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Number 50

Public - Private Provision of Urban Services

(Prepared for the Planning Commission)

National Institute of Urban Affairs
New Delhi
December 1992

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PREFACE

One of the major urban issues currently being faced in India is, how best to meet the growing demands of the country's urban population in respect of services such as water supply, sewage and garbage disposal and its treatment, street lighting, maintenance of roads, and intracity transportation. Should it be done within the framework of the institutions presently responsible for their provision and maintenance, or should an alternative to the existing arrangements be considered and introduced? The issue of the institutional arrangement is very real as within a very short period of time, the urban population of the country has increased at a phenomenal rate, and the various programmes intended to influence and slow down the rate of urban population growth have not been effective. In 1961, for instance, about 79 million persons lived in the urban areas; by 1991, this number had increased to over 217 million, registering an increase of over 250 per cent within a period of just three decades. The planners' dilemma on this front which directly affects the demand for services does not end here; almost all population projections indicate that India will enter the twentyfirst century with an urban population of 330-340 million persons, which will further increase to an astronomical figure of over 400 million by the year 2011 AD.

The population factor, however, represents only one side of the issue. An equally important aspect of the

problem is that the supply of services in relation to demand has hardly increased, or increased, at best, marginally, and the institutions responsible for the provision of services have not been very successful in balancing the supplies with the demand for services. The changes that have periodically been made in the coterie of public bodies and institutions such as the provincialisation of urban services and the creation of special-purpose, autonomous and semi-autonomous agencies have made little difference to the overall supply and distribution of services. Most such agencies have lost over these years whatever financial leverage they had, and are in no position to even operate the services, let alone augmenting or expand them. What then should be done?

Apart from the demand and supply compulsions, another factor that has helped this issue to be raised and re-examined at this point of time is the rapidly changing economic environment reforms and adjustments in the country. Can this environment be taken advantage of in opening up the vast and expanding area of urban services such as water supply, solid waste disposal, urban transport etc. to the private enterprise? Does this area offer the conditions for the private sector to come in?

It is in the light of this general background, and the central issue of the appropriateness of the existing institutional set up for the provision of services that this

study on "Public-Private Provision of Urban Services" has been prepared. The study has been extremely useful and instructive as, to begin with, it dispels the widely-held notion that services such as water supply, solid waste collection and disposal, primary health, and transport are provided by the public and public-owned agencies and institutions, and the private sector has no role in their provision. The study shows that the private sector, in fact, plays a significant role in services provision although, as would be expected, the role is greater in some services and smaller in others. Like the hierarchy in the network of public agencies, the private provision is heterogeneous, and consists of households own-arrangements, small scale informal enterprises, and large scale and formal enterprises. In most services, the public and private sectors supplement each others' roles; in others, they complement each other. The evidence on the extent of competition between the public and private provision of services, however, is not clear from the study.

The study brings out rather sharply the inadequacies of public provision of services. It shows that the public provision is inadequate on a number of counts, these being -

i. inability to provide services to the entire urban population;

ii. inability to reach out to particularly the low-income and poor households;

iii. inadequacy of services in relation to the service standards and norms;

iv. inability to recover from the users what they spend on the provision and delivery of services;

v. inability to involve and mobilise the users in efficiently managing and maintaining the services; and

vi. inability to efficiently use the available manpower and equipments to improve the service delivery.

While the study reveals the inadequacies of the public provision, it is not able to confidently show in a comparable vein the weaknesses or the strengths of the private sector. Nor is it possible to say with any degree of confidence that the weaknesses of the public sector agencies are the strengths of the private sector, or that the private sector offers the natural panacea or a sustainable alternative in this area. What it does establish is the significant role already being played by the private enterprise - be the service a natural monopoly, a merit good or a public good. This itself is an important finding and should shed any reservations that may currently exist in involving the private sector in the provision of urban services.

This study has been conducted and coordinated by Ms. Usha Raghupathi, a senior colleague of mine at NIUA. Professor Gopal Krishan, Chairman, Department of Geography, Punjab University, Chandigarh has served as a Consultant to this study. Several other staff members of NIUA including S.P. Tyagi, Rajan Pal and Noble Thalari have assisted in conducting the field work and compilation and tabulation of primary survey data. I would like to thank all of them for their contributions. I would like to particularly acknowledge the work of Professor Gopal Krishan and Ms. Raghupathi, for assuming responsibility for carrying out this study.

I would like to express my gratitude to the Planning Commission for entrusting this study to us. We hope that the Planning Commission will be able to make use of the results of the study in shaping its position on the future institutional set-up for the provision of urban services.

December, 1992

DR. DINESH MEHTA
DIRECTOR

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I

ISSUES AND SCOPE

It is a common knowledge that the existing institutional arrangements for the provision of essential services like water supply, garbage collection and disposal, primary health, road upkeep and maintenance, and street lighting in the urban areas of the country are grossly inadequate, overstretched, and overstrained. In a number of urban areas, the arrangements have virtually collapsed, with the result that the urban households, a significant number of them, are forced to manage either with very inadequate levels of services or no services at all. This situation has led many to point out that the institutions which are responsible for the provision of services came into being at a time when the pressure of urbanisation and urban growth were low and weak; today's context within which the institutions have to provide these services is very different. The population of urban areas has increased in recent years at rapid rates, and made it extremely difficult for the institutions to maintain pace, expand and augment the supply of services. During 1961-91, urban population in the country, for instance, increased by over 250 per cent; comparatively, the increase in the supply of services was insignificant although, as subsequent sections will show, heavy investments were made in some of the services.

Table 1.1

Growth of Urban Population

Year	Urban Population (in million)	Decadal Change (%)
1901	25.85	-
1911	25.94	0.35
1921	28.08	8.27
1931	33.45	19.12
1941	44.15	31.97
1951	62.44	41.42
1961	78.93	26.41
1971	109.11	38.23
1981	159.46	46.14
1991	217.17	36.19

Notes : 1. As the 1981 Census was not conducted in Assam, the 1981 population figures for India include interpolated figures for Assam.

2. The 1991 Census has not been held in Jammu and Kashmir. The 1991 population figures for India include projected figures for Jammu & Kashmir as projected by the Standing Committee of Experts on Population Projections (October, 1989).

Source : Census of India 1991, Series 1 Provisional Population Totals: Rural Urban Distribution, Paper-2 of 1991.

The rapid increase in urban population is not the only factor that has strained the institutional capacities; a related factor is that a part of the urban population - in fact, a significant part, is either not able to pay or does not pay for the services that they use. While precise

estimates on the number of such population are not available, there is no escaping the fact that the non-payment of service charges has weakened the institutional capacities in terms of their being able to provide adequate levels of services. Most institutions are in a financial mess, and have accumulated large arrears and debt obligations that they are not able to meet. Today's context is also much more turbulent for those institutions that are unable to take note of the changes that are taking place in the demand profile of consumers. Under these changed circumstances, it is argued, there is no justification for continuing with the same institutional set-up. Pressures of population, age and technology of services, and the rapidly changing demand profile of consumers have rendered the present set-up obsolete and irrelevant.

