

Commercialization of Water Supply and Sanitation Sector – Attempts in India

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By

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CERTIFICATE

This is to certify that the thesis entitled Commercialisation of Water Supply and Sanitation Sector – Attempts in India and submitted by B. Kanaka Durga Raja ID. No. 1997PHXF002 for award of Ph.D. Degree of the Institute, embodies original work done by him under my supervision.

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
APIDC	Andhra Pradesh Industrial Development Corporation
BOO	Build-Operate-Own
BOOT	Built-Operate-Own-Transfer
BOT	Build-Operate-Transfer
BOLT	Build-Operate-Lease-Transfer
BWSSB	Bangalore Water Supply and Sewerage Board
CBO	Community Based Organisation
CPHEEO	Central Public Health Environmental Engineering Organisation
FI	Financial Institution
GDP	Gross Domestic Product
GIDC	Gujarat Industrial Development Corporation
HUDCO	Housing and Urban Development Corporation
IFC	International Finance Corporation
LIC	Life Insurance Corporation of India
LPCD	Litres Per Capita per Day
LT	Local Taxes
MGD	Million Gallons per Day
MIDC	Maharashtra Industrial Development Corporation
MLD	Million Litres per Day
NGO	Non-Governmental Organisation
NIUA	National Institute of Urban Affairs
NRW	Non-Revenue Water
O&M	Operation and Management
ORG	Operations Research Group
PHED	Public Health Engineering Department
PPP	Public Private Partnership
PSP	Private Sector Participation
ROT	Rehabilitate-Operate-Transfer
UFW	Unaccounted For Water
ULB	Urban Local Body

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CHAPTER 1

INTRODUCTION TO PRIVATE SECTOR PARTICIPATION

CHAPTER 1 – INTRODUCTION TO PRIVATE SECTOR PARTICIPATION

1.0. Introduction

The usage of the new terms Private Sector Participation and Privatisation is rapidly growing world-wide. Privatisation is a form of advanced private sector participation. Throughout the world there is a growing trend towards private sector participation in infrastructure. Privatisation is not exactly the opposite of public; the distinction between the two is elusive (Savas E.S., 1989). The word public is used to imply many different circumstances; like government ownership, widespread ownership and widespread access. Broadly, private sector participation is the act of reducing the role of government, or increasing the role of the private sector, in an activity or in the ownership of assets. Privatize means “to make or hold private, to turn over (a public property, service, etc.) to private interests” (Webster’s New World Dictionary and Thesaurus, 2003). The earliest use of this term appears to be by Peter F. Drucker, he used the term “reprivatization” (Drucker P.F., 1969). The opponents of privatisation believe that it is a simplistic call to cut back government and regress to a harsh state where only the fittest survive and the poor and sick are left to cope as best they can. Popularly termed as *Succession of the Successful*.

Privatisation symbolises a new way of looking at society’s needs, and a rethinking of the role of government in fulfilling them. It means relying more on society’s private institutions and less on government to satisfy the needs of the people. Privatization could appear in the following forms:

- Contracting with private firms for financing, construction, and operation of bridges, waterworks or wastewater treatment plants
- Contracting out the sweeping of the streets
- Contracting out certain tasks like literacy campaigns, distributing health related material, creating health and hygiene awareness, etc. with NGOs (Non-Governmental Organisations)
- Selling off or denationalizing state-owned airlines, factories, coal mines, etc.
- Allowing private businesses to do insurance
- Allowing private parties to run commuter bus services

Literally most of the activities that the government is under taking now can be privatized. For example, people follow privatization when they form neighbourhood security patrols during bandit attacks in rural and peri-urban areas.

1.1 Privatization Drivers

Several major drivers are behind the privatization movement: pragmatic, ideological, commercial, and populist. The goal of the pragmatists is better government, which means a more cost-effective one (Savas, E.S., 1989). The goal of those who approach the matter ideologically is less government, one that plays a smaller role in comparison with private institutions. In a survey conducted in 1980 in the United States of America, only 21 percent of the people believed government is largely run for the benefit of all; the figure improved somewhat to 29 percent in 1982 (Clymer A., 1983). The goal of commercial interests is to get more business by having more of government's spending redirected

towards them. The goal of the populists is to achieve a better society by giving people greater power to satisfy their common needs, while diminishing that of large public and private bureaucracies. The characteristics of these four drivers are summarised below.

Driver	Goal	Reasoning
Pragmatic	Better Government	Prudent privatization leads to more cost-effective public services.
Ideological	Less Government	Government is too big, too powerful, too intrusive in people's lives and therefore is a danger to democracy. Government's decisions are political, thus are inherently less trustworthy than free market decisions.
Commercial	More business	Government is spending a large part of the economy; more of it can and should be directed toward private firms. State-owned enterprises and assets can be put to better use by the private sector.
Populist	Better Society	People should have more choice in public services. They should be empowered to define and address common needs. There should be a sense of community by relying more on family, neighbourhood and ethnic and voluntary associations and less on distant bureaucratic structures.

Table 1.1: The Forces Influencing Privatisation

a. Pragmatic Pressure

When governments face severe fiscal stress, that is, when the cost of government activities is rising but the public's resistance to higher taxes is also rising, public officials seek any promising solution to their quandary (Savas. E.S., 1989). Typically, the first resort is to creative bookkeeping that masks the magnitude of the disparity between revenues and expenditures. The second resort is borrowing to close the gap. But lenders are unwilling to support wasteful government enterprises, particularly in developing countries like ours. In developed countries, public antipathy to more government spending leads to rejection of government policies. The growing adoption of generally accepted accounting principles in government tends to foreclose the surreptitious option of *creative bookkeeping* (adjusting

the books). The remaining choices for public officials are then narrowed to two: reduced activities or greater productivity.

Naturally, eliminating or cutting back government activities is unpopular among beneficiaries of the activity. Therefore increasing productivity seems more attractive politically. But even this encounters opposition, for it often creates resentment among the affected public employees, and in any event it is difficult to do. The history of modern government is replete with efforts to improve government by centralizing, decentralizing, reorganizing and introducing several performance enhancement management techniques. Their overall impact has been modest, however, a more fundamental and strategic approach is needed.

Privatization is a strategic approach to improving the productivity of government agencies and thereby to give people more value for their money. Privatization when properly carried out, generally leads to large increases in efficiency, while improving or at least maintaining the level and quality of public services. For this reason, cost-conscious public officials, spurred by good-government groups and others who favour privatization, are turning to privatization as an important tool for better public management and as the key to more cost-effective government.

b. Ideological Pressure

The role of government differs in different societies, and even within a single society. It changes over time, waxing and waning over decades and centuries. The goods and services that a society enjoys are represented as points in Figure 1.1, and responsibility for

providing them is divided between the governmental and nongovernmental (i.e., private) sectors. The location of the boundary line between the two is different in different countries; for example in the former Soviet Union the governmental sector occupied almost the entire area.

The boundary also changes its shape and shifts position over time. For example, in the United States of America (and to some extent in India) more and more mail is being delivered by the private sector, and the role of the government mail service is shrinking in relative terms. In contrast, government's role in medical care has expanded enormously in recent decades. It may be noted at the same time that the private sector has also invested significantly in health care sector. In other words, different sections of the boundary can be moving in opposite directions at the same time.

Despite these contrary shifts, overall there has been much waxing but little waning of government. Many view this trend with alarm and see it as a danger to democracy. Their rallying cry is "Get government off our backs and out of our pockets" (Savas. E.S., 1989)

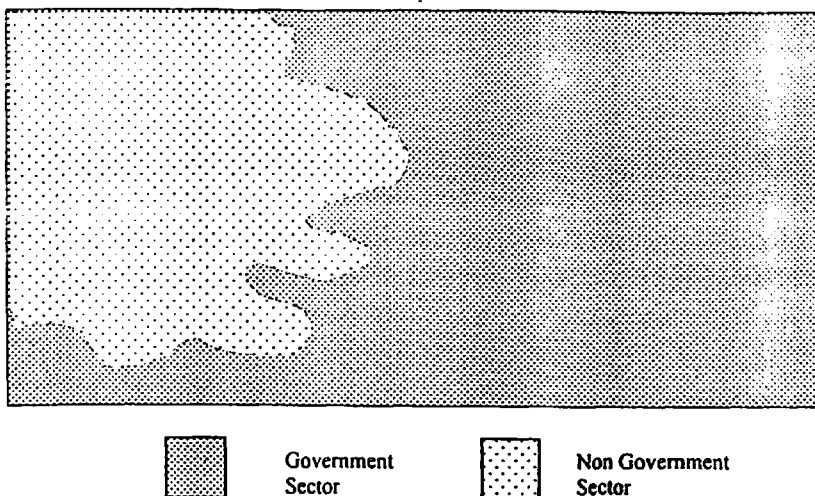


Fig. 1.1: The Composition of Government and Non-Government Sectors

The reasoning of those who subscribe to this view is based on political and economic philosophy. As more of people's earnings are taken by government, as decisions about the disposition of these moneys are made by increasingly distant and unresponsive organs of government, and as government's presence pervades more areas of human activity, there is a loss of freedom. The history of civilization shows that government could be a serious threat to the individual rights. Government institutions could become instruments of tyranny even in a democratic society; those who mobilize majority support could use government's coercive sanctions to deprive those in the minority. Therefore, the framers of our Constitution designed a system of checks and balances. At each turn, the power of government was circumscribed by checks and balances.

Individual freedom is not the only value that is endangered by a powerful government. Justice, which is highly prized and equality which is an important component of justice are also endangered by a powerful government. People will differ on the degree of inequality or the extent of redistribution that is acceptable and can still be considered just. But it is clear that government greatly affects the level of justice, for better and for worse, by taking from some and giving to others.

In a world of finite resources, efficiency is also an important societal goal. We should extract the maximum from each ton of raw material and from each hour of work. Efficiency is good because it produces a higher standard of living. Just as freedom and justice are menaced by an overly powerful government, so is efficiency.

Freedom, justice, and efficiency are all essential, and each is alloyed with other. They are different and sometimes have conflicting goals, and a balance must be struck among them. For example, trading some individual freedom or some economic efficiency for more justice. Government is a tool that society employs to help attain these goals and to strike the balance, but in excess it threatens all three goals.

Another dimension to the ideological concern about big government is the harm that comes from distrust of government. Modern civilization requires individuals to cede substantial control over vital aspects of their lives to impersonal institutions. Personal autonomy has been reduced, and responsibility for the well-being of the individual has been assumed by collective institutions; principally government. But government is not sufficiently responsive or accountable, and if it acquires a life of its own, then people feel that it is not living up to its end of an implied agreement; to do those things that only government is supposed to be able to do. They lose faith in government.

In some countries people view government as an evil to be endured, a horde of self-aggrandizing officials and civil servants. Antigovernment sentiment grew more rapidly than antibusiness sentiment between 1958 and 1980 in the United States. This feeling, too, abated somewhat after 1980, at the same time that a new administration began to change the role of the federal government in the United States; perhaps the two phenomena are related. When it comes to ability to get things done, the public considers the private sector superior to political institutions. As for quality of service, the same holds good. The same kind of trend is taking place in India since the past two decades. The much-needed social and business reforms adopted earlier in this century are themselves in

need of reform, as mistakes, excesses, and waste proliferate, and as institutional decadence inevitably sets in.

Up to this point we have reviewed the ideologues' arguments against big government from the perspective of political philosophy. Another line of their argument is based on economic philosophy. The long term well being of society will be maximized if economic decisions are left mostly to the marketplace (with government assuring that no one is left without the basic necessities of life). But government, by definition, has a strong effect on the economy and this inevitably means that decisions affecting the economy will be made on political grounds instead of economic grounds. Therefore, big government, in contrast to small government, will gradually make a society poorer than it otherwise would be.

Based on political and economic philosophy, therefore, advocates of these viewpoints want to shift the boundary line in figure 1.1 much farther to the right, reducing the role of government and expanding the role of the private sector. This is privatization, and hence the movement has drawn its strongest support from this quarter. Paradoxically, the ideologists who do not want government made more efficient (because this will encourage a continuation of its current role) find themselves allied with the pragmatists who support privatization for that very reason. The ideological proponents of privatization want less government; the pragmatic proponents merely want smaller government, in the sense of a more efficient one.

c. Commercial Pressure

Further support for privatization comes from commercial interests. The thinking is straightforward. Government spends a lot of money, much of it on salaries for its employees. Much of the work performed by government employees consists of routine commercial activities that are in no way unique to government, such as maintenance of buildings, grounds, vehicles, ships, and airplanes; typing and data processing; handling insurance claims and sending out bills; and collecting trash and repairing roads. Business groups advocate more privatization of these in-house government activities and support the legislation that would prohibit using government employees to perform work that private, tax paying business can perform.

Another segment of the private sector sees substantial business opportunities in large capital projects for government. These include prisons, wastewater treatment plants, and waste-to-energy plants. Private firms can finance, build and/ or operate any of these kinds of facilities. The novel element here is financing the facility; in many circumstances this can be an appealing option to a hard pressed government that is unable to raise capital funds in a timely manner, yet must build a facility to relieve overcrowding in its prisons or a waste-treatment plant to eliminate an environmental hazard.

In countries with nationalized industries or assets (and no country is entirely without them), commercial pressures come from business leaders who see mismanagement, underutilized assets, and slothful practices in an environment sheltered from competition. They encourage denationalization, which is a particular form of privatization, because they see excellent prospects for that industry or those assets if they were sold and brought into

the private sector; they see the potential for innovation, whereas they predict continuing stagnation and growing inefficiency, if the enterprise is left unperturbed in the public including manufacturing plants, mines, oil fields, transportation lines, communication systems, banks, timber forests, and open land.

For these various reasons, commercial forces are active supporters of privatization, although their interests are very different from those of the pragmatists and those who endorse privatization on the basis of political or economic philosophy.

d. Populist Pressure

The final source of support can be called populist. Populists are against both the big government and big business and for other, more local institutions and the empowerment of people. This point of view has been articulated in the following terms:

This country's "public" systems, governmental and private, have become too institutionalized, too bureaucratized, too professionalized, too protective of their own interests. These major systems must be made instead to work for people. It is possible to redesign the institutional arrangements to make the life support systems of a community both competitive and equitable. Choices should be expanded and no private or public buyer should rely on a sole source of supply (Kolderie T., 1984).

The two elements of the populist position are that people should have greater choice in public services than they now have, and they should be empowered to define their common needs and address them without undue reliance on distant bureaucracies. They

can rely instead, to a much greater degree, on family, neighbourhood, ethnic and voluntary associations. The process of formulating common needs, and working through traditional local institutions to satisfy those needs, will reinforce a much-needed sense of community.

Such institutions are being imperilled. A large and powerful government can displace and swamp them. The family gives way to Departments of Health, Education, Welfare, Housing, and Human Services. The local elders are replaced by various project agencies. Voluntary groups are replaced by issue-oriented lobbies that seek to use the force and majesty of government to impose their values on others.

These other institutions provide safety to society by their very redundancy and help arrive at an adaptive equilibrium among the conflicting goals of freedom, justice, and efficiency. To the extent that one institution, such as government, gains great strength at the expense of the others, it limits their contribution to these goals, eliminates the diversity they afford, and thereby increases society's dependence on government alone to choose and impose particular allotments of freedom, justice, and efficiency.

Adherents of this world view endorse privatization because it enhances choice and affords opportunities for strengthening traditional institutions and reinforcing a local sense of community. In seeking a better society, populists also press for privatization, and join forces with those ideologically committed to less government, pragmatists who want better government, and commercial interests that seek to do more of government's work.

1.2 Nationalisation and Liberalisation

The current wave of privatisation in India, follows a long period characterised by nationalisation after independence until the seventies. This resulted in the growth of the size of the public sector in the economy. Like today's privatizations, these nationalisations took place in practically every area of economic activity, be it, electricity, gas, banks, insurance, air and surface transport, mining, steel, tourism, etc. After the independence the country wanted to regain control of the productive assets from foreign enterprises and took up a nationalisation programme. However, over the past fifteen years there is a reversal of this trend, spurred by a new international economic and political environment and other factors. Over the past ten years, particularly due to the onset of liberalisation of economy since 1991, the volume of privatisation operations has accelerated. To achieve potential benefits it is important to select the appropriate approach based on impartial advise and to apply careful management to each step in the process.

CHAPTER 2

LITERATURE REVIEW ON PRIVATE SECTOR PARTICIPATION

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2.0 Introduction

There is a wide spectrum of options for private sector participation. At one end of the spectrum are those in which the government retains full responsibility for operations, maintenance, capital investment, financing and commercial risk and at the other end are those in which the private sector takes on much of this responsibility (The World Bank, 1997). For the options at the beginning of the spectrum of private sector participation, the government needs to exercise administration as with any contract. Under the options at the end of the spectrum of private sector participation, the private sector does so with in a regulatory framework created by the government. These regulatory arrangements are to protect the consumers from monopolistic pricing, enforce health and environmental standards and to ensure access to service to the disadvantaged through subsidy regimes. The main private sector participation options are listed below:

a. Service Contracts: Contracting out specific tasks such as leakage repairs, revenue collection, installing and reading meters, etc. for short durations. This is the simplest form of private sector participation and can introduce the benefits of private sector expertise and competition but needs careful coordination and management and is not likely to bring in benefits to an inefficient utility. It also leaves the responsibility of investment with the public sector.

b. Management Contracts: Contracting out full responsibility for the operation and maintenance of a public utility to private sector. If such contracts are carefully designed they can bring efficiency improvements resulting in reduced costs and increased revenues which may, in the longer run, provide a means of financing new capital works. It does not provide a means of introducing private finance to facilitate major new capital works. However it may be used to advantage in conjunction with financing of capital works by international funding agencies who may be more inclined to provide finance if an experienced operator is managing the operations. This type of contract can also be useful when legislation or public opinion make the full privatisation of a utility impossible or financially unviable or politically undesirable. It is not essential with this type of contract for the tariff to cover the costs. To gain full benefit from this type of contract the management fee should be linked to efficiency savings. This means that the levels of service must be benchmarked and the efficiencies defined in a way that can be readily measured.

c. Leases: A private operating company leases the assets from the public utility and takes full responsibility for operating and maintaining them and for delivering a defined level of service to the consumers. Ownership of the capital assets and responsibility for further capital investment remains with the public utility. The advantages of this option are very dependent upon the drafting of the agreement. In practice it is common to place upon the contractor some responsibility for rehabilitation and extension of the system although major capital investment in the form of new capital works is normally excluded. This approach is most effective where there is a lot of potential for efficiency savings. It can also be used when there is a legal or political objection to the private ownership of utility assets.

d. Concessions: A private operating company is given the responsibility for the operation and maintenance and investments of a public utility for a fixed duration. The main advantage is that the full responsibility is with private sector, which can bring in incentives for efficiency in the utility's activities. This option is attractive where large investments are needed to expand the coverage or to improve quality of services. For the government it is a complex business to administer the contract. Proper and efficient regulation is required to determine the success of the concession contract and for distribution of benefits between the concessionaire and consumers.

e. BOT/BOO Arrangements: A contract is given to a private sector company for providing bulk services for fixed duration. This option is normally used for greenfield projects such as bulk supply and treatment plants. The contract between the BOT concessionaire and the utility is usually on a take-or-pay basis. This arrangement works well if the utility's main problem is related to bulk water supply or treatment. But if the problem is faulty distribution or poor revenue collection, the BOT may be unlikely to remedy it. If separate contracts are awarded for bulk supply, treatment, distribution and revenue collection, then this arrangement is likely to bring in advantages. However this option brings in private finance and the expertise of the private sector. Proper and efficient regulation plays a major role in the success of this arrangement.

f. Divestitures: Divestiture of assets through sale of assets or shares or through management buyout. This option gives the private sector full responsibility for operations, maintenance and investments. Under this option the ownership of assets is transferred to

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f. Divestitures: Divestiture of assets through sale of assets or shares or through management buyout. This option gives the private sector full responsibility for operations, maintenance and investments. Under this option the ownership of assets is transferred to

the private sector. This option is likely to bring in efficiency gains. Regulation will remain the task of the government.

g. Public Private Partnership: Corporatisation of a public utility and the sale of the share in the new company to the private sector. This arrangement facilitates the introduction of private sector capital and management expertise into a utility while permitting the municipality to retain majority shareholding. This approach has proved effective where legislation or political ideology has not permitted control of a utility to pass out of public hands.

2.1 Private Sector Participation Options

The options for private sector participation can be ranged along a spectrum. At one end are those in which the government retains full responsibility for operations, maintenance, capital investment, financing, and commercial risk; at the other, those in which the private sector takes on much of this responsibility. This is shown in Figure 2.1 (World Bank, 1997). But even where the private sector takes on full responsibility for operations and financing, as in concessions and asset sales, it does so within a framework created by the government. The most important parts of this framework are regulatory arrangements to protect consumers from monopolistic pricing and enforce health and environmental standards, and subsidy regimes to ensure access to services for the disadvantaged.

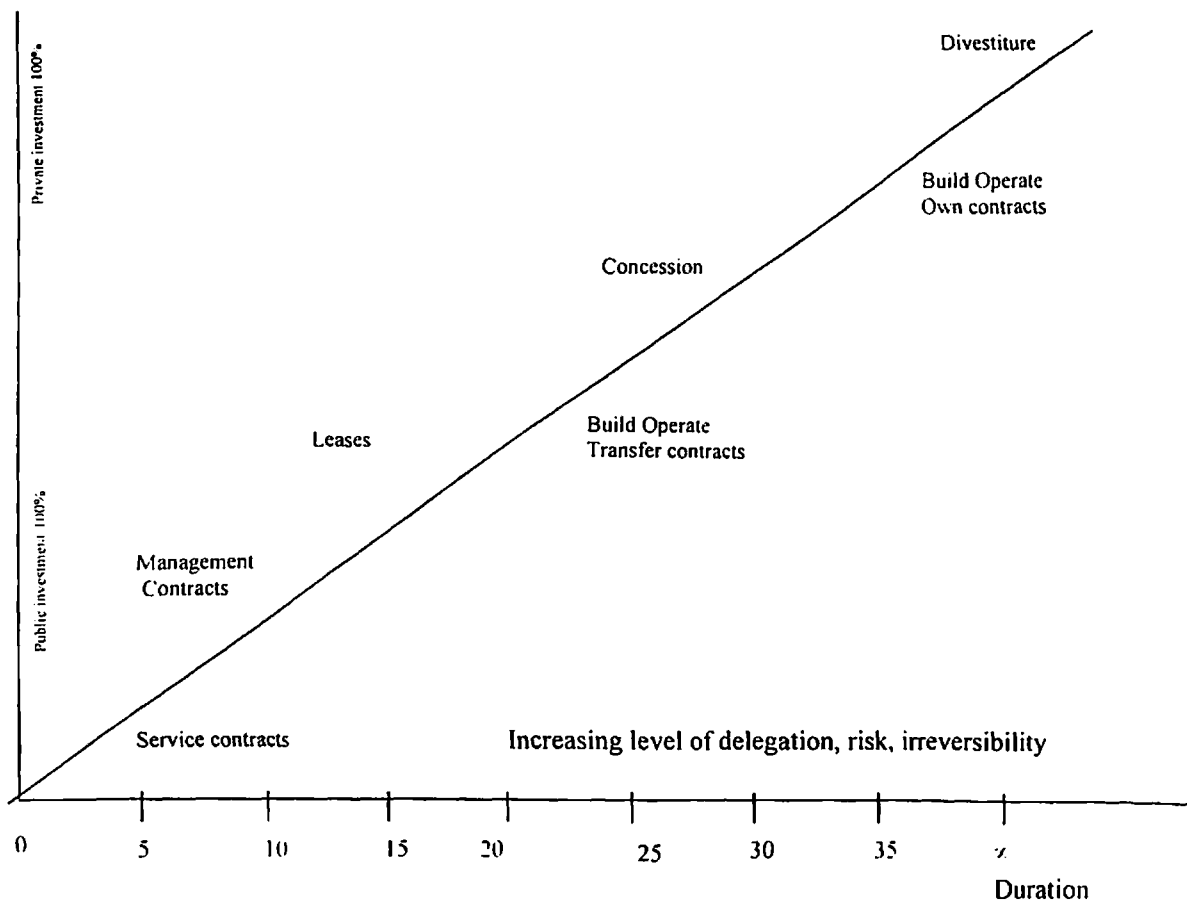


Fig. 2.1: The Range of PSP Options

The main options for private sector participation can be clearly distinguished by how they allocate responsibility for such functions as asset ownership and capital investment between the public and private sector. This is shown in table 2.1 (World Bank, 1997). But in practice, private sector arrangements are often hybrids of these models. For example, leases often pass some responsibility for small scale investment to the private sector, and management contracts may have revenue sharing provisions that make them a little like leases. Options might also be used in combination for example; a build-operate-transfer (BOT) contract for bulk water supply might be combined with a management or lease contract for operating the distribution system.

Option	Asset Ownership	Operations and maintenance	Capital investment	Commercial risk	Duration
Service contract	Public	Public & Private	Public	Public	1-2 years
Management Contract	Public	Private	Public	Public	3-5 years
Lease	Public	Private	Public	Shared	8-15 years
Concession	Public	Private	Private	Private	25-30 years
BOT/BOO	Private & Public	Private	Private	Private	20-30 years
Divestiture	Private or private and public	Private	Private	Private	Indefinite (may be limited by license)

Table 2.1: Allocation of Key Responsibilities Under the Main PSP Options

a. Service contracts – simple, but with limited benefits

Service contracts secure private sector assistance for performing specific tasks; installing or reading meters, monitoring losses, repairing pipes, or collecting accounts. They are typically for short periods, from six months to two years. Their main benefit is that they take advantage of private sector expertise for technical tasks or open these tasks to

competition. They leave the responsibility for coordinating these tasks with the public utility managers. They also leave the responsibility for investment with the public sector.

Service contracts are widely used. In India, Chennai Metro Water has contracted services ranging from the provision of staff cars to the operation and maintenance of sewage pumping stations (World Bank, 2000). The Water utility in Santiago de Chile has contracted out services accounting for about half its operating budget, including computer services, engineering consulting services, repair, maintenance, and rehabilitation of the network. To enhance competition, the Santiago utility has at least two service contracts for each kind of task.

Although relatively simple, service contracts must be carefully specified and monitored. If a utility is poorly managed, its service contracts probably will be too. Services contracts are at best a cost effective way to meet special technical needs for a utility that is already well managed and commercially viable. They cannot substitute for reform in a utility plagued by inefficient management and poor cost recovery.

b. Management contracts – a good first step

Management contracts transfer responsibility for the operation and maintenance of government owned businesses to the private sector. These contracts are generally for three to five years. The simplest involve paying a private firm a fixed fee for performing managerial tasks. More sophisticated management contracts can introduce greater incentives for efficiency, by defining performance targets and basing remuneration, at least in part, on their fulfillment. To be worthwhile, these more complex management

contracts must produce efficiency gains large enough to offset the regulatory costs of establishing targets and monitoring performance against them.

Specifying clear and indisputable targets is often difficult, especially when information about a system's current performance is limited. Some targets may be beyond the private sector partner's power to achieve. For example, unaccounted for water is a good indicator of a system's efficiency, but it can be hard to measure, especially if metering is inadequate, making it difficult to establish a meaningful base for evaluating the operator's performance. (World Bank, 1997). And the operator's ability to reduce unaccounted for water may depend not only on its efforts to reduce leaks but also on the resources that the government makes available for rehabilitating pipelines. There is often a fine dividing line between operations and maintenance expenditures, for which the private operator is responsible and capital investment, for which the government is responsible; and both will affect the operator's performance.

Because management contracts leave all responsibility for investment with the government, they are not a good option if a government has as one of its main objectives accessing private finance for new investments. And because they do not necessarily transfer any of the commercial risk to the management contractor, they draw little on private sector incentives to reduce costs and improve the quality of services.

Management contracts are most likely to be useful where the main objective is to rapidly enhance a utility's technical capacity and its efficiency in performing specific tasks, or to prepare for greater private involvement.

c. Leases – a way to pass on commercial risk

Under a lease arrangement a private firm leases the assets of a utility from the government and takes on the responsibility for operating and maintaining them. Because the lessor effectively buys the rights to the income stream from the utility's operations (minus the lease payment), it assumes much of the commercial risk of the operations. Under a well structured contract the lessor's profitability will depend on how much it can reduce costs (while still meeting the quality standards in the lease contract), so it has incentives to improve operating efficiency.

Leases have been widely used in France and Spain and are currently in place in the Czech Republic, Guinea and Senegal (World Bank, 1997). They were also used in Cote d' Ivoire until replaced by a concession.

Leases leave the responsibility for financing and planning investments with the government. So if major new investments are needed, the government must raise the finance and coordinate its investment program with the operator's operational and commercial program.

Leases are most appropriate where there is scope for big gains in operating efficiency but only limited need or scope for new investments. Leases have also sometimes been advocated as stepping stones toward more full-fledged private sector involvement through concessions. But their administrative complexity and the demands they place on governments for commitment are nearly as great as those of concessions so a lease is a much bigger first step than a management contract.

“Pure” leases are rare, however. Most place some responsibility for investment on the private partner, if only for rehabilitation works. These contracts operate as a hybrid between a lease and a concession contract.

d. Concessions – a route to full-fledged private participation

A concession gives the private partner responsibility not only for the operation and maintenance of a utility’s assets but also for investments (World Bank, 1997). Asset ownership remains with the government, however, and full use rights to all the assets, including those created by the private partner, revert to the government when the contract ends usually after 25 to 30 years. Concessions are often bid by price: the bidder that proposes to operate the utility and meet the investment targets for the lowest tariff wins the concession. The concession is governed by a contract that sets out such conditions as the main performance targets (coverage, quality), performance standards, arrangements for capital investment, mechanisms for adjusting tariffs, and arrangements for arbitrating disputes.

Concessions have a long history of use in infrastructure in France. And recently they have spread to the developing world, where they have been used for water and sanitation in Buenos Aires, for water in Macao, and for sewerage in Malaysia.

The main advantage of a concession is that it passes full responsibility for operations and investment to the private sector and so brings to bear incentives for efficiency in all the utility’s activities. The concession is therefore an attractive option where large investments are needed to expand the coverage or improve the quality of services.

On the government's side, administering a concession is a complex business, however, because it confers a long term monopoly on the concessionaire. The quality of regulation is therefore important in determining the success of the concession, particularly the distribution of its benefits between the concessionaire (in profits) and consumers (in lower prices and better service).

e. Build Operate Transfer contracts a solution for bulk supply and treatment problems

Build Operate Transfer (BOT) arrangements resemble concessions for providing bulk services but are normally used for greenfield projects, such as a water or wastewater treatment plant. In a typical BOT arrangement a private firm might undertake to construct a new dam and water treatment plant, operate them for a number of years, and at the end of the contract relinquish all rights to them to the public utility. The government or the distribution utility would pay the BOT partner for water from the project, at a price calculated over the life of the contract between the BOT concessionaire and the utility is usually on a take-or-pay basis, obligating the utility to pay for a specified quantity of water whether or not that quantity is consumed. This places all demand risk on the utility. Alternatively, the utility might pay a capacity charge and a consumption charge, an arrangement that shares the demand risk between the utility and the BOT concessionaire.

