very isolated cases of Arsenic contamination were found in Nagpur District. (Scott Wilson Report 2001-2002).

Municipal Corporations monitor water quality by testing water samples from various points, at source, at distribution points and at the user end. The norm for quality is based on chlorine content, which is 2 PPM. The desired chlorine content at the purification centre is 1.3 PPM and at storage reservoir it is 0.80 PPM.

In Pune, around 70 samples are tested per day to monitor the quality of water. Out of these, 25 are fixed samples taken from various reservoirs and 45 are random samples collected from wells and tubewells for testing. The laboratory facilities in Pune are well equipped to carry out pertinent physical, chemical and bacteriological testing of raw water as well as filtered water.

The Sangli Corporation has tried to involve the users in water quality monitoring by carrying out awareness campaigns through radio and newspapers. In addition to the public health department, the Pollution Control Board is also involved in quality testing and monitoring.

2.6. Delivery Mechanisms, Infrastructure and Quality of Service

The urban water supply system is further decentralized at the city level by dividing the city into water zones, each administered by the Zonal Water Board. The idea is to improve efficiency and management of the system Operation and maintenance is carried out at the zonal level. Complaints books are kept in the zonal offices where complaints can be filed. Complaints are generally dealt with within 24 to 30 hours. The Nagpur Municipal Corporation has mobile surveillance teams to identify illegal connections and inspect leakages. Detected leakages are promptly repaired by the plumbers and technical staff. Similarly, illegal connections are

regularized by charging penalty. Last year 31 illegal connections were identified and the penalty recovered was Rs 3,14,000 (US$ 6977).

Water from the source, either dams or rivers, is transported through canals to reservoirs or tanks. The storage capacity of these reservoirs or tanks is often less than the total quantity of water required for distribution. In Nagpur, for example, the storage capacity is 1/3rd of the total demand. From the storage tanks, the water is filtered, tested for quality and supplied through a network of pipelines. The distribution system also consists of private connections and stand posts. Since the water is supplied for a few hours during the day, most households store water, both in over-head tanks and in large cans for domestic use, and in vessels for drinking purposes.

Some of the common constraints in the delivery mechanism and infrastructure in the four cities are:

- Illegal connections
- Faulty meters and non-functional meters
- High water losses
- Insufficient staff

The following are measures being undertaken in the four cities to meet the future requirements and achieve optimum performance of the water supply systems:

- Development of water supply system for newly added areas (fringe areas) is under implementation
- Storage capacity is being increased
- Old pipelines are being replaced with pipes of greater diameter and better quality
- Water and energy audits have been proposed
- Policies for groundwater withdrawal and water harvesting are being finalised
- New water pumps are being procured with a 100 % standby for the existing water supply system
- Automation of pumping system and procuring and fixing of automatic power factor control units is being undertaken
- Use of modern techniques of communication for synchronization and for increasing the efficiency of water supply system
- Keeping complaints redressal cell alert and active
- Use of modern techniques for efficient O & M
- Preparation of water quality and water pressure profile
- Use of PI pipes for laying distribution system

2.7. Financial Status

Table 7: Income and expenditure related to water supply in 4 cities in Maharashtra

City	Income from water tax for last year 03-04 (approximate amounts)	Expenditure on water supply	Percentage of recovery of water tax	Deficit
Nagpur	Rs 400-500 million (US$ 9-11 million)	Rs 550 – 700 million (US$ 12.22 – 15.55 million)	72%	Rs 150-200 million (US$ 3.3 – 4.4 million)
Pune	Rs 330 million (US$ 7.33 million)	Rs 548.7 million (US$ 12.17 million)	88%	Rs 218 million (US$ 4.84 million)
Sangli	Rs 78.6 million (US$ 1.57 million) + annual installment to be paid on loan Rs 1 million (US$ 0.02 million) Total=Rs 79.1 (US$ 1.75 million)	Rs 83.4 million (US$ 1.85 million)	78%	Rs 4.3 million (US$ 0.09 million)
Thane	Rs 200 million (US$ 4.44 million)	Rs 740 million (US$ 16.44 million)	78.22%	Rs 540 million (US$ 12 million)

Source: Figures taken from reports and secondary data and during discussions with officials.