If we review the overall situation with respect to the availability of services in the urban areas, many of these assertions would seem to be valid. In 1985, for which country-wide data are available, 27.1 per cent of India's total urban population had no access to safe drinking water, and 71.6 per cent had no access to basic sanitation. In many states such as Bihar, Andhra Pradesh, Assam, Orissa, and Rajasthan, the proportions of population without these services were much higher. Also, the accessibility percentages do not at all mean that the services were either quantitatively adequate or qualitatively satisfactory. According to the studies on the subject, there are very few

cities that are able to supply water at norms that are considered desirable on "health considerations".[1] In 20 per cent of cities with over 100,000 population, per capita supplies are less than 50 lts. per day - a bare 24 per cent of what might be considered to be a desirable norm. The position with respect to the collection and disposal of garbage - one of those services that has high negative externalities, is worse; apart from the low population coverage by garbage collection services, on an average, 28 per cent of the garbage is left on the city streets, uncollected, the impact of which on environment is beginning to pose a serious problem in a large number of urban areas.[2]

These inadequacies are not confined to public institutions which are responsible for water supply or garbage collection, but extend equally to those that are responsible for services like primary health, intracity transport, electricity etc. Despite massive public investments that have been made during the past few decades in augmenting these services, the impact has not been significant. For instance, one would have assumed that

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1. National Institute of Urban Affairs, "Upgrading Municipal Services: Norms and Financial Implications, Vol.I Research Study Series No.1, New Delhi, 1989.

2. National Institute of Urban Affairs, "Management of Urban Services", Research Study Series No.14, New Delhi, 1986.

that public investments in health infrastructure will help in reducing the mortality rates; however, the infant mortality rates in the urban areas continue to be extremely high (62 per 1,000 live births in 1986).

Table 1.2

State of Urban Services, 1985

States/U.Ts	Percentage of population	
	Not covered by safe water supply	Without basic sanitation
Andhra Pradesh	47.9	89.1
Assam	62.5	89.1
Bihar	40.5	77.1
Gujarat	16.8	62.0
Haryana	30.9	71.6
Himachal Pradesh	10.9	86.3
Jammu and Kashmir	13.4	92.3
Karnataka	18.8	61.6
Kerala	35.5	71.8
Madhya Pradesh	20.3	92.2
Maharashtra	12.9	60.2
Manipur	48.5	99.2
Meghalaya	77.9	N.A
Nagaland	53.3	N.A
Orissa	61.9	90.5
Punjab	28.8	51.5
Rajasthan	44.0	90.4
Sikkim	11.0	67.1
Tamil Nadu	16.2	52.5
Tripura	48.5	86.8
Uttar Pradesh	29.9	85.9
West Bengal	36.3	80.5
Andaman & Nicobar Island	N.A	45.0
Arunachal Pradesh	11.5	61.5
Chandigarh	0.0	0.0
Delhi	8.9	26.6
Dadra & Nagar Haveli	1.0	-
Goa, Daman & Diu	18.1	86.7
Lakshadweep	N.A	N.A
Mizoram	92.4	98.5
Pondicherry	23.7	60.1
India	27.1	76.6

Source: Ministry of Urban Development "Mid-term Review of Water Decade Programme, Proceedings of Conference, New Delhi, 1985.

Table 1.3

Infant and Child Mortality Rates, Urban

States/U.Ts	Infant Mortality Rate	Child Mortality Rate (0-4 Years)
	1989	1988
Andhra Pradesh	53	17.9
Assam	63	21.0
Bihar	63	22.8
Gujarat	70	22.2
Haryana	58	19.7
Himachal Pradesh	33	10.4
Jammu and Kashmir	55	16.9
Karnataka	53	16.1
Kerela	15	9.2
Madhya Pradesh	78	28.8
Maharashtra	44	15.5
Orissa	78	19.7
Punjab	44	16.8
Rajasthan	58	24.8
Tamil Nadu	43	14.6
Uttar Pradesh	75	28.1
West Bengal	53	13.1
All India	58	18.7

Source:1. Health Information India - 1988, Ministry of Health and Family Welfare, Government of India, New Delhi.

2. Sample Registration System, 1988. Registrar General of India, New Delhi.

Nearly 1.5 million children die every year in India on account of diarrhoea and other water-related diseases. The persistence of high birth rates is yet another indication of the fact that the wide-ranging network of public agencies which has been created to propagate family planning practices has failed to make any noticeable impact in the urban areas. Likewise, barring in a few places, intracity public transport services are meager, and account for no more than 15-40 per cent of the total household trips. The

failure of the public transport system is equally evident in the large number of households using personalised modes of transport which, in many cases, may seem to be an avoidable option.

The inadequacies of institutions are felt most by the low-income and urban poor households. An examination of the available studies would show that the poor are accessed for their water requirements to sources like standposts, handpumps and vendors which, in many instances, are high risk sources. A study of the health services in the Union Territory of Delhi (1988), revealed that while, in the aggregate, the health services in relation to Delhi's population fulfilled the adequacy norms, there were gross disparities in their availability, with generally the poorer areas being the victims of spatial inequities.

An examination of the financial resources that the municipal bodies, which are the premier agencies in India, use for operating and maintaining the services, shows that the resources at their disposal are scarce, and barely increasing. During 1979-80/83-84, the revenue incomes of municipal bodies increased by 9.2 per cent in a four year span; as against this, the revenue expenditure escalated by 56.2 per cent. Per capita expenditure at 1986-87 prices on municipal services was 64 per cent of the desirable

expenditure norms and standards.[3] In most of the class I cities (with population of over 100,000) the per capita expenditure levels were below the norm.[4]

Given this general situation, the question arises as to what should be done to improve the access of urban population to basic urban services. Should we still continue to rely on the existing institutions such as the municipal bodies, parastatal agencies, and other development board and departments, or jettison them in favour of new alternatives? Should the private sector be brought in to replace or supplement or complement the net of existing institutions?

It is important to mention at this stage that the question as to which agencies/institutions actually deliver and provide the various services and what their precise roles are, has not been systematically examined in literature. There are no studies that throw light on this question. The result of the absence of research studies on this subject is that several notions in respect of "who provides the urban services" have come into being which, in fact, are misplaced, if not unfounded, and have led to confusion in policies relating to the institutional arrangements for urban services provision.

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3. National Institute of Urban Affairs, "The Nature and Dimensions of Urban Fiscal Crisis", Research Study Series No. 18, New Delhi, 1987.