BOTs have been used for water treatment in such countries as Australia and Malaysia and for sewage treatment in Chile and New Zealand (World Bank, 1997). BOTs tend to work well if the main problem a utility faces relates to water supply or wastewater treatment. But if the problem is a faulty distribution system or poor collection performance, a BOT is unlikely to remedy it and may even aggravate it.

Where private sector participation is needed both to provide new bulk services (a reservoir or a water or wastewater treatment plant) and to improve the performance of or expand distribution systems, separating these tasks under different contracts and bidding processes may have advantages. Separating the tasks maximizes the potential efficiency gains from competitive bidding and reduces the monopoly power given to a single company.

There are many possible variations on the BOT model, including Build Operate Own (BOO) arrangements, in which the assets remain indefinitely with the private partner, and Design Build Operate (DBO) arrangements, in which the public and private sectors share responsibility for capital investments. BOTs may also be used for plants that need extensive overhauls: in arrangements sometimes referred to as ROTs (Rehabilitate Operate Transfer).

2.2 Key risks in Privatisation

Critical to the success of a project is appropriate allocation and mitigation of risk (World Bank, 1997). Risk in contracts is apportioned by the conditions of contract between various agencies involved (Raja. B.K.D., 1996). The assessment of risk for a project and the allocation of that risk will depend on the project conditions including the type and location of the project, whether bulk water supply and off-take arrangements are used, the negotiating position of the parties and the proposed technology. Early action to identify and mitigate risk can often be far more effective in reducing its seriousness than similar action taken later. Risks tend to change, so it is important to review risks and mitigation strategies regularly. Some of the key risks are given below:

- Demand Risk
- Design and Development Risk
- Construction and Supply Risk
- Operation Risk
- Revenue Risk
- Financial Risk
- Force Majeure Risk
- Insurance Risk
- Legal Risk
- Environmental Risk
- Political Risk

Risks should preferably be allocated to the party who is best able to manage them. It is possible to place upon a contractor or concessionaire risks, which are entirely outside her/his control, but this will tend to result in a higher total cost for the service. The author is compelled to insert the couplet which was developed during discussions, some time during the last decade of last century while the reforms were being introduced.

The Dilemma

*To laugh is to risk appearing fool
To weep is to risk appearing sentimental
To reach out for another is to risk involvement
To expose feeling is to risk rejection*

*To place your dreams before the crowd is to risk ridicule
To love is to risk not being loved in return
To go forward in the face of overwhelming odds is to risk failure
But risks must be taken because the greatest hazard in life is to risk nothing*

*The person who risks nothing, does nothing, has nothing is nothing
He may avoid suffering and sorrow, but he can not learn, feel change, grow or love
Chained by his certitude, he is a slave
Only a person who takes risks is free*

However, the above couplet is not intended to advise project implementers to dive into risks without analysing. The advise is to examine and analyse the risks carefully before risking.

2.3 Regulation

The establishment of a regulatory framework is a prerequisite for the success of any infrastructure private sector participation program where the option chosen is lease or BOT or divestiture (World Bank, 1997). Utility regulation has the following main aims:

- To protect consumers from abuse by firms with substantial market power
- To support investment by protecting investors from arbitrary action by the government
- To promote economic efficiency
- To satisfy demand
- To promote competition

Regulating utilities is not easy. The political pressures, the vulnerability of the long-term infrastructure investments and the difficulty in creating credible commitments both from governments and investors complicate the issue of regulation. A regulatory agency must have independence, autonomy and expertise to be truly effective and accountable. It is important that a regulatory body is established before private sector participation is implemented. The base condition of assets and base level of service must be determined to establish benchmarks against which performance can be monitored.

2.3 Private Sector Participation Attempts in India

Recognizing the need to attract more investment in infrastructure, India opened itself to private investment as part of the country's 1991 reform program. There have since been some advances. The first privately financed basic telecommunications services now compete with the public service provider. More than 1.1 million cellular phone subscribers now receive service from private companies. A total of 3,000 megawatts of privately financed independent power projects are now operational. Private investors are funding the construction of roads, ports and airports.

We still receive infrastructure services largely through public entities, usually part of a government department. Because those services are erratic, our businesses routinely provide their own power and water. The World Economic Forum's 1998 Global Competitiveness Report, a business survey of international investors, ranked India last among 53 countries in the quality of overall infrastructure. If the provision of high quality, reliable, and reasonably priced infrastructure services continues to be inadequate, it will be a major drag on economic growth in India. The expected increase in demand for infrastructure services points to the need for augmenting capacity and improving efficiency in all areas. The Expert Group on the Commercialization of Infrastructure Projects estimates that India needs to invest \$115 billion to \$130 billion in infrastructure from 1996–2001, and \$215 billion in 2001–2006 (NCAER, 1996). Achieving this investment will require major policy reforms. Looking ahead, private sector participation in infrastructure is an important focus of India's tenth five-year Plan for 2002-2006. The government also has established a high-level task force to attract investment, including private funds, to projects of national and regional importance. The task force is

concentrating on developing expressways, adding lanes to national highways, and building five world-class international airports. The full potential of the private sector to meet India's pressing infrastructure needs is largely untapped. With few exceptions, principally in the power sector in the state of Orissa, there has been little divestiture of existing assets. The private sector has built new infrastructure, such as independent power projects and new port sites, and established new companies that compete with public operators, particularly in the telecommunications sector. However, the productivity and efficiency improvements that private management and ownership could introduce to existing public sector service providers, under an appropriate regulatory regime and with competition when possible, would hopefully help to relieve some of the current infrastructure constraints.

India has started to restructure government roles in power, particularly by separating operations from policy and regulation. This has occurred to a lesser extent in telecommunications and ports. In other sectors the process is incomplete or has not yet begun. This separation of roles and the creation of independent regulatory agencies will be particularly important where there is competition between private and publicly owned service providers, and when there is a need to insulate tariffs from political pressure.

a. Telecommunications

The entry of private operators into the telecommunications sector indicates great potential for competition and private investment. But market structure and license conditions have undermined incentives for large investments and new entry. Tele-density remains extremely low as given in table 2.2 (ITU, 1997). The New Telecom Policy, unveiled in

March 1999, provides a platform for further development and liberalization of the sector. It envisions a more competitive market for all telecommunications services. The important points for consideration are given below:

- Defining relationships among the regulatory agency, policymakers, and the current service provider.
- Establishing an efficient interconnection regime to spur competition.
- Continuing to rebalance prices within a more competitive environment.

Country	Telephone mainlines per 100 people	Waiting list as percent Per 100 people of mainlines in operation
India	1.9	15.2
China	5.6	1.5
Indonesia	2.5	6.3
Malaysia	19.5	4.2
Pakistan	1.9	11.8
Sri Lanka	1.7	89.9

Table 2.2: India's Telecom Performance Compared with Neighboring Countries, 1997

b. Power

State electricity boards are an increasing financial drain on their governments. They have low average tariffs, with high cross subsidies to agricultural and residential consumers. They suffer from poor management, high levels of theft of power, and a large volume of uncollected bills. These details are given in table 2.3 (Ministry of Power, 1997, ADB, 1997). This has led to capacity shortages, poor system reliability, and frequent blackouts. Despite government steps to introduce private sector investment in generation, due to the poor financial standing of most boards far fewer deals have reached financial closure than expected. The important points for consideration are below:

- Private ownership in distribution would provide commercial incentives to reduce technical and, in particular, non-technical losses.
- Genuinely independent regulatory agencies would help ensure that prices are set to correct present distortions and provide incentives to make operators more efficient.

Country	Percentage access to electricity, 1994	Energy losses, 1996
India	88	21
China	92	7
Indonesia	39	12
Malaysia	90	11
Pakistan	46	23
Sri Lanka	38	17

Table 2.3: India's Electricity Performance Compared with Neighboring Countries

It may be noted that access to electricity in India is measured by electrified villages as a percentage of total villages rather than electrified households as a percentage of total households. As a result, the above figure may overestimate the percentage of the Indian population with access to electricity. Although the Ministry of Power reported total energy losses of 21 percent throughout India, closer examination shows serious underreporting. In Orissa, for example, where loss reduction and revenue enhancement measures have been most active of late, actual losses are far above losses reported prior to reform, at around 46 percent.

c. Roads

Small projects, like bridge and bypass construction, have been privately financed, but larger projects have not. Just 4 percent of national highways have four lanes. Only 20 percent of paved roads are considered to be in good condition, and many roads cannot

cope with increasing traffic volumes (Planning Commission, 1999). The government has begun introducing tolls on newly expanded stretches of road, and the number of toll roads, bridges, and bypasses will increase. The government is implementing the Golden Quadrilateral and North-South and East-West Corridors to upgrade the national highway network with the inclusion of private sector. Points for consideration by central and state governments are:

- Identifying and preparing financially viable projects.
- Determining how tolls fit into the overall funding of road projects, both public and private.
- Identifying and providing for the contingent liabilities that privately financed projects imply for the public sector.

d. Ports

Indian port productivity was extremely low by international standards and is presently in the direction of improvement. Unless the productivity and capacity of ports are increased, more bottlenecks will occur as demand for port services grows. The Ministry for Surface Transport oversees the country's 11 major ports, for which the Tariff Authority for Major Ports regulates prices. The other 142 ports come under state jurisdiction. The central government has adopted broad policy measures to open ports to private investors and operators. Some maritime states are also attracting private investments. The central government is seeking private investment in captive and other facilities, and state governments are seeking private investment, largely in new sites. The important points to note are:

- Separating statutory and operational roles at the major ports.

- Continuing to transfer operational roles to the private sector.
- Enhancing competition between ports to provide greater choice for consumers.
- Improving the sector's institutional structure, particularly the distinction between major and minor ports.

e. Airports

The air passenger traffic is mostly concentrated at Bangalore, Chennai, Delhi, Hyderabad, Kolkata and Mumbai. The Airports Authority of India operates all these airports. Major investments in airports are needed to bring existing facilities up to international standards and to handle the expected increase in passenger traffic and cargo. One project with private sector participation was recently commissioned in Cochin, Kerala. To set the stage for more private sector participation, the government is planning to lease operations at the Calcutta, Chennai, Delhi, and Mumbai airports. Key points for consideration are:

- Structuring the proposed leasing contracts.
- Establishing a regulator to oversee private operations under the lease.

f. Urban Water and Municipal Services

No large privately sponsored projects have yet reached financial closure in the water and sanitation/ sewerage sector, which is handicapped by inadequate revenues and a cumbersome institutional approach. See table 2.4 (ADB, 1997, World Bank, 1999). Central and state governments and Urban Local Bodies have been providing and regulating services.

The goal of the 74th Amendment to the constitution is to move toward municipal management of urban water services, but the process is in the early stages. Although several bulk water schemes are under consideration, they are likely to prove viable only when supported by sales to industrial consumers or when the municipality has strong finances. Poor management of existing networks suggests that efficiency could be improved greatly by introducing private operators and measures to provide an adequate revenue stream. Failure to provide water of adequate quantity and quality is a major cause of death and illness in India, often resulting in epidemics. An estimated 12 percent of premature deaths and disabilities in India are due to water-related infections, primarily diarrhea, hepatitis, and parasitic infections, with the proportion rising to about one-fifth of all causes of death among children. That translates into about half a million deaths in children under five each year. The key issues are:

- Municipal governments must be stronger and have sound finances.
- Private sector management is needed to improve efficiency.
- Pricing reform needs to be a priority.

Country	Access to safe water availability as a percentage, 1993	Water availability hours/day, 1995
India	85	4
China	83	24
Indonesia	65	18
Malaysia	89	24
Pakistan	62	17
Sri Lanka	70	22

Table 2.4: India's Water Performance Compared with Neighboring Countries

2.4 Developing Regulatory Institutions

A growing number of special economic regulatory agencies in India oversee power, telecommunications, and ports. Their experience provides lessons about the political economy of infrastructure regulation in India and about the design of regulatory bodies to ensure that they fulfill their mandate as independent regulators. The points to note are:

- Effectively delineating the responsibilities of regulators and policymakers.
- Placing the creation of an independent regulator within a broader restructuring of the sector.

2.5 Promoting Domestic Infrastructure Finance

India has a relatively high savings rate of more than 25 percent, but the term of loans available for infrastructure projects is still relatively short. The number of providers of long-term debt is limited, these providers have similar incentives and investment patterns. The regulatory system constrains the willingness of lenders to provide financing for infrastructure projects. The development of a secondary market for debt is also somewhat constrained by existing taxes and regulations. These factors are reflected in India's relatively large primary debt market, but light secondary market trading. The key issues are:

- Increasing demand for long-term debt instruments through pensions and insurance reform.
- Making the debt market work better by simplifying taxes to reduce distortions, regulating the private placement market, supporting securitization, and simplifying and harmonizing debt auction procedures.

2.6 Improving the Public-Private Interface

Although public investment in infrastructure has declined as a percentage of gross domestic product (GDP) since the start of the decade, private investment has failed to fill the gap. As a result, total investment in infrastructure, as a percentage of GDP, is below the levels of 1991–93 as given in table 2.5 (World Bank, 1997). The increasing emphasis on private provision of infrastructure services is placing new demands on the public sector's contracting and supervision skills. This situation frequently results in the bidding of projects that have been inadequately prepared. There is a need for greater inter-ministerial coordination at the central and state levels. This need is also highlighted by constraints on private sector developers, particularly in the power sector where many public and private sector actors are involved. Policy recommendations as identified are given below:

- Improve the efficiency and transparency in contracting infrastructure projects to the private sector. Each state government could establish a single body responsible for contracting and obtaining necessary clearances.
- State governments should monitor their contingent liabilities systematically and provide other forms of support. Public agencies should create liquid funds that allow agencies to meet liabilities as they arise.
- Governments should work toward auditing the award of public-private infrastructure partnership projects.

Sector	1991–92	1992–93	1995–96	1996–97	1997–98
Public	4.0	3.7	3.2	2.9	3.0
Private	1.4	1.6	1.0	1.5	1.6
Total	5.4	5.3	4.2	4.4	4.6

Table 2.5: Investment in Infrastructure as Percent of GDP

CHAPTER 3

STATUS OF PRIVATE SECTOR PARTICIPATION IN WATER AND SANITATION SECTOR

CHAPTER 3 – STATUS OF PRIVATE SECTOR PARTICIPATION IN WATER AND SANITATION SECTOR

3.0 Introduction

Today 33 percent of Indians live in 6 mega cities, 23 major cities, 300 large towns and 3,396 small and medium towns. It is projected that by the year 2025, 50 percent of Indians will be living in urban centres. The challenge is not just increasing the urban space but also expanding the infrastructure facilities like housing, roads, power, water supply, sewerage and sanitation. The challenge is both in terms of quality and quantity. Among all these water supply and sewerage pose the biggest of all challenges.

3.1 Urban Water Requirements

Urban water requirements vary from place to place depending on the population and their traditional and cultural habits. Generally cities of lesser population require less water compared to bigger cities with higher population. Smaller cities are still depending on the traditional sources of water like tanks, wells to meet some of the non-essential uses like washing clothes, while big cities are depending on the water supply for such purposes. Water supply standards, thus, have been set separately for cities of smaller and higher population.

The Central Public Health Environmental Engineering Organization (CPHEEO) has set a minimum standard of 125 to 200 liters per capita per day (LPCD) for cities with a population of 50,000 and above. Zakaria committee recommended a supply of 157.5 to 270 LPCD for cities with a population of 100,000 and above. Irrespective of population size, the National Master Plan of India has suggested a water standard of 70 to 250 LPCD with an average of 140 LPCD. A Water demand of 40 LPCD, recommended by National Drinking Water Mission for rural villages, can be considered for the supply of urban slum population.

The urban water demand has been rapidly increasing due to tremendous increase in population. About 134 percent increase of urban population is observed in four decades, from 1951 to 1991. The present and future water demands of urban population of India considering an average supply of 140 LPCD is given Table 3.1 (NIUA, 2000). The projected figures for the year 2021 suggest a water demand of 28,260 million cubic meters per year (Mm^3/year).

Census	Total Population (million)	Urban Population (million)	Annual Urban Growth (percent)	Water Demand, million cubic meters (Mm ³)	
				Daily	Yearly
1951	361.08	62.44		8.74	3,190.6
1961	439.23	78.93	2.37	11.05	4,033.3
1971	548.15	109.11	3.29	15.27	5,575.5
1981	683.32	159.46	3.87	22.32	8,148.4
1991	846.30	217.61	3.16	30.46	11,119.9
2001	1,048.5	296.97	3.16	41.55	15,164.9
2011	1,298.15	405.26	3.16	56.73	20,708.8
2021	1,607.77	553.04	3.16	77.42	28,260.3

Table 3.1: Urban Water Requirements in India 1951-2021.

3.2 State Wise Status

As per 1991 census approximately 85 percent of India's total population and 81 percent of urban households had access to piped drinking water supply (NIUA, 2000). In 1988-89, 58 percent of households had access to safe drinking water facilities within the premises, 40 percent within a distance of 0.5 km. Table 3.2 (NIUA, 1997) gives the percentage of population and households covered under water supply in various states of India. The average per capita water supply in these states are also given in this table.

India/ States	%age of households covered by safe drinking water.		%age of population covered by water supply.		Supply in Lpcd
	1981	1991	1987	1992	
India*	75.06	81.38	79.20	84.65	
India**	74.13	81.59			
States					
Andhra Pradesh	63.27	73.82	62.40	78	134
Arunachal Pradesh	87.93	88.20	100	100	
Assam	N.A	64.07	37.50	40	30
Bihar	65.36	73.39	63.60	70	61
Goa	52.31	61.71	81.50	92.00	
Gujarat	86.78	87.23	93.40	98.00	133
Haryana	90.72	93.18	100.00	100.00	123
Himachal Pradesh	89.56	91.93	92.90	100.00	144
Jammu & Kashmir	86.67	N.A	95.00	98.00	33
Karnataka	74.40	81.38	98.70	96.00	108
Kerala	39.72	38.68	65.60	75.00	106
Madhya Pradesh	66.65	79.45	80.50	88.00	185
Maharashtra	85.56	90.50	99.70	98.00	
Manipur	38.71	52.10	75.50	71.00	
Meghalaya	74.40	75.42	49.50	100.00	57
Mizoram	8.79	19.88	18.60	79.00	
Nagaland	57.18	45.47	19.90	63.00	
Orissa	51.33	62.83	37.10	50.00	239
Punjab	91.13	94.24	71.20	71.00	170
Rajasthan	78.65	86.51	54.40	100.00	108
Sikkim	71.93	92.95	67.10	74.00	
Tamil Nadu	69.44	74.17	88.20	49.00	94
Tripura	67.92	71.12	53.20	53.00	251
Uttar Pradesh	73.23	85.78	69.30	97.00	192
West Bengal	79.78	86.23	68.30	80.00	106
Union Territories					
A&N Islands	91.95	90.91	100.00	86.00	
Chandigarh	99.39	97.68	100.00	100.00	
D&N Haveli	54.35	90.97	73.70	100.00	
Daman & Diu	67.04	86.76		100.00	
Delhi	94.91	96.24	97.00	99.00	
Lakshadweep	3.65	18.79			
Pondicherry	84.18	86.05	100.00	95.00	

* Excludes Assam ** Excludes Assam and Jammu & Kashmir

Table 3.2: Status of Water Supply in India.

Population coverage under piped water supply is an indication of levels of water supply.

The water supply situation in most of the states is grim. Only 5 states, as per the available information from, Arunachal Pradesh, Haryana, Himachal Pradesh, Maghalaya and

Rajasthan have been fully covered under piped water supply. At aggregate level although nearly 84 percent of urban population is covered under piped water supply, there are severe deficiencies with regard to safe drinking water available to urban residents. The urban water supply situation is grave particularly in the states of Assam, Nagaland, Orissa, Tamilnadu and Tripura. In some of the states like Kerala and West Bengal most urban households have their own wells and may have invested in their own private pumps and piped systems based on these wells.

Tables 3.3 and 3.4 gives the summary of the data presented in Table 3.2 as percentage of states covering various percentages of population and households respectively.

Percentage of population	States		Union Territories	
	Number	Percentage	Number	Percentage
100	5	20	3	42.9
90-99	6	24	2	28.6
70-89	9	36	1	14.3
50-69	3	12	0	0
Less than 50	2	8	1	14.3
Total	25	100	7	100

Table 3.3: Distribution of States with Respect to Percentage of Population Coverage.

Percentage of households	States		Union Territories	
	Number	Percentage	Number	Percentage
100	0	0	0	0
90-99	5	20	4	57
70-89	12	48	2	29
50-69	4	16	0	0
Less than 50	3	12	1	14
No data	1	4	-	-
Total	25	100	7	100

Table 3.4: Distribution of States with Respect to Percentage of Household Coverage.

Only 20 percent of the states have water supply covering 100 percent urban population and 24 percent of the states have water supply covering more than 90 percent of the population. Similarly 20 percent of the states have provided water supply to more than 90 percent households. 20 percent of the states are not providing water supply to 30 percent

of their urban population and 16 percent of states have not covered 30 percent of their urban households.

The poor coverage of households in urban water supply indicates low infrastructure facilities in the states. Though the states like Meghalaya and Rajasthan are supplying water to 100 percent of its population the coverage of household supply is 75 percent and 86 percent respectively.

The variation in per capita supplies in liters in various states are presented in Table 3.5. Orissa and Tripura are supplying more than 200 LPCD of water to its urban residents, though they are covering only 50 percent of the population. Assam and Himachal Pradesh are providing less than 50 LPCD of water to their urban population. Only 24 percent of the states are providing a maximum of 140 LPCD, an average water requirement set by Master Plan. The average per capita consumption for the country as a whole is 71 LPCD, which is lower than prescribed norms.

LPCD	Number of States	Percentage of States
More than 200	2	8
141 - 200	4	16
101 - 140	7	28
51 - 100	3	12
Less than 50	2	8
No Data	9	28
Total	25	100

Table 3.5: Distribution of States with Respect to Per Capita Supply

3.3 City Wise Status – Water and Sanitation

Number of studies were conducted by different research organisations to assess the water supply status of various urban centers in India.

Water supply status in 24 urban cities (NIUA, 1997) is presented in Table 3.6. Percentage of population covered under urban water supply and per capita water supply for these cities are also given in this table. The data revealed that per capita availability of water to the urban population is about 214 liters per day. 100 percent of the population is covered by six cities. They are Visakhapatnam, Patna, Ahmedabad, Nagpur, Pune and Varanasi.

Metro Cities	Water supply (LPCD)	%age population covered
Hyderabad	127	90
Visakhapatnam	113	100
Patna	297	100
Delhi	341	91
Ahmedabad	182	100
Surat	178	66
Vadodara	133	75
Bangalore	137	90
Kochi	231	70
Bhopal	234	95
Indore	208	80
Mumbai	272	92
Nagpur	158	100
Pune	241	100
Ludhiana	175	65
Jaipur	195	95
Coimbatore	104	88
Chennai	81	90
Madurai	74	86
Kanpur	200	80
Lucknow	252	98
Varanasi	215	100
Calcutta	200	90
Total	214	90

Table 3.6. Water Supply in Metro Cities

The percentage distribution of cities covering different population coverage and different per capita water supply are given in Tables 3.7 and 3.8 respectively. 67 percent of cities have covered more than 90 percent of their population where as 67 percent of the cities supply more than 140 liter per capita per day. Several cities, though have poor municipal coverage, households have their own source of water supply in their premises through wells due to easy availability of good groundwater.

% of population	No. of cities	Percentage of cities
100	6	25
90-99	10	42
70-89	6	25
50-69	2	8
Less than 50	-	-
Total	24	100

Table 3.7: Distribution of Cities with Respect to Population Coverage

LPCD	No. Of. Cities	Percentage of cities
More than 200	12	50%
141-200	4	17%
101-140	6	25%
51-100	2	8%
Less than 50	-	-

Table 3.8: Distribution of Cities with Respect Per Capita Supply

3.4 Urban Water and Sanitation – Performance and Requirements

Authority over urban water and sanitation services lies with each state, although implementation of the 74th Constitutional Amendment, passed in 1992, is intended to promote decentralization of service provision to the municipal level. The central government's role in urban water is generally limited to an advisory function through the Ministry of Urban Affairs and Employment. The government also influences the sector through centrally controlled infrastructure finance institutions such as the Housing and Urban Development Corporation. There are no standard institutional arrangements for providing water and sanitation services. In Andhra Pradesh, for example, the state Municipal Engineering Department is responsible for capital works, while municipal bodies handle operations and maintenance. There is an entirely separate, partially autonomous local water board in the capital city of Hyderabad. In some cases, the Public Health and Engineering Department of the state Urban Development Department handles engineering planning, design, and construction, while the local government's water and sanitation service provider manages operations and maintenance. However, there are relatively few metropolitan agencies that supply only water and sanitation services. The Delhi Jal Board was recently created to provide these services, which were previously supplied by the municipality. There are now boards in Delhi, Bangalore, Chennai, and Hyderabad.

Even service providers that are semi-autonomous in theory are governed by an extensive set of government regulations. There is also considerable political interference in operations, managerial decision making and tariff setting (Krishnan, K.P., 2003). The current institutional arrangements do not create the proper structures and incentives for

improving operational efficiency and quality of service. They also do not encourage service providers to operate in a commercially oriented and financially sound manner. The 74th Constitutional Amendment, passed in 1992, enables local governments to assume a greater role in the planning, management and financing of urban services. The approach paper to the Ninth Five Year Plan states, "The responsibility for planning, operation and maintenance of the urban facilities will be passed on, wherever not done, to the local bodies, in line with the 74th Amendment to the Constitution." Generally, this means that municipal bodies will take responsibility for providing services within their geographical boundaries. Although most states have ratified the amendment, there are many problems related to realizing decentralization in practice. There is the need to make management in medium and small urban areas more professional; build technical skills in accounting, procurement, and financial planning; and change the roles of the institutions that now perform these functions. Another concern is how to transfer resources from state governments to municipalities. Kerala, for example, has transferred more than 40 percent of its funds to municipalities and other local governments.

3.5 Operational Performance and Unmet Demand

Although official statistics indicate a reasonably high level of service coverage (85 percent of people living in urban areas have access to safe water), water availability is very low in practice. Of 27 Asian cities with populations over 1 million, India's four largest cities are ranked among the five worst cities in terms of hours of availability of water per day. See tables 2.4 (Asian Development Bank, 1997 & World Bank, 1999) and 3.9 (Asian Development Bank, 1997). Between 25 percent and 50 percent of water supplied is lost due to leaks. Low water pressure and intermittent supplies allow back-syphonage and contamination. The lack of water availability disproportionately affects the urban poor. For example, although the official per capita water supply is about 200 liters a day in Delhi, about 30 percent of the city's 9 million people have access to less than 25 liters a day. About 42 percent of the population is reported to have access to basic sanitation services, but only 15 percent of the households in low-income slum and squatter settlements have toilets. About 21 percent of these settlements have access to community toilets. About 61 percent of poor households use open spaces for personal sanitation (Sivaramakrishna, Dasgupta, and Buch, 1993).

Cities	Coverage (percent)	Water availability (hours)	LPCD	Average Tariff (US\$/m ³)	Metering (percent)	Staff per 1000 connections	Accounts receivable (months)
Calcutta, India	66	10	202	0.01	0	17.1	1.5
Chennai, India	97	4		0.25	25.9	25.9	5.8
Delhi, India	86	4	209	0.03	73	21.4	4.5
Mumbai, India	100	5	178	0.06	67	33.3	19.7
Beijing, China	100	24	96	0.05	100	27.2	0.1
Shanghai, China	100	24	143	0.07	100	6.1	11.1
Colombo, Sri Lanka	58	22	165	0.14	94	7.3	3.2
Dhaka, Pakistan	42	17	95	0.09	74	18.5	11
Faisalabad, Afghanistan	60	7	170	0.035	5	25	12
Jakarta, Indonesia	27	18	135	0.61	100	5.9	1
Karachi, Pakistan	70	1-4	157	0.09	1	18.4	16.8
Kathmandu, Nepal	81	6	91	0.14	83	15	4.5
Kuala Lumpur, Malaysia	100	24	200	0.34	100	1.1	0.5
Lahore, Pakistan	84	17	213	0.2	24	5.7	7
Manila, Philippines	67	17	202	0.23	98	9.8	6

Table 3.9: Summary of Results for Water Utilities Consumption Accounts

3.6 Water Sources - Legislation

Water provision is considered a state responsibility under the Indian Constitution. Although the Constitution does provide for the regulation and development of interstate rivers and river valleys by the central government, state authority is pre-eminent in practice. Exploitation of interstate river basins is to some extent governed by specific interstate agreements or tribunal decisions, rather than a national policy outlining the principles by which states will share these resources. The legal status of individual surface water abstraction rights from rivers is unclear. The courts have recognized riparian rights in which people living next to natural waterways can use the water without disturbing a similar benefit to other people. However, only a government permit can grant extraction of water from artificial bodies and waterways. Individual rights to water abstraction and use can be established only through time consuming litigation. It is unclear whether government assurances of water allocation can be withdrawn in favor of new uses. Given the lack of definition and security of surface water rights, there is considerable confusion over whether these rights can be commercially transferred.

There is more clarity on the status of groundwater rights. Indian law considers groundwater an easement connected to land. Ownership of groundwater thus falls to the landowner; tenancy laws govern groundwater uses, and groundwater rights cannot be transferred to others. The existing legislation also treats groundwater as a private good, ignoring externalities. Only a few states have passed legislation concerning groundwater extraction. Legislation covers groundwater extraction in the Chennai metropolitan area. In Maharashtra an act passed to protect the drinking water supply provides for some regulation of groundwater quality.

3.7 Service Providers

Water supply along with sewerage and sanitation falls within the ambit of state governments. Presently there is a varied mix of institutional responsibilities with regard to planning, implementation and maintenance of water supply facilities. Generally state governments, through parastatal agencies such as a state water supply and sewerage boards, industrial development corporations, and city level boards have been involved in planning, designing, execution, and commissioning of water supply projects. For example, in Andhra Pradesh the Municipal Engineering Department implements most of the water and sanitation projects in the state. In Hyderabad it is the Hyderabad Metropolitan Water Supply and Sewerage Board which implements projects, operates and maintains them. In Maharashtra, the Maharashtra Jeevan Pradhikaran owns, operates and maintains 35 urban water supplies of which 24 involves retail distributions. Like the Andhra Pradesh Industrial Development Corporation (APIDC), the Maharashtra Industrial Development Corporation (MIDC) and the Gujarat Industrial Development Corporation (GIDC) have been supplying water for industrial purposes within their industrial estates. In certain cities such as Chennai, Hyderabad, Bangalore and Delhi, water and wastewater services have been delegated to a city level body, which is directly under the control of the respective state government.

In most of the large cities, municipal corporations are responsible for implementing the capital works and maintenance, while in Chennai and Bangalore, state level utility boards are responsible for planning and implementing the capital works. O&M was traditionally done by the local bodies. But in recent years the public utility boards have had a greater role in O&M of completed schemes in Uttar Pradesh, Orissa and some parts of Karnataka.