In Nagpur, the income from water tax during the previous financial year was Rs 400-500 million US$ 9-11 million. There is a deficit of Rs 150-200 million (3.33-4.44 million dollars) which is covered from the income that the Corporation gets from other sources. One of the major problems faced by the Board is that in the slum tenements, people purchase low quality meters, which do not work very well. 80 % of these are not working and billing is not being done for these meters. In order to solve this problem, they propose to discard the meters in slums and charge a flat rate of Rs 25.00 (0.55 dollars) per month, which will be attached to the house or property tax.

In Sangli, the total expenditure on water supply for last two years was Rs 7,86,11,182 (1.74 million dollars) and Rs 7,10,41,989 respectively (1.57 million dollars). The corporation has availed a loan of Rs 1,93,00,007 (0.42 million dollars). An annual installment of Rs 10,87,648 (24,169.9 dollars) is paid, inclusive of the interest amount of Rs 2,10,375 (4675 dollars). The total billing amount collected from consumers was Rs 8,33,96,735 (1.85 million dollars), of which 78% is recovered. In Thane, the total expenditure for the last two years is reported to be Rs 640 million (14.22 million dollars) and 740 million (16.44 million dollars) approximately. As

against this the total water tariff collected was approximately Rs 200 million (4.44 million dollars). The recovery rate is reported to be 78.22 %.

Table 8. Expenses incurred by Pune Municipal Corporation for water supply

Item	Year 2002-2003	Year 2003-2004
Water purchase	Rs 122.43 million (US$ 2.72 million)	Rs 118.49 million (US$2.63 million)
Water purification	Rs 15.73 million (US$ 0.34 million)	Rs 18.44 million (US$ 0.4 million)
Electricity	Rs 273.43 million (US$ 6.07 million)	Rs 258.58 million (US$ 5.74 million)
Repairs and maintenance	Rs 20.46 million (US$ 0.45 million)	Rs 26.73 million (US$ 0.59 million)
Staff and establishment	Rs 110 million (US$ 2.44 million)	Rs 117.31 million (US$ 2.60 million)
Other expenses	Rs 6.68 million (US$ 0.148 million)	Rs 6.4 million (US$ 0.142 million)
Total expenditure	**Rs 548.74 million (US$ 12.19 million)**	**Rs 545.96 million (US$ 12.13 million**

Source: Pune Municipal Corporation

Table 6 shows that Pune Municipal Corporation, with a recovery of 88 %, has a deficit of Rs 218 million (US$ 4.84 million).

There is an urgent need to revise the water tariffs and improve the rate of recovery of water tax. As the Assistant Commissioner of Nagpur Municipal Corporation said, "If electricity and telephone bills are not paid, the concerned authorities cut off the connections. This cannot be done for non-payment of water tax. The same rule should also apply here, but the bye laws of the Corporation are outdated and do not support this kind of a revision". In order to make it easier for people to pay their taxes, the Nagpur Municipal Corporation has worked out a system whereby payments will be accepted in certain banks from 1st May 2004. Although tariffs have been revised in all four cities, the increases are far from sufficient to meet expenses. One of the main constraints cited by officials was the lack of support from local politicians.

2.8. Consumer Participation

In the present system, there is very little scope for consumers to participate in any kind of decision making related to water supply, distribution or tariff setting. Decisions are taken by bureaucrats and finalized by politicians. Plans are not shared with the consumers and their participation is not expected. Decisions are conveyed to the consumers through the media. The main expectation from the consumers is that they pay their taxes on time. Although complaint books are available for consumers to register their complaints, very few complaints from consumers are found. Complaints regarding leakages and breakdowns in the system are generally reported by the staff themselves.

Consumer participation is a two-way process. Citizens need to become aware and more demanding of the quality of services they receive.

Box 2.

No platform for dialogue between citizens and government authorities

When villages on the fringes of Pune city were to be included within the Corporation limits, the water supply scheme for these villages was planned on the basis of old figures and calculations of the population that lived in these villages. The resulting water supply scheme did not meet the needs of the current population. Sometimes the water supplied was as low as 20 lpcd. The populations suffered the situation for some time, trying to meet their water needs by various means such as purchasing water from local water vendors.