4. National Institute of Urban Affairs, "Upgrading Municipal Services: Norms and Financial Implications, Vol.I, Research Study Series No. 38, New Delhi, 1989.

For instance, it is assumed that the "municipal bodies", (municipal corporations, municipalities, and notified area committees) enjoy a kind of monopoly in respect of services such as water supply, waste disposal, primary health, road maintenance etc. and that these services fall within their exclusive domain, with no role for other agencies. A survey of the urban areas would invalidate such a view, as there is a whole hierarchy of institutions within and outside the public domain, which are involved in the services provision. For instance, in the case of water supply, there are at least three "major" forms of institutional arrangements, these being -

i. water being supplied by the municipal bodies, with no role for either the parastatal agencies or higher levels of governments;

ii. water being supplied by the parastatal agencies with no role for municipal bodies;

iii. water being supplied as a shared responsibility between the State Government, parastatal agencies, and municipal bodies.

These are only the major forms, and do not include other interesting combinations of arrangements. In addition to institutions in the public domain, there are a large number of private, formal and informal sector enterprises that play an important role in the provision of water. In other services like intra city transport, health, education,

the area of institutions involved in their provision is much wider. The urban services market, in this sense, is not simple or homogeneous, but highly complex and heterogeneous, presenting a situation where there are a number of "sellers" and a very large number of "buyers".

The question of "who supplies what services", or a more difficult one, "who should supply what services" has traditionally been determined by one major consideration, i.e., the nature of the service. Why public agencies hold on to certain services without explicitly promoting or encouraging the private sector institutions, and why they prefer a secondary role, is determined to a significant extent by the nature of the service, i.e., whether it is a natural monopoly, or a merit good, or a public good. The example of water supply is pertinent here as, it being a natural monopoly, the direct role of public agencies in the production, treatment and distribution has all through been dominant and visible. In other services which have no such dominant characteristics, and where the externalities are not significant, the institutional network is evidently more complicated. Here too, the traditional way of dividing the public-private roles has undergone a major change, and it is no longer uncommon to have the private enterprise in natural monopolies or the public sector ownership in services that have no element of a merit/public good.

Natural Monopoly

When a factor of production cannot be duplicated, a natural monopoly is said to exist. For example, water supply

Merit Goods

Merit goods are those goods and services that society considers to have special merit but that might be produced in insufficient quantity if left to private markets. Health, education and housing are often thought of as merit goods - at least up to a certain minimum level.

Public Goods

Goods and services that have to be provided to a group as a whole and cannot be subdivided for the benefit of particular individuals.

In the study on Public-Private Provision of Urban Services, we have attempted to find out the roles of different agencies and institutions in the provision of urban services. Further, by using a variety of indicators, we have attempted to ascertain the level of efficiency with which the different agencies and institutions provide the various services. The main indicators used are given below.

Indicators used to evaluate each service

Water Supply	1. Population covered by the water supply system.
	2. Population dependent on private arrnagements.
	3. Per capita per day domestic supply.
	4. Duration and frequency of supply.
	5. Income and expenditure on the service.
	6. Payment for the service and affordability.
Garbage Disposal	1. Population covered by the service.
	2. Sanitary staff per 1000 population.
	3. Generation v/s collection and disposal.
	4. Income and expenditure on the service.
Health	1. Accessibility of the service.
	2. Affordability.
	3. Efficiency of the public and the private facilities.
	4. Use of public and private health facilities by people.
Transport	1. Use of buses and IPT modes.
	2. Affordability.
	3. Efficiency of the bus system and the IPT modes.
	4. Accessibility of the different modes.

The study is confined to four services, namely, water supply, solid waste collection and disposal, intracity

transport, and health, each of which have different attributes and characteristics. Water supply is a natural monopoly, solid waste collection and disposal is a public good; health has the characteristics of a merit good; and intracity transport is a service that has a vital impact on the productivity levels and functioning of the urban areas.

Data for the study have been drawn from three cities - Varanasi, Vishakhapatnam, and Gurgaon which also are different in terms of their size, composition and topography. They are managed and governed differently and their municipal income and expenditure levels are also different as can be seen in the following two tables.

Table 1.4

Basic Demographic Data

City	Population		Growth Rate 1981-91	Area (in sq.km.)	Density per sq.km.
	1981	1991		1981	1981
Varanasi (U.A.)	797,162	102,6467	28.77	103.87	7675
Vishakha-patnam (U.A.)	603,630	105,1918	74.27	96.54	6253
Gurgaon (U.A.)	100,877	134,639	33.47	24.13	4181

Source : Census of India, 1981, Part II A Paper 2 of 1991.

Table 1.5

Municipal Income and Expenditure

(Rs.)

City	Income		Expenditure	
	1986-87*	1989-90**	1986-87*	1989-90**
Varanasi	97,782,751	229,845,468	91,676,008	227,585,000
Vishakha-patnam	129,939,000	437,050,600	73,033,000	422,259,900
Gurgaon	15,358,289	18,180,791	14,626,071	18,120,320

* Actuals ** Estimates

The study was conducted at two levels, at the institutional level and at the household level. For eliciting information from the concerned institutions a proforma was prepared for each service separately and information was collected through personal visits and discussions. The proforma covered the institutional arrangements, the level and quality of services as well as the financial aspects.

For household level information a questionnaire was prepared covering all the four services. Three hundred households were surveyed in each of the selected cities. The survey was conducted in May-June 1989.

The household questionnaire contained five sections.

The different sections covered the following :

Section A: Household data:

Household size, household income, and shelter type.

Section B: Water Supply:

Source of water supply (public/private), duration of supply, monthly payment for water, payments for purchase of water, and expenditure on installation and running of private sources of water supply.

Section C: Refuse Disposal:

Method of garbage disposal, payment for disposal, frequency of garbage collection, and cleaning of streets and drains.

Section D: Transport:

Vehicle ownership, public modes used, and payment for use of different modes of transport.

Section E: Health:

Health care facility used (public/private), Payment for services used, and preventive health services available.

The report is divided into six sections. Section one details the issues and scope. Sections two to five deal with each of the selected services viz, water supply, solid waste collection and disposal, transport and health respectively. The last section gives the summary and conclusions of the study.

II

PROVISION OF WATER SUPPLY

Concern for the provision of safe and potable drinking water is universal, cutting across countries, cultures, religion, races, and the social and income status of the consumers. A review of literature on the subject shows that the universality of concern springs from the fact that water, apart from being an essential good for survival and a part of the life support system, is not a "substitutable" good, although it might be more preferable to say that its substitutability factor is "near-zero". No less important is the fact that water supply has serious negative externalities in the sense that "unsafe" and nonpotable water can result in a host of communicable and non-communicable diseases. On account of these factors, the provision of water has largely been within the public domain and a public responsibility, although historically the private sector has played an important role in developing water supply systems. London and Paris got their drinking water through private companies in the eighteenth century. As the scale of operations increased, both public and private agencies started to share this responsibility, and, since then, this position has continued. At present, 75 per cent of the water supply companies in the United Kingdom, 60 per cent in France, and 55 per cent in the United States are in the public fold.