In Rajasthan, the Public Health Engineering Department is responsible for all operations including O&M, and local bodies have no role to play in water supply. The shift in functions has come about primarily due to the lack of technical and financial capabilities of local bodies to maintain the services provided.

The state-level water supply and sewerage boards tried to plan and implement the schemes without active involvement of the local bodies. Except for World Bank assisted projects, the boards try to provide an engineering solution to the problem rather than an integrated approach, combining financial, managerial and technical aspects. The local bodies feel left out and are not able to take over the responsibility of operating and maintaining the system. In many cases the local body has to pay debt due to capital works. The view of state board is that it is the obligatory function of the local bodies to provide the basic services of water supply and sanitation. The boards only provide technical assistance in planning and implementing and for mobilizing necessary resources for capital works and maintenance.

3.8 Operation & Maintenance Expenditure

The principal components of water supply scheme are intakes, raw water storage, transmission line from raw water storage to treatment, treatment plant, storage, distribution line from storage to consumers. All the components require lot of operations and maintenance (O&M) costs for smooth functioning of the water supply scheme. The expenditure is being generally met from internal taxable and non-taxable resources like water tax, water charges, water rent, fines, penalties etc. The taxes on water supply are basically statutory levies operated by the municipal corporations in accordance with various Municipal Acts. If the specialised agencies like boards, PHED, etc. are providing the services, these taxes are levied by the concerned local bodies and the proceeds are handed over to the agencies after deducting collection charges. For example, in Delhi, Madras, Bhuvaneshwar and Lucknow, the proceeds are transferred to the board/ PHED. Where municipalities are solely responsible for provision of these services (e.g. Visakhapatnam, Raipur, Solapur and Surat), they themselves levy, collect and appropriate the revenue for overall development of the services.

Generally the Operation and Maintenance costs consists of the following:

- O&M cost of civil structures
- O&M cost of plant and equipment
- Repairs/ Replacement cost of plant and equipment
- Cost of consumables
- Manpower cost
- Power charges
- Laboratory costs/ Water quality monitoring costs

- Other incidentals

Expenditure on water supply ranks third in municipal spending outlays (NIUA, 1989). The Zakaria committee has recommended O&M expenditure norms for water supply as Rs. 61.30 per capita per annum at 1986-87 prices. But in reality, the expenditure levels spent by the municipalities are very low. The expenditure levels of various urban centers (NIUA, 1989) are given in Table 3.10. More than 70 percent of the sampled municipal bodies spend less than Rs. 20 per capita per annum as O&M cost of water supply systems. Only 6 percent of the municipalities are spending more than Rs. 50 per capita per annum.

Per Capita Expenditure, Rs.	Number of Urban Centres	Percentage of Total
Less than 20	99	71.33
20 – 40	28	20.98
40-50	3	2.17
More than 50	8	2.79
Total	138	100

Table 3.10: Per Capita O&M Expenditure on Water Supply by Various Municipalities

According to a study conducted by, National Institute of Urban Affairs in 2000, municipalities spent 17 per of their expenditure on O&M of water supply at a per capita rate of Rs. 125.77 per annum. The break up of the expenditure for the various states is given in Table 3.11 (NIUA, 2000).

States	Per Capita Expenditure per annum, Rs.
Andhra Pradesh	50.22
Assam	2.98
Bihar	4.32
Gujarat	60.40
Haryana	191.84
Karnataka	62.56
Kerala	2.84
Madhya Pradesh	79.44
Maharashtra	230.00
Orissa	9.66
Punjab	95.38
Tamilnadu	45.92
Uttar Pradesh	16.48
West Bengal	60.01
Himachal Pradesh	89.57
Manipur	0.03
Meghalaya	46.57
Tripura	0.01
Total	125.77

Table 3.11: Per Capita Expenditure on O&M of Water Supply Services, 1997-98

Haryana and Maharashtra are the only two states who are spending about Rs. 200 per capita per annum towards O&M cost of water supply. The states like Assam, Bihar and Kerala are spending less than Rs. 5. The situation is much worse in the states of Manipur and Tripura, where it is less than 3 paisa per capita per annum. 56 percent of the states, as given in Table 3.12 are spending less than Rs. 60 per capita per annum, a minimum norm recommended by Zakaria Committee.

Per Capita Expenditure, Rs.	Number of States	Percentage of Total
Less than 20	7	38.9
20 – 40	0	0
40-60	3	16.7
More than 60	8	44.4
Total	18	100

Table 3.12: Distribution of States by Per Capita O&M Expenditure Levels

3.9 Financial Performance and Tariffs

The financial performance of water and sanitation agencies is generally poor. Many agencies fall short of recovering even operations and maintenance costs through tariffs. One justification for low tariffs is that they allow the poor to receive essential services at affordable rates. However, the evidence suggests that the urban poor pay significantly higher charges for water.

The existence of a secure revenue stream, the finances to pay bills on time, and sound accounting and financial management practices will allow municipalities to access the domestic debt markets and pay for facilities constructed and operated by the private sector.

Municipalities receive revenues from three principal sources:

- transfers from state governments
- taxes levied by the municipality, such as octroi and property taxes
- non-tax revenues, such as service charges for water and sanitation and rents from municipal properties.

Gujarat and Maharashtra are the only large states that still collect octroi; most other states have phased it out in favor of less distortionary taxes. Service charges are generally low and do not contribute much to overall revenues. A formula-based approach for devolving funds would provide secure revenues for municipalities. There are other ways to increase revenues as well. The Ahmedabad Municipal Corporation, for example, increased its revenue base by raising octroi revenues from Rs. 13 billion to Rs. 22 billion, and property tax receipts from Rs 4 billion to Rs 9 billion from 1993/94 to 1996/97. These revenue

increases stemmed from measures to improve collection ratios of taxes and to update assessment procedures.

Though tariff collection is aimed at the recovery of the costs made towards O&M expenditure, in practice most of the local bodies fail to recover even the O&M costs. The O&M expenditure and tariff revenue for four cities namely Bangalore, Visakhapatnam, Aurangabad and Mangalore is given in Table 3.13. This table indicates that except for Visakhapatnam, the other selected cities, are unable to recover O&M costs. Thus it can be found that there is a huge gap between the revenue receipts and revenue expenditure, which may necessitate the increase of tariff rates.

Water tariffs in most cities are much lower than cost of providing water. Some organisations like Bangalore Water Supply and Sewerage Board (BWSSB) and those agencies, which have taken loans from the financial institutions, are revising water costs to meet increasing costs of the service (Mehta M., 1993). Visakhapatnam, Chennai, Tirupur, Alandur, and Pune are some of these municipalities, which have either revised their tariffs or in the process of doing so. The BWSSB has increased water rates by 20 percent almost every year since 1991 to recover the escalatory cost of processing and supplying water. Though facing financial problems, many of the municipalities have not been able to revise water rates, as there was considerable local opposition to the same. Thus, instances of rationalisation of the water tariffs are few, and the service is still highly subsidised and water tariffs have remained stagnant in many cities for decades.

City	Revenue Expenditure Per 1000 liters	Revenue Receipts Per 1000 litres	Surplus/ Deficit
Bangalore	3.84	3.50	-0.34
Visakhapatnam	1.05	2.85	1.80
Aurangabad	1.32	0.74	-0.58
Mangalore	1.24	0.68	-0.56

Table 3.13: Revenue Receipts and Revenue Expenditure for Water Supply and Sanitation.

To understand the present performance of water supply schemes in terms of their revenue and expenditure, the revenue and expenditure levels of a few selected cities are shown in the table 3.14 (ORG, 1995) for 1993-94. This table represents the gloomy picture of water supply status in Indian cities. Of the eight cities presented in the table, only Visakhapatnam is having more revenue than expenditure. For remaining all cities, the difference between revenue and expenditure is negative. Total expenditure towards water supply is less than total revenue through tax and user charges. For cities like Delhi, Madras and Lucknow the difference between revenue and expenditure is more than 100 million rupees per annum. A minimum difference of Rs. 3.4 million was observed in Bhuvaneshwar.

City	Total revenue (Tax + User charges)	Total Expenditure	Difference between revenue and expenditure
Delhi	688.7	800.00	-111.3
Madras	66.3	509.1	-442.8
Lucknow	73.8	181.7	-107.9
Surat	23.8	80.0	-56.2
Visakhapatnam	170.9	100.9	70.0
Solapur	40.3	62.9	-22.6
Raipur	13.2	18.1	-4.9
Bhuvaneshwar	18.4	21.8	-3.4

Table 3.14: Performance of Water Supply Services, 1993-94 (Rs. Million)

In view of low existing tariffs, the water supply projects financed by agencies like HUDCO are proposing increase of tariff to cover the costs. The proposed increase ranges from 35 to 275 percent. Existing and proposed tariff rates for a few of the selected water supply projects financed by HUDCO before revision are given Table 3.15. It may be noted that some municipalities are supplying water free and hence there is scope for revision of tariffs.

State	City / Town	Existing Tariff (Rs. per KL)	Year	Proposed Tariff (Rs per KL)	Year	Production cost based on Gross Water production (Rs per KL)	Net Water Prod. (Rs. Per KL)
Karnataka	Arasikere						
	Domestic	Free of cost	1991-92	7.12	1992-93	7.87	9.26
	Non Domestic	Free of cost	1991-92	14.24	1992-93		
	Commercial	Free of cost	1991-92	21.36	1992-93		
Karnataka	Hubli- Dharwad						
	Domestic	1.50	1991-92	2.03	1992-93	2.24	2.635
	Non Domestic	3.00	1991-92	4.06	1992-93		
	Commercial	6.09	1991-92				
Karnataka	Tiptur	Free of cost					
	Domestic	Free of cost	1991-92	4.82	1993-94	5.32	6.26
	Non Domestic	Free of cost	1991-92	9.64	1993-94		
	Commercial	Free of cost	1991-92	14.46	1993-94		
Karnataka	Hassan	1.90	1991-92	3.18	1993-94	3.525	4.147
	Domestic	3.80	1991-92	6.36	1993-94		
	Non Domestic	5.70	1991-92	9.54	1993-94		
	Commercial						
Karnataka	Tumkar						
	Domestic	Rs. 8-10/month/per house	1990-91	2.10	1993-94		
	Non Domestic	Rs. 75/month/per connection	1990-91	4.20	1993-94		
	Commercial	-	1990-91	6.35	1993-94		
Kerala	Tellicherry						
	Domestic	0.40	1991-92	1.50	1992-93		
	Non Domestic	0.80	1991-92	3.00	1992-93		
	Commercial						
Kerala	Cannanore						
	Domestic	0.40	1990-91	1.50	1992-93		
	Non Domestic	1.80	1990-91	3.00	1992-93		
Kerala	Malapuram						
	Domestic	0.75	1990-91	1.50	1992-93		
	Non Domestic	2.00	1990-91	3.00			
Kerala	Iranjal Kuda						
	Domestic	0.50	1990-91	1.50			
	Non Domestic	1.00	1990-91	3.00	1993-94		
Kerala	Tiruvalla & Changanacherry	Rs. 0.60	1989-90	Rs. 1.20	1993-94		
Tamil Nadu	Madurai	-	1989-90	Rs. 1.80	1991-92		
Orissa	Bhuvaneshwar	Rs. 0.71/KL	1989-90	Rs. 0.90/KL	1993-94	0.804	0.99
West Bengal	Calcutta	-	1989-90	Aug. Rs. 4.00/KL	1994-95	2.63	
Assam	Guwahati	0.40	1989-90	Rs. 3.00/KL	1992-93		

Table 3.15: Existing and Proposed Tariff rates of HUDCO Financed Water Supply Schemes.

3.10 Investment Requirements

Municipal authorities traditionally have depended less on their own budget surpluses, but more on grants and loans from the central and state governments. Recently, limited institutional financing from government owned development finance institutions has benefited the sector. The funds available through plan allocations are less than those required for providing basic services. Political considerations, rather than any rigorous project preparation or appraisal process, generally decides allocation of these funds to different municipal authorities.

The levels of investment needed are dictated largely by the sector objective to be achieved in the Ninth Five-Year Plan. The broad objective is to achieve 100 percent urban population coverage with water supply facilities and 75 percent population coverage with sanitation facilities. The Plan envisions substantial support from the private sector in meeting these targets.

The investment required to achieve 100 percent coverage with safe drinking water and 75 percent with sanitation are massive and call for recurring and non-recurring investment of very high magnitudes. The planning commission estimates that to make up the huge backlog in the water supply and sewerage sector in the next 10 years, investments of about Rs. 15,000 crores per annum would be required.

a. Additional Investments Needed

To meet the O&M expenditure and for better coverage of the population, additional investments are required to the municipalities from the external agencies, as the in-house revenues of the municipalities are not able to meet its O&M expenditure. The external sources of funding include grants from the state government, deposits/ advances made by users for service connection, borrowings from markets and central/ state governments, capital grants or loans raised from the overseas agencies like World Bank, Asian Development Bank, etc.

A few financial norms have been set by various committees at the national level for provision, operation and maintenance of urban infrastructure facilities like water supply. The important among them are norms as suggested by Zakaria Committee, the Planning Commission, the Government of Gujarat and the Operations Research Group. The cost of additional investments required based on their norms were suggested by these organizations for the total infrastructure facilities covering water supply, sewerage, solid waste disposal, drainage, roads and street lights. Investments required only for water sector and sanitation as per 8th plan is Rs 57.57 billion for the period 1992-1997. The Planning commission has estimated Rs 86.12-129.18 billion would be required for additional investments in water supply for the period 1996-2001. As against this, ORG gives the range Rs 56.55 to 148.77 billion. The figures estimated by the Zakaria Committee and the Government of Gujarat based on their own norms are Rs 61.15 billion and Rs 109.15 billion respectively. Society for Development Studies, Delhi had estimated Rs 739.9 to 1582.5 billion would be required to meet the backlog up to 1995 and for the

projected investments required for the next 25 years i.e. is up to 2001. Table 3.16 gives the state-wise additional investment required per annum, for water supply by 2001.

A minimum amount of Rs 9.43 to 14.35 billion per annum is required for the period 1996-2001. Table 3.17 (NIUA, 1995) gives the total investment required per annum for urban water supply would be Rs 77.38 billion for 2001-26 as per Zakaria committee norms. As per the estimates available Rs 696.70 billion would be required to clear the backlog as of 1995. These estimates are based on 1994-95 prices.

States	Planning Commission estimates: Average Need per annum: 1996-2001 Rs. Mil		Government of Gujarat estimates: Average Need per annum: 1996-2001 Rs. Mil	ORG estimates: Average Need per annum: 1996-2001 Rs. Mil		Zakaria Committee estimates: Average Need per annum: 1996-2001 Rs. Mil
	Low	High		Low	High	
Andhra Pradesh	1290	1940	1640	850	2230	920
Assam	140	210	180	90	240	100
Bihar	690	1030	870	450	1190	490
Gujarat	920	1370	1160	600	1580	650
Goa	40	60	50	20	60	30
Haryana	290	440	370	190	510	210
Himachal Pradesh	30	50	40	20	50	20
Karnataka	840	1250	1060	550	1440	590
Kerala	680	1020	860	450	1170	480
Madhya Pradesh	1130	1700	1430	740	1950	800
Maharashtra	2090	3130	2640	1370	3600	1480
Meghalaya	20	30	30	10	40	20
Orissa	280	420	350	180	480	200
Punjab	360	540	450	230	620	250
Rajasthan	690	1040	880	460	1200	490
Tamil Nadu	980	1470	1240	640	1690	700
Tripura	50	70	60	30	80	30
Uttar Pradesh	1880	2820	2390	1240	3250	1340
West Bengal	1120	1680	1420	740	1940	800
Total (Selected)	13520	20270	17130	8870	23350	9600
All India	14350	21530	18190	9430	24800	10190

Table 3.16: Additional Investments Needed for Water Supply by 2001

Year	Amount Rs. Mil
Backlog up to 1995	696.7
Additional investment for 1996-97	86.12
Additional investment for 2001-06	77.58

Table 3.17: Investments Required to Clear Backlog and for Additional Provisions

3.11 Private Sector Participation Attempts in Water Supply and Sanitation

Over the last few years there have been several attempts to introduce privatization in the water sector, especially in the states of Tamil Nadu, Andhra Pradesh and Karnataka and Maharastra. Most of these have been O&M and service contracts. Municipalities and water boards are looking up to the private sector to provide financing to increase capacity and supply. Their weak financial condition leads to questions about their ability to pay for increased supply. Increasing bulk supply will not solve these problems. Increased bulk supply with same system would put more pressure on the system. And if water pressure is increased, it could lead to greater losses. Increased losses would again require finances to arrest these losses. Substantially improved commercial performance and mechanisms for ensuring more cost-reflective tariffs are required if the sector is to generate financial resources that meet the expected increase in demand. There have been several initiatives to encourage private sector participation in providing urban water, sewer and other municipal services in India. The Chennai Metropolitan Water Supply and Sewerage Board outsourced the operations and maintenance of 14 sewage pumping stations in 1992. These were followed by an additional 61 pumping stations, the operations and maintenance of 4 water boreholes, and an operations and maintenance contract for Chennai's new water treatment plant. Sewage pumping stations that are contracted out have achieved cost savings of 45 to 65 percent over the time stations were operated by the board. Other municipalities, including Hyderabad, Rajkot, Surat, Nasik, Pune, and Tirupur have contracted out the provision of services. Rajkot has contracted out solid waste management, street light maintenance and other services to private companies and community groups. The municipality has maintained sufficient capability to provide essential services in the event of service disruption. Rajkot has reduced costs by 5 percent

of total revenue expenditures and has achieved some increases in service coverage. As is common in most developing countries, private water vendors play a substantial role in meeting water demand.

Water vendors operating with carts or trucks and self-supply by housing associations are examples of private participation meeting residential demand. Municipalities, state governments and water boards have shown considerable interest in attracting the private sector into funding, constructing, operating and maintaining facilities such as bulk water treatment plants. However, no projects have reached financial closure so far, although the Tirupur project is nearing this milestone. Several projects have been abandoned, notably in Hyderabad, Cochin, and Pune, as per table 3.19. The planned project in Goa has been shelved and the state government is considering the introduction of a statewide concession.

S.No.	City	Nature and status of PSP in water and sanitation
1.	Hyderabad	BOT for Krishna Bulk Water Supply. Initiated in 1995, Abandoned BOT for sewerage treatment plant. Initiated in 1996. Abandoned. Proposal for either institutional restructuring along the lines of Johannesburg or concession along the lines of Manila. Initiated in June 2001 with the support from the WSP and under development. Pilot O&M Management contract also under consideration.
2.	Tirupur	Industrial and municipal water and sewerage project with 30 years concession. Initiated in 1994 and the Notice to proceed to contractor was issued in October 2001. Construction is to begin shortly.
3.	Cochin	Initiated water supply project. Pre-feasibility conducted in 1996. Bidding process was not initiated.
4.	Bangalore	BOT Project for Cauvery Bulk Water Supply. Initiated in 1997 and abandoned. ROT (Rehabilitation-Operate-Transfer) of existing system. Initiated in 1997 and abandoned.

		<p>BOT for two sewage treatment plants (two separate projects). Initiated in 1997 and abandoned.</p> <p>Management contract for two pilot areas of 1 million population each. Consists of operation and maintenance to improve the service quality and efficiencies. Initiated in early 2001. Vivendi and Ondeo have jointly submitted a proposal recently and the contract is under negotiations. Presently stalled.</p>
5.	Chennai	BOT Project for Water Treatment Plant. Initiated in 1997 and abandoned. In addition, few O&M contracts for pumping stations and treatment plants operational.
6.	Goa	BOT for source development and water treatment plant. Initiated in 1997 and abandoned in 1998.
7.	Pune	Build-Finance-Transfer (BFT) for water and sewerage system for construction, finance, operations and billing and collection. Initiated in 1997 and cancelled in 1998.
8.	Dewas	Long term concession for industrial and domestic water and wastewater system. Initiated in 1996 and under development.
9.	Visakhapatnam	Long term concession for industrial domestic water system. Initiated in 1996 and under development.
10.	Nagpur	BOT for water treatment plant, transmission and distribution system. Initiated in 1998 and abandoned in 1998.
11.	Kolhapur	BOT for water sewerage and solid waste management. Initiated in 1997 and abandoned in 1997. Solid waste management component is under construction through BOT arrangement.
12.	Surat	Initiated as long term concession for water and wastewater in 1998 and abandoned the same year.
13.	Alandur Tamilnadu	BOT for sewerage treatment plant of 14 years and construction contract for sewerage system. Initiated in 1997 and the contract was awarded in 1999. Construction is underway.
14.	Haldia	BOT for water source development. Initiated in 1998 and abandoned.
15.	Delhi	<p>BOT project for water treatment plant. Discussion initiated in 1998 and no action.</p> <p>Water treatment plant with 10 year O&M contract awarded in 2001.</p>
16.	Kakinada	Initiative by Ondeo for operations and maintenance with appropriate

	AP	investments. Initiated in 1998 and abandoned.
17.	Tamilnadu	Villupur-Cuddalore water supply project on BOT basis. Four sewerage projects on BOT basis in cities of Pallavaram, Erode, Karur, Tambaram. Documentation initiated in 1997 and under development.
18.	Four towns Karnataka	Mysore, Hubli-Dharwad, Bangalore and Belgaum. Initiative by Anglian Water International for operations and maintenance with appropriate investments. Initiated in 1998 and abandoned.
19.	13 towns Karnataka	Proposal for management contract for O&M in 13 towns. Initiated by the Government of Karnataka in 1997 with the support from the World Bank. Under Preparation. Some towns opted out. Model of regional water company with ownership from cities along the PSP lines is being explored. Now 3 towns (Belgaum, Gulbarga and Hubli-Dharwad) selected for demonstration projects for 24/7 supply (24 hour 7 day). The author is connected with this project for developing the Social Intermediation and Communications Strategy.
20.	Mumbai	Proposal for management contract for O&M in pilot area with 1 million population.
21.	Sangli Maharashtra	Proposal for management contract in Phase I and a concession in Phase II. Initiated during 2000 with the support from the Government of Maharashtra, IL&FS and FIRE project and under preparation.
22.	Zahirabad AP	BOT for entire system. Initiated in 2001 and under development with the support from Hyderabad Metro Water Supply & Sewerage Board.

Table 3.18: Nature and Status of PSP in Water Supply and Sanitation in India

There are two main approaches to structuring these projects. The first is selling water solely to a municipality or water board, as in the abandoned Hyderabad project or the ongoing Bangalore project. The second is delivering water principally to industrial consumers who have a good credit base, as in the Tirupur project. Several municipalities have attempted to tap the financial markets. Ahmedabad's bond issue, which was based on escrowing octroi revenues, is relatively well known. To attract private funds in Pune, bonds backed by octroi receipts were to fund proposed water projects. The Tamil Nadu

Urban Development Fund finances predominantly small projects within municipalities. This fund is composed of about Rs 191 crores. Of this amount, the ICICI Ltd. provided Rs 21 crores and Infrastructure Leasing and Financial Services Ltd. and the Housing and Urban Development Corporation provided Rs 15 crores each. Many international water operators are investigating opportunities for managing water service in India. There are several potential obstacles to introducing the private sector. These include inadequate information about the current financial and physical condition of the service provider and assets, tariffs well below cost recovery levels, and the need to obtain the full support of the workforce. Additionally, there is a need to create regulatory framework for other forms of private sector participation such as leasing and concession contracts. Many international water operators are trying to identify opportunities for concessions in medium-size towns in India.

A relatively limited number of build-operate-transfer (BOT) projects have been attempted in India so far. When these projects sell water to a municipality or board, the potential investor's main concern is the purchaser's ability to pay for services. When these projects sell water to industrial consumers who have the ability to pay, additional complications arise, such as the requirement to provide water at subsidized rates to residential consumers located nearby. In the case of the Tirupur project, table 3.18 (Mehta M., 1999 & Satyanarayana, 2002), out of a total of 185 million liters per day (MLD), 14 MLD will be provided at highly subsidized rates to residential consumers.

The detailed description of the projects being implemented or attempted with private sector participation is given in Tables 3.19 and 3.20 (Mehta M, 1999. Naraang S, 1998, Subramanyam L, 1999, Rao GK, 1999, Ahmed Imtiaz 1999, Kirti Devi 2000, Kirti Devi

and V Subramanyam 2001). Majority of the privatization attempts in water supply sector have fallen by the wayside. The Hyderabad Bulk Water Supply Project from the Krishna River, which was initiated in 1995 on a BOOT basis, failed. The Ahmedabad Water Supply and Sewerage Project also attempted to involve the private sector but without success. Pilot projects in selected zones have been preferred for outsourcing of operational tasks in a larger city or utility frame work. But they have not been very successful as in the case of Bangalore and Mumbai. Chennai was one of the early starters. As early as 1992, Chennai Metropolitan Water Supply initiated several O&M projects including O&M of mobile water supply using tankers, water production wells and water treatment plants. Some of these contracts are still in operation. The Hyderabad Metro Water and Sewerage Board in 1993-94 gave O&M contracts for water treatment, sewerage treatment and metering. In 1997, the Nagpur Municipal Corporation gave away O&M for a water treatment plant. Bangalore Municipal Water Supply Initiated a delegated management contract in two water supply zones which did not take off.

There are other initiatives as well. One project which is in progress is a 14-year BOT project for sewerage treatment at Alandur in Tamil Nadu. The contract has been awarded to the Hyderabad – based IVR group. There are other contracts where private participation is greater. The Tirupur project is among the biggest projects involving private – public investment, this is to be implemented on a BOOT basis. The project will supply 185 million litres of water per day and service nearly 1,000 textile units and over 1.6 million residents of Tirupur. The project achieved financial closure after several years of delay. It is expected to be commissioned by mid 2005.

The Visakhapatnam Industrial Water Project is another project that is being developed on a public – private format. This project being developed by L&T, is a few months from financial closure. Meanwhile, a project for water supply to Jamshedpur, which is a joint venture between Tata Steel and Vivendi Water India, is under implementation. Another progressive project is coming up in Sangli in Maharashtra. Phase-1 of the project seeks to award a three-year management contract for improving the efficiency and customer service of the water and sewerage systems. In the second phase, a 30-year concession contract will be awarded.

Table 3.19: Description of PSP projects being implemented in Water and Sanitation Sector in India

S. No.	Project and location	Sector	Focus	Project cost Rs. In million	Financial Sources	Means of PSP	Project Status	Project Description
1	Ahmedabad Water Supply And Sewerage Project	Sewerage, Water Supply	Capital Investment	4890	Bonds, Financial Institutions, Own Sources	Financing	Construction Operation & Maintenance	Ahmedabad municipal Corporation (AMC) has designed a project for improved water supply and sanitation services with an objective to provide 180 lpcd of water to the city and 150 lpcd to the recently developed localities of eastern Ahmedabad. The sewerage component of the project would provide sewage collection, treatment, and disposal to a part of East Ahmedabad that is currently not served. To partly finance the project, AMC issued a municipal bond of Rs. 1,000 million in January 1998; 75 percent was raised through private placement and 25 percent through a public offer. This was the first public issue from a municipal authority in India without a state government guarantee.
2	Andhra Pradesh Urban Services For The Poor	Integrated Area Development	Capital Investment, Operation & Maintenance		Central Government, Financial Institutions, Own Sources, State Government	Financing	Operation & Maintenance	To improve the urban poor's accessibility to sustainable services in 32 Class 1 towns benefitting 2.2 million slum dwellers. The APUSP has three complementary components: a) municipal reforms to become more efficient and responsive b) supply improved environmental infrastructure - water supply, sanitation, solid waste management, drainage, roads/footpaths, and street lighting - to the poor on a sustainable basis c) identify and undertake other poverty reduction measures with the active participation of the poor and civil society.
3	Industrial Water Supply Project, Visakhapatnam	Financing, Water Supply	Capital Investment, Operation & Maintenance		Financial Institutions, Own Sources, Operator Finance, State Government	Build-operate-transfer, Financing	Project development	Andhra Pradesh Industrial Infrastructure Corporation Ltd. (APIIC) is in the process of providing water supply and wastewater disposal services to the industries establishing in Industrial Development Area (IDA) near the village of Pravada, about 30 km south-west of Visakhapatnam. APIIC proposed implementing this water supply project in two phases. In phase I, they will supply water to the IDA by reducing seepage losses in the YLBC from 70% to about 32%, without any extra release of water from the Yeleru reservoir. This will satisfy the current and anticipated demand for water in the immediate future and will demonstrate to industries, considering setting up factories at the IDA, that sufficient water

								will be available. Once the demand for water justifies it, phase II will be implemented. This will involve new construction of a system to take water from the Godavari River to YLBC. The bidding process for the Phase I of VIWSP is underway.
4	Management And Service Contracts, Hyderabad Metropolitan Water Supply	Sewerage, Water Supply	Operation & Maintenance		Own Sources, Operator Finance	Service Contract		<p>The Hyderabad Metropolitan Water Supply and Sewerage Board (HMWSSB) with a view ensure that technology selected for new facilities or equipment will increase efficiency has entered five service contracts for private sector participation. Private Sector Participation through Service Contracts: three of which are for newly constructed or refurbished water and sewage treatment plants while the other two are for new equipment.</p> <p>The Board entered into three operation and maintenance (O&M) service contracts in the second half of the 1990s for Operation and Maintenance of Sewer Cleaning Machines and Installation, Operation and Maintenance of Water Meters:. Another contract was for installation, operation and maintenance of water meters. This was to support the utility level strategy to reduce unaccounted water. The contract covers maintaining 73 bulk flow meters, 27,000 bulk consumer meters, and over 98,000 domestic meters. The contract covered a period of four years following the one-year warranty. Annual charges were fixed for the entire contract period as part of the initial bid.</p>
5	Management Contract For Water Supply Distribution, Mumbai	Water Supply	Operation & Maintenance		Financial Institutions	Service Contract	Identification	<p>The Mumbai Sewage Disposal Project will provide water system management in K (East) Ward, one of the 24 administrative wards of the city. K (East) ward has approximately one million residents and 65 industries. The PSP contract includes the following</p> <p>Complete study of present distribution, billing and tariff collection system and suggest measures for improvement management including duties and performance of personnel managing the system; the operation, maintenance and monitoring system; consumer service procedures; water billing and collection system and suggested measures for improvement. Measure UFW accurately and rectify defects to reduce UFW.</p>

Table 3.20: Description of PSP projects being implemented exclusively in Sanitation in India

S. No.	Project and location	Focus	Project Type	Project cost Rs. In million	Financial Sources	Means of PSP	Project Status	Project Description
1	Alandur Sewerage Project, Tamil Nadu	Operation & Maintenance	Sewerage: Collection, Treatment	480.00	Financial Institutions, Own Sources, State Government	Build-operate-transfer, Financing Project Management, Turnkey	Selection of Operator	Alandur municipality, located in the Chennai metropolitan area lacks an underground drainage and sewerage system, so it designed a project that would provide this service for its current population as well as for an estimated population of 300,000 in the year 2027. In order to minimize construction and design risks, the municipality plans to implement the project through an innovative contractual arrangement. In this arrangement the private operator will: (a) construct the sewer collection system and pumping station through a regular contract; and (b) construct and operate the sewage treatment plant on a build-own-operate-transfer (BOOT) basis. Revenue already collected from the deposits is estimated to be Rs. 82.25 million through a one time deposit of Rs. 5,000 and Rs. 10,000 per connection for domestic and non-domestic users respectively. The local body will recover the costs through a combination of sewerage tax, sewerage charge, connection charges, general revenues and state government support. The sewerage charge was fixed at Rs. 150 per month per connection.
2	Contracts For Solid Waste Management, Hyderabad	Operation & Maintenance	Solid Waste Management: Collection, Disposal, Transportation		Operator Finance	Concession, Management Contract, Service Contract	Operation & Maintenance	Over the past seven years the Municipal Corporation of Hyderabad (MCH) has been developing and refining approaches to private sector participation in solid waste management (SWM). These measures include private sector involvement in primary collection, street sweeping, transportation and disposal of solid waste in the city. In 1995, the Corporation began to contract out solid waste related services. In 1998 MCH introduced a new unit-based system for private sector participation that integrated the two types of contracts --for road cleaning at night and for sweeping, collection, and transportation by day. According to MCH estimates, these latest reforms saw the collection increase to about 90-92 percent. Overall about 60 percent of the work is contracted out.