Tired of this situation, a group of young citizens with the help of an NGO, demanded information regarding the water supply scheme which was being installed for the area in which they lived. This information was not forthcoming. However, they eventually learned that part of the pipeline that would supply the water to them would have to pass through land which belonged to the Ministry of Defense, and the concerned department in the Ministry had not yet given permission for the pipeline to be installed. When repeated attempts to meet the authorities of the various departments and have an open discussion failed, the citizens launched an agitation during which they blocked the roads and halted traffic for several hours. This forced the officials to resolve the issue and complete the installation of the pipelines. It was finally the efforts made by the citizens that helped to resolve the deadlock between different government departments.

This experience clearly brings out the need for a platform for dialogue between citizens' groups and government departments. It was the lack of a process of dialogue that forced the citizens to resort to an agitation.

2.9. Innovative Approaches for Systems Improvement: the case of Nagpur and Thane Municipal Corporations

2.9.a. Regularizing Unauthorized Connections in Nagpur:

In 2001, Nagpur Municipal Corporation (NMC) initiated a drive to regularize about 35,000 unauthorized water connections in the city and to achieve universal metering by installing meters for about 18,000 authorised, but unmetered connections. With an innovative approach, transparent and uncomplicated procedures and a widespread public awareness campaign, it achieved great success of regularizing as many as 25,000 connections within a short period of about four months.

The need for reforms in water supply sector of the city was long overdue as the water supply situation in the city was far from satisfactory. The quantity of water available was adequate, but huge losses at the distribution level caused acute water shortage. A persistent problem faced by NMC was of the illegal water connections. It was estimated that there were about 35,000 unauthorised water connections in the city in 2001. Added to it, was a problem of about 18,000 water connections, which were authorized, but not metered. These connections were authorized

before 1966 when the policy of universal metering was adopted in the city. These unauthorised and unmetered connections caused heavy losses of revenue to NMC. Against Rs 500 million (11.11 million UD$) spent on the O&M per year, the revenue collected by the water supply department came to Rs 170-180 million (3.77-4 million US$).

In 2001, NMC revaluated the situation and attempted to account for such huge revenue losses. The water billing and recovery system was reformed and computerized, which revealed a wide gap between the water supplied and the amount billed. This clearly pointed at the large number of illegal connections as the primary cause behind revenue loss.

Motivated by the requirement to augment revenues, NMC in October 2001 declared a time-bound programme aimed at regularizing illegal water connections and also applying universal metering policy. These objectives were planned to be achieved at the minimum cost and through simple procedures.

The main problem in implementing the scheme was identifying unauthorized and unmetered connections. This problem was tackled by involving licensed plumbers in the programme since they were the ones who generally installed water connections and were probably instrumental in installing the illegal connections to begin with. The challenge lay in motivating the plumbers to participate in the scheme. The Corporation came up with an idea whereby the license renewal fee for the plumbers was increased from Rs 25 (0.55 US$) to Rs 300 (6.66 US$) and a security deposit of Rs 5000 (111.11 US$) was made imperative. As was expected, the plumbers' union went on strike. The Corporation then informed them that if they participated in the programme, the security deposit would be waived. A target of finding 35,000 illegal connections was set for the plumbers.

A publicity drive was carried out and information about the scheme was given to consumers through pamphlets, banners, hoardings, advertisements in the newspapers and local cable TV network.

About 200 plumbers were organized into teams and assigned to the seven water zones of the city. Their tasks included:

- finding illegal connection through door to door survey
- convincing the illegal connection holders to regularize their connections
- completed the prescribed forms
- getting the connections sanctioned
- depositing the requisite charges
- fixing the meter
- reporting those who refused to regularize their connection to respective zonal office

The plumbers were motivated by the incentive of Rs 50-100 (0.9-2.22 US$) for every illegal connection found. The water connections of those who refused to avail the scheme were immediately disconnected.

The application form required to be filled for regularizing the connection was made very simple in which minimum information was to be provided. Only one documentary proof of ownership

or occupation of the premises was required. The deposit amount and the labour charges for the meter installation were specifically mentioned in the form to ensure that the plumbers did not over-charge the consumers. The procedure of regularization, which involved submission and sanction of the application form, site inspection and payment of requisite charges, was carried out at all zonal offices instead of one main center. Steps were also taken to expedite the procedure. Like the plumbers, the NMC staff working on the team was also motivated by a fixed monthly target of revenue collection from respective zones.