Legal Responsibility for Providing Water Supply

Provision of water supply in India has traditionally been a 'public' responsibility. It is a listed obligatory function in the State Municipal legislations which enjoin the municipal bodies with wide-ranging powers in respect of water supply provision. The Gujarat Municipal Act, 1965 (Gujarat Act No. 34 of 1964), for instance, lays down that "it shall be the duty of every municipality to make reasonable and adequate provision for obtaining a supply, or an additional supply of water, proper and sufficient for preventing danger to the health of the inhabitants from the insufficiency or unwholesomeness of the existing supply ." In Tamil Nadu, Article 129 of the Act provides that the municipal councils shall, so far as the funds at its disposal may admit, provide a sufficient supply of water fit for the domestic use of inhabitants. Provisions relate not only to the supply of water but to a large number of related matters such as the construction, maintenance, repair, alteration, improvement and extension of waterworks, prohibition of fraudulent and unauthorised use of water and prohibition of certain acts affecting the Mahapalika waterworks. Most legislations lay down the obligations of owners and occupiers of houses which have been connected to municipal water supply in respect of the use of water. All states in the country have similar legislations and the differences in them are not significant.

It is important to point out that despite the unambiguous role that has been entrusted to the municipal bodies, a new hierarchy within the public domain has emerged in recent years to provide water to the urban areas. In Uttar Pradesh, the State Government has established under a separate Act, called the Uttar Pradesh Water Supply and Sewerage Act, 1975 a Corporation by the title of Uttar Pradesh Jal Nigam and assigned the Nigam, inter alia, the functions of operating, running and maintaining any water works, and of reviewing and advising (the State Government) on the tariff, taxes and charges of water. Under the same Act, the State Government has set up Jal Sansthans in municipal areas, and given them the task of providing "the people of the area within its jurisdiction with wholesome water", and of planning, promoting, and executing schemes of water supply, and operating an efficient system of water supply. Jal Sansthans have also been empowered under the Act to exercise all powers and perform all the functions relating to water supply, sewerage and sewage disposal of areas which lie within their jurisdiction.

In many states, the State Governments themselves through their departments such as the Public Health and Public Health Engineering Departments have assumed responsibilities in respect of the provision of water. Mostly , they are responsible for the capital works such as construction of water works, laying down of distribution pipes etc., although there are several instances where they

are equally responsible for the distribution of water to the various categories of consumers. Thus, there are diverse institutional arrangements in respect of water supply provision, and at least the following typologies can be found to represent the ground-level position -

i. where the municipal bodies perform all functions relating to water supply, including the capital works, distribution, operation and maintenance of water supply, and administrative functions such as billing, charging etc.;

ii. where the city-level, autonomous water supply boards and corporations have been entrusted with functions relating to the water provision;

iii. where water supply boards are a part of municipal bodies but enjoy functional autonomy;

iv. where the state-level parastatal agencies such as the water supply and sewerage boards or the State-level departments like the Public Health Engineering Departments undertake the capital works; and the municipal bodies operate and maintain the water supply systems;

v. where the parastatal agencies undertake the capital works and also operate and maintain the water supply systems at the level of cities; and

vi. where the development and regulation of water supply and related matters are shared by a hierarchy of institutions set up under a single Act, such as the Jal Nigam and Jal Sansthans in Uttar Pradesh.

This diversity in the institutional set-up in the urban water supply sector is a comparatively recent phenomenon, in fact, a phenomenon of the 1960s when the State Governments in the country set up semi-independent and autonomous corporations and boards to undertake the preparation of long range plans for urban water supply, and carry out capital

works, hitherto being carried out by the State Governments' own public works departments. These changes were triggered by the fact that as population in the urban area began to accelerate and increase at rapid rates, it became evident that the municipal bodies could not rely on water resources falling within their own boundaries and jurisdictions, and had to tap water sources from outside their own boundaries. The corporation/boards having State-wide jurisdictions found it easier to tap such sources rather than the municipal bodies whose jurisdictions were limited.

Notwithstanding the fact that the provision of water, it being a "natural monopoly", is a stated public responsibility, the fact is that the non-governmental organisations and private agencies play a noticeable role in the sector. According to the 42nd round of the National Sample Survey Organisation, 28.5 per cent of water supply in India is provided by the non-governmental sources. These sources include community (2.79%), charitable trust (0.52%), and others (25.22%). These sources use various methods of supply, which include hand pumps/tube wells, pucca wells, tanks and ponds, and tankers. Tap supplies are a relatively unimportant source as far as the non-governmental agencies are concerned.

Table 2.1

Major Supply Sources of Water Supply (Urban), 1987-88

Sources	Percentage
Government	71.5
Community	2.8
Charitable Institutions	0.5
Others	24.8
Not available	0.5
	100.0

Sources : NSS 42nd Round, July 1986-June 1987.

Statutory Provisions in the State Acts covering the Sampled Towns

Like in most states, the provision of water supply in the three cities, namely, Varanasi, Vishakhapatnam, and Gurgaon is governed and regulated by the state-level legislations. Water supply in Varanasi is an obligatory function of the Mahapalika (Corporation); appropriate provisions in this respect are laid down in the Uttar Pradesh Nagar Mahapalika Adhiniyam, 1959. The 1959 Adhiniyam lays down that it shall be incumbent upon the Mahapalika to make reasonable and adequate provision for the "management and maintenance of all Mahapalika water works and the construction and acquisition of new works necessary for a sufficient supply of water for public and private purpose. In 1975, the State Government put through a legislation, called the Uttar Pradesh Water Supply and Sewerage Act under which it set up the Jal Nigam and Jal Sansthans to assume all responsibilities in respect of water

supply. In Varanasi, it is the Jal Sansthan that maintains the water works, supplies water and performs other related administrative functions. Capital works are carried out by the Jal Nigam. The Varanasi Municipal Corporation now plays no role in water supply provision, as the provisions of the Uttar Pradesh Water Supply and Sewerage Act, 1975, are overriding in character.

In Vishakhapatnam, the entire responsibility, i.e., the capital works, operation and maintenance, and administration of water supply vests in the Municipal Corporation. The Act defining the functions of this Corporation lays down that the Corporation shall make adequate provision for the management and maintenance of all municipal water works and the construction or acquisition of new works necessary for a sufficient supply of water for public and private purposes.