3	Private Sector Participation In Solid Waste Management In Chennai	Capital Investment	Solid Waste Management: Collection, Transportation		Operator Finance	Service Contract	Operation & Maintenance	<p>In March 2000, the Chennai Municipal Corporation privatized waste collection and transportation in three of the 10 city zones covering approximately 35 per cent of the Corporation area and about one fourth of the city's eight million population. Its purpose is to modernize service delivery and service management.</p> <p>The Corporation agreed to pay the private firm (M/s C.G.E.A. Asia Holdings, Singapore) Rs.648 per metric ton (MT) for the first year. This amount will be escalated annually at five percent. This is much lower than the Corporation's estimated cost of Rs.1050 per MT for service delivery using its own employees and machines. The Corporation estimates that it will save Rs.10 to 12 crores a year. Existing Corporation workers were redeployed to other departments and no worker lost his job.</p>
4	Privatisation Of Solid Waste Management, Package I, Greater Noida, Uttar Pradesh		Sewerage: Collection Solid Waste Management: Disposal, Transportation		Operator Finance	Service Contract		Greater NOIDA Industrial Development Authority (GNOIDA) is currently developing a greenfield integrated township and is keen to attract private sector participation (PSP) in infrastructure development and operations and maintenance of the facilities.
5	Solid Waste Disposal Plant In Lucknow	Capital Investment	Solid Waste Management: Disposal	Rs. 760 million	Central Government, Financial Institutions	Build-operate-transfer	Construction	The municipal corporation, Lucknow Nagar Nigam, partnered with Enkem India Ltd, a promoter, through a Special Purpose Vehicle called Asia Bio Energy (India) Ltd. (ABIL), to build a power generation-cum- bio-fertilizer plant on a Build-Own-Operate (BOO) basis. The project would generate 5.1 megawatts (MW) of electric power per day (after captive consumption of 0.5 MW) and about 75 tons per day (TPD) of organic manure by treating 300 TPD of waste. The power generated by the company would be transmitted into the grid of the Uttar Pradesh State Electricity Board (UPSEB).
6	Solid Waste Management By Neighbourhood Groups In Ludhiana		Sewerage: Collection, Treatment		Own Sources	Service Contract	Operation & Maintenance	The Ludhiana Municipal Corporation (LMC) was able to provide sanitation services (solid waste collection and clearing of drains) to only 40 percent of the city's area. To expand the service to more people, LMC promoted the involvement of

								neighbourhood groups (community based organization). In this programme, the municipality first forms and registers neighbourhood groups. Then, it contracts with them for door-to-door waste collection in the locality.
7	Solid Waste Treatment Facility, Nagpur Municipal Corporation		Solid Waste Management: Disposal	513.00	Financial Institutions	Financing	Financial Closure	The Nagpur Municipal Corporation (NMC) decided to set up a waste-to-energy (bio-methanation) facility for the solid waste dump sites to convert organic waste into biogas the Nagpur Municipal Corporation entered into a concession agreement with CICON and ENBEE Infrastructure Ltd. to set up the waste-to-energy facility on a Build-Own-Operate (BOO) basis. The project had not been able to take off since its inauguration in November 1998 even though construction on the facility had begun with the initial financing available. The corporation announced that ENBEE, the financing entity, had backed out of the project due to its inability to invest in the project.
8	Solid Waste Treatment - Compost Plant In Vijayawada	Capital Investment, Operation & Maintenance	Solid Waste Management: Disposal	14.90	Operator Finance	Build-operate-transfer		Vijayawada Municipal Corporation (VMC) and Excel industries setup a new recycling plant, which converts organic waste to compost on a BOO (build -own-operate basis). There was no provision for a final transfer of the facility to the municipal authority. Excel Industries completed construction of the facility in 1997 and has been operating it since then. Excel expects to recover its investment and meet their financial obligations to the VMC through the sale of organic manure, a by-product of the composting process. The firm shares profits with the municipal corporation.
9	Solid Waste Treatment Facility, Kolhapur Municipal Corporation		Solid Waste Management: Disposal	30.00	Operator Finance	Build-operate-transfer	Construction	Kolhapur Municipal Corporation (KMC) to upgrade its solid waste management system, decided to implement a waste composting project using private sector participation. The KMC, in April 1999, selected Zoom Developers to implement the project in association with Larsen Engineers. The KMC and Zoom Developers signed a 30-year Build-Own-Operate-Transfer (BOOT) contract in September 2000. The concessionaire (Zoom Developers) agreed to design, construct, operate, and maintain the waste treatment facility for the concession period and to mobilize its financing. The local body views this as a way to attract private capital to create

								facilities that will eventually be owned by them. The estimated capital cost was Rs. 30 million (1998 prices) and was mobilized by Zoom Developers. The concessionaire, who is solely responsible for marketing organic fertilizer produced by composting waste, will retain income from sales. This will enable it to recoup its investment.
10	Vijayawada Sewage Treatment Plant		Sewerage: Treatment	80.00	Own Sources, Operator Finance	Build-operate-transfer		The Vijayawada Municipal Corporation (VMC) introduced a number of urban innovations with private sector participation. The Corporation contracted with a private firm to build a solid waste treatment plant on a build-operate-transfer (BOT) basis. VMC proposes to construct two sewage treatment plants with private sector participation. The total capacity of the plants will be 32 million litres per day (mld) and the estimated cost is Rs. 80 million.

Reasons for low success Rates:

1. ULBs lack commercial orientation and a progressive approach. It is difficult to have private formats within ULBs – this is why special purpose vehicles have been formed in the cases of Visakhapatnam and Tirupur.
2. ULBs also lack “project development” expertise required for project conceptualization, technical studies, contractual frame work, procurement process, stakeholder consultation, etc. Neither is this role recognized adequately nor is outside support is generally sought.
3. ULBs often contract out with inadequate understanding and preparation. In such scenarios, the bidders doubt the transparency and efficacy of the bidding process. As a result, very often there is little interest in bidding.
4. Many initiatives have been abandoned due to the lack of political support or due to political changes, as in the case of the Hyderabad Water Supply Project.
5. There are few experienced local private contractors and operators for turnkey water projects on BOOT basis and for management of systems. There are very few instances of partnerships among local operators and experienced foreign private utilities.
6. The lack of regulatory framework that covers issues such as service standards, quality and tariff issues and balances industry and domestic consumer interests is a big deterrent. In the absence of a regulator, perceived risks are higher.
7. Users (be it industrial users or communities) need to participate in the process by providing early information on the benefits of involving private parties.
8. Financing these projects is also challenging. These projects are capital intensive and involve longer tenors of 25-30 years. Proper risk mitigation techniques and the need for escrow covers and reserve fund necessitate that the project be structured well with clean contracts and fall backs. Also, water being a basic need, such projects bear tariff-related risks as well as strong social and environmental risks.

CHAPTER 4

IDENTIFICATION OF ISSUES RELATED TO PRIVATE SECTOR PARTICIPATION IN WATER AND SANITATION SECTOR

CHAPTER 4 – IDENTIFICATION OF ISSUES RELATED TO PRIVATE SECTOR PARTICIPATION IN WATER AND SANITATION SECTOR

4.0 Introduction

Traditionally urban water supply and sanitation services have been provided by local level agencies, financed usually in the form of loans/ grants from central/ state governments and external organizations like World Bank (WB), Asian Development Bank (ADB), etc. The revenue collection from the water supply scheme is not sufficient even to meet its O&M requirements. In majority of the ULBs there are no separate sanitation charges; these are generally a part of water supply tariff and/ or property tax. ULBs' (Urban Local Bodies) are not able to hike the tariff rates, as water supply services are considered as free services by public, to be provided by the government. However, it was found that people in some cities are willing to pay rather large amounts to private water suppliers. For example, in Delhi private tankers are charging Rs. 45 per 1000 liters, whereas public authority charges 69 paisa. The concept of cost recovery has never been considered relevant and the ULBs could not develop a commercial approach. Even if the facilities were funded by loans, repayments were usually book adjustments or paid out of grants from the state governments. When the user charges are levied, the price per unit is too low to cover even the variable cost of providing the service, resulting in poor performance of water supply schemes. Huge investments are required to provide water supply to the entire urban population of country. It is estimated that about Rs. 210 billion and Rs. 228 billion would be required, to provide required water supplies. for the periods 2001-11 and 2011-21 respectively. As the government does not have the financial capacity for mobilizing such huge investments, commercialization of urban water supply is becoming an inevitable option to the government. In summary the following

points are to be studied in depth to understand the need for water supply and sanitation commercialization.

- Poor performance of the ULBs in operating water supply schemes
- Huge gap between expenditure and returns
- Low tariff when compared to private operators and inability of ULBs to fix viable tariffs
- Requirement of huge additional investments, which ULBs does not have

Recent trends indicate that the urban water and sanitation sector is highly inefficient, there are problems in meeting the growing demand from industry and investment needs exceed funding from existing sources. The public has adjusted to urban water and municipal services to some extent to meet their needs, by storing water to safeguard against shortages and purchasing extra water from private suppliers. The poor operational performance of this sector strongly parallels the performance of the power sector. The emphasis on bulk supply facilities financed by the private sector and selling water to a public body or industrial consumers mirrors the power sector's initial emphasis on independent power projects. Experience in that sector since 1991 has shown that it will be difficult to finance projects without fundamental reform. Although some of the bulk water and sewer schemes being negotiated may reach closure, they are unlikely to solve the fundamental problems besetting water systems. India's urban water supply suffers mainly because it lacks a commercial orientation. Under an appropriate regulatory framework, the private sector can provide the required management expertise and incentives to reduce losses and expand service. However, India has yet to introduce private management in this area. An appropriate strategy would combine tariff increases with improvements in service standards and water availability, which in some cases will require substantial investments. Management contracts may be an entry point. However, without full management control, such contracts are unlikely to improve

operating performance significantly. Some private operators have suggested using management contracts to gather information about the system to allow the introduction of a more substantial form of private sector participation, such as concessioning. One alternative would be for the municipality or water board to undertake extensive due diligence to give bidders a concession with all the relevant information. This approach would avoid providing an advantage to a management contractor who is responsible for collecting the information and then allowed to bid. The issue of cost recovery needs to be addressed if the private sector is to assume investment responsibility. Price increases may need to be phased over time to better match improvements in water availability and quality and to allow a transition from the current low price levels. Targeted government support may be required. Such support could include financing a revenue gap, with explicit targets that would diminish over time, or providing capital investments to match private sector resources. Maintaining adequate prices while protecting consumer interests will require the creation of an appropriate regulatory framework. The strategies that are adopted need to provide a policy framework in which informal water providers can continue to provide services to the poor. The framework must also address water resource and allocation issues, particularly in water deficient areas.

4.1 Identification of Issues

The major issues in the water supply and sanitation sector which work against its commercialization are varied and listed below:

a. Supply Orientation

Water supply and sanitation in developing world's cities has expanded in an unplanned manner. Demand has always exceeded the supply. Many ULBs do not have sewerage facilities. Leading to unscrupulous depletion of natural resources like groundwater. Soaring demand is presently met by short-term planning and augmentation. Planners always projected future needs without considering whether available supplies could sustainably meet them. Today's water institutions, government agencies, the policies, the laws, planning and engineering practices that shape water supply projects are steeped in a supply side management philosophy which is no longer sustainable. Though the conventional approach of continuously expanding supplies may work when the water is abundant, it is not suitable to an era of water scarcity and rising water demand.

b. High System Losses

Cities in developing countries have a major problem of system leakage losses, termed as Unaccounted For Water (UFW). The leakage losses range from 30 to 50 percent. This problem has a direct impact on revenue generation and sustainability of the whole system. The losses are mainly due to old pipelines, poor quality of material and poor operation and

maintenance. Instead of going for 50 percent augmentation, the water supply agencies should invest in leakage prevention, which could save additional capital investments.

c. Lack of Water Conservation Methods

Reduction in water consumption has an impact on reduction in operation and maintenance costs. Several American states have laws requiring fixtures in houses and offices to meet conservation standards. This reduces water consumption by 50 to 70 percent. In India, no such conservation fixtures are in use. Typical Indian toilet users tend to use 12 liters of water for flushing while the cisterns in the United States uses only 5 liters. Even by conservative estimates, water efficient fixtures in India could reduce water consumption by 25-50 per cent. The other major problem is the lack of awareness about conservation of water resources.

d. Non-Adoption of Recycling Technologies

Cities and industries typically release wastewater into the nearest watercourse. Treating this water before discharge and reusing it not only protects the quality of watercourses, but by using water several times, cities and industries can also get more production out of each liter, thereby lessening the need to develop new supplies. In the US, on an average, one cubic meter of water is used three to four times in industries before it is discharged. In Mexico City, 4 percent of water supply; mainly for gardening, filling up lakes and watering of public parks; is from recycled water. Such a concept is not prevalent in Indian cities. Further, rarely have planners focused on reducing demand and waste so as to balance the long-term supply and demand equation.

c. Unviable Tariff

Water tariff is highly subsidized in India. The “user pays” concept is almost absent. The reservoirs, pipes, treatment plants and sewerage that comprise the modern water utility system require vast capital investments to build, operate and maintain. Water prices reflect neither the capital cost nor production and maintenance cost. Naturally, water supply corporations are in the red. Further, the subsidized rates encourage inefficiency and wastage.

f. Comparison of tariffs between municipalities and private operators

The myth of people’s unwillingness to pay for water supply is exploded if one compares the rates paid by the residents to private suppliers with the tariff rates of municipalities. Table 4.1 (ADB, 1997) gives the average price being charged by the public authorities and private operators for providing one thousand liters of water in some selected Indian cities. The tariff charged by municipalities for providing 1000 liters of water is less than 70 paise in the cities of Delhi, Madras, Surat and Solapur, while private tankers are charging Rs. 35 to 60 for providing the same amount of water. These figures are not being viewed seriously by the municipalities as the advent of private suppliers has only marginally attacked their monopoly position and there is no need for the government agencies to feel threatened at competition. Hence the concept of cost recovery and efficiency have not been improved. High cost of establishment on account of wages and salaries continue to account for a major chunk of the costs.

City	Municipality (for 1000 liters)	Private Tanker (for 1000 liters)
Delhi	69 Paise	Rs. 45
Madras	18 Paise	Rs. 60
Surat	28 Paise	Rs. 40
Solapur	5 Paise	Rs. 35

Table 4.1: Comparison of Tariffs between Municipalities and Private Operators

g. Absence of Seasonal Tariffs

The serious water supply problem faced by water utilities is during the summer when capacity is limited and demand higher. Unlike in the United States, India has a standard tariff throughout the year. Therefore, the concept of water conservation in the summer months is non-existent, leading to a high-demand low-return situation.

h. Absence of Telescopic Charges

In most Indian Cities, the rates are either flat or based on a percentage of property tax. This is detrimental to water conservation practices. People tend to use any amount of water since the cost ceiling is the same. In fact, the tariff should be on a telescopic sliding scale with rates increasing in proportion to consumption. This facilitates the cross-subsidisation to the poor and the needy.

i. Methods of Cost Recovery

In most cities, the cost of water supply is financed out of water taxes of the ULBs. The tax base of these bodies is the property tax, which the Rent Control Act has kept stagnant at levels that hardly cover costs. The revenue collection efficiency too is generally poor.

The other method of financing water supply is user charges. These are expected to reflect the direct quid pro quo element and are expected to cover O&M expenditure, interest charges, cost of material etc. They are based either on number of outlets (taps) or on metered consumption. While pricing per outlet leads to wasteful consumption, meters are often tampered with at times in connivance with the municipal staff. Also, the meters are low quality and high cost. The charges vary according to user category or consumption level. At times, water is made available at concessional rates to some groups. In Delhi, these concessional rates are applied to resettlement colonies, employees of DWS&WDU, to the municipal corporation and to religious institutions.

4.2 Viability of Water Supply Commercialisation

Water supply projects are not commercially viable as they lie in non-market framework within which the services have been provided and the consequent neglect of both cost and revenue aspects of providing services. However proper attention to certain basic requirements, will improve the commercial viability of the water supply schemes. The basic requirements are:

- Proper project formulation and implementation
- Demand orientation
- Cost optimization, Pricing and Cost Recovery
- Encouraging competition

a. Project formulation and implementation

Proper project formulation is the basis of a successful and viable project. Skills are to be developed at the national level to strengthen the project formulation capabilities. Some projects should be planned simultaneously, as individually they may not be viable on their own. Viability of the project may also be improved due to reduction in waste and consequently cost. For example, water and drainage projects have to be implemented together as drainages pollute the surface waters and raises the cost of water treatment. This argument is even more valid for road and sewerage projects. In India, usually, road projects are followed by sewerage projects, wherein freshly laid roads are promptly dug up to lay sewer lines.

b. Demand Orientation

Services should be supplied in response to demand rather than anticipation of demand. Demand for services is to be seen not only in terms of quantity of water supplied but other dimensions like quality of water, time of supply and accessibility. Formulations of the projects are to be done with proper demand survey, which will increase the willingness to pay and commercial viability of the project. Demand assessment can improve decision making about the level of service, appropriate technology and prices to be charged.

c. Cost Optimization, Pricing and Cost Recovery

The price for user charges should be so determined as to cover not only the operational cost but also the capital and maintenance cost. It has been seen that fixing prices on full-cost recovery basis raises prices to an unacceptable multiple of existing prices, which may be unaffordable, by some sections of the population. In such cases, part of the cost may be caused through budgetary allocations or a discriminatory pricing policy that cross-subsidises the poorer sections. It is not possible to adopt a uniform approach and a decision will have to be taken based on the parameters of the service. Thus costs of water supply can vary from region to region. So do the affordability levels.

Greater emphasis needs to be put on cost minimization and minimization of that component of output which is sold at zero price. The latter refers to the leakage of output. Plugging these leakages can improve cost recovery significantly. For instance, it is estimated that 40 percent of water consumption in Delhi is unaccounted for. Similarly, proper maintenance of existing facilities can reduce the need of excessive capital expenditure to replace the facilities

prematurely. The infrastructure agency should take a long-term view of cost and avoid saving on short-term maintenance cost. Similarly, upgradation of existing assets and services can result in tremendous cost saving. Before taking up of any new water supply project, these factors should be carefully gone into and alternatives in terms of maintenance, upgradation, etc. be considered.

High cost translated into high price does not necessarily mean high profit. It may mean low cost recovery and low profit. Proper pricing helps not only in cost recovery but also in optimizing consumption. Low or subsidized prices may lead to wasteful or excessive consumption of the service.

d. Encouraging competition

A major instrument for promoting commercialization of water supply projects is through encouraging competition. Competition increases efficiency, improves the quality of service made available to the consumer at the minimum, possible price. A prerequisite for competition is the existence of a large number of players willing to participate in supplying water supply services. Government can create competition conditions also through leases or concessions that makes firms compete for the right to supply the entire market.

4.3 Checklist for Private Sector Participation in Water and Sanitation Sector

If it is considered desirable to introduce private sector participation into the management and operation of a utility, careful consideration must first be given to the selection of the appropriate approach. This will depend on the primary reasons for introducing the private sector and the legal, political, social, institutional and financial constraints that will apply. Having selected those approaches that are considered viable it is then necessary to consider the following questions.

- Who are the parties to the contracts that constitute the arrangement?
- What are the objectives and scope of the contractual arrangement?
- What is the duration of the arrangement, and what circumstances will give rise to early termination?
- What are the obligations and rights of the concessionaire?
- What are the obligations of the grantor?
- What are the key regulatory provisions?
- How will key risks be managed?
- How will performance be measured and monitored?
- How will assets (including land) be transferred?
- What consents are required?
- Who will be responsible for past environmental liabilities?
- How will disputes be resolved?
- Has an adviser with relevant expertise been selected to assist?

Having considered all of the above issues it should then be possible to select a preferred approach. The viability of the chosen model must then be tested by preparing a preliminary financial model. There is no point in going to the trouble of preparing documents and inviting tenders for a concession if a simple financial model indicates that the tariff that the concessionaire would have to charge would be far higher than would be considered acceptable. Once the approach has been chosen and the financial viability confirmed it is time to prepare the tender documents. It is not generally desirable to invite tenders without having prepared comprehensive tender documents, which answer all of the above questions in some detail. To do so results in tenders which are difficult to compare.

CHAPTER 5

DEVELOPMENT OF QUESTIONNAIRE AND RESPONSES

CHAPTER 5 – DEVELOPMENT OF QUESTIONNAIRE AND RESPONSES

5.0 Introduction

In order to arrive at acceptable and practical recommendations for private sector participation in water and sanitation sector, a questionnaire was designed and tested in the city of Hyderabad. The questionnaire is in Appendix 1. A brief note on the research and explanation of the terms used in the questionnaire was also distributed alongwith the questionnaire. The questionnaire was given to a wide cross section of individuals. They consisted of the following sections:

- Academicians
- Water Board Officials
- Non-Governmental Organisations
- Resident Associations
- Private Water Suppliers
- Contractors
- Consultants
- Media Professionals
- Water Board Consumers
- Other Professionals

The questionnaire was distributed to 120 persons belonging to the above categories. The questionnaire and the accompanying notes were explained to them. They were later pursued to fill in the questionnaire and keep it ready for collection. Out a total of 120 distributed

questionnaires. all 120 responses were obtained. These responses are summarised and tabulated below in the same order as the questionnaire in the following sub-chapters.

5.1 Methodology

The methodology used for this research is briefed under this sub-chapter. The following points describe the methodology and the process that has taken place during the research.

- Privatization or Private Sector Participation or Public Private Partnership is gaining popularity with the government and people in India. This is the result of the economic reforms process that is taking place in the country. Whether one likes it or not, it is going to be a part of the life of Indian citizens. Hence this topic was chosen for research.
- Water supply and sanitation were the burning issues of the last century, are of this century and will probably be for the centuries to come. There are many promises to provide good and reasonable water and sanitation services, but many of them are not fulfilled. There were decades named after water and sanitation, but with little effect. For this reason this sector was chosen for this research.
- After a thorough review of the available literature, the issues related to failure or slow progress of private sector participation were identified. It may also be noted that this is a relatively fresh and new subject, which does not have much of a literature or references, except for reports from institutions like the World Bank, Asian Development Bank, etc. There is only one significant report prepared by NCAER (NCAER, 1996). In the absence of much of literature, the author had to depend on the available reports and documents from international agencies mentioned above. Practical, hands-on and on-site experience of the author in this area was useful in this regard. Further the author has participated in a number of seminars, workshops and conferences on private sector participation in infrastructure, in particular water and sanitation.

- A two-tier questionnaire and responses process was followed for seeking informal public opinion and arrive at conclusions and recommendations. The two tier process eliminates any errors that may occur during the first round of the responses.
- A first hand questionnaire was developed to seek informed public opinion on private sector participation in water supply. The questionnaire was developed, distributed and collected after filling the responses of the respondents. Care has been taken to ensure that the respondents are not stuck with the new jargon and terminology used, by giving them some notes explaining the jargon and terminology.
- The responses of the first level questionnaire are summarised into a questionnaire and opinion on these sought from experts. The summarised responses were taken to experts to get their views on these. The experts amounting to 10 percent were chosen during the first round of the survey, so that they are well informed of the process.
- The responses were analysed to note perceptions of both the public and experts. The responses are given under sub-chapter 5.2 below. The question wise perceptions with degrees of agreement/ disagreement and/ or ranking/ choice on these issues are given in Chapter 6.
- Duly taking into account the perceptions of the people some conclusions were arrived at for speeding up the private sector participation process. A model has been built for private sector participation duly taking into account the perceptions of the people and the conclusions.
- The respondents are mostly from the age group of 30-50. 16 percent of the respondents are from the age group of less than 30, 56 percent are from the age group of 30-50 and 28 percent are from the age group of more than 50. The qualification of most of the respondents (55 percent) is graduate. 35 percent of respondents have post graduate qualification and 10 percent of respondents have doctorate degrees.

5.2 Responses

1. How do you rate the overall performance of the Water and Sewerage Board in your city?

Excellent	Very Good	Satisfactory	Below Satisfactory	Poor
2%	9%	39%	45%	5%

2. What is the source of Water Supply to your own needs?

Type	Water Board	Open Well	Borewell	Tanker	Private (Lay-out) Water Societies
Primary	82%	0	11%	5%	3%
Secondary	35%	0	47%	18%	0
Third	13%	10%	12%	25%	0

3. Which of the following can improve water supply status in the city?

Preference	New system	Expansion	Improving O&M of Distribution System	Reducing UFW
1	18%	23%	47%	12%
2	6%	19%	35%	40%
3	0	54%	10%	36%
4	76%	0	8	12%

4. Which of the following do you hold responsible for the present Water supply situation in your city?

Rank	Govt. in general	Politicians	Water Board Management	Distribution Operators
Rank 1	9%	6%	51%	34%
Rank 2	12%	10%	22%	56%
Rank 3	62%	23%	15%	0
Rank 4	17%	61%	12%	10%

5. Which of the below you think contribute to the losses in the Water supply in your city?

Rank	Main Trans. lines	At treatment	At Storage	In the Distribution System	At household level
Rank 1	40%	3%	7%	50%	0
Rank 2	17%	5%	10%	41%	27%
Rank 3	17%	28%	21%	5%	30%
Rank 4	23%	34%	14%	3%	26%
Rank 5	3%	30%	48%	1%	17%

6. Give your views on the adequacy of water tariff to domestic users in your city?

Option	Percentage
Too High	10%
A little more than adequate	21%
Adequate	40%
A little less than adequate	29%
Too Low	0

7. If the tariff is not adequate, by what percentage it should be increased for various users?

Increase	Percentage
80-100%	8%
60-80%	5%
40-60%	20%
20-40%	29%
0-20%	38%

8. If Tariff is more than adequate, by what percentage it should be reduced for various users?

Decrease	Percentage
80-100%	0
60-80%	23%
40-60%	48%
20-40%	16%
0-20%	13%

9. Which of the following factors you feel should be taken into consideration for fixing a rational tariff?

Rank	Quantity	Quality	Time and duration of supply	Service
Rank 1	55%	15%	27%	3%
Rank 2	35%	29%	32%	4%
Rank 3	10%	43%	19%	28%
Rank 4	0	13%	22%	65%

10. What kind of tariff structure is appropriate for your city?

Rank	Flat Rate	Telescopic with reduction	Telescopic with increase	Subsidized uniformly	Subsidized for poor
Rank 1	16%	15%	50%	5%	14%
Rank 2	27%	9%	12%	8%	44%
Rank 3	47%	6%	8%	24%	16%
Rank 4	10%	22%	8%	43%	17%
Rank 5	0	47%	22%	20%	11%

11. If finances are required for improvising the water supply and sanitation situation in your city, which of the following options is appropriate?

Rank	Increase in LT/Utility Share	Funds from State/Central Govt.s	Increase in Local taxes	Raising Bonds	Loan from WB/ADB/HUDCO/LIC/other FIs	Grants from Donors/Aid Agencies
Rank 1	7%	8%	42%	13%	19%	11%
Rank 2	0	23%	19%	40%	8%	10%
Rank 3	20%	24%	13%	12%	27%	4%
Rank 4	13%	38%	7%	32%	6%	4%
Rank 5	45%	0	5%	3%	32%	15%
Rank 6	15%	7%	14%	0	8%	56%

12. Which of the following agencies are best suitable / appropriate to handle water supply and sanitation to your city?

Rank	State Government	Urban Local Body	Autonomous PSU	Private Sector	User Cooperatives
Rank 1	9%	7%	53%	24%	7%
Rank 2	15%	11%	25%	22%	27%
Rank 3	22%	47%	14%	17%	0
Rank 4	5%	33%	7%	30%	25%
Rank 5	49%	2%	1%	7%	41%

13. What do you feel is the best suitable form of Private Sector Participation to improve water supply and sanitation in your city?

Rank	Service Contracts	Mgmt. Contracts	Concessions	BOT type arrangements	Total Privatization	User Cooperatives
Rank 1	26%	33%	7%	27%	6%	1%
Rank 2	24%	24%	12%	23%	10%	7%
Rank 3	21%	20%	21%	7%	8%	23%
Rank 4	13%	14%	13%	15%	19%	26%
Rank 5	16%	4%	38%	12%	13%	17%
Rank 6	0	5%	9%	16%	44%	26%

14. Which of the following components of your city's water supply could be easily opened up for Private Sector Participation?

Option	Bulk Supply	Distribution	Billing & Collection	Leak Detection and Repairs	Whole Operation and Maintenance
Very Easy	34%	37%	68%	58%	16%
Easy	15%	29%	23%	26%	37%
Not Easy	51%	34%	9%	17%	47%

15. Please rate the success / failure of privatization attempts in the following sectors as per the following scale.

Option	Aviation	Banking	Highways	Insurance	Ports	Power	Tele-communications	Water Supply
Successful	70%	75%	22%	64%	44%	36%	88%	17%
Average	26%	5%	46%	36%	39%	17%	12%	10%
Failure	4%	20%	32%	0	17%	47%	0	73%

16. If you rate Private Sector Participation as successful, then which of the following benefits you consider would result from it?