The scheme was a great success. With insignificant expenses of about Rs 0.2 million (2,25,000 US$) as incentives for plumbers and minimum amount spent on publicity drive, the programme achieved regularization of about 25,000 (71%) connections within a short period of four months. The programme contributed immensely to the NMC's goal of achieving universal metering. There was significant and evident increase in revenue generation as the quantity of water billed in 1998-99 was 163 MLD, while it reached 300 MLD in 2002-2003 translating into an increase in revenue from Rs 148.3 million (3.29 US$) in 1998-99 to Rs 500 million (11.11 US$) in 2001-02. The simplified forms as well as procedures, reasonable connection charges and transparent approach resulted in a tremendous response from consumers and staff of the Corporation.

2.9.b. The Reduced Water Rate Deposit Scheme in Thane

The Reduced Water Rate Deposit Scheme or The Reward Scheme was launched by Thane Municipal Corporation in 2002, in order to raise capital for investment in their water works. The consumers were offered a five-year service by paying one-time charges for 55 months. During the last year, approximately Rs 50 million (1.11 US$) were collected. During the current year, it is expected that about Rs 70 million (1.55 US$) will be collected through the scheme.

The main incentive for participating in the Rewards Scheme was immunity from the projected 15% annual increase in water tariff and payment at the current rate for 55 months instead of 60 months. Additional facilities offered included transferability of the Rewards Certificate with transfer of property and an option for one or more families to participate in the scheme individually or jointly. The Corporation also offered quick service, with the certificate being issued within 15 minutes after application if the money was paid in cash.

The Rewards Scheme was launched with the two main objectives of effective recovery of water tariff and raising a large amount of money at one go, which would be useful for capital investment. The scheme was successful in fulfilling both objectives, besides saving administrative costs, time and effort of the recovery staff. It was possible to implement the scheme because in Thane, the property tax and water tax are billed and recovered separately. The local politicians supported the venture and organized local citizens' meetings in order to explain the scheme and encourage them to participate. The scheme was also publicized through newspapers, local television networks, posters and hoardings.

The main criticism of the Scheme has been that the number of households who participated in the scheme was less than 25%, consisting mainly of those households who regularly pay their water taxes anyway. In years to come the corporation will find it hard to maintain the recovery percentage as the regular payers who participated in the scheme will not be paying taxes for the next five years. Further, Thane has a large population coming from outside to live here for short

periods of employment in rented accommodation. These temporary households were reluctant to participate in the scheme, as they did not find it relevant to their situation.

2.10. Privatization and PSP experiences

2.10.a. Privatization experience in Pune

In 1996, in response to the need for a comprehensive expansion plan to meet the needs of a rapidly growing population, engineers of the Pune Municipal Corporation (PMC) carried out a detailed study of current and projected demand and supply of water for the forthcoming years. Before a plan could be drawn up to augment the existing water supply scheme in order to meet the projected demand, the Pune Municipal Corporation decided to also commission an independent study to understand what would be required to be done to meet future water needs of the city. Kirloskar Consultants, Pune, a private consulting firm was commissioned to carry out this independent study. The proposal the firm came up with was very huge; an estimated Rs 7.0 billion or 1.5 million US dollars would be required to install a scheme which would meet the projected demand until the year 2025. Such a huge investment could only come from the private sector, and the Standing Committee of the PMC, and the High Powered Committee for Privatisation of Infrastructure of the Government of Maharashtra called for international partners that would implement the scheme on the build –own –operate system.

Box 3.

Main features of the proposed project
• 100% water coverage and uninterrupted water supply, taking into account the projected population growth until 2025. • 100% sewerage collection and treatment • recycling water for irrigation purposes

The details of the scheme were never discussed with the local elected representatives and no information was available in the public domain. Expertise already exists in the private sector in India for designing and implementing such schemes, but these experts were not involved in any way. Lack of transparency in the entire process created misgivings and suspicion. Local political leaders and informed citizens questioned the necessity for such a huge investment, particularly since the investor would own and operate the system, taking away decision-making from the local officials.

Box 4.