Provision of water supply in Gurgaon is governed by the Punjab Municipal Act, 1911 which lays down that the "Committee (Municipal) may, and when the government so directs shall, provide the area under its control or any part thereof with a supply of wholesome water sufficient for public and domestic services. Notwithstanding this provision, Gurgaon represents a unique case where a whole hierarchy of agencies and departments is involved in the provision of water supply: the capital works are undertaken by the Public Health Engineering Department; the operations and maintenance including the distribution of water is

regulated and conducted by the Public Health Division, and the administrative functions like giving water connections to households, billing for water consumption, and collection of payment are carried out by the Gurgaon Municipal Committee.

Institutional Responsibilities for Water Supply, 1987-88

City	Responsibilities		
	Administration	Operation and maintenance	Capital works
Varanasi	Jal Sansthan	Jal Sansthan	Jal Nigam
Vishakhapatnam	Municipal Corporation	Municipal Corporation	Municipal Corporation
Gurgaon	Municipal Committee	Public Health Division	Public Health Engineering Department

These are, however, the formal and legal provisions in the existing legislations governing the supply of water. In this study, we have attempted to find out (i) the extent to which departures have been made from the extant legal provisions, and (ii) the extent to which the institutions statutorily responsible for the provision of water have been able to fulfil their responsibilities satisfactorily. For coming to grips with these questions, we have used the following sets of data obtained from the sampled cities:

i. the share of various institutions in the provision of water supply (population coverage);

ii. the efficiency of the existing institutions measured by the following indicators;

(a) the adequacy of water supply;

(b) the duration of supply; and

(c) the regularity in the supply of water

iii. the relative costs at which water is supplied;

iv. the financial efficiency i.e. the recoveries that are made in relation to the costs incurred by the existing institutions.

Share of Public and Private Provision

According to this study, the share of public agencies in the provision of water is significant. As Table 2.1 shows, 81 per cent of population in Varanasi, 75 per cent in Vishakhapatnam, and 80 per cent in Gurgaon are served by the public distribution systems involving, as indicated earlier, the Jal Sansthan in Varanasi, Municipal Corporation in Vishakhapatnam, and the Public Health Division in Gurgaon. It also means that these agencies, although statutorily responsible for this function, are not able to supply water to the entire population falling within their jurisdictions. A significant proportion of population is bypassed by these agencies. Table 2.2 suggests that anywhere between 19-25 per cent of the population of the three cities are not covered by the public systems, who have to perforce rely on their "own private arrangements". In other words, one in every four in Vishakapatnam, and one in every five persons in Varanasi and Gurgaon rely on "private provision", that is, by having their own handpumps, wells and tubewells.

Table 2.2

Water Supply : Share of Public Provision, 1987-88

City	Population covered by Public Provision (%)	Uncovered Population (%)
Varanasi	81	19
Vishakhapatnam	75	25
Gurgaon	80	20

Public provision of water does not necessarily mean that the population or the households served have domestic connections of piped water. Table 2.3 shows that a substantial proportion of population who are the beneficiaries of the public provision are dependent for their water supply on "standposts", and, to a minor extent, on "tanker supplies". According to the table, 31 per cent of the total population of Varanasi - a city which has adequate and perennial sources of water and 15 per cent of Vishakhapatnam's population are dependent on "standposts". It is important to note that those who receive their supplies through standposts are the relatively poorer sections of the cities' population; those who receive water through tankers are both poor and dispersed on hill tops and living in the fringe areas, and those who have no supplies are those who live on the periphery and unplanned settlements. Thus, the general perception that the public provision is meant to reach the poorer sections is not borne by the field-level data.

Table 2.3

Mode of Public Provision, 1987-88

City	Population Coverage (%)		
	Taps	Standposts	Others
Varanasi	50	31	-
Vishakhapatnam	56	15	4*
Gurgaon	NA	NA	NA

* Tankers

The role of private provision of water supply, in fact, is higher, if we take into account the proportion of households who use, out of necessity, both the public and the private sources. According to the study, 12 to 17 per cent of the households depend exclusively on their own private arrangements which include handpumps, wells and tube-wells, but a substantial proportion of households - 19.7 per cent in Gurgaon, 37 per cent in Varanasi, and 7 per cent in Vishakhapatnam, combine the public provision with private arrangements. An important fact to take notice of is that although the three cities have different institutional set-up for water supply, these do not make a difference insofar as their reach and coverage are concerned.

Table 2.4

Procurement of Water through Public and Private Management Systems, 1987-88

Management System	Percentage of households		
	Gurgaon	Varanasi	Vishakhapatnam
Exclusively public	64.0	51.3	76.3
Public and private in combination	19.7	37.0	7.0
Exclusively private	16.3	11.7	16.7

Adequacy of Public Provision of Water

Adequacy or inadequacy of water supply is a function of a number of factors, and it will not be wholly correct to attribute all the inadequacies of water supply systems to the agencies responsible for its provision. The most important factor is the "source", its nature and perenniality.

In Varanasi, the Jal Sansthan is able to tap, treat and supply 177 million litres daily (mld) of the water. It has both the perennial Ganga and plentiful underground water as rich sources. On the other hand, Vishakhapatnam Municipal Corporation, which has an almost equal size of population to cater to, is able to procure and supply only 99 mld. Its main source of water supply is a reservoir located approximately 60 kms. from the city. Another reservoir located at a distance of 11 kms., has a limited capacity. The underground water is also scarce. By comparison,

Gurgaon which depends entirely on underground water is able to supply only 7.65 mld. Its population is about one-eighth of that of Varanasi.

The per capita supply in these cities varies from a low 54 litres per capita daily (lpcd). In Gurgaon to 202 lpcd in Varanasi (Table 2.5). The former gets only one-third of its requirements, as per norms. The latter, by contrast, is adequately served. In Vishakhapatnam, only 61 per cent of the requirement is met.

Table 2.5

Public Water Supply in the Sampled Cities, 1987-88

City	Source	Amount of water supplied (mld)	Estimated population 1987 ('000)	Per capita supply (lpcd)	Norm (lpcd)	Supply as percentage of norm
Varanasi	River, tubewell	177.00	878	202	202	100
Vishakha-patnam	River, reservoir, tubewell	99.00	800	124	202	61
Gurgaon	Tubewell	7.65	143	54	157	34

All this reflects the inability of public agencies to deliver the goods. However, as pointed out above, attributing the low levels and below-norm supplies entirely to the public agencies is not justified. These are associated, to not-so-insignificant extent, with the constraints in production of water related to the nature of the water sources.

Table 2.6

Domestic and Non-Domestic Supply, 1987-88

City	Amount of water supplied (mld)	Domestic supply* (mld)	Non-domestic supply (mld)	Per capita domestic supply* (lpcd)
Varanasi	177.00	129.15	47.85	147
Vishakha-patnam	99.00	40.95	58.05	51
Gurgaon	7.65	6.12	1.53	43

* Includes standposts but excludes wastage.