Rank	Efficiency gains	Virtuous management Practices	Technology growth	Prudent financial practices	Good Quality & service	Impartial regulation by govt.
Rank 1	43%	9%	6%	2%	40%	0
Rank 2	24%	26%	27%	11%	12%	0
Rank 3	21%	21%	30%	11%	14%	3%
Rank 4	9%	18%	22%	23%	13%	15%
Rank 5	3%	22%	6%	29%	5%	35%
Rank 6	0	4%	9%	24%	16%	47%

17. If you rate Private Sector Participation as failure, then which of the following losses have occurred to the sector.

High tariffs	Profiteering by Private sector	Cartel forming by private sector & monopoly	Technology stagnation	Financial irregularities	Poor Quality & Service	Biased regulation by govt.
18%	22%	21%	15%	11%	6%	7%

18. Which of the following can improve sanitation status in the city?

Preference	New system	Expansion	Improving O&M of Sewerage System	Treatment of sewage
1	25%	8%	58%	9%
2	17%	42%	33%	8%
3	17%	42%	8%	33%
4	42%	8%	0	50%

19. Which of the following do you hold responsible for the present sanitation situation in your city.

Rank	Govt. in general	Politicians	WB Management	STP Operators
Rank 1	9%	6%	51%	34%
Rank 2	12%	10%	22%	56%
Rank 3	62%	23%	15%	0
Rank 4	17%	61%	12%	10%

20. Which of the following components of your city's sewerage could be easily opened up for Private Sector Participation?

Option	Collection and transmission	Pumping Stations	Treatment
Very Easy	24	65	53
Easy	27	24	39
Not Easy	49	11	8

5.3 Summary of Responses

The summary of responses are described below

- Performance of Water and Sewerage Board is below satisfactory.
- Water Supply from the Water Board is the major source of drinking water supply than the private borewells or tankers or private water societies.
- Improving Operation and Maintenance of Distribution system will greatly improve the water supply status than building a totally new system or expansion of existing system by adding more bulk water capacity or reducing unaccounted for water (UFW).
- Water Board management is primarily responsible present water supply and sanitation status in the city than the government or politicians or distribution operators.

- Major losses in the water supply occur in the distribution system than in the transmission lines or at treatment or at household level.
- Present water tariff is adequate.
- Quantity of water supply should be considered as fixing the rational water tariff than the quality of supply or time and duration of supply or service levels.
- Telescopic rate with increase with increase of usage should be the appropriate tariff structure than the flat rate or telescopic rate with reduction or uniform subsidy or subsidized for poor.
- Increase in local taxes is the appropriate option for raising finances for improvising the water supply and sanitation situation than the funds from state/central governments or raising bonds or loan from banks or grants from donors and aid agencies.
- Autonomous Public Sector Units the best suitable agencies to handle water supply and sanitation status than the State Government or Urban Local Body or Private Sector or User Cooperatives.
- Management, Service and BOT contracts are the appropriate forms of private sector participation in water supply and sanitation than Concessions or Total Privatisation.
- Of the various components in water supply components, Billing and Collection is the only component that can be easily opened for private sector participation than bulk supply or distribution or leak detection and repairs or whole operation and maintenance.
- Improving operation and maintenance of sewerage system will greatly improve the sanitation system than building new sanitation system or expansion of existing system by additional sewer capacity or treating sewerage to acceptable standards

- Of the various components of sanitation system, Pumping Stations of sewerage system can be easily opened up for private sector participation than the Collection and Transmission of the sewerage or treatment of the sewerage.
- Privatisation attempts in the telecommunications, aviation and Banking are highly successful while they are failed in water supply.
- The major benefits of the privatisation are efficiency gains and good quality and service.
- The major losses that have occurred in the sectors where private sector participation has failed are profiteering by the private sector and cartel forming by private sector and monopolisation.

5.4 Responses of Experts

Another questionnaire is prepared based on the summary of response obtained from the initial questionnaire and it is distributed to ten experts selected from the respondents to again seek their views on the results of the survey. The questionnaire and the responses are summarised and presented in Table 5.1

S. No.	Survey Result	Number of experts agree with the result	Alternative Suggestion (number of experts who expressed the view)
1	Improving O&M performance will improve service delivery	7	Building New System (1) Expansion of existing systems by adding more bulk water capacity (1) Reducing Unaccounted For Water (1)
2	Water board managements are primarily responsible for present status of water and sanitation service	5	Government (1) Politicians (2) Operators (2)
3	Distribution losses are major contributor to water losses	5	Transmission lines from source to treatment (2) Treatment (2) Storage (1)
4	Improving Operation and Maintenance of Sewerage system and pumping stations would improve the Sanitation situation	7	Expansion of existing system by adding additional sewer capacity (1) Treating Sewage to acceptable standards (2)
5	Present water tariff is adequate	9	A little less than adequate (1)
6	Quantity should be the basis for tariff fixing	8	Quality (2)
7	Telescopic rate with increase in increase of usage should be appropriate for tariff fixing	9	Flat rate (1)
8	Increase in local taxes should be the recourse for financing Water and sanitation infrastructure	4	Funds from state/ central government (2) By raising bonds (1) Loans from Banks (3)
9	Autonomous PSUs should manage water and sanitation services	4	ULBs (2) Private Sector (2) User cooperatives (2)
10	Management and Service contracts and BOT should be suitable form of privatization	6	Total Privatization (2) User cooperatives (2)
11	Billing and Collection of water supply should be privatized	4	Whole operation and maintenance (4) Leak detection (2)
12	Pumping stations of sewerage should be privatised	6	Treatment (4)

Table 5.1: Views of experts on Survey results.

CHAPTER 6

DISCUSSIONS OF RESULTS AND CONCLUSIONS

CHAPTER 6 – DISCUSSION OF RESULTS AND CONCLUSIONS

6.0 Introduction

The responses of the questionnaire are analyzed to know the perception of the respondents about the present status of water supply and sanitation system in Hyderabad and privatization of urban water supply. The responses were primarily grouped into the following categories

- Performance of water and sewerage board
- People responsible for the present water supply and sanitation status and appropriate agencies to manage water supply and sanitation schemes in a reasonable manner
- Reasons contributing to losses in water supply and the components that need improvement to improve the water supply status.
- Adequacy of the present tariff and factors to be considered for fixing of rational tariff.
- Areas open for privatization, suitable forms of private sector participation.
- Views on the privatization of other infrastructure facilities like roads, ports, power, aviation, banking, telecommunication etc.

6.1 Analysis of Responses

The analysis of responses is presented below in the above order.

a. Performance of Water and Sewerage Board

The responses on the performance of water and sewerage board in Hyderabad is presented as pie chart in Fig. 6.1. While 50 percent of the respondents are satisfied with the present performance of the water supply and sewerage board, 50 percent of the respondents rated the performance of water and sewerage board is below satisfactory. Of the 50 percent of respondents satisfied with the performance of the board, 11 percent have rated the water board performance as very good to excellent. 5 percent have rated the performance of the board as very poor.

b. Major source of Water Supply

Municipal water supply is the major source of Hyderabad water supply. The secondary major source is Borewells located in individual houses. A few of the private colonies have their own water supply systems through borewells. Some of the residential complexes are solely depending on private tankers for water supply.

Fig. 6.2 shows the various sources of water supply and their percentage contribution to the urban water supply. 82 percent of the people are primarily depending on water board for water supply. While 11 percent of the people are depending on borewells as primary source

of water supply, another 8 percent of the people are depending either on private tankers or have their own water supply societies.

A few of those who are primarily depending on water board are also depending either on borewells or on private tankers as the secondary source. Borewells are the second major source of drinking water supply.

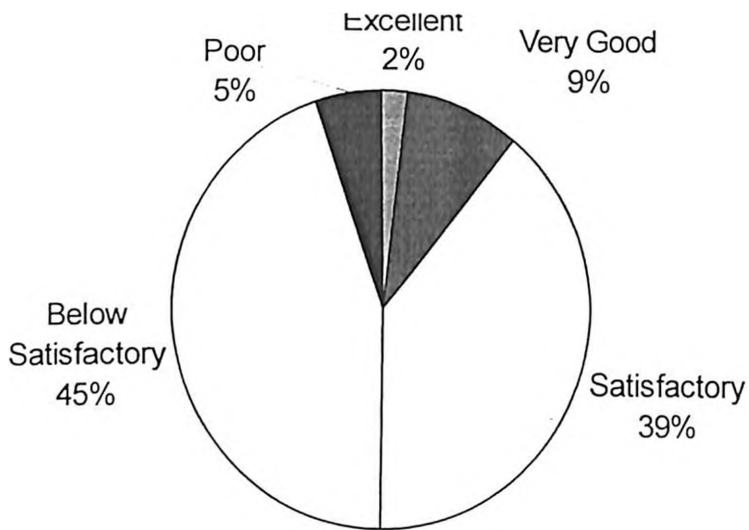


Fig. 6.1: Performance of Water and Sewerage Board in Hyderabad

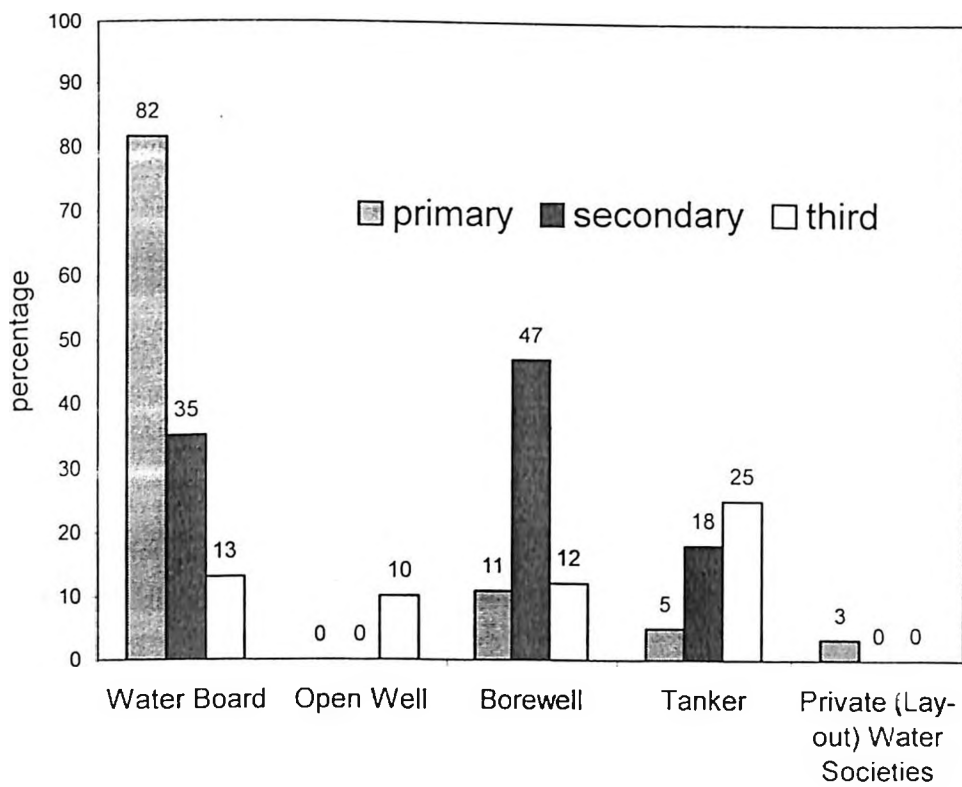


Fig. 6.2: Major Source of Water Supply for Citizens of Hyderabad

c. Improvements Required in Water Supply System

Respondents were asked to rank their priorities on the following water supply components, which can significantly improve the existing water supply system.

- Building totally new system
- Expansion of the existing system
- Improving the operations and management of the distribution system
- Reducing losses (unaccounted for water)

Fig. 6.3 shows the priorities of the respondents. Majority of the respondents (47 percent) gave top priority for improving the operation and management of distribution system. Expansion of the existing system and building totally new system are given top priorities by 23 percent and 18 percent respondents respectively.

Second top priority was given to O & M of distribution system and reducing unaccounted for water by 35 and 40 percent respondents respectively. Expansion of existing water system was given third priority by the 54 respondents. Interestingly 76 percent of the people are given least priority for the building of totally new system.

d. Elements Responsible for Present Water Supply System

The responsibility of the following bodies are tested for their role in the present state of urban water supply systems

- Government in general
- Politicians
- Water board management and
- Distribution operators

Interestingly people believe that government and politicians have little responsibilities on the water supply system. Fig. 6.4 shows the priorities of the respondents. Majority of the people (51 percent) feel that the management of water board is the most responsible for the present water supply status. 56 percent of the respondents are given second priority to the distribution operators. Politicians are thought to be least responsible by the majority of the respondents.

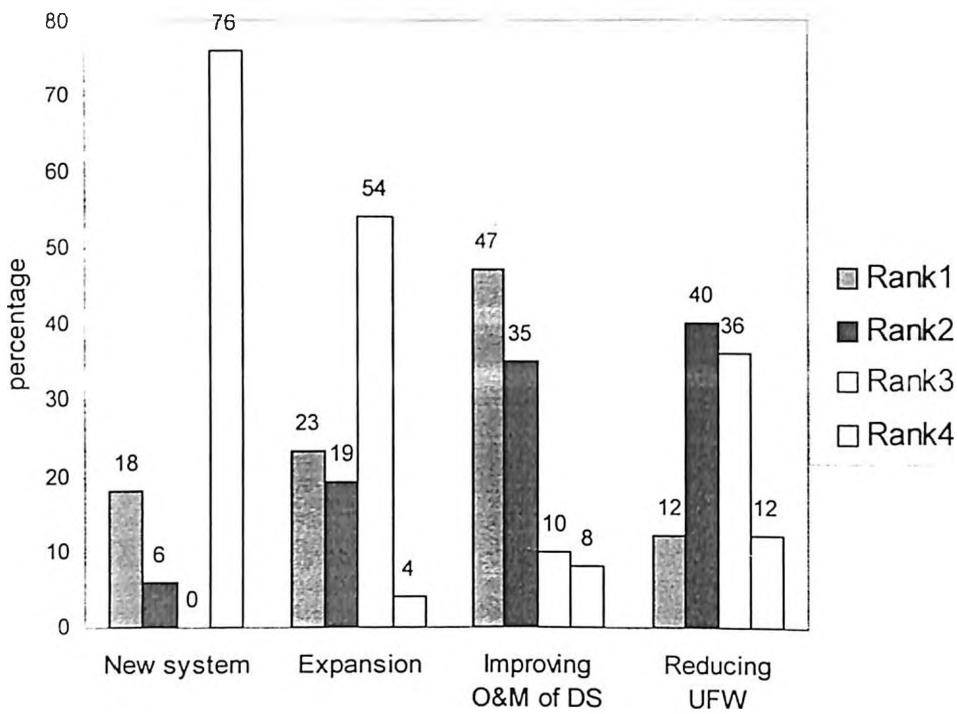


Fig. 6.3: Rating of Water Supply Components, which need to be Improved to Improve Water Supply System.

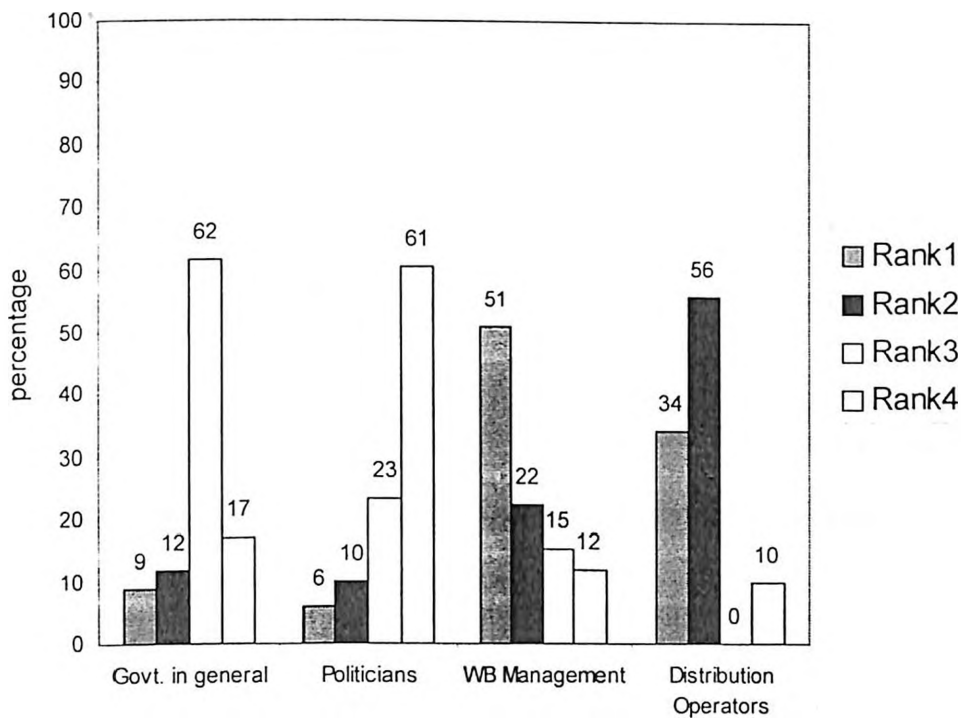


Fig. 6.4: Ranking of the Responsibility of Various Elements for Present Water Supply Status.

c. Factors Contributing to Losses in Water Supply

Respondents were tested to prioritize the following factors significantly contributing to the losses in water supply

- ⇒ Losses in main Transmission lines
- ⇒ Losses at treatment plants
- ⇒ Losses at storage tanks
- ⇒ Losses in the distribution system
- ⇒ Losses at the household level

The responses of people on the factors contributing losses are shown in Fig. 6.5. Losses in the distribution system and main transmission lines are thought to be the most important factors for major losses in water supply. 50 and 40 percent of the respondents ranked these factors respectively as primary reasons.

Losses at household level in addition to the above two factors are considered as second top factor for losses in water supply. 27 percent of the respondents gave second rank to the losses at household level. Losses at treatment and at storage are considered to be least significant by the 78 percent of the respondents. 17 percent of respondents also feel that losses at household level are least significant.

(Values in percentage)

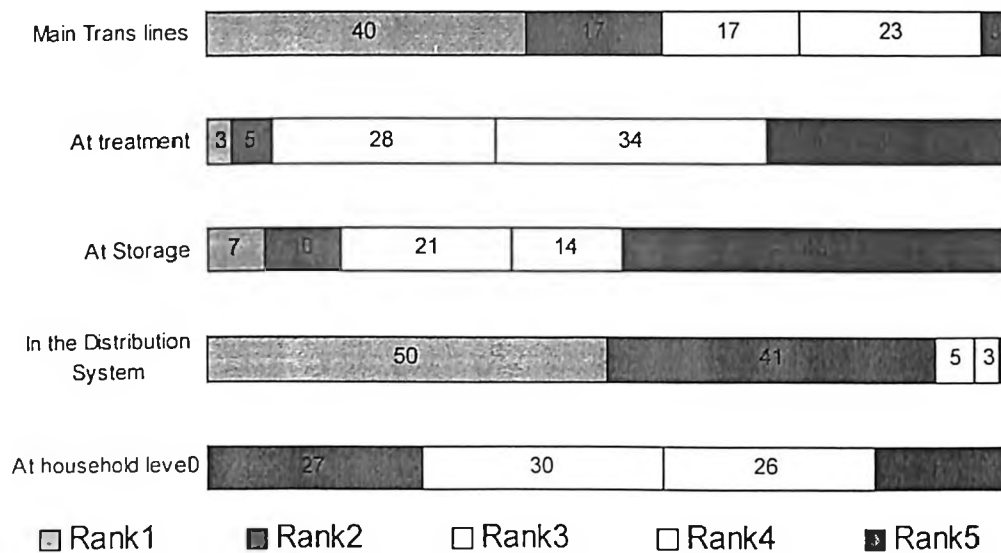


Fig. 6.5: Rating of Factors Contributing to Losses in Water Supply

f. Adequacy of Domestic Water Tariff

The responses on adequacy of water tariff are shown in Fig. 6.6. Majority of the respondents (40 percent) feel that present water tariff is adequate. About 29 percent of the respondents feel that water tariff is a little less than adequate. About 31 percentage of respondents considered present tariff is either too high or more than adequate.

Majority of the 29 percent respondents who considered present water tariff is low are recommending upto 20 percent increase in the tariffs. This is in shown in Fig. 6.7. Some of the respondents have recommended 80 to 100 percent increases in water tariff.

Of the 31 percent people who considered the tariff is high, recommended upto 60 percent reduction in the present tariff (Fig. 6.7).

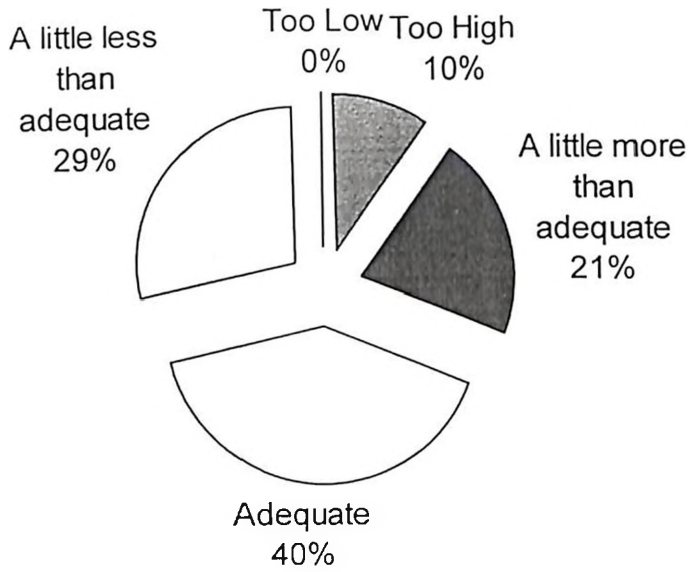


Fig. 6.6: Adequacy of Water Tariff to Domestic Users

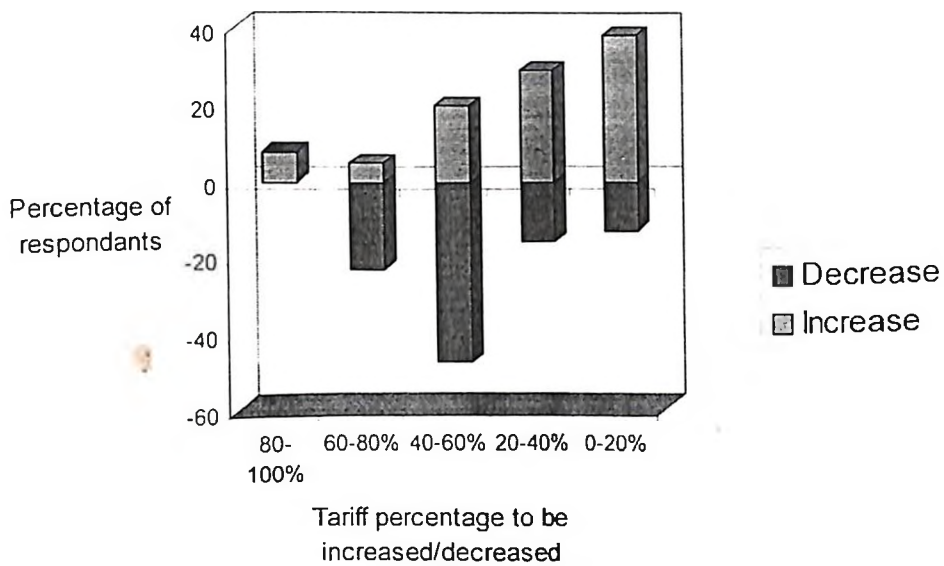


Fig. 6.7: Increase or Decrease of Tariff Recommended.

g. Factors to be Considered for Setting Tariff

Quantity, quality, time and duration of water supply, service offered by the water board are generally considered as the major factors for fixing of rational tariff. Fig. 6.8 shows that priorities of the people on the above factors.

Quantity of water, time and duration of water supply are considered to be the top priority for fixing of rational tariff by the 82 percent of the respondents. While 55 percent favours quantity of water as top priority, 27 percent favours time and duration as the top priority. In addition to the above two factors, quality of water is also given second priority for fixing of tariff. Service is considered to the least priority by most (65 percent) of the respondents.

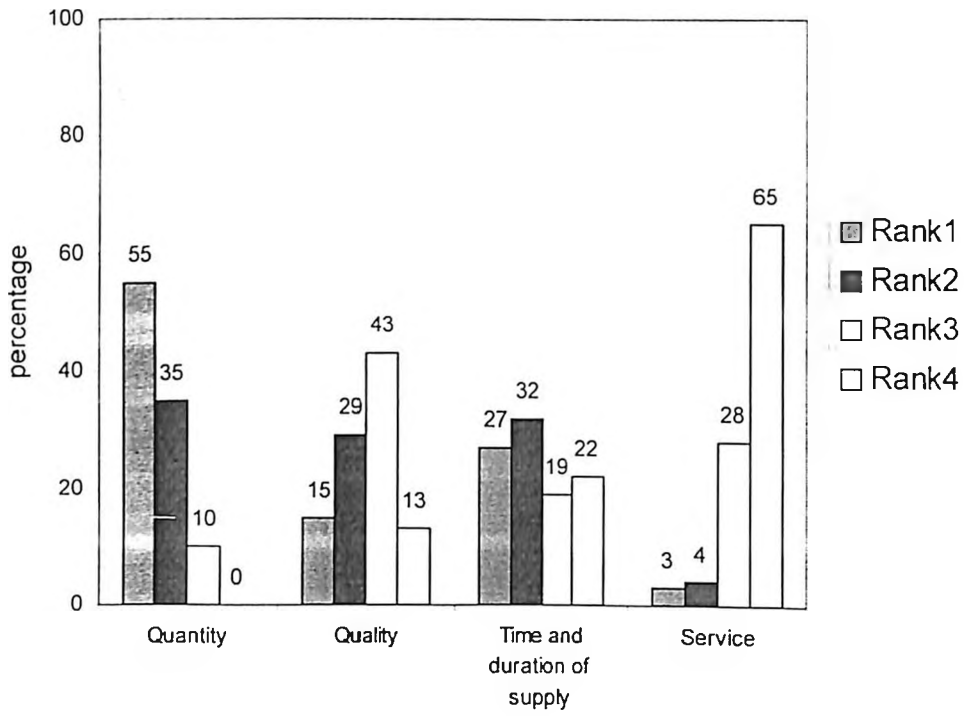


Fig. 6.8: Factors to be Considered for Fixing of Tariff

h. Proposed Type of Tariff Structure

Fig. 6.9 shows the priorities of the respondents on the following options for proposing a new kind of tariff structure.

- Flat rate
- Telescopic rate with reduction in increase of water usage
- Telescopic rate with increase in increase of water usage
- Subsidized uniformly for all
- Subsidized only for poor

Telescopic rate with increase in increase of water usage is considered to be top priority by majority of the respondents (50 percent). Subsidizing for poor is considered as second priority by the 44 percent. Uniform subsidy for all and telescopic rate with reduction in increase of water usage are selected as least priorities.

i. Appropriate Financiers of Water Supply and Sanitation

Various forms of finances available for improving water supply and sanitation situation have been prioritized by ranking. Fig. 6.10 shows the privatization of various financial options.

The respondents have ranked the options in the following order.

- Increase in local taxes
- Loan from World Bank, Asian Development Bank, HUDCO, LIC and other financial institutions
- Raising bonds

- Funds from State and Central governments
- Grants from Donars and aid agencies

42 percent of respondents have favoured increase in local taxes for financing water supply and sanitation components as the top priority. 40 percent of respondents have favoured raising bonds as the second priority for financing water supply and sanitation. While 45 percent favoured increase in user charges as the fifth priority, 56 percent favoured grants from donors and aid agencies as the least option.

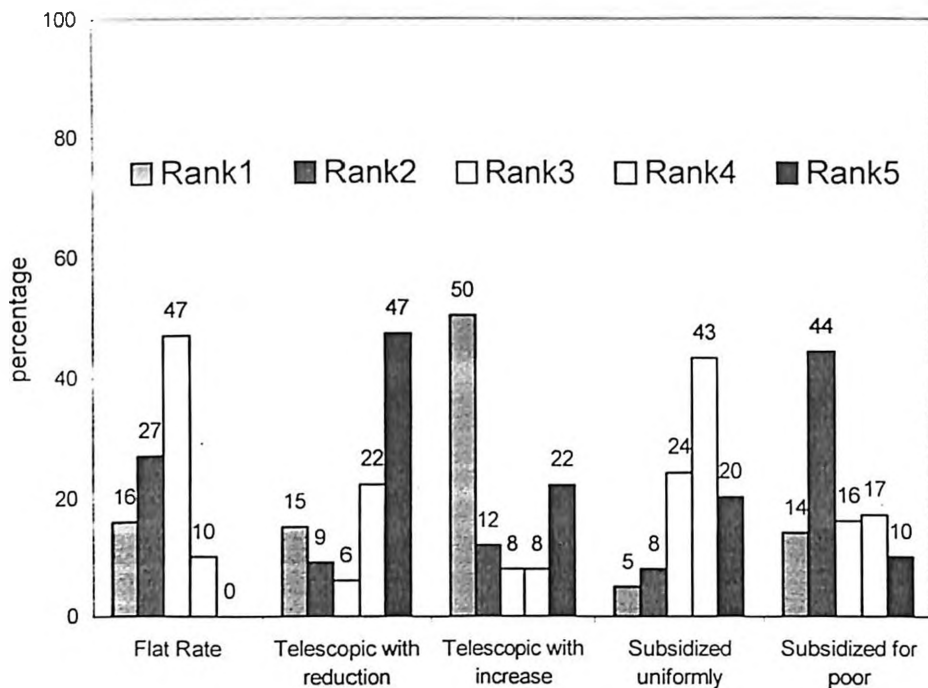


Fig. 6.9: Proposed Kind of Tariff Structure

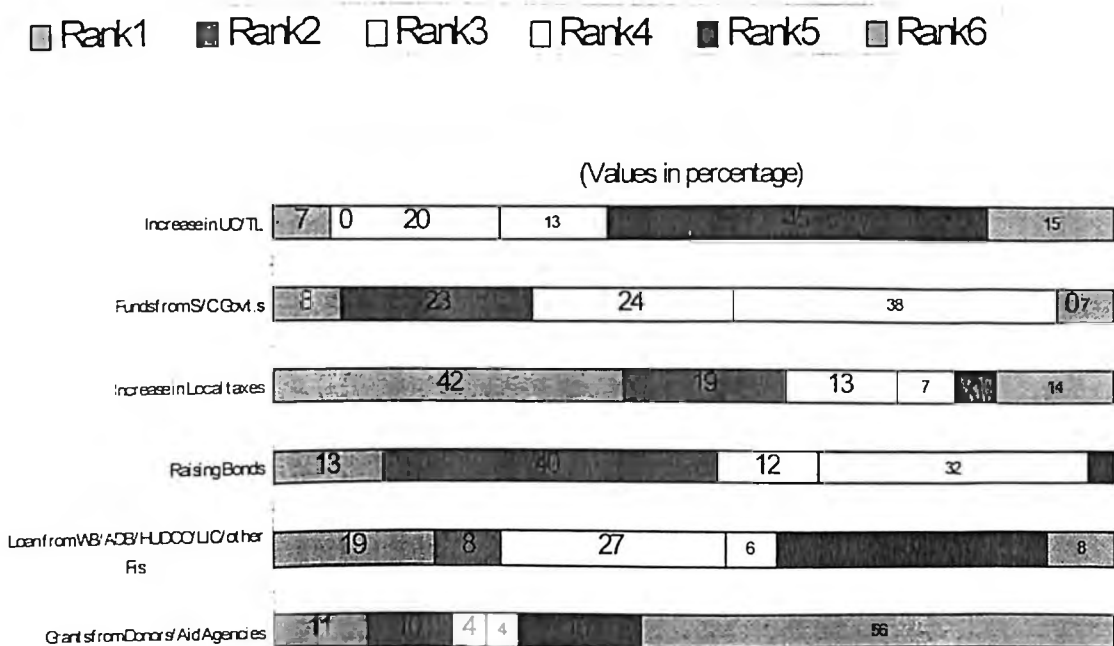


Fig. 6.10 Ranking of Appropriate Financiers for Improving Water Supply and Sanitation Situation

j. Appropriate Agencies to Handle Water Supply and Sanitation Schemes

Prioritization of various appropriate agencies, like state government, urban local body, autonomous public sector units, private sector and user cooperatives, to manage water supply and sanitation are shown in Fig. 6.11. Autonomous public sector unit has been considered as the top priority by the 53 percent of the respondents, while 24 percent favoured the private sector as the top priority.