Proposed project financing

The project was estimated to cost Rs 4.27 billion (US$ 9.48 million), which was a base cost. The actual cost was estimated at Rs 7.35 billion (US$ 16.33 million), taking into account likely future inflationary raises, price escalation and time and cost overruns. The project was planned to be funded by both internal and external aids. Pune Municipal Corporation (PMC) was to guarantee one-third of the cost from public funds; of which 23.3% was to be grant assistance from the state government and 10% was from the municipal corporation. Rest two-thirds was to come from private investments, which was the responsibility of the contractor. The bid proposal of the contractor was to contain a Plan of Finance, aimed at tapping best national and international financing options for the project. The bidders could include any of the sources of finance for which PMC received a commitment. These included:

- An AA credit rating for a Rs 2 billion (US$ 4.44 million) municipal bond issues
- Housing Guaranty Funds from USAID through the (Indo-US Financial Institutions Reform and Expansion Project-Debt Market Component) FIRE (D)' project
- Loans from the Industrial Credit Investment Corporation of India (ICICI) for Rs 3 billion (US$ 6.66 million) and from HUDCO for Rs 2.25 billion (US$ 5 million). It was the first case of such commitment for an urban project from ICICI.

The PMC proposed to establish a Water and Sewerage Project Fund (WSPF) underwritten by Octroi[4], which accounted for 45% of the municipal revenues.

PMC also proposed substantial rise in tariffs such as

- 25% increase in water charges for domestic users (from Rs 2 per cu m (US$ 0.04) to Rs 2.5 per cu m (US$ 0.05))
- 43% increase in the annual fee levied on standpipes in slums (from Rs 175 (US$ 3.88 to Rs 250 (US$ 5.55)
- The Standing Committee of the PMC rejected a proposal to index water charges to electricity prices and to increase tariff levels by 50% to capture inflationary rise since 1994.

In an effort to demonstrate that such a large investment from international financing firms would not be required to augment the present water supply scheme, local experts prepared an alternate plan which required far less investment, almost half of what the consultants had drawn up. The alternate plan was placed before the general body of the Corporation which compared the two plans and subsequently accepted the plan prepared by the local experts. The tenders invited from the private sector were never opened. There was an expectation that the private consultant's plan would bring in some really important contribution in terms of technology and expertise and also would suggest some economically viable options but actually this did not happen.

The main objections to the proposed scheme were as follows:

- On the basis of the huge capital cost, it was expected that the cost of water to the consumer would be very high. The proposal already indicated a 25% rise for domestic users, but the issue was never discussed in the public domain, or even with the elected representatives of the local people. Much was left to speculation.
- The project assumed that surface water from the rivers and dams in and around Pune would be enough to sustain the projected quantity of water to be supplied until 2025.

[4] Duty on goods and vehicles entering the city

Sources of surface water that are used for meeting the drinking water needs of the city are also used for irrigation. When demand for drinking water increases, water is diverted from irrigation to meet these needs. These conflicting demands over Pune's existing water resources also need to be taken into consideration when plans are being made for installation of water supply schemes. Further, Maharashtra has a history of recurring droughts. For the last three consecutive years, Western Maharashtra, where Pune is located has suffered from deficient rain and drought like conditions have prevailed. Low rainfall in the catchment of the dams that supply water to Pune resulted in low water levels, creating water shortages in the city.

- The operation and maintenance costs were also expected to be very high in order to maintain the quality and quantity of water supply projected in the scheme. It was feared that this would place a financial burden on the PMC as well as the consumers.
- The PMC would have had to take huge loans creating a debt burden which could siphon funds earmarked for other development programs.
- Further, in spite of such large investments, there was no guarantee that water would be equitably distributed in the city. The project was not designed to address the needs of the slum dwellers. The network was designed to reach the entrance of every slum; the responsibility for individual connections would be with the PMC and not the private operator.
- There was no transparency in the entire process. Neither the private consultants nor the PMC administration were willing to have an open dialogue with local community leaders. An atmosphere of distrust was created which translated into opposition to the entire scheme.

2.10.b. Privatization experience in Sangli

In mid 2000, a proposal was floated by Sangli-Kupwada-Miraj Corporation, henceforth referred to as Sangli Municipal Corporation, to involve the private sector in improving the efficiency of the existing water supply system. With the assistance of the USAID FIRE project, a proposal was prepared for undertaking the reforms and rehabilitation work in stages. The first phase of the project proposed to reduce leakages, promote energy savings, improve O&M, improve customer service and undertake training of staff. This phase was to be implemented through a three year management contract. The second phase was proposed to be implemented through a concession contract, which would be carried out by an organisation set up jointly for the purpose by the Corporation and Infrastructure Leasing & Financial Services Limited (IL&FS).