Figures for per capita domestic supply are understandably lower. In Varanasi, the per capita domestic supply is only 147 lpcd as against an overall supply of 202 lpcd (Table 2.6). Industrial and commercial uses take away about 27 per cent of the water supplied. In Vishakhapatnam, this percentage approaches 60. Here the per capita domestic supply is hardly 51 lpcd as compared to an overall supply of 124 lpcd. Industry is a big consumer of water in this city. In Gurgaon, the per capita domestic water supply is barely 43 lpcd. About 20 per cent of the overall water supply in this city goes towards commercial and industrial uses. It follows that not only is water production for public supply system highly inadequate in Indian cities but also its availability for domestic use gets restricted due

to heavy demands from industrial and commercial establishments.[5]

Duration of Supply

One of the most disconcerting features of the public water supply systems is the limited duration for which water is supplied. In the three sampled cities, piped water is supplied for one to two hours in Vishakhapatnam, for six hours in Gurgaon, and for twelve hours in Varanasi.

However, due to variations in pressure not all households are able to draw water for the entire duration of supply. According to the household survey, piped water is available normally for one hour in a day in Vishakhapatnam, for three to four hours in Gurgaon, and for over six hours in Varanasi. Water is supplied only once a day in Vishakhapatnam, the different localities get water on hourly shifts. People have to make necessary adjustments to collect piped water at a specified hour. This speaks of the inconvenience caused to the public in procuring the most basic necessity of life. They have to adjust their daily routine to the schedule laid out by the public authorities.

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5. The mode of procuring water has a strong bearing on the quantity of water used. In case where standposts are available within 200 meters, the per capita consumption often ranges from 20 to 40 litres; where houses have a single tap, the per capita consumption increases to 40 to 60 litres, and in multiple tap situations, as in high income localities, the daily per capita water consumption is around 200 litres. (United Nations Centre for Human Settlements (1987): Global Report on Human Settlements, Oxford University Press, New York.)

Also it is necessary for them to arrange supplementary sources of water in the form of handpumps or borewells at private level. This involves considerable investment in their installation and maintenance. Moreover, the water they get is raw or untreated, and likely to cause disease.

Table 2.7

Hours and Frequency of Water Supply in the three Sampled Cities by Income Groups, 1987-88

	Income Group (per month/household)			
	Rs.1500 and below	Rs.1500 to Rs.3000	Rs.3000 and above	Total
Hours of supply				
Less than 2	54	41	46	141
2 - 4	93	122	66	281
4 and above	115	108	38	261
Irregular	3	23	21	47
No reply	2	3	-	5
Total	267	297	171	735
Frequency of supply				
Once	68	56	51	175
Twice	159	180	90	429
Thrice	39	44	20	103
Irregular	1	15	10	26
No reply	-	2	-	2
Total	267	297	171	735

No clear cut pattern emerges from the data on hour frequency of water supply by income groups (Table 2.7). An overall scarcity of water, for all income groups, is evident. The word inequity loses its meaning in the traditional sense.

Purchase of Water

Although people get inadequate water in most Indian cities yet they normally do not resort to its purchase from vendors unless there is a situation of acute scarcity and distant availability. Among the sampled cities, it is only in Vishakhapatnam that water becomes so scarce at times that public has to purchase it. As per our survey, about one-fifth of the households stated to have purchased water at times during the last five years. Among these households, daily purchase of water was restricted to only less than half of them, and that too only during the lean period. Purchase of water was comparatively more frequent among the low income household (Table 2.8).

Table 2.8

Purchase of Water from Vendors in Vishakhapatnam during the Last Five Years, 1987-88

Income group per month household)	Number of Households			
	Yes	No	No response	Total
Rs.1500 and below	25	64	27	116
Rs.1500-3000	21	68	13	102
Rs.3000 and above	11	55	16	82
Total	57	187	56	300

It is worth mentioning that there are no organised private suppliers of potable water in the city. Vendors collect water free from public borewells or handpumps. Charges for this water vary from 0.25 paise Re.1 per bucket of 15 to 20 litres capacity. No cost is incurred on procuring water, the charge made is essentially for rendering the transport service. No sharp difference is observed between income groups on the purchase of water but this tendency is higher among lower income households. This is true particularly of those households which are composed of old persons and who reside at a distance from any water source. Obviously, the burden of such exhorbitant payments falls heavier on the poor. It shows that absence of public water supply is generative of a highly inequity situation.

Metering of Supply

In 1987-88, 98 per cent of the domestic connections in Gurgaon and 70 per cent in Varanasi were metered. In Vishakhapatnam domestic connections are not metered. All non-domestic connections are, however, metered in the sampled cities.

Many municipal bodies find the practice of metering difficult to administer, particularly when the quantity of water supplied is limited, meters can be tampered with, and because the amount of water bills is small, people are indifferent toward their regular payment. In such situations, a recourse is taken to a flat rate system. The

primary reason stated for not metering the domestic connections in Vishakhapatnam was the highly restricted supply of water and small amount of payment due in return. It was highlighted that when a household could get water for just one hour a day, there was little scope of its overutilisation or wastage. The flat charge served the purpose. In Varanasi, administrative difficulties were expressed in regular billing against reading of water meter. The existing staff was judged as inadequate to do this job in this fast growing city. Billing of non-metered connections at a flat rate was deemed as more convenient. It is no surprise that 10 to 30 per cent of water supplied in the three cities was reported as unaccounted for. This is a fairly high incidence of wastage. Though administratively convenient, non-metering of water supply is economically inefficient and socially unjust. People should be charged in proportion to the amount of water they use. Metering also helps in assessing the water demand at a given price in different localities of a city.

Payment for Water

The payment made by households for piped water supply varies between cities according to the tariff structure. Since only some cities have a graduated tariff structure and water rates are usually kept low, the difference in payment made by the high and low income group is not wide. This difference gets further moderated when the charges are made at a flat rate.

According to the results of the household survey, the average monthly direct payment for water is about Rs.6 per household in Vishakhapatnam, Rs.15 in Gurgaon, and Rs.25 in Varanasi. These payments reflect the quantity of water made available for domestic use and the duration of its supply. In Vishakhapatnam, where the domestic supply averages 51 lpcd and is made generally once a day, the payments are the lowest. In Varanasi, the payments are the highest as the supply lasts for 12 hours and its quantity averages 147 lpcd. The payment by households having an unmetered connection in Varanasi is Rs.30 while those with metered connection pay an average of about Rs.25 per month. The Jal Sansthan has structured the tariff in such way that unmetered supply becomes more expensive and people are tempted to convert their connections to metered ones. This indeed is a sound policy. On an average, payment for water does not exceed 2 to 3 per cent of the monthly income of the sampled households.