Second priority was given to user cooperatives, autonomous PSU and private sector by 27 percent, 25 percent and 22 percent of respondents respectively. Urban local bodies are given third priority and the State government is given least priority.

k. Suitable Forms of Private Sector Participation in Water Supply and Sanitation

The following forms of private sector participation have been prioritized as the best suitable options for water supply and sanitation

- Service contracts
- Management contracts
- Concessions
- BOT type arrangements
- Total privatization
- User cooperatives

The responses are shown in Fig. 6.12. As seen from the figure, there was no clear favourism for any form of private sector participation. However three forms of private sector participation viz. Service Contracts, Management Contracts and BOT type arrangements have been given equal prioritization. The ranking of the priorities of the above forms are given below.

Rank 1, 2 and 3	Service Contracts, Management Contracts and BOT type Arrangements
Rank 4	User Cooperatives
Rank 5	Concessions
Rank 6	Total privatization

Table 6.1: Ranking of PSP Options

About 86 percent of the respondents equally favoured the service contracts, management contracts and BOT type arrangements as the top three priorities. It is interesting to note that respondents have opted for the options at the lower end of private sector participation than the total privatization. They have outrightly rejected the total privatization of water supply and given least priority to such option.

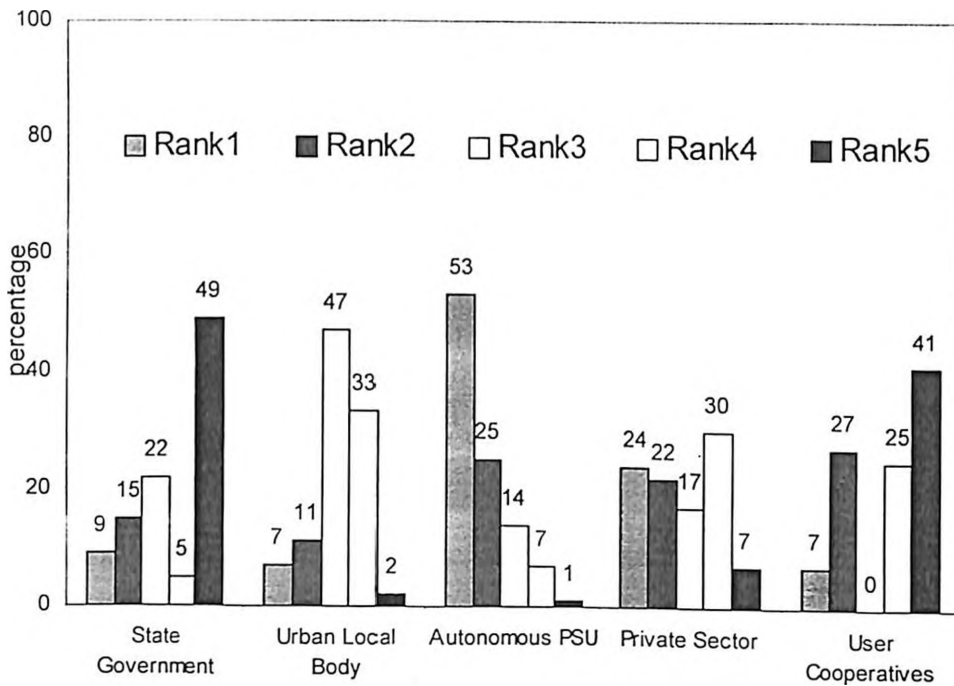


Fig. 6.11 Appropriate Agencies to Handle Water Supply and Sanitation Schemes

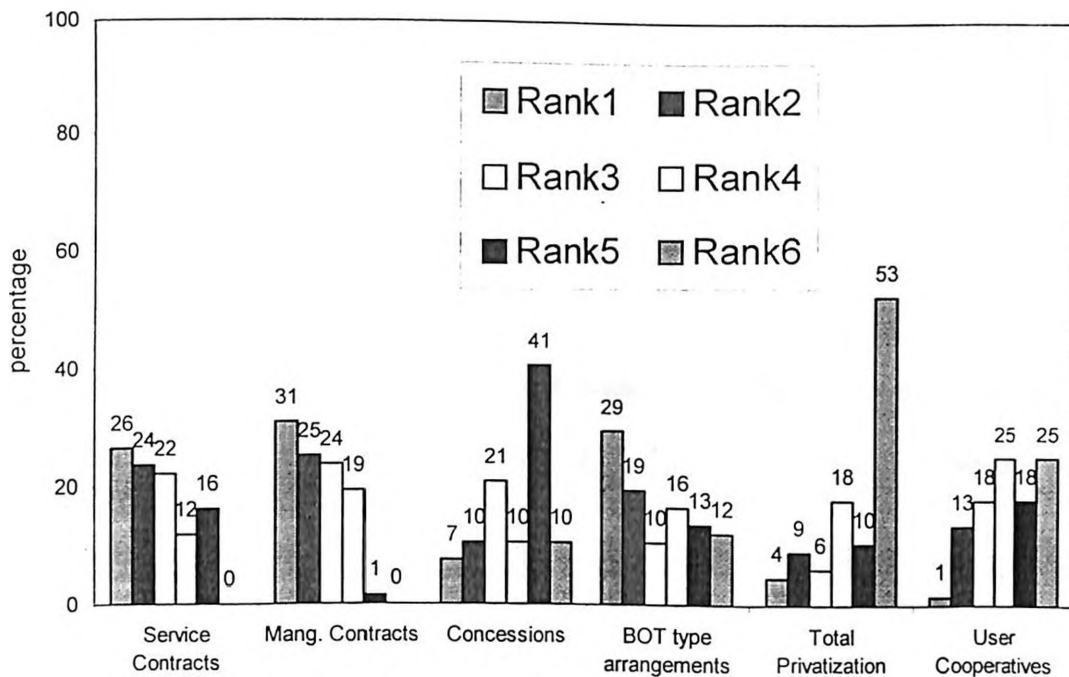


Fig. 6.12: Ranking of Best Suitable Form of Private Sector Participation to Improve Water Supply and Sanitation.

I. Areas easily opened up for privatization in Water Supply

Opinions on the easiness of the following components of urban water supply that can be opened for private sector participation are shown in Fig. 6.13.

- ⇒ Bulk Supply
- ⇒ Distribution
- ⇒ Billing and Collection
- ⇒ Leak Detection and Repairs
- ⇒ Whole Operation and Maintenance

Billing and Collection and Leak Detection and Repairs are considered as the areas, which can be very easily opened for private sector participation. About 68 percent of respondents think Billing and collection can be very easily opened for PSP and 58 percent respondents feel leak detection and repairs can be easily opened up for private sector participation.

In case of distribution system, there was mixed response. While 37 percent feel it can be very easily opened, 29 percent feel it is not easy, 24 percent consider that it can not be easily opened up for private sector participation.

Though there was no clear-cut opinion, majority of the respondents feel that 'Bulk supply' and whole operation and maintenance are the two areas that cannot be easily opened up for privatization. 51 percent and 47 percent of respondents have expressed such opinions respectively.

m. Assessment of Other Private Sector Participation Attempts in India

Many infrastructure facilities like telecommunication, aviation, transport etc. are being rapidly privatized in India. Opinions on the success or failure of such privatization attempts in India are shown in Fig. 6.14. The opinions of respondents are briefly tabulated below.

Successful	Aviation, Banking, Insurance, Telecommunications
Average	Highways, Ports
Failure	Power, Water supply

Table 6.2: Assessment of Success of PSP Attempts in India

Most of the respondents considered that privatization attempts are successful in majority of sectors like Aviation, Banking, Insurance, and Telecommunications. There was mixed response for privatization attempts in Highways and Power but majority feel such attempts are neither completely successful nor a total failure. Privatization attempts in water supply are considered to be totally failure. Only 17 percent of respondents opinioned that privatization attempts in water supply sector are found to be successful, while 73 percent considered it as failure.

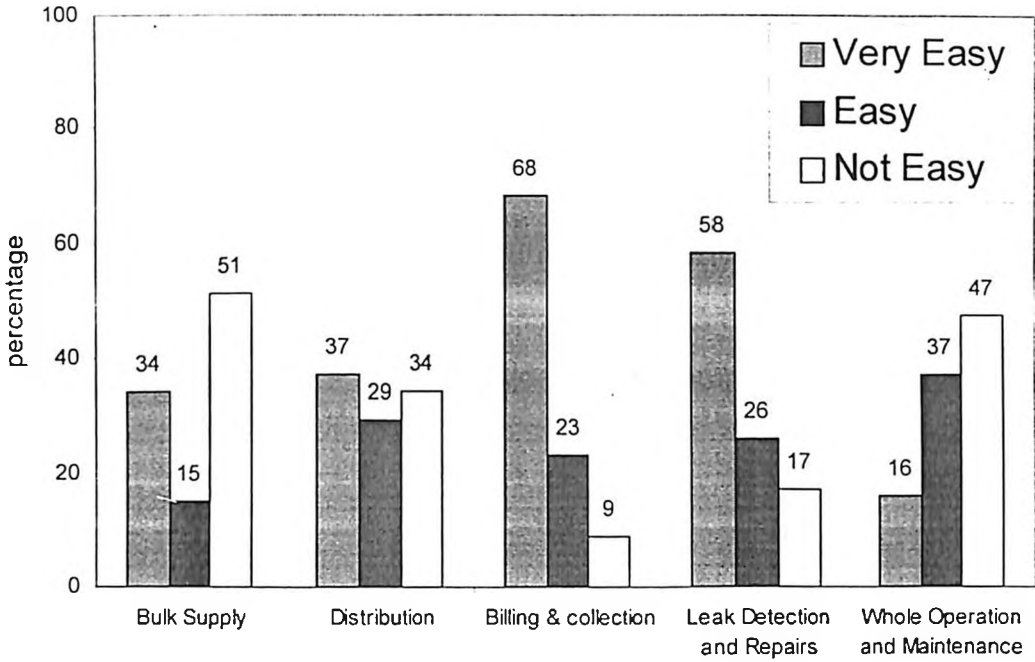


Fig. 6.13: Ranking of the Areas that Can be Easily Opened Up for Private Sector Participation.

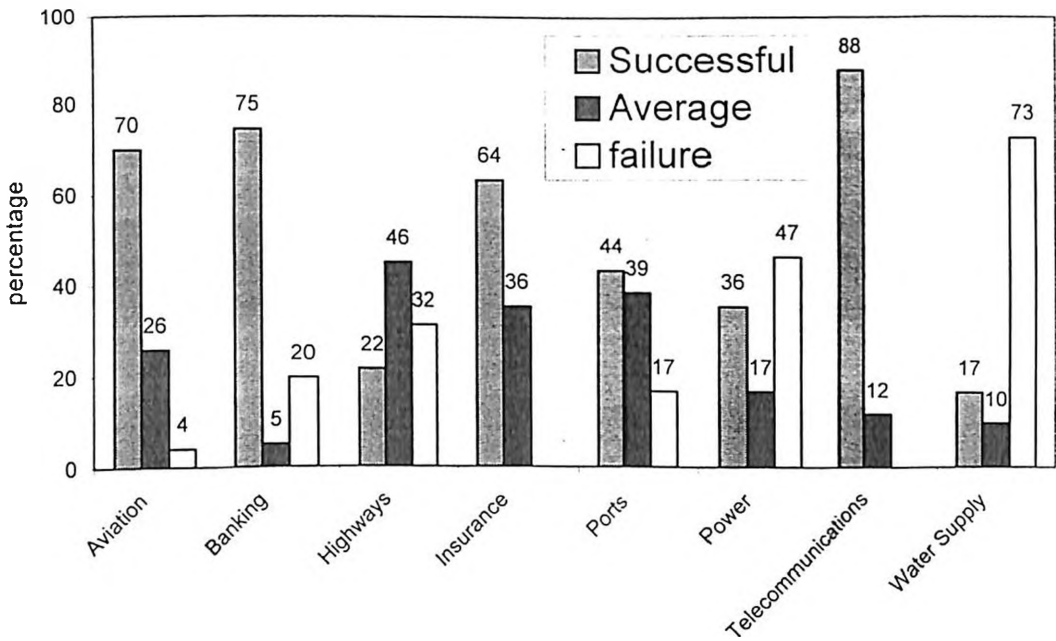


Fig. 6.14 Assessment of the Success of Privatization Attempts in India

n. Benefits of Private Sector Participation

Prioritization of various benefits that can be obtained through privatization is shown in Fig. 6.15. Good quality, service and efficiency gains are considered to be the top benefits of privatization. Technology growth and virtuous management practices are considered to be second top benefits of privatization in addition to the above services. Impartial regulation by the government is considered to be the least benefit of privatization.

o. Reasons for Failure of Privatization

A few of the respondents who considered the privatization as failure have rated the following reasons for failure in decreasing order of preference.

- Profiteering by private sector
- Cartel farming by private sector & monopoly
- High tariffs
- Technology stagnation
- Financial irregularities
- Biased regulation by government
- Poor quality and service

The reasons for the failure of privatization are given in Fig. 6.16. 21 percent of the respondents, who consider privatization as failure, consider cartel farming by private sector and monopoly, while 22 percent opine profiteering by private sector are the major reasons for

failure of privatization. Poor quality and service and biased regulation by the government are considered the least reasons for failure of privatization.

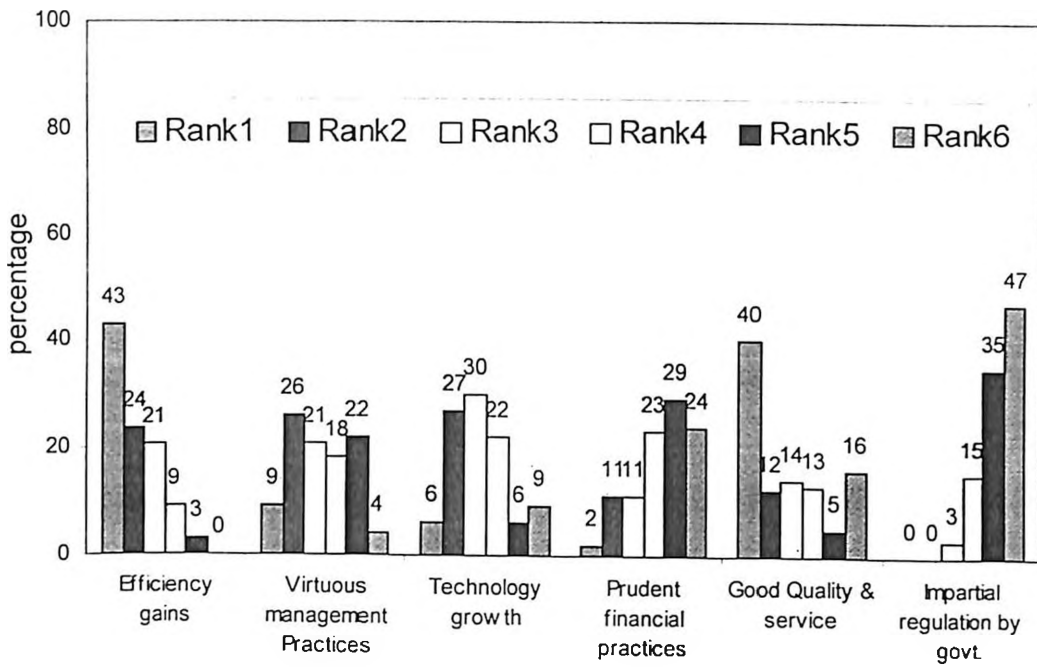


Fig. 6.15: Ranking of the Benefits that can be obtained through Private Sector Participation.

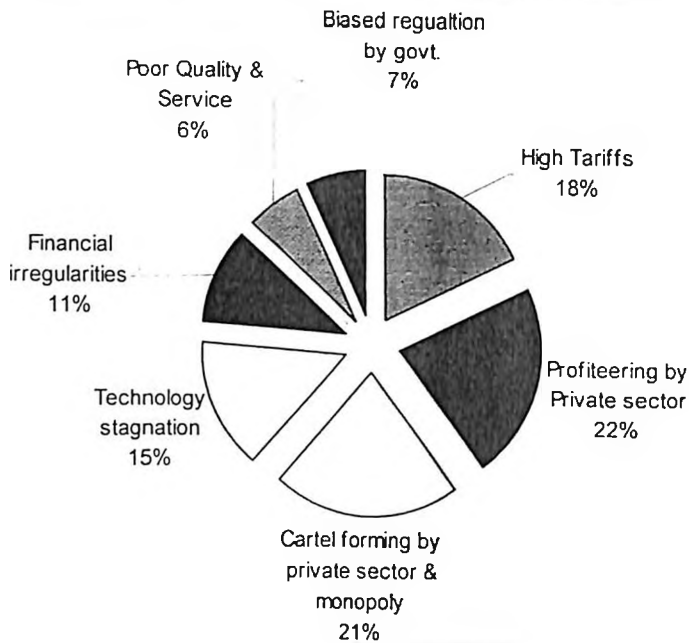


Fig. 6.16: Rating of the Reasons for Failure of Private Sector Participation.

p. Improvements Required in Sanitation System

Respondents were asked to rank their priorities on the following sanitation components, which can significantly improve the existing sanitation system.

- Building totally new system
- Expansion of the existing system by additional sewerage capacity
- Improving the operation and maintenance of sewerage system and pumping stations
- Treating Sewerage to acceptable standards

Fig. 6.17 shows the priorities of the respondents. Majority of the respondents (68 percent) gave top priority for improving the operation and maintenance of the existing sewerage system and pumping stations.

q. Elements Responsible for Present Sanitation System

The responsibility of the following bodies are tested for their role in the present state of urban sanitation system

- Government in general
- Politicians
- Water and Sewerage board management and
- STP operators

Fig. 6.18 shows the priorities of the respondents. Majority of the people (51 percent) feel that the management of water and sewerage board is the most responsible for the present sanitation status. 56 percent of the respondents are given second priority to the STP operators. Politicians are thought to be least responsible by the majority of the respondents.

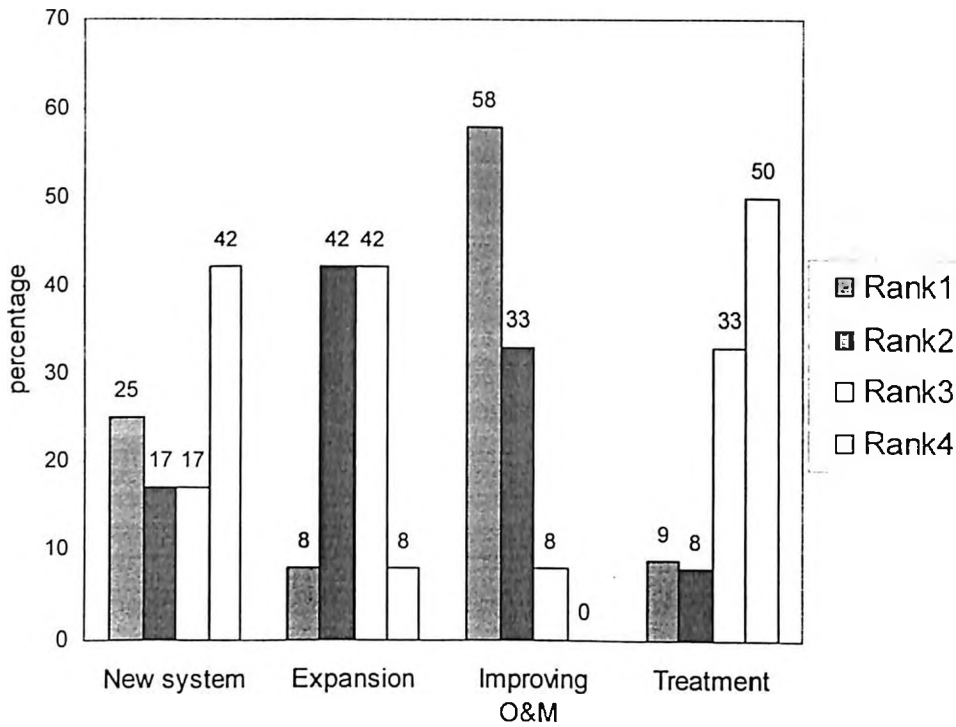


Fig. 6.17 Rating of Sanitation which need to be improved to improve sanitation system.

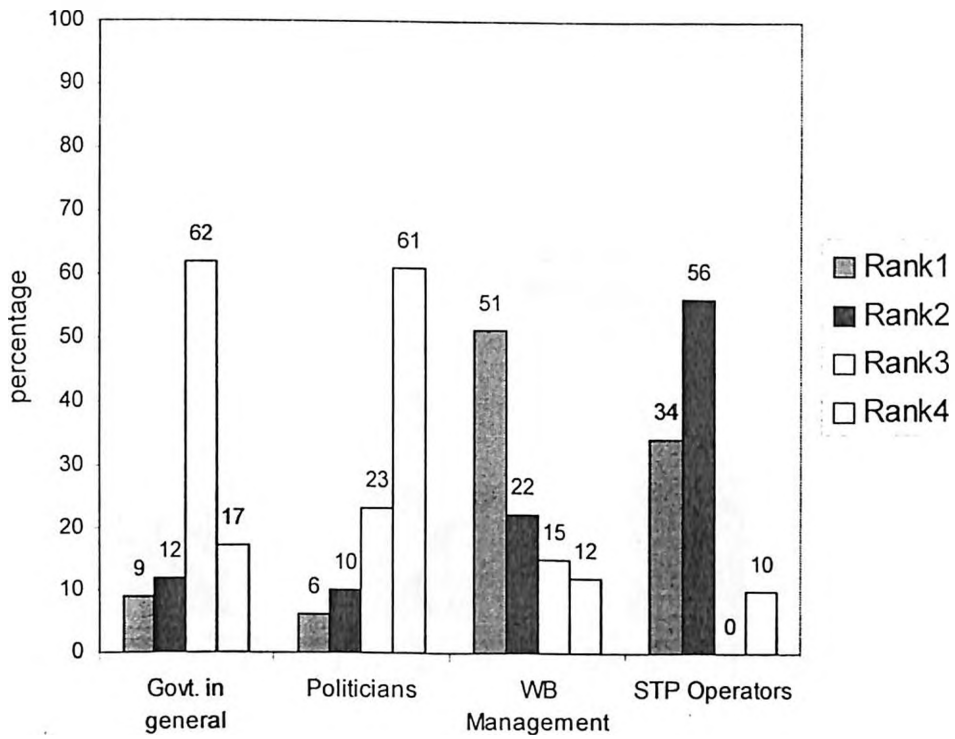


Fig. 6.18 Ranking of the responsibility of above factors for present sanitation status.

r. Areas easily opened up for privatization in Sanitation

Opinions on the easiness of the following components of urban water supply that can be opened for private sector participation are shown in Fig. 6.19.

- ⇒ Collection and Transmission
- ⇒ Pumping Stations
- ⇒ Treatment

Pumping stations and treatment units are considered as the areas, which can be very easily opened for private sector participation. About 65 percent of respondents think that Pumping Stations can be very easily opened for PSP and 53 percent respondents feel treatment units can be easily opened up for private sector participation. 49 percent of respondents considered that collection and transmission of sewerage can not be opened easily for private sector participation.

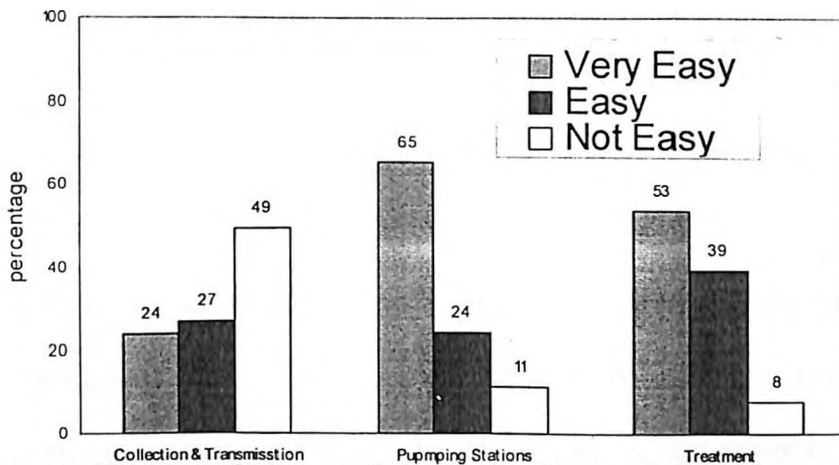


Fig. 6.19 Ranking of the areas in Sanitation that can be easily opened up for private sector participation

6.2 Analysis of Views of the Experts on the Responses

The experts have endorsed their views for majority of the responses described in section 6.1. However for some of the key issues they have suggested other alternatives, which are described below.

- 1) 80 percent of the experts have agreed on the view that improving O&M performance of distribution system will greatly improve the water supply status and service delivery. 30 percent of experts equally suggested that other measures like building totally a new system, expansion of the existing system by adding more bulk water capacity and reducing Unaccounted For Water will also improve the existing water supply status.
- 2) 50 percent of the experts have agreed that Water Board management is primarily responsible for present status of water and sanitation service. 40 percent of experts equally expressed that politicians and operators are primarily responsible for present status. Only 10 percent of experts felt that government is responsible for present status.
- 3) 50 percent of experts have agreed that distribution losses are major contributor for losses in water supply status, while 40 percent of experts equally expressed that losses at transmission lines and at treatment units are the major losses in water supply system. Only 10 percent of the experts felt that losses at storage are the major losses in water supply system.
- 4) 70 percent experts agreed that improving operation and maintenance of sewerage systems and pumping stations would improve the sanitation system. Other experts suggested that treating sewage to acceptable standards (20 percent) and expansion of existing system by adding additional sewer capacity (10 percent) will also greatly improve the sanitation situation.

- 5) 90 percent of experts have agreed that present water tariff is adequate. Only 10 percent of experts have felt that present water tariff is little less than adequate.
- 6) 80 percent of experts have agreed that quantity of water supplied should be taken as criteria for fixing water tariff. 20 percent of experts suggested that quality of supply should be the basis for tariff fixing.
- 7) 90 percent of experts have agreed that telescopic rate with increase in increase of usage should be appropriate for tariff fixing. Only 10 percent of experts suggested flat rate.
- 8) Only 40 percent of experts have agreed that resources generated through increase in local taxes should be used for financing water and sanitation infrastructure. Majority of the experts have suggested that other options like loans from banks (30 percent), funds from state/central government (20 percent) and by raising bonds (10 percent) are to be considered for raising finances for building water and sanitation infrastructure.
- 9) Only 40 percent of experts have agreed with the opinion that autonomous PSUs should manage water and sanitation service. Experts have also recommended that other agencies like ULBs (20percent) Private Sector (20 percent) and User Cooperatives (20 percent) should manage water supply and sanitation services.
- 10) 60 percent of experts have agreed that the Management contracts, Service Contracts and BOT type arrangements are the best suitable forms of privatisation. 20 percent of experts have recommended total privatisation and other 20 percent of experts have recommended user cooperatives are the best suitable form privatisation.
- 11) Only 40 percent of experts have agreed that the Billing and collection of water supply should be privatised. 40 percent of experts have recommended that private sector participation is required in operation and maintenance water supply. 20 percent of experts suggested private sector participation in leak detection.

12) 60 percent of experts have agreed that the pumping stations of sewerage should be privatised while other 40 percent of experts have suggested privatisation of treatment process.

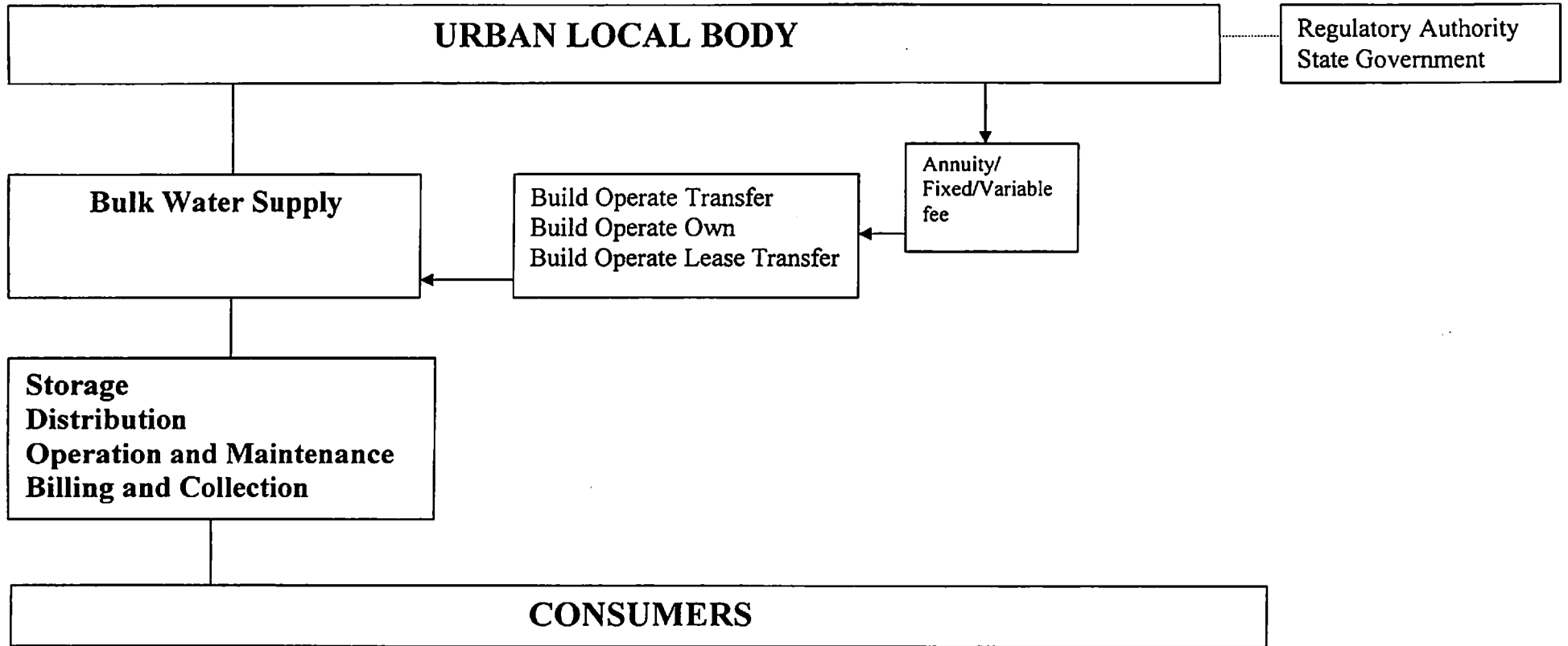
6.3 Some Existing Models

Model 1 for Water Operations with Bulk Supply by Private Party and Operation and Maintenance by Urban Local Body

This model exists in many of Karnataka Urban Local Bodies. Under this model the bulk water supply is done by the Karnataka Urban Water Supply and Drainage Board. This supply is done up to the town limits. Then the Urban Local Body takes over the system. The ULB does the storage, distribution and operation and maintenance of the system. This model has some risks. They are:

- There is no one point responsibility
- There is no coordination between the two agencies.
- The ULB generally does not pay the KUWSDB on a regular basis for the bulk supply. Generally, the payments are book adjustments and the KUWSDB becomes financially dependent on the State Government.
- The ULBs do not have funds to pay for the electricity, repairs and augmentation of the system.