The Corporation applied to the State Government for a grant under the Capital Grants Program (see page no. 12 of this paper) for the first phase to cover 75% of the cost of the management contract. The State Government was later expected to award another grant to cover 23.3% of the cost of rehabilitation of the system. The Corporation entered into an agreement with IL&FS to support the Corporation in the development of the project.

The Corporation, with the help of IL&FS met with private sector water operators to discuss the project requirements. The operator was to be selected through a bidding process. The bidder was to act as Project Manager while expenses towards power, salaries and consumables etc. were to be borne by the Corporation. The bidder was to study the system, prepare a business plan to

improve the system and estimate the investments required. Leading international companies had expressed interest in the contract. The state government was providing a grant to cover 23.3% of the expenses, but the Corporation was required to raise the remaining amount required for the rehabilitation of the system as per the plan prepared by the private operator. These financial inputs were quite high and the Corporation was unable to take the lead in launching the proposal. The initially passive role of the politicians who had been watching the process turned into active resistance when informed citizens began criticizing the proposal. In the meantime, the Municipal Commissioner was transferred and his successor did not want to take the process further.

The main reasons for the failure of the project were:

- The lack of transparency created a feeling of suspicion in the minds of the people and politicians.
- A high water tariff, 5 times more than the present tariff, was being proposed without any supporting rationale.
- A new company was to be set up to implement the scheme, and the private sector company IL&FS was to retain a major share in the company. The decision making was being taken away from the Corporation and the public domain. This raised issues of accountability.
- Public opinion was created against the scheme by journalists and activists who questioned the lack of transparency.
- The new water supply scheme did not cover installation of stand posts. Water was to be supplied only through pipelines and taps, the rationale being that water losses are higher from stand-posts. On the other hand, these stand-posts are the only source of water to the poorer communities and slum-dwellers who cannot afford individual tap connections. These stand-posts also provide water to the large number of local and seasonal migrant populations that come to the city in search of wage labour. Activists and NGOs argued that removal of stand posts would reduce access to water for these communities. In effect, the scheme did not take into account the needs of the poor in the city.
- Further there were no institutional mechanisms to hold consultations with different sections of the populations, neither were any platforms created for citizens to voice their concerns.
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2.10.c. Examples of PSP experiences in Nagpur

The Nagpur Municipal Corporation (NMC) has two main divisions: the distribution wing and the projects wing. The projects wing is responsible for planning and execution of schemes and projects related to various departments of the Corporation. The MJP (Maharashtra Jeevan Pradhikaran), the state level body that oversees water supply and sanitation sector also gets quotations for new works to be executed by the Corporation. In the experience of the NMC, these quotes are sometimes very high. Recently they received a very high quotation for one of their expansion schemes. The water supply department of NMC then decided to go in for a target oriented focused tendering process, which brought in a lot of new ideas along with substantial reduction in the costs and time span for project completion. The locally available consulting

organizations suggested some innovative options such as use of pulsator technology for water treatment and also changed the whole process into a professional business.

The Corporation regularly hires consulting firms through an open bidding process for jobs such as water audit, energy audit and routine repairs and maintenance jobs so that they are done with a much more professional approach and save time and public money. The leakage detection work was also sourced out to a consulting firm and suggestions from them to avoid further leakages was seriously implemented, such as bringing the water through pipelines from the source itself, rather than through open channels. .

The Nagpur Municipal Corporation (NMC) also has a contract with a private firm for conducting repairs. When a complaint is received, a form is filled in by the complainant, the Jr. Engineer from the Water Board accompanies a technician from the private firm and they visit the site. If the repairs cost less than Rs 10,000 (222.22 US$) then they are executed by the firm right away. The technician and the Jr. Engineer write a report about the repairs, what they have done and how much it has cost, and a photograph is taken of the site. The payment is then made by the Water Board to the firm. The Standing Committee of the Water Board awards annual contracts for this work.

These small but vital experiences of PSP have brought in a new culture of solving problems, and improving efficiency.

3.0. Analysis and Conclusions

3.1. Issues in systems improvement

A review of the policy framework, legislations and reforms show that there is a good understanding of the issues, problems and solutions required in order to attain the goal of "universal access to water". The government is committed to achieving this aim and has provided the enabling policy and governance environment for this purpose. Yet, on the ground, we seem far from achieving this aim.