Since piped water supply is limited in quantity and restricted in hours of distribution, people make their own private arrangements to supplement the public supply. Installation of handpump or borewell is common. According to the household survey, investment on a handpump/well ranges from Rs.1000 to Rs.6000. Investment on a motorised tubewell lies anywhere between Rs.5000 to Rs.10,000. While hand pumps and wells do not incur any running cost, except minor repairs, motorised tubewells are expensive to operate

and cost at least Rs.30 per month to run. People do bear all these financial liabilities. Hence they spend much more on water than what their water bills from the municipal body indicate.

Financial Aspects

Municipal bodies in Indian cities devote about one-eighth (12.8 per cent) of their revenue expenditure to water supply. This is next to the expenditure on sanitation (19.8 per cent) and practically equals that on general administrtion. In respect of water supply itself, 28 per cent of the total expenditure is incurred on establishment and 72 per cent on production, operation and maintenance. As against this, income from charges for the various services, of which water supply is one, is just 13.5 per cent of the total income. One can easily infer from this that income from water supply is far too short of the expenditure incurred on this serivce.

Table 2.9 gives the financial aspects of the water supply systems in the sampled cities, and shows that the per capita income from water supply in Vishakhapatnam is almost six times the per capita expenditure; in Varanasi the per capita income and expenditure are almost equal; and in Gurgaon income is only about half of the expenditure. On the other hand, Varanasi ranks first in per capita daily supply of water, followed by Gurgaon and Vishakhapatnam. The expected correspondence between the financial and supply

parameters of water supply is lacking. This distortion is explained by the wide difference in the cost of producing water as also in pricing of water in differnt cities.

Table 2.9

Financial Aspects of Public Water Supply Systems in Vishakhapatnam, Varanasi, and Gurgaon, 1987-88

(in Rs.)

City	Per capita income from water supply	Per capita expenditure on water supply	Estimated per capita expenditure required to maintain the existing system*	Per capita expenditure norm**
Varanasi	21	22	100	63
Vishakha-patnam	110	19	62	63
Gurgaon	6	13	27	60

* Estimates worked out from the report of the Task-force
** Zakaria Committee norms.

The exceptionally high income from water in Vishakhapatnam is attributed to the presence of a number of large scale industries which are charged at a comparatively higher rate. These industries contribute over 90 per cent of the revenue accruing from water supply. Tariffs for domestic and commercial water supply are also higher in this city (table 2.10).

Table 2.10

Tariff Structure of Public Water Supply System in Vishakhapatnam, Varanasi and Gurgaon, 1987-88

(in Rs.)

Type of use	Vishakhapatnam	Varanasi	Gurgaon
Domestic:			
Metered (per 1000 litres)	2.78	0.75	0.35
Unmetered	Rs.6 for one tap per month; additional Rs.5 for the second tap; additional Rs.4 for the third tap per month	Rs.360 per annum	Rs.12 for one tap per month; Rs.2 for each additional tap
Commercial (per 1000 litres)	2.78	2.00	0.60
Industrial (per 1000 litres)	4.44	2.50	0.85
Standpost	Free	Free	Free

Thus, the financial position of the water supplying agencies is significantly explained by the functional character of the cities they serve. Places with a large industrial base perform much better and are able to generate substantial surpluses as the losses made on domestic supplies are compensated by gains on industrial supply. Still another major factor determining the financial performance is the component of water tax. In Varanasi, water tax forms over one-third of the total income from water. This provision does not exist in Vishakhapatnam or Gurgaon. Finally, the financial performance also depends upon the internal efficiency of the water supplying

authority in respect of billing and collection of payments. Vishakhapatnam seems to be doing the best on this count.

From the above, it is not difficult to understand as to why the difference in per capita income from water supply are much greater than those in per capita expenditure. Issues pertaining to financial management seem to be more critical than technical factors such as the distance to the source of water and the cost of water production. The tariff structure for water supply does not show any direct relationship with the per capita income/paying capacity of the states in which the three cities are located. Gurgaon in Haryana, with the highest per capita income among the three states, shows the lowest tariff rates. The reverse is true of Vishakhapatnam in Andhra Pradesh. It is also seen that such tariffs are originally fixed on the basis of production, distribution and maintenance costs but are not rationalised periodically. The high income states seem to be bigger defaulters on this count. Perhaps they have a greater capacity to absorb such losses.

Table 2.10 deserves a closer scrutiny to draw some additional inferences. In all the three cities, the per capita expenditure on the public water supply system is much below the expected norms set by the Zakaria Committee: less than one-fourth in Gurgaon, less than one-third in Vishakhapatnam, and less than one-half in Varanasi. Likewise, the per capita expenditure in three cities widely

falls short of the Task Force* estimates of the required expenditure.

The obvious inference from the above is that the public agencies just do not have adequate resources to invest in water supply systems. Also their capacity to raise resources through water charges is highly constrained by the social and political pressures.

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* Planning Commission, Task Forces on Housing and Urban Development, Vol.II. Financing of Urban Development, Government of India, 1983.

III

SOLID WASTE COLLECTION AND DISPOSAL

Disposal of solid waste is a critical, costly and one of the least developed of urban services in most Third World countries. It is a critical service as on account of the high organic content in waste and the tropical climate of serveral Third World countries, the uncollected and undisposed waste can result in various types of communicable diseases, and present serious health problems. It is a costly service. According to the estimates made by the United Nations Centre for Human Settlements (UNCHS), solid waste collection costs are roughly one per cent of the gross domestic product of countries. These account for as high as 30-40 per cent of the budgets of municipal bodies who are generally responsible for the provision of this service. It is also an undeveloped service, as few countries have paid attention to developing affordable technologies for waste collection and disposal. The fact that wastes have an economic value has also been very slow to be recognised.

Responsibility for Providing the Service

The solid waste collection and disposal services in India - like in other countries, fall within the public domain, and are the statutory responsibility of municipal bodies. The Gujarat Municipalities Act, 1963, for instance, lays down that it shall be the duty of every municipality to make reasonable and adequate provision for "cleaning public

streets, places and sewers, and all spaces not being private property, which are open to the enjoyment of the public [87 (h)]". The Act empowers the municipalities to construct drains and maintain control over them. Statutes of other states in the country have identical provisions. These provisions do not at all mean that other agencies have no role in the collection and disposal of wastes. In several places, the public sector undertakings and large industrial houses make their own arrangements for waste collection and generation, and, in some instances, undertake some kind of a primary treatment.

Waste Generation and Collection

Compared to other countries, the solid waste generated in India's urban areas is not large in quantitative terms. According to Halmoe and Heie, the average per capita waste generation in India is about 415 grams per day.[6] NIUA's studies show that it varies between a low of 294 grams to a high of 483 grams, the variation being explained by a number of factors including the size of cities, function of cities, household incomes, and the level of economic development.