Model 1 for Water Supply Operations (Bulk Supply by Private Party and O&M by ULB)

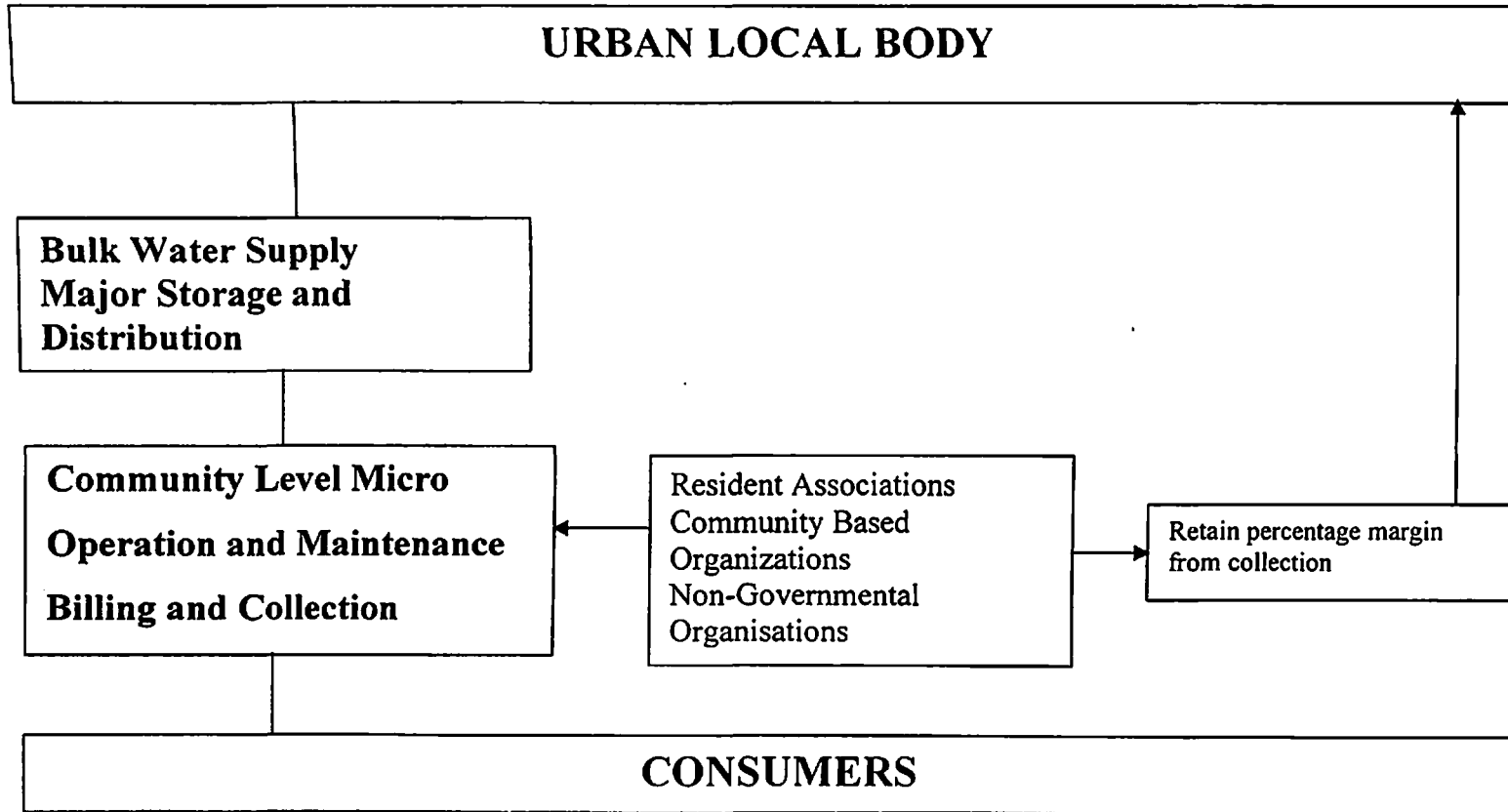


Model 2 for Water Operations with Community Level Operation to Societies

This model exists in many of parts of Hyderabad. Under this model the bulk water supply is done by the Hyderabad Metropolitan Water Supply and Sewerage Board. This supply is done up to the colony/ limits. Then the Resident Welfare Association of the particular colony takes over the system. The Association does the storage, distribution and operation and maintenance of the system within their colonies. The association collects the tariff from the colony residents and pays the Board for the bulk supply. A portion of the tariff collected goes into the association funds for operation and maintenance. This model works very well within the confines of the colony. Though a good model this too has some risks. They are:

- There is no one point responsibility
- There board might increase the water rates
- Though the Association operates well, when the Board is not run well the costs of inefficiency are distributed to all equally

Model 2 for Water Supply Operations – Community Level Operation to Societies

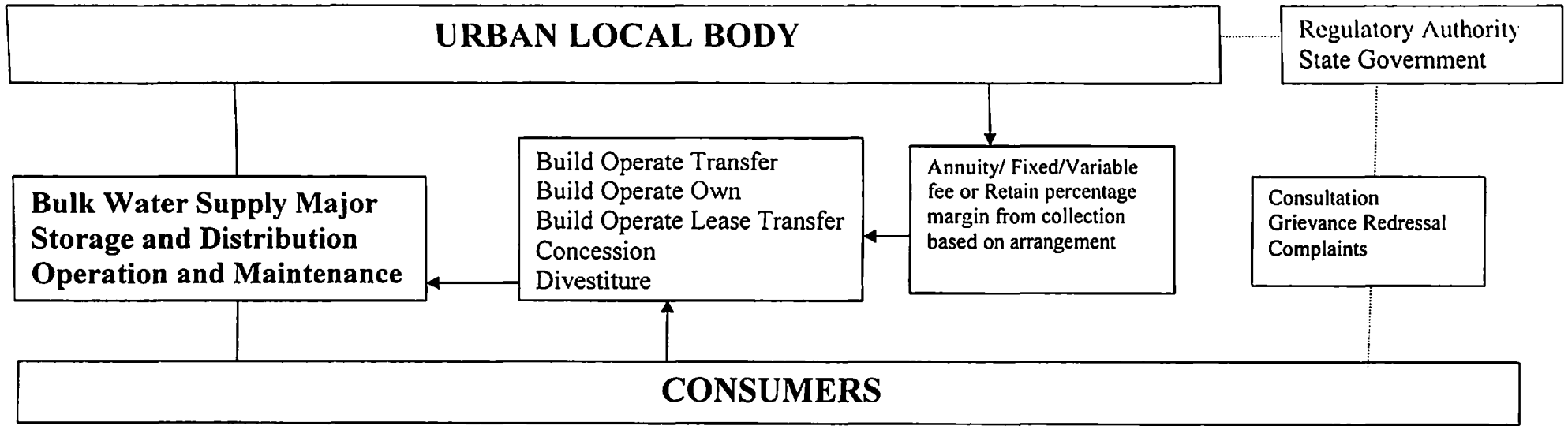


Model 3 for Total Water Operations by Private Party

This model is being implemented in Tirupur of Tamilnadu. Under this model the private party builds the required infrastructure and operated and maintains it. The private party also collects the tariff from the ULB. This is model is under implementation and the results would be out soon after the completion of the project. Under this model, the tariff is fixed through an agreement. This agreement provides the scope for revision of tariff as per the inflation. This model has the advantage of having one point responsibility. This model too has some risks. They are:

- All the eggs are put in one basket.
- Expected revenue might not generate from the ULB
- Political interference might tamper with the agreement clauses at a later date.

Model 3 for Total Water Supply Operations to Private Party

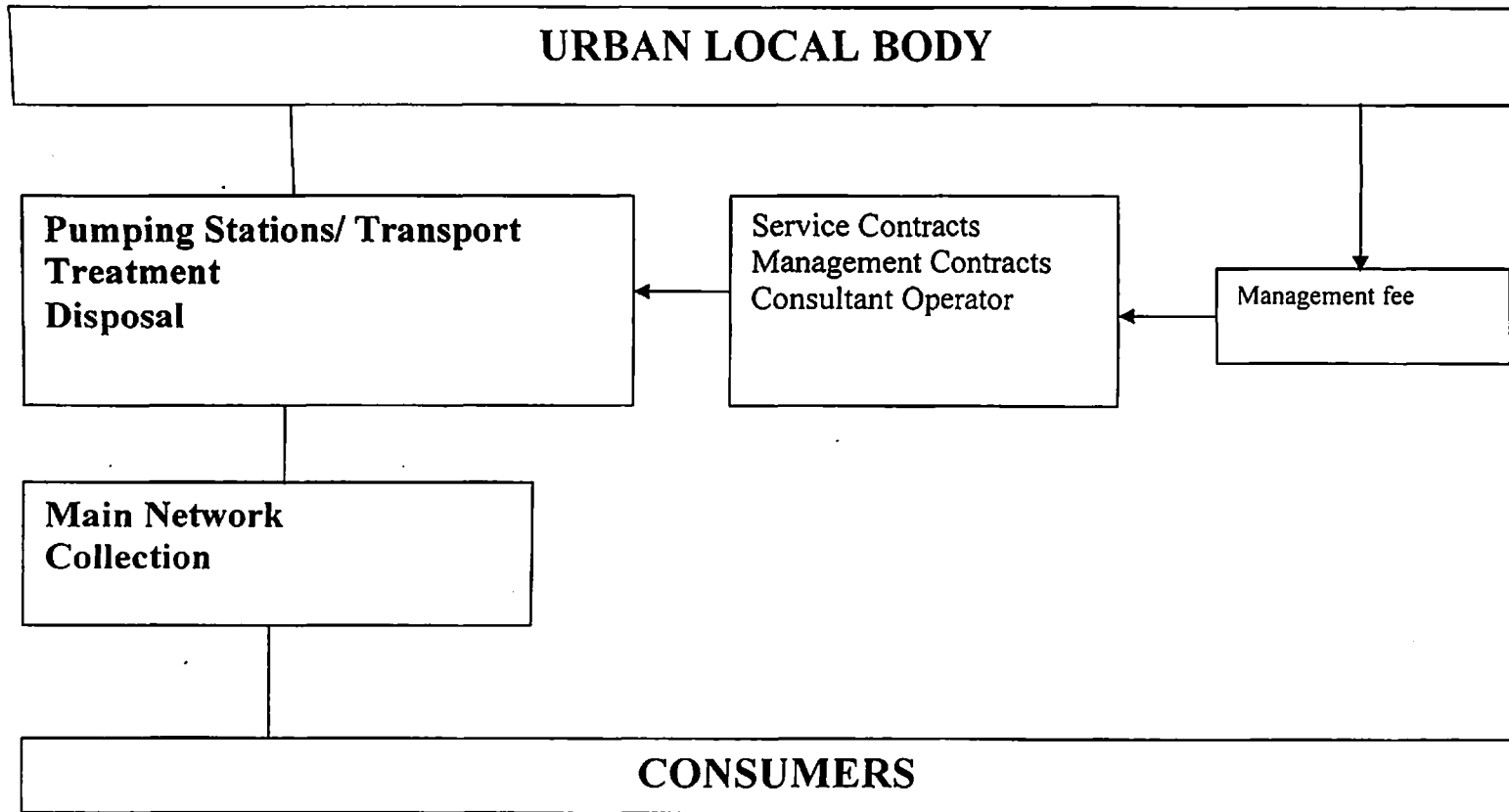


Model 1 for Sanitation Operations with transport, treatment and disposal by Private party

This model is being implemented in Chennai. Under this model the sewage is collected from the households through sewer network and transported through the network up to the pumping stations. The collection and network maintenance is done by the ULB. The pumping stations and treatment plants are maintained by the private operator. The private operator does the disposal also. This method works well. In spite of this, it has some risks. They are:

- Sufficient sewage could not be generated to make use of the capacity of the treatment plants.
- The operator might violate some environmental guidelines

Model 1 for Sanitation Operations – Transport, Treatment and Disposal by Private Party

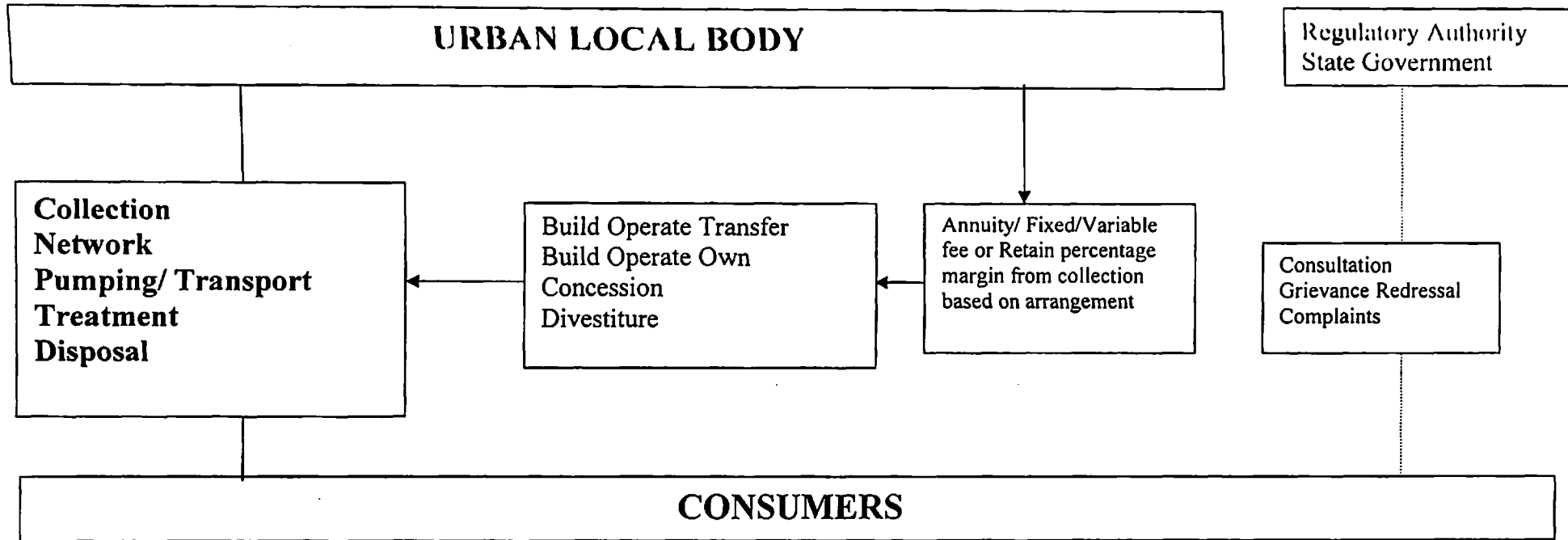


Model 2 for Total Sanitation Operations by Private party

This model has been under implementation in Tirupur. Under this model all the sewage operations are done by a private party. The private party builds a collection system and network. The same private part builds the pumping stations, treatment plants and disposal system. The network, pumping stations and treatment plants are maintained by the private operator. The private operator does the disposal also. The ULB pays the operator as per the agreement. This method works well. In spite of this, it has some risks. They are:

- Sufficient sewage could not be generated to make use of the capacity of the treatment plants.
- The operator might violate some environmental guidelines
- The ULB may not pay the operator

Model 2 for Total Sanitation Operations by Private Party



6.4 Proposed Model

Based on the responses from the experts, the conclusions from the previous chapters, the risks noted from the five models discussed above, a new model has been proposed. This model takes into account the following:

- The Responses of the experts
- The Conclusions
- The Risks taken into Account – Choosing a Good Arrangement

A. The responses of the experts:

- Improving O&M performance of distribution system will greatly improve the water supply status and service delivery.
- Reduce the involvement of Water Boards
- Reduce the distribution losses
- Improving operation and maintenance of sewerage systems and pumping stations would improve the sanitation system.
- Management contracts, Service Contracts and BOT type arrangements are the best suitable forms of privatisation.
- Billing and collection of water supply should be privatised.
- Pumping stations of sewerage should be privatised

B. Conclusions

Private sector participation in the water sector can bring benefits of much needed capital investments and improved efficiency. The selection of a privatisation option should be chosen with care after due diligence and analysis of the pros and cons. Designing and implementing private sector participation in water and sanitation requires substantial economic, financial, technical and legal expertise and the co-ordination of that expertise. Advice from experts with exposure to privatisation process in other countries and under similar conditions will prove to be of value to utilities. The utility will probably need to hire independent experienced advisors to assist in refining and implementing the proposed private sector arrangement. This kind of expert advice could be paid through technical assistance from international funding institutions like World Bank, Asian Development Bank, etc. ULBs, which are in financial distress, should look for this kind of assistance.

a. General Conclusions

The following conclusions are arrived at taking into account the responses to the questionnaire and the analysis of the responses. These have been generally integrated with the issues identified earlier. The general principles guiding the policy are outlined below:

- Shift focus of reforms from expanding the water supply to improving distribution
- Privatised the distribution of water and sanitation services through service and management contracts
- Ensure internal augmentation of water resources
- Ensure water conservation through an appropriate tariff structure and rationalise tariffs

- Formulate policies to attract and support private sector participation and develop water policy guidelines
- Set up an independent regulatory authority
- Un-bundle water assets

b. Specific Conclusions

Water Supply and Sewerage schemes require heavy capital investments for development of source, transmission, treatment, storage, distribution, billing and collection. Considering the substantial sunk costs, following vertical stages have been identified for introducing Private Sector Participation.

- Bulk Water Supply
- Operation and Maintenance of Water Supply at macro and micro zone levels
- Sewage Treatment
 - sale of treatment sludge
 - Reuse of treated wastewater for industrial purpose, gardening, lawning, etc.
 - Sewage farming, agriculture, sale of septic tank waste, composting, sale of manure, aquaculture/ pisciculture, etc.
- Sewerage network
- Pumping stations and pumping machinery

Introduction of PSP into urban Water and Sanitation systems would require the following to be ensured.

- For sustainable improvement in performance, allow full management control to the private sector (including the authority to hire and fire workers and the ability to provide incentives for good performance).
- Phase in price increases over time to match improvements in water availability and better quality to allow a transition from the current low prices.
- Include targeted government support to finance revenue gap, with explicit targets for reducing them over time, or provide capital investments to match private sector resources.
- Provide a policy framework so the poor can get service from the water providers.
- Address water resource and allocation issues, particularly in water deficient areas.
- Ensure the continuity and stability of the contractual environment, to aid private participation in the water sector.
- Give an independent agency the role of overseeing concessions to insulate tariff and investment decisions from political interference.
- Allow municipalities to grant contracts and licenses, but give powers of enforcement and monitoring to a state regulatory agency. Institute central government policies to compare performance of water systems and enhance fiscal support for municipalities
- Develop a benchmarking scheme to help stimulate public debate by comparing the technical and financial performance of water systems in towns across India.
- Enhance fiscal support for municipalities attempting to reform water distribution.

C. The Risks taken into Account – Choosing a good arrangement

This choice requires considering what kind of contract will best mobilize private sector skills and resources to meet consumer demands and what legal and regulatory framework will be necessary to support and sustain that contract. For the chosen arrangement to work, it has to make sense *technically, financially and politically*.

A technically sound proposal is one that is well targeted to the problems (such as need for new investment or for gains in operational efficiency) and is compatible with the existing legal framework or includes supporting changes in that framework. A financially sound proposal is one that can be financed at a tariff that consumers are willing to pay or with the aid of a fiscally and politically viable government subsidy scheme.

A politically sound proposal is one that has political support, both within government and among interested stakeholders. The political viability of a chosen arrangement will depend in part on how well it meets technical problems. But it will also depend on such factors as:

- The presence of political champion, willing and able to provide high level support for the project throughout the preparation and bidding.
- The government's capacity to mobilize support for the arrangement within its own ranks.
- Support from the utility's management and labour, to allow a smooth transition.
- The identification of key stakeholders and the development of a plan for responding to their concerns.

- The transparency and fairness of the process of implementing private sector participation.

Experience around the world with efforts to reform and restructure water and sanitation utilities shows that, as with any other reform, political commitment is absolutely crucial to the success of a transaction. Political commitment is essential, for example, to ensure a genuine response to the concerns of stakeholders, particularly government utility employees.

Political commitment is also essential to attract private sector interest. Potential private sector partners and their financiers will be looking for signs that the present government is willing not only to sign a contract, but also to put in place regulatory arrangements that will protect their legitimate future interests. They will also look for evidence that the government will honour the commitments it makes in contracts. Concerns about political commitment on these points will be reflected in less attractive bids or in an absence of bidders altogether.

a. Finding a Suitable Partner

Once a government has decided on the kind of arrangement it would like, it needs to find a suitable private sector partner for that arrangement. The most effective way to do so, and to elicit the best bid, is to require prospective partners to compete with one another to win the contract. Such competition is particularly important where the company that wins the contract will have a sole (or monopoly) right to serve customers in the utility's jurisdiction. The purpose of the competition is to get potential partners to find the most efficient ways possible to meet consumer demands.

The extent to which competition for a contract can be achieved and the extent to which this competition translates into the best possible outcomes for consumers depends on how bidding is organized. Getting good results for consumers also depends on the regulatory arrangements put in place and on the government's ability to find other mechanisms for keeping competitive pressures alive.

To prepare a private sector arrangement requires carrying out many tasks simultaneously. In particular, work on the regulatory framework required to support the transaction generally needs to be under way while the transaction is being prepared. The time required to complete all these tasks will vary among countries and by the type of private sector option being pursued. Countries with legal and regulatory frameworks supportive of private sector participation in water and sanitation and with good quality information on the system may be able to proceed relatively rapidly. Management contracts should take less time to prepare and implement than concessions. Given strong political commitment, a management contract could be designed and implemented in 8 to 10 months, while a concession could easily require 18 months to 2 years. The Buenos Aires concession, for example, took 2 years to prepare, while the Manila concessions were completed in around 18 months.

As a country undertakes more private sector contracts, it may be able to shorten the preparation time. But there is a lower limit, determined by the need to develop an arrangement well tailored to local circumstances and by the time required by potential bidders to develop considered offers.

Preparing a transaction for private sector participation is inevitably an iterative process, as new information continually emerges. Different stages in the process will require different

levels of detail and precision. Governments will need to give some thought to all the subject areas covered here before coming to an initial decision about the kind of private sector participation option they would like to pursue, but this early analysis can be quite crude. For example, early financial modelling can be based on limited data and approximations. By the time bidders are asked to prepare their bids, however, governments will want to have the best possible information available and to have thought through in detail both the proposed contract and the supporting regulatory arrangements.

The key tasks in preparing the transaction fall into six areas: policy formulation, technical analysis, legal and regulatory work, economic and financial analysis, social intermediation, human resources and public relations. For each of these groups of tasks governments may need to hire consultants.

b. Policy formulation

The cornerstone of the reform is the central policy paper in which the government sets out its main policy objectives and the broad parameters of the proposed transactions. This policy paper will draw on several inputs:

- A review of completed sector studies.
- A review of the key financial parameters on which the government will base policy decisions on such matters as the financial support that it is prepared to give to projects.
- A review of the legal framework relating to the sector.
- A review of the institutional framework of the sector.

c. Technical analysis:

During the preparation phase inputs from technical engineering consultants should be obtained to estimate the expenditures needed to achieve realistic performance standards in such areas as water quality, pressure, water losses, and service coverage. This input will be key in developing reasonable performance targets and methods for measuring performance. This input will aid in valuing the assets at the end of the contract. Most private operators will also wish to conduct their own technical due diligence.

The results produced by the technical consultants will be key inputs for the financial consultants. The technical consultants assessment of the assets' physical condition, judgment on the assets' remaining useful life, and estimate of the capital expenditure required to meet the performance criteria will all serve as inputs required to provide safe, efficient service. These will feed into the analysis by the lawyers and financial analysis of the likely effect of retrenchment and compensation on tariffs and financial feasibility. The results on human resource needs will also go to the human resource consultants, who will manage this information and present it to the workers and their unions in a way that ensures transparency and a clear flow of information.

d. Legal and regulatory work

First step is to make broad policy decisions about what form of private sector participation is preferred, what areas and functions will be covered and how private sector participation will operate within the national structures for water resource management and regulation. Further work on legal and regulatory aspects is required to prepare for the transaction. This work,

carried out by lawyers, consists of two groups of tasks, the first relating to the legal and regulatory framework and the second to the transaction strategy.

The first group of tasks involves:

- Identifying the areas within existing laws, regulations, and decrees that constrain the transaction or increase its cost (reduce its value) and either preparing amendments or proposing safeguards within the transaction.
- Examining the continued regulatory tasks of the public sector and advising on how these should be accomplished (by contract, by sector specific regulation, by legally specified duties of a regulatory agency, or by some combination of these).
- Based on a review of existing institutional arrangements, clarifying the roles of different agencies in relation to the private company and advising on the development of new bodies and mechanisms for coordination. For example coordination among municipal, provincial, and national functions, between economic development and land use planning.
- If restructuring the utility company is a policy option; evaluating the necessary legal and political measures for this option.

In the second group of tasks the lawyers will develop, in conjunction with the other advisers, the principal transaction strategy including key papers on corporatization, tax, labour transfer, and bidding process issues and present this strategy to key policymakers. In addition, the lawyers will be responsible for developing all the transaction documents. Different private sector options will require different suites of contracts and instruments.

e. Economic and financial analysis:

The economic consultants, working with the financial analysts, will play a key part in developing the tariff formulae and base tariffs for the transaction documents. They will also assist in developing the general legal framework. They will examine demand projections and willingness to pay information, prospects for growth, the current tariffs and tariff structure, and the method for calculating tariffs. Their output will be an input to the final transaction documents and the final laws and regulations for the sector. The economists should also be able to assist in evaluating the current institutional capacity for regulation and to advise on how best to configure the sector to maintain competitive pressures after the transaction closes.

The financial advisers will usually play a wide ranging role from pre-marketing (identifying and discussing with potential private investors the possible transaction options), to coordinating inputs from other advisers, to marketing the transaction. The financial advisers will assist the government in determining the effects of changes in the tariff on the likely price or value of the assets or concession fee. This analysis will entail developing a financial model and discussing with the government the policy assumptions that should be included in the model. The model will be used to test the viability of the proposed service objectives and their impact on the tariff. Once an option has been selected, the model can be used to develop the financial specifications for bids and as a reference for contract negotiations.

The financial advisers will need the input of the legal and regulatory advisers, because the draft contracts will affect the commercial and financial viability of the proposed project. The

financial advisers will review the demand forecasts, test alternative tariff structures and technical solutions, and estimate capital, operating, and maintenance costs. They will advise on the capital structure for the new entity (debt-to-equity ratio), and any covenants that should be applied with regard to financial ratios and potential collateral for lenders. They will also advise on the preparation of the information memorandum for the transaction and later assist in evaluating bids.

f. Social Intermediation

Social Assessment and Social Intermediation consultants, preferably with good knowledge of the local area and communications capacity, can be hired to conduct social assessment and develop a social intermediation process including a communication strategy for the communities. They should in the process keep the public informed of the proposed transaction structure. Through regular team meetings, these consultants should be kept fully upto date on the details of the proposed transaction, and briefed on which matters are confidential and which may be disclosed. It is usually a good idea to have these consultants run a general community awareness campaign to ensure that the public is aware of the reform process is taking care of their legitimate concerns as consumers.

g. Human resources and Public Relations

Human resource and public relations consultants should also be hired, to help organize interactions with unions and employees and identify ways of meeting their concerns. These consultants need to be kept fully briefed on how the proposed transaction is evolving and on which matters are confidential and which may be disclosed to employees and their union representatives.