- **Top-down planning:** The government authorities who were interviewed were of the opinion that the sector reforms themselves sometimes are a setback to the progress that the Municipal Corporation is making. Most schemes are planned at the state level, without involving field officials, therefore there are many practical problems that need to be taken care of which are not addressed by the schemes. What is required is an integrated approach at the zonal level, not plans which are made at the state and central levels.

- **Lack of inter-departmental coordination:** There are several departments involved in the development of water resources. For example, the water body, or source is often managed by the Water Resources Department, whose main interest is in irrigation, but the water supply is the responsibility of the ULB. Allocation of water resources should prioritise fulfillment of drinking water needs. This can be achieved only if there is coordination among the different departments that are responsible for development and management of water resources. Further, the water and sanitation programmes are planned and executed in isolation from programmes in health and education, reflecting the fact that water and sanitation is not pursued with the aim of reducing diseases, improving hygiene or improving educational levels.

- **Outdated and inefficient infrastructure:** The present infra-structure needs to be changed and upgraded. Large investments are required in order to achieve this, which the urban local bodies are unable to generate. For example, the engineers in Nagpur mentioned that leakage can be controlled only if the valves are changed every five years. This requires finance and manpower both of which they do not have. In all the cities visited during the study, pipelines needed to be changed, meters needed to be repaired and new networks established. None of this was possible in the given situation.

- **Lack of relevant data:** None of the Corporations have adequate facilities for maintaining a reliable and dependable database and information related to water supply. The lack of reliable and dependable information on UWS and database at local, state and central level mean that the actual basis for planning improvements is inadequate.

- **Source management:** Not enough attention is given to source management, both in terms of augmentation and conservation aspects. In a state like Maharashtra, where precipitation and groundwater recharge is unpredictable, source management is critical to ensure that water is available all through the year.

- **Financial viability:** It is very clear that measures need to be taken to increase capital investments in upgrading the infrastructure. One of the ways this can be achieved is by revising water tariff to increase revenues, improve recovery rates, and impose efficient metering and billing systems. Efforts are already being made in this direction. However, political influences often dictate pricing and investments; in trying to please potential voters the political leaders actually end up making the situation worse for the poor communities. Transparency and stakeholder participation in fixing the tariff structure is required if more realistic water tariffs are to be implemented.

- **Service provision to the urban poor:** Rapid growth in urbanization is not matched by the pace of service expansion in water supply and sanitation. It is the poor who lose out in this situation, and end up paying high prices to water vendors, when water supply does not reach their housing colonies.

- **Service to peri-urban areas:** Villages located near urban areas experience faster growth. Eventually their water demand keeps on increasing and often they approach the Municipal bodies for water supply. Such diversion puts considerable strain on the facilities available for the towns. While most rural schemes, whether for single village or multi-village coverage are independently planned, implemented and operated, villages located close to or in the vicinity of towns/cities or villages for which independent proposals are not feasible are sometimes included within urban town schemes.

  In the cases of villages drawing water from the Municipal towns, it has been noticed that they often do not pay water bills, largely because the water rates of urban towns are higher than water charges levied in the villages. When their connections are cut off because of lack of payment, as often done by MIDC, which supplies water to a number of villages, the villages approach Government for taking some scarcity measures or even take up a new scheme.

  In some cases, water supply scheme for urban areas is designed with a surface source located far away. The pipeline from the reservoir passes through some villages, which demand water from the same pipeline. Many times the urban towns have to accommodate the demand of such villages in their scheme, as there is a possibility of villagers stealing water from the pipes en route. A circular issued by the Government of Maharashtra requires the water demand of the "on-way" villages and villages located within a radius of 5 Km of the town, be fulfilled within the design capacity of the urban scheme. But the Municipal bodies are often not ready to stretch their limited resources, largely because revenue recovery from the rural areas is problematic

  Some villages in the vicinities of urban centres are neglected by the Zilla Parishads (local body responsible for providing civic amenities to the villages), because they are aware that these villages will sooner or later, be merged in the extended limits of the Municipal bodies. Therefore, diverting already inadequate funds to solving problems of such villages is considered useless.