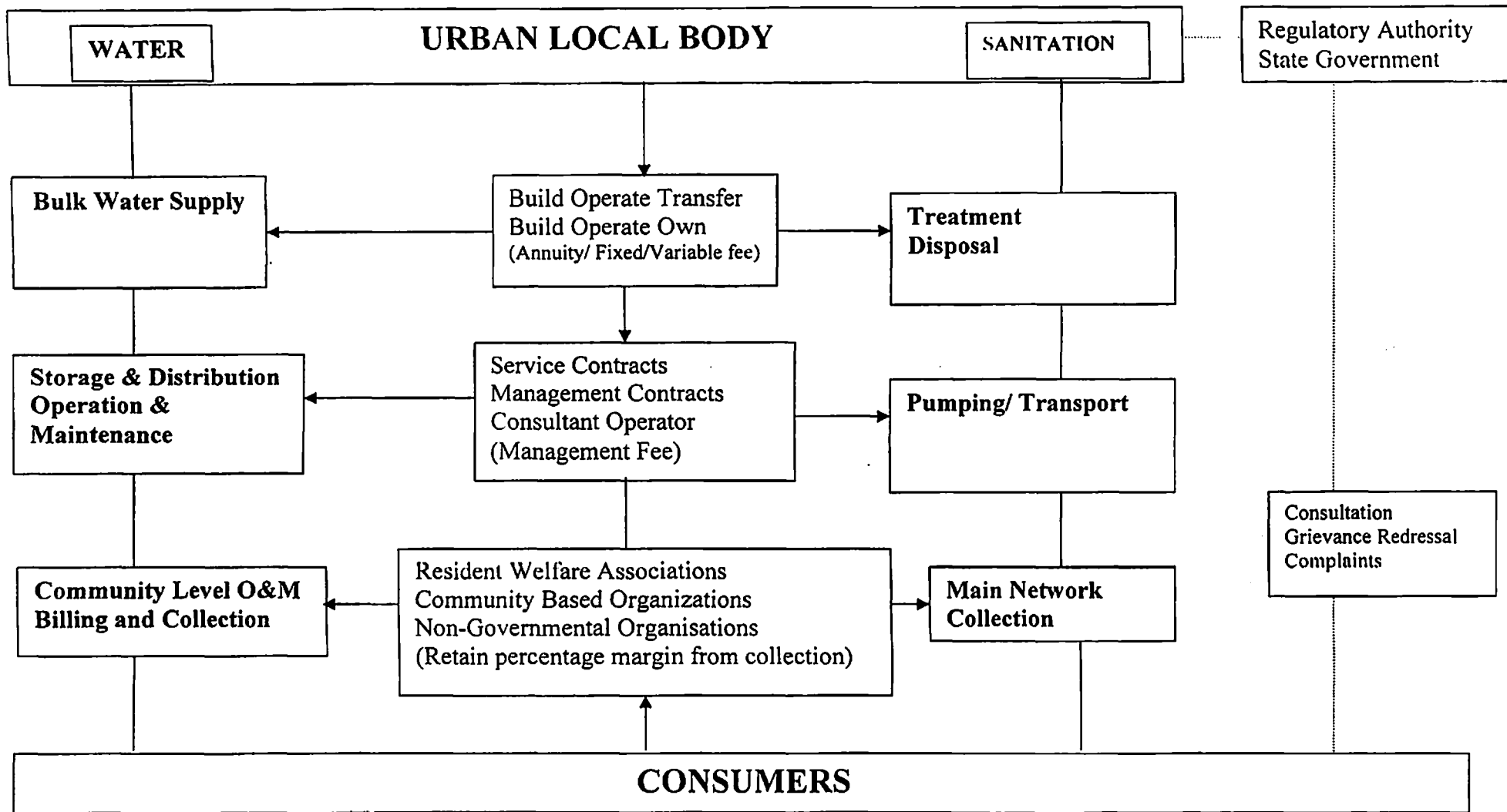
6.5 Development of a Model for PSP in Water and Sanitation Sector

For the benefit of ULBs and other Urban water bodies, based on the responses to the questionnaire, a model for private sector participation has been developed and presented on the next page. This model has been developed keeping in mind the nature and pros and cons of each private sector participation option that was described in the earlier chapters and the following Chapter 6.5 Choosing a Good Arrangement. This model is briefly described below:

- The bulk water provision is on a BOT/ BOO/ BOLT basis. This means the ULB will have bulk supply from the private operator to meet the required water demand. This arrangement is done through specific contract developed for the purpose.
- The Operation and Maintenance of the Major Storage and distribution is contracted out either as Service Contracts or Management Contracts to experienced operators. This can be given to a Consultant Operator also. This Consultant Operator arrangement would be beneficial, as the Consultant Operator will be using the ULB staff for Operation and Maintenance. In the process they get trained.
- The operation and maintenance of the system at the micro zone level, i.e., at lane level is done by Resident Associations or Community Based Organisations (CBOs) or Non-Governmental Organisations (NGOs). These agencies will be trained by the Operators. These agencies would also do the billing and collection and get a percentage of it as fee.
- The above arrangement would un-bundle the ULBs' assets, gets the ULBs' employees trained by the Consultant Operator and instil a sense of ownership through community participation. This kind of arrangement is likely to bring in the efficiency gains of Private Sector Participation.

This combined model is presented on the next page

Final Model for Water and Sanitation Operations – From Vicious Circle to Virtuous Sphere



A. Comparative Features of the Proposed Model

The following are the comparative features of this proposed model with the existing model.

- This model can be called a true participative model, since it has been built taking peoples perceptions into account.
- This model does not rely on one form of private sector participation; it involves many of these forms such as BOT and its variants, Service/ Management contracts, Consultant Operator systems, Community based Operation and Maintenance systems, etc.
- The proposed model would reduce the losses in the bulk transmission as the bulk water is supplied through BOT/ BOO/ BOLT arrangement. The payment to the operator is based on the bulk supply, which means that the operator would be responsible for any losses and will not be paid for these.
- The distribution losses in the main storage and distribution are reduced as this is given out as Service Contract/ Management Contract/ Consultant Operator. The fee is performance based.
- The micro distribution, consumer end operation and maintenance and billing and collection is done by the Resident Associations/ CBOs/ NGOs. Payment for these services is through a percentage of the tariff collected by these agencies. Hence this would effectively reduce the losses at the consumer end.
- This model proposes to fix the tariff in consultation with the consumers and the Resident Associations/ CBOs/ NGOs. This means a high level of willingness to pay by the consumers.
- The factors considered for setting the tariff are quantity, quality, time and duration of supply and service. This is done in consultation with the Resident Associations/ CBOs/

NGOs. The model also incorporates a Consultation, Complaints and Grievance Redressal mechanism into the model.

- This model proposes telescopic tariff with increase in rates with increase in usage of water. Cross-subsidisation would be introduced to take care of poor sections of the society. This model also proposes to introduce seasonal tariffs to conserve water. Seasonal tariff is introduced by increasing tariff levels sufficiently in water scarce seasons (summer) to encourage judicious usage of water and reduce wastage.
- This model takes care of finances by having an operator for bulk water supply and having performance based contracts for major storage and distribution through Service Contract/ Management Contract/ Consultant Operator and micro zone distribution through Resident Associations/ CBOs/ NGOs. This means that the ULB is relieved of the financial burdens of investing and paying hefty amounts as fees.
- This model proposes to use various institutions like private sector, consultants, community and government for providing water and sanitation services to the town. This consists of a good mix of institutions.
- In effect this model is incorporating all the informed people's perceptions in design, implementation and operation and maintenance of water supply to the towns. This will be a true transformation from a Vicious Circle to a Virtuous Sphere.

6.6 Methodology to Test The Model

This section describes a methodology to test the model proposed. The testing of this model for any Urban Local Body would be quite expensive. The costs would run into from tens to hundreds of crores of rupees depending on the population and the water and sanitation system that is in place and the improvements required. Hence, it is proposed that the methodology could be tested on a pilot basis in a demonstration zone of an Urban Local Body. When this demonstration is successful, this model could be up scaled for the whole Urban Local Body and further to other Urban Local Bodies as well. This methodology proposed for testing the model is given in the following 10 Tasks:

- TASK 1: Council Resolution by the ULBs
- TASK 2: Choosing the Component for Improvement
- TASK 3: Choosing the Appropriate Option
- TASK 4: Finding a Funding Agency
- TASK 5: Choosing Demonstration Area
- TASK 6: Preparation of Detailed Project Report
- TASK 7: Procurement Management
- TASK 8: Community Participation
- TASK 9: Monitoring, Evaluation and Transference into Action
- TASK 10: Scaling Up the Model

- TASK 1: This Task deals with passing a Council Resolution by the ULBs adopting the model. The ULB should pass a resolution in its council that they want to go for a better system of water and sanitation provision duly involving the private sector. The benefits of

involving the private sector in water and sanitation provision must be duly mentioned in this resolution. Adopting such resolution is to make firm the commitment of the ULB with regard to taking the reform process of adopting a private sector participation approach in water and sanitation service provision. By adopting such a resolution the political bosses of the ULB will make public their commitment, as political will is a must for any reform process to proceed and take place. Without this political will and commitment from the bureaucrats recorded properly in the form of a Council Resolution, the succeeding political set up or bureaucrats can reverse the process of reforms. With a firm resolution it requires adequate reasoning to reverse the process of public private partnerships in the water and sanitation service provision. The process of adopting a resolution will deal with building a consensus for the private sector participation in water and sanitation service provision. Conflict resolution will take place through discussions in the council on this issue. The bureaucrats should take a lead role in this process in properly guiding and informing the politicians about the private sector participation in water and sanitation service provision and the role of the politicians in the whole process. In this process an experienced consultant can conduct a stakeholder analysis and capture the interests, effect, importance and influence of various stakeholders with regard to the private sector participation in water and sanitation provision. Once this exercise is done properly, it is likely that all the stakeholders would understand the project properly and make their stand clear about the project. Once all the energies are directed towards the project, it is likely that the project becomes success.

- **TASK 2:** This Task deals with making a decision on which parts of the water and sanitation system to be improved using the private sector participation. This depends on the type of water and sanitation system present in the ULB. In general, the most likely

options for Private Sector Participation are the type of systems to be about what to privatise or which component of the Water and Sanitation system to take up as private sector participation for improving performance. As per the expert opinion, the operation and maintenance of the water supply system and operation and maintenance of the sewage pumping stations could be privatised. The ULB council should pore over this for a while and make an informed decision. This is an important decision with regard to the private sector participation in water and sanitation service improvement through private sector participation. The important factors to be considered before making a decision are the performance of the ULB in water and sanitation service provision, efficiency of the operation and maintenance staff, areas requiring improvements, etc. a consumer satisfaction survey could be conducted before making this important decision.

- **TASK 3:** This Task deals with choosing an appropriate Private Sector Participation option. The ULB has to choose the most appropriate option that suits requirements. The important factors to be considered before making this decision are envisaged improvements in service provision, period of private sector participation intervention, anticipation, approximate cost of the intervention, requirement of any capital works, source of funding, etc. The most recommended options in this case range from service contracts to BOT arrangements.
- **TASK 4:** This Task deals with choosing a funding agency for the investment required. It may be noted that the BOT option would not require any up front capital requirement for infrastructure building as the successful operator will be investing in the venture. The ULB has to pay for the bulk supply, if the component chosen is bulk supply of water. In operation and maintenance, BOT operator would collect the revenue from the users, if

provided for in the BOT agreement, or other wise the ULB has to pay charges (monthly?) as per the agreement. If it is service contract or management contract, then the ULB has to fund the infrastructure building if required and pay for the operator as per the agreement (monthly?). Hence, a funding agency is required, if the ULB is not having the required financial capacity. The advice is to seek grants from aid agencies, as the proposal is to have a demonstration first and up scale it to the entire ULB. There are many aid agencies which can give grants for such kind of demonstrations, because these experiences can be documented and used as learning experience elsewhere. When the demonstration is successful, then up scaling of the model can take place with loan funds from financial institutions.

- **TASK 5:** This Task deals with choosing a demonstration area in the ULB. Since the introduction of Private Sector Participation is a hitherto new intervention, it is better to approach this rather cautiously. The best approach would be to test the model in a demonstration area in the ULB before up scaling it to the whole ULB and later on to other ULBs. The criteria to be used for choosing the demonstration area is political acceptance, a good mix of all classes, castes and religions of people, the representativeness of the area of the ULB, technical feasibility to test out the model and willingness of the people to participate in the experiment.
- **TASK 6:** This Task deals with preparation of detailed project report. The ULB has to use the services of an experienced consulting firm to prepare the detailed project report. This report should contain the technical feasibility of the project, commercial financial of the project, the private sector participation arrangement, the institutional arrangements, the roles and responsibilities of all stakeholders during the whole project life cycle, the

designs, drawings, bills of quantities, tender documents, etc. Another equally competent consultant could be used to whet the report for its soundness and suitability.

- **TASK 7:** This Task deals with procurement management. The ULB has to chose and an appropriate bidding system for the project. The preparation consultant has to advise the ULB on this. Universally acceptable and in particular procurement procedures acceptable to the funding agency have to be adopted. Generally two stage bidding can avoid lot of problems. Prequalification of all applicants be done using a predetermined eligibility criteria. This bidding phase has to be given wide publicity to attract all eligible bidders into the race. Publishing in the news papers and contracting all eligible firms individually could be the best methods to adopt to increase publicity and to attract more number or bidders. The prequalification be done to chose 5 to 8 suitable firms who have the relevant experience and expertise. These firms should also have the required technical expertise, equipment, financial capacity, and enough spare time to perform the assignment. Once a short list is prepared, the short listed firms are issued with formats for submitting the proposal along with all the technical details, specifications and service levels expected to be achieved. This stage of bidding has to be a two envelop process, with the bidders submitting the technical and financial proposals separately. The technical proposals be evaluate first and the highest ranked technical proposal's financial bid be opened and negotiations conducted with that bidder to arrive at an acceptable offer. If the negotiations fail, then the next technically highest ranked bidder's financial proposal is opened and that firm be invited for negotiations. This process is repeated till an acceptable arrangement is arrived at.
- **TASK 8:** This Task deals with providing opportunities for the community to participate in the implementation of the project. The projects should provide sufficient space for the

community to participate in the project. The community must be thoroughly involved in all the decision making processes. This is necessary as the community has to pay tariff for the services provided. The community has to be involved in tariff setting too. This would mean that the community would then own the whole project and cooperate in the implementation and operation and management phases. The community should also participate in the monitoring and evaluation of the project. In fact, the community should be provided with opportunities to participate during all phases of the project life cycle.

- **TASK 9:** This Task deals the Monitoring Evaluation and Transference into Action. The ULB must properly monitor the project against predetermined quantifiable and qualitative indicators. These indicators should be identified during project preparation stage itself. The results of the monitoring have to be used for mid-course corrections. The results of the evaluation have to be transferred into action for up scaling the project for whole ULB coverage and for other ULBs. This Task is a very important element of the whole model testing as the lessons learnt from this Task have to be transferred into action for success of the model.
- **TASK 10:** This Task deals with up scaling the model. The model when successful after implementation as a demonstration has to be up scaled for implementation in the whole ULB. The benefits of the model can then be taken to other ULBs as well.

A. The Risks:

The risks to be taken care of while preparing, implementing and up scaling model are briefed below:

- Demand Risk: The demand for water and sanitation services need to be assessed accurately as far as possible. Projects would be sustainable when they are demand driven. Present supply driven approach makes projects unsustainable. A demand assessment before project preparation could be the best way to alleviate this risk.
- Design Risk: The project design has to use the technology in vogue. Only then proper operation and maintenance would possible. Usage of technology in vogue would be in sync with other projects as well. The design should keep the cost of the project as low as possible without compromising on quality by optimising all the resources. Best way to alleviate this risk is to have a third party consultant to look into the designs and give suggestions and comments.
- Supply Risk: The supplies during implementation and operation have to be identified before hand and agreements signed with these suppliers on a long term basis as required. The costs have to be kept in mind. The agreements have to be flexible with regard to costs of materials and services duly providing opportunity for revision for cost escalation or inflation. This kind of agreements before hand would save the project from supply risks.
- Revenue Risk: The ULB and the operator have to sign agreements related to revenue from water and sanitation services. There should be an agreement between the operator and the ULB on what to charge and how to provide for inflation, escalation of costs, etc. This should also provide for any increased or decreased demand for the services.
- Financial Risk: Firm agreements have to be signed with all the financing agencies like the World Bank, Asian Development Bank, etc. for funding the project. Any lapses or delays in funding can jeopardize the project and would land the project in trouble. Clear cut prior agreements with defined cash flows related to project mile stones would alleviate this risk.

- **Force Majeure Risk:** These are the risks that can not be foreseen and ULB or the operator would not have any control on. These are acts of god like, earthquake, flood, war, civil war, alien attacks, and other such disasters. These kinds of risks have to be alleviated by insuring with appropriate insurance agencies.
- **Insurance Risk:** The project should provide for insurance to cover the risks. There are many new policies and instruments available for covering the risks mentioned above. The insurance should include coverage of all project personnel with regard to accidents and the like.

CHAPTER 7

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CHAPTER 7 – REFERENCES

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APPENDIX - 1

QUESTIONNAIRE

APPENDIX – 1 – QUESTIONNAIRE

Name	
Age and Sex	
Education	
Profession	
Employer (please give address)	
Annual Income Level (as per the following scale) A – Above Rs. 750K, B – Between Rs. 400-750K, C – Between Rs. 200-400K, D – Between Rs. 100-200K and E – Below Rs. 100K	
Address (please give phone, pincode and Email)	
Date	
Notes	Please read the attached notes with details before answering the questionnaire. Please write any specific suggestions on the back of the questionnaire. For any clarifications/suggestions on the questionnaire, please contact B. Kanaka Durga Raja by phone on 00 91 40 6648895 (Mobile) or by email on bkdraja@samajvikas.org with a copy to bkdraja@rediffmail.com

Sino.	QUESTION	RESPONSE	REMARKS (IF ANY)
1	<p>How do you rate the overall performance of the Water and Sewerage Board in your city? Please rate it as per the following scale.</p> <p>A – Excellent B – Very Good C – Satisfactory D – Below Satisfactory E – Poor</p>		
2	<p>What is the source of Water Supply to your own needs? Please tick your source(s) and rank as per your usage. The source you use most (quantity) is to be ranked number 1 and the next source is to be ranked number 2 and so on.</p>		
	Water Board		
	Open Well		
	Borewell		
	Tanker		
	Private (Lay-out) Water Societies		
	Other (Specify)		
3	<p>Which of the following can improve water supply status in the city? Please rank the improvements of your choice(s). The choice you think would bring in most improvement is to be ranked as number 1 and the next choice to be ranked as number 2 and so on.</p>		
	Building a totally new system		
	Expansion of the existing system by adding more bulk water capacity		
	Improving the Operation & Maintenance of Distribution System		
	Reducing Unaccounted For Water (UFW)		
4	<p>Which of the following do you hold responsible for the present Water supply situation in your city? Please rank them. The one you think is most responsible for the situation is to be given number 1 and the next most responsible is to be given number 2 and so on.</p>		
	Government in General		
	Politicians (Ruling party or Opposition party, please specify)		
	Water Board Management		
	Distribution Operators		
5	<p>Which of the below you think contribute to the losses in the Water supply in your city? Please rank them. The choice contributing to most of the leakage is to be given number 1 and next choice to be given number 2 and so on.</p>		

	Main Transmission lines from source to treatment		
	At treatment		
	At Storage		
	In the Distribution system		
	At Household level		
6	Give your views on the adequacy of water tariff to domestic of users in your city? Rate the tariff adequacy as per the following scale. A – Too high B – A little more than adequate C – Adequate D – A little less than adequate E – Too low		
7	If the tariff is not adequate, by what percentage it should be increased? Please indicate the increase as per the following scale. If you have a specific percentage in mind or prefer no increase, please specify in remarks column. A – 80 – 100 % B – 60 – 80 % C – 40 – 60 % D – 20 – 40 % E – 0 – 20 %		
8	If Tariff is more than adequate, by what percentage it should be reduced? Please indicate the reduction as per the following scale. If you have a specific percentage in mind or prefer no reduction, please specify in remarks column. A – 80 – 100 % B – 60 – 80 % C – 40 – 60 % D – 20 – 40 % E – 0 – 20 %		
9	Which of the following factors you feel should be taken into consideration for fixing a rational tariff? Please rank them by priority. The factor, which is most important, is to be given number 1 and the next factor is to be given number 2 and so on.		
	Quantity		
	Quality		
	Time and duration of supply		
	Service		

10	What kind of tariff structure is appropriate for your city? Please rank it's appropriateness. The most appropriate is to be given number 1 and next is to be given number 2 and so on.		
	Flat Rate		
	Telescopic with reduction for more usage		
	Telescopic with increase for more usage		
	Subsidised uniformly for all		
	Subsidised only for the eligible poor		
11	If finances are required for improvising the water supply and sanitation situation in your city, which of the following options is appropriate? Please rate them for appropriateness. The most appropriate choice is to be given number 1 and next choice is to be given number 2 and so on.		
	Increase in User charges/ Tariff levels		
	Funds from State/ Central Governments		
	Increase in utility's share of local taxes		
	By raising Bonds (municipal/ utility)		
	Loan from World Bank/ Asian Development Bank/ HUDCO/ LIC, etc.		
	Grants from Donors/ Aid Agencies		
12	Which of the following agencies are best suitable/ appropriate to handle water supply and sanitation to your city? Please rank them. The one most suitable/ appropriate is to be given number 1 and next is choice to be given number 2 and so on.		
	State Government Department		
	Urban Local Body		
	Autonomous Public Sector Undertaking		
	Private Sector		
	User Cooperatives		
13	What do you feel is the best suitable form of Private Sector Participation to improve water supply and sanitation in your city? Please rank the appropriateness of your choice. The most appropriate is to be given number 1 and the next is to be given number 2 and so on.		
	Service Contracts		
	Management Contracts		
	Concessions		
	BOT type arrangements		
	Total Privatization		
	User Cooperatives		

14	Which of the following components of your city's water supply could be easily opened up for Private Sector Participation? Please rate their ease in opening up for private sector participation as per the following scale. A - Very easy B - Easy C - Not easy		
	Bulk Supply		
	Distribution		
	Billing & Collection		
	Leak Detection and Repairs		
	Whole Operation and Maintenance		
15	Please rate the success/ failure of privatization attempts in the following sectors as per the following scale. A - Successful B - Average (neither successful nor failure) C - Failure		
	Aviation		
	Banking		
	Highways		
	Insurance		
	Ports		
	Power		
	Telecommunications		
	Water Supply		
16	If you rate Private Sector Participation as successful, then which of the following benefits you consider would result from it? Please rank them. The largest benefit to be given number 1 and next largest to be given number 2 and so on.		
	Efficiency gains		
	Virtuous management Practices		
	Technology growth		
	Prudent financial practices		
	Good quality and service		
	Impartial regulation by government		
17	If you rate Private Sector Participation as failure, then which of the following losses have occurred to the sector. Please rate them. The biggest loss to be given number 1 and the next biggest to be given number 2 and so on.		

	Deprivation and suffering to the poor (high tariffs)		
	Profiteering by private sector		
	Cartel forming by private sector & Monopolisation		
	Technology stagnation		
	Financial irregularities		
	Poor quality & service		
	Biased regulation by government		
18	Which of the following can improve sanitation status in the city? Please rank the improvements of your choice(s). The choice you think would bring in most improvement is to be ranked as number 1 and the next choice to be ranked as number 2 and so on.		
	Building a totally new system		
	Expansion of the existing system by additional sewer capacity		
	Improving the Operation & Maintenance of Sewerage System and pumping stations		
	Treating Sewage to acceptable standards		
19	Which of the following do you hold responsible for the present Sanitation situation in your city? Please rank them. The one you think is most responsible for the situation is to be given number 1 and the next most responsible is to be given number 2 and so on.		
	Government in General		
	Politicians (Ruling party or Opposition party, please specify)		
	Water and Sewerage Board Management		
	STP Operators		
20	Which of the following components of your city's sanitation could be easily opened up for Private Sector Participation? Please rate their ease in opening up for private sector participation as per the following scale. A - Very easy B - Easy C - Not easy		
	Collection and transmission		
	Pumping Stations		
21	Please give your suggestions on improving water supply and sanitation in your city?		
	Please comment on the attempts to privatise water and sanitation sector.		
	Please give your suggestions for improvement of this questionnaire for future use.		
	Please comment on the design of the questionnaire		

NOTES TO ACCOMPANY THE QUESTIONNAIRE

Options for Private Sector Participation

The usage of the terms Private Sector Participation (PSP) and Privatisation are rapidly growing world-wide. Privatisation is a form of advanced PSP. Broadly PSP is the act of reducing the role of government, or increasing the role of the private sector, in an activity or in the ownership of assets. There is a wide spectrum of options for PSP. At one end of the spectrum are those in which the government retains full responsibility for operations, maintenance, capital investment, financing and commercial risk and at the other end are those in which the private sector takes on much of this responsibility. For the options at the beginning of the spectrum of PSP, the government needs to exercise administration as with any contract. Under the options at the end of the spectrum of PSP, the private sector does so with in a regulatory framework created by the government. These regulatory arrangements are to protect the consumers from monopolistic pricing, enforce health and environmental standards and to ensure access to service to the disadvantaged through subsidy regimes. The main PSP options are listed below:

Service Contracts: Contracting out specific tasks such as leakage repairs, revenue collection, installing and reading meters, etc. for short durations. This is the simplest form of private sector participation, which can introduce the benefits of private sector expertise and competition but needs careful co-ordination and management and is not likely to bring in benefits to an inefficient utility. It also leaves the responsibility of investment with the public sector.

Management Contracts: Contracting out full responsibility for the operation and maintenance of a public utility to private sector. If such contracts are carefully designed they can bring efficiency improvements resulting in reduced costs and increased revenues which may, in the longer run, provide a means of financing new capital works. It does not provide a means of introducing private finance to facilitate major new capital works. However it may be used to advantage in conjunction with financing of capital works by international funding agencies who may be more inclined to provide finance if an experienced operator is managing the operations. This type of contract can also be useful when legislation or public opinion make the full privatisation of a utility impossible or financially unviable or politically undesirable. It is not essential with this type of contract for the tariff to cover the costs. To gain full benefit from this type of contract the management fee should be linked to efficiency savings. This means that the levels of service must be benchmarked and the efficiencies defined in a way that can be readily measured.

Leases: A private operating company leases the assets from the public utility and takes full responsibility for operating and maintaining them and for delivering a defined level of service to the consumers. Ownership of the capital assets and responsibility for further capital investment remains with the public utility. The advantages of this option are very dependent upon the drafting of the agreement. In practice it is common to place upon the contractor some responsibility for rehabilitation and extension of the system although major capital investment in the form of new capital works is normally excluded. This approach is most effective where there is a lot of potential for efficiency savings. It can also be used when there is a legal or political objection to the private ownership of utility assets.

Concessions: A private operating company is given the responsibility for the operation and maintenance and investments of a public utility for a fixed duration. The main advantage is that the full responsibility is with private sector, which can bring in incentives for efficiency in the utility's activities. This option is attractive where large investments are needed to expand the coverage or to improve quality of services. For the government it is a complex business to administer the contract. Proper and efficient regulation is required to determine the success of the concession contract and for distribution of benefits between the concessionaire and consumers.

Build Operate Transfer (BOT)/ Build Operate Own (BOO) Arrangements: A contract is given to a private sector company for providing bulk services for fixed duration. This option is normally used for Greenfield projects such as treatment plant. The contract between the BOT concessionaire and the utility is usually on a take-or-pay basis. This arrangement works well if the utility's main problem is related to water supply or treatment. But if the problem is faulty distribution or poor revenue collection, the BOT may be unlikely to remedy it. If separate contracts are awarded for bulk supply, treatment, distribution and revenue collection, then this arrangement is likely to bring in advantages. However this option brings in private finance and the expertise of the private sector. Proper and efficient regulation plays a major role in the success of this arrangement.

Divestitures: Divestiture of assets through sale of assets or shares or through management buyout. This option gives the private sector full responsibility for operations, maintenance and investments. Under this option the ownership of assets is transferred to the private sector. This option is likely to bring in efficiency gains. Regulation will remain the task of the government.

Public Private Partnership (PPP): Corporatisation of a public utility and the sale of the share in the new company to the private sector. This arrangement facilitates the introduction of private sector capital and management expertise into a utility while permitting the municipality to retain majority shareholding. This approach has proved effective where legislation or political ideology has not permitted control of a utility to pass out of public hands.

Unaccounted For Water (UFW)

Unaccounted for Water (UFW) is roughly the difference between the quantity of water produced and quantity of water billed. This UFW essentially accounts for losses between production and consumption including pilferage.

Financing

The five-year and annual plans of central and state governments and Urban Local Bodies (ULBs) allocate funds for Urban Infrastructure Development. This was never sufficient to bring the urban infrastructure to a reasonable level. These funds are generally supplemented with funds from LIC, HUDCO, World Bank, Asian Development Bank, other multi-lateral and bi-lateral (DFID, OECF, KfW, Danida, SIDA, CIDA, EU, EC, USAID, NEDA, GTZ, etc.) programmes. Generally, these funds were given as part grants and part soft loans and routed through Central/ State governments to the ULBs. As a part of these funds were soft

loans they were to be repaid over long periods of time with low interest rates. The recovery of these loans was not effective and most of the time the repayments were through book adjustments. In many cases the Central/ State governments wrote off these loans. In this kind of a situation financing by commercial financial institutions or banks was not possible. They can not provide these services unless their financial position is improved. The following are some of the mechanisms for augmenting the ULBs financial resources.

- **State Revenue Sharing:** A portion of the State tax revenue need to be set-aside as a pool for distribution to ULBs. Taxes like Octroi can be phased out and replaced by tax sharing between States and ULBs.

- **Local Tax Collection:** Certain taxes which are essentially local in nature like entertainment tax, Motor Vehicles Tax are collected by the States for reasons of collection ease and efficiency. The bulk of these taxes need to be shared with the ULBs.

- **Government Grants:** An annual pool for distribution needs to be created at the State level. This pool should be consisting of a predetermined percentage of State revenues, shared taxes and other taxes like Sales Tax. The criterion for distribution from this pool should be the needs, fiscal capacity, performance, and development readiness of the ULBs.

- **Municipal Equalisation Fund:** In general, except for a few, most ULBs are in various degrees of fiscal breakdown. A fund needs to be created to take care of these fiscal disparities between ULBs. The distribution of this Equalization fund should be based

again on a composite index linked to fiscal needs, capacities, performance and development readiness of the ULBs.

- **Municipal Bonds:** This idea is catching up with the ULBs, though initially there were some hurdles. The ULBs require approval of State government for open market borrowing. Maharashtra and Gujarat have enacted legislation with explicit provisions for open market borrowings by ULBs. Other states must enact such legislation. To be able to provide transparency the ULBs need to carry out reforms of accounting practices with separation of project and non-project accounts. The ULBs would need to exercise considerable financial skills to gain investor confidence.

- **User Pay Charges:** Below given are certain innovative user pay instruments that the ULBs can think of and on a case to case or project to project basis.

Infrastructure	User Pay Instruments
Water Supply	Advance Registration Charges, Connection Charges, Tariff Enhancement, Betterment Charges, Development Charges, Share in Octroi, Property Tax, Plot Sales, etc., Water Kiosks Charges
Sewerage	Collection Charges, Conservancy Tax, Renewable Waste Sale, Sludge Sale, Nutrient Rich Wastewater Sale
Solid Waste	Collection Charges, Renewable Waste Sale, Waste Dumping Fines

Tariffs - Cost Recovery - Subsidies

The ever increasing Urban Infrastructure development capital costs and ever rising operation and maintenance expenses are an increasing burden on the static municipal resources. In general the public feels that it is the government's duty to provide water and related service at

free of cost. This deep-rooted feeling coupled with other factors has put the ULBs in an unhealthy financial position. This has led to a steady state of deterioration of urban services.

The present state of affairs of subsidised and free services has to change and the cost of services including production, distribution, debt servicing and operation and maintenance have to be recovered from the beneficiaries. In certain places the cost of the production and the cost of providing the service are not known.

This does not mean that the poor and the have-nots are to be deprived of the urban infrastructure services. The pricing mechanism has to take this into consideration and design realistic tariff structures. The subsidy mechanisms have to target to reach the poor. In many cases the subsidies end up benefiting the rich.

ULBs need to be given powers to set tariff levels for user charges for the services provided. A practical pricing approach aimed at cost recovery is a must for the financial well being of ULBs. The various tariff structures include flat rate (a single for each unit of consumption irrespective of consumption), telescopic (increasing or decreasing rates as the consumption gets higher), subsidized (the consumption upto certain level is subsidized or consumption above certain level is subsidized), etc.

Regulation

The establishment of a regulatory framework is a prerequisite for the success of an infrastructure Private Sector Participation program where the options chosen is lease or BOT or divestiture. Utility regulation has the following main aims:

- To protect consumers from abuse by firms with substantial market power
- To support investment by protecting investors from arbitrary action by the government
- To promote economic efficiency
- To satisfy demand
- To promote competition

Regulating utilities is not easy. The political pressures, the vulnerability of the long-term infrastructure investments and the difficulty in creating credible commitments both from governments and investors complicate the issue of regulation. A regulatory agency must have independence, autonomy and expertise to be truly effective and accountable. It is important that a regulatory body is established before private sector participation is implemented. The base condition of assets and base level of service must be determined to establish benchmarks against which performance can be monitored.