The case of Sangli Corporation gives an idea of the ground reality. Madhavnagar, Haripur, Ankali and 8 other villages around Sangli have received water from the Corporation for the last 15 years. By the end of July 2002, the dues amounted to Rs 4,04,34,997 (8,98,555.48 US$). Efforts to recover the amount have not yielded any results. The Corporation has decided to file a writ application in Mumbai High Court against the villages, Zilla Parishad and the State Government.

- **Capacity building:** As an engineer in the Nagpur Water Board said, "engineers spend entire careers in routine jobs. Without exposure and orientation, how can they be expected to come up with innovations to improve the system?" Internal capacity building, exposure visits to other cities and towns, refresher technical courses need to be designed and implemented for staff of public utilities in order to improve performance and provide incentive for further growth.

In conclusion, the major areas of concern in urban water supply sector in the country are primarily paucity of funds, non-availability of adequate trained work force, over-centralisation and poor revenue recovery rates. Almost all urban areas continue to enjoy highly subsidized water, whether it is for domestic use, commercial use or industrial use. The billing and collection mechanism is also weak and faulty and needs considerable improvement. It is necessary to adopt appropriate tariff structure, as applicable to different strata of population. Cost recovery needs to be built into the municipal financial structures and subsidies where inevitable, kept explicit. Operation and maintenance costs can possibly be fully recovered through adoption of cross-subsidy measures, so that small local bodies become self sustaining while metropolitan and other big cities, additionally, are able to meet the costs of further developments.

3.2. Private Sector Participation

PSP is generally criticised for the fear of commercial and more intensive exploitation of natural resources. There have been cases where the countries have lowered corporate taxes and environmental regulations to remain competitive and the governments are left with tasks of reclaiming polluted water bodies and building infrastructures to protect water, but almost no regulatory capacity to prevent further pollution (Le Monde diplomatique: Global Market in Water). The global trend indicates that privatization has resulted in high and disparate water tariffs, often beyond the reach of the poor.

In a developing country like India, where the concept of the welfare state has been so predominant, the acceptance of private sector participation in social sectors is bound to take time. The experiences in Maharashtra have clearly indicated that an atmosphere of openness and transparency along with the demystification of privatization is required if PSP is to be made acceptable to the consumers. It is clear that local political opinion and support is necessary for PSP to succeed, particularly since water supply is being managed by local self-government bodies. On the other hand PSP experiences in all four cities have shown that ULBs can increase the efficiency of existing systems by contracting or leasing out certain functions like O&M, billing and collection, water treatment, conducting repairs and also upgrading of infrastructure.

These options may be more viable and will certainly have greater political and local support from the citizens than privatization of entire distribution systems where decision making and control is taken away from the ULBs who, because they are elected bodies, have some degree of accountability to the citizens. It is also clear that local experts who have the capacity to offer cost-effective options need to be drawn into the process of project formulation before any scheme is finalized with international private sector companies.

The process of private sector participation in addition to being made transparent, also requires a mechanism for involving the community as monitoring and regulatory bodies. The contracts and bidding process results as well as action plans for implementation need to be made available in the public domain and access to them by citizens needs to be made easy and convenient. Attempts at privatization failed mainly due to lack of transparency, unequal access to water in different parts of the city, exclusion of the poor slum communities from the coverage and projected high water tariffs.

The present institutional arrangements for water supply are not citizen friendly. More space for participation by the community in design and implementation and O&M needs to be created. This can be achieved by setting up platforms for dialogue with all stakeholders where the progress of the water supply scheme can be discussed on a continuous basis. In these meetings, issues related to equitable distribution, taking into consideration all sections of the society especially urban poor, revision of tariff structure keeping in mind the capacity to pay of different socio-economic groups and problems in O&M can be discussed so that meaningful solutions can be found. This process of dialogue will also help in building a feeling of ownership amongst the citizens about the water supply facility in their city.

Although the private sector tends to look at failed contracts as “failed opportunities” to increase efficiency of water supply systems, what is encouraging is that one of the reasons why these proposals did not gain popular and political support was that they did not address the needs of the poor. In India, where democratic processes plays a strong role in influencing decision making at the local level, private sector interventions in implementing water supply systems will have to take into account the needs of the poor if they are to receive political and local support.

Finally the lack of an independent regulatory body to monitor regulations and tariff fixing reduces the accountability of any service provider, whether private or government, to maintaining a high standard of service. Regulatory bodies which include representatives from the local communities would need to be set up if information and decision making is to be kept transparent.

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