It is important to note that there is a wide gap between the quantum of waste that are generated, and which are collected and disposed. According to a 1986 study (Table 3.1), the municipal bodies, which are the monopoly

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6. T. Halmoe and A.Heie, 'Introduction to Solid Waste Management in Developing Countries' in Management Options for Urban Services', World Bank, Report on a Seminar held at Cesme, Turkey on November 11-20, 1985.

agencies as far as the collection and disposal of waste are concered, are able to collect no more than 72 per cent of the total waste generated. The balance remains uncollected, which is one of the biggest sources of environmental degradation in the urban areas. In some of the cities, the collection to generation ratios are as low as 60 per cent; very few cities have reported over 80 per cent collection. -

Table 3.1

Quantity of Waste Collected, 1986

	Name of the sampled cities								
	Baroda	Bhopal	Tiruchi-rapalli	Villu-puram	Dhoraji	Sehore	Hoshan-gabad	Deva kottai	Kad
Quantity of waste collected (tons)	161	166.4	83.3	10.8	12.8	17.8	10.2	5.84	9.
Quantity of waste collected as percentage of total waste generated	73.2	61.9	83.0	60.1	60.0	76.4	84.6	65.5	86.
Quantity of waste not collected (tons)	59	102.6	16.7	40	8.5	5.5	1.8	34.6	1.5

Source: National Institute of Urban Affairs, Management of Urban Services, Research Study Series No.14, New Delhi, 1986 pp.34

Cost of Solid Waste Collection

The solid waste collection costs in India are high. It is estimated that waste collection costs are about 0.4 per cent of the gross national product which, although low in comparison with the global average costs, when assessed in

relation to India's per capita incomes, is extremely high. With an overall per capita expenditure of Rs. 28.9 out of a total revenue expenditure of Rs.143.14, (or 19.8 per cent of the total municipal expenditure) it is the single most important item of municipal expenditure.

Table 3.2

Expenditure on Municipal Services, 1986-87*

Service	Average Per Capita Annual Expenditure 1986-87*	% Expenditure as a Proportion to Total Revenue Revenue Expenditure (%)
Water Supply	18.6	12.8
Sanitation	28.9	19.8
Roads	13.8	9.5
Street Lighting	6.9	4.7
Medical Relief	4.0	2.8
Education	15.0	10.5
Recreation	3.0	2.1
Others	23.4	16.4
General Administration	18.3	12.8
Total Revenue Expenditure	143.14	

* Figures pertain only to cities with a population of over 100,000

Source : National Institute of Urban Affairs, 'Upgrading Municipal Services: Norms and Financial Implications, Vol.I, Research Study Series No.38, New Delhi, 1989. pp 63, 66.

Solid waste collection and disposal is a staff intensive activity in India. The Committee on Solid Wastes, set up in 1973, laid down that there should be 2.8 sanitary

workers per 1,000 population. In general, few cities meet these norms. At the same time, the fact remains that staff costs constitute over 80 per cent of the total expenditure on solid waste collection and disposal, the balance is used for the transportation of refuse and waste, maintenance of equipments etc.

Waste Collection and Disposal in the Sampled Cities

It is in the light of this general background that we have attempted to ascertain in this study the efficiency and responsiveness of the existing institutional set-up in the three sampled cities, i.e., Varanasi, Vishakhapatnam, and Gurgaon. In all the three cities, the statutory responsibility for waste collection and disposal vests with the municipal bodies (unlike in the case of water supply where a number of public agencies are responsible for its provision) who carry out all functions related to waste collection and disposal, i.e.

- collection from streets and designated locations;
- transfer of waste to centralised points;
- transportation of waste to disposal points; for this, the municipal bodies use multi-modal transport ranging from bullock carts and trucks, to tractors, trailors and compactors;
- disposal and treatment.

Door to door collection of garbage and waste is not a municipal function. It is collected and removed by the

households themselves or by private sweepers engaged by them on a charge basis. In Vishakhapatnam, however, which is the location of many large-scale industries and public sector undertakings, approximately 30 per cent of the total city waste is generated and collected by industries themselves.

For judging the efficiency, and effectiveness of the existing arrangements, as pointed out earlier, we have used a number of indicators which include --

- population covered by solid waste collection services;
- frequency of waste collection;
- waste collection to waste generation ratios;
- adequacy of staff in relation to norms, and work load per sanitary worker;
- utilisation of waste trucking capacity;
- earnings from waste as a proportion of expenditure on waste; a
- other qualitative indicators that bear upon the efficiency of particularly the municipal system.

Waste Generation in the Sampled Cities

Mention should be made at the outset that there is a wide difference in the quantum of waste generation in the three sampled cities, with Varanasi generating on an average 500 grams per capita; Vishakhapatnam generating 287 grams; and Gurgaon generating only 180 grams per capita per day. Varanasi's high average which happens to be higher than the national average of 418 grams is explained by its very special character which attracts no fewer than 150,000 persons into the city every day for religious and tourist

purposes. Vishakhapatnam's figures are somewhat on the lower side on account of the fact that a part of the garbage is collected by the large industries directly, and that it does not enter into municipal account.

Table 3.3

Waste Generation, 1987-88

City	Total Waste Generated Per Day (in tons)	Per Capita Waste Generated Per Day (per gram)
Varanasi	439	500
Vishakhapatnam	230	287
Gurgoan	20	180

Population Coverage

The study's foremost finding is that municipal services in respect of solid waste are able to reach out to 95 per cent of the population in Varanasi, 98 per cent in Vishakhapatnam, and 85 per cent in Gurgaon. Although from most counts, such high percentages would indicate a good performance on the part of the municipal system, the fact that 5 to 20 per cent of population are not reached by them cannot escape attention, more so in view of the fact that there are no other alternative formal systems in existence.

Table 3.4

Population Covered by Municipal Refuse Collection Services, 1987-88

City	Estimated Population 1987 ('000)	% Population Covered
Varanasi	878	95
Vishakhapatnam	800	98
Gurgaon	143	80

Population coverage is an aggregate indicator, and obscures important efficiency aspects such as frequency of waste collection, collection to waste generation ratios etc.

i. not all areas within the municipal jurisdictions are served by the regular sanitary staff; in several areas, municipal bodies arrange "gangs" on a periodic basis who undertake waste collection once-a-week to once-a-fortnight; and

i. contrary to the claims by municipal bodies that collection of waste is a routine task and carried out at least once a day the household survey shows a high degree of irregularity in the service. Table 3.5 which gives the results of the household survey shows that the waste collection services are highly irregular, with nearly two-thirds of the households in Varanasi and Gurgaon reporting that there is virtually no service worth mentioning. In Vishakhapatnam where these services are somewhat better, 19 per cent of households have reported that refuse is collected a few times per week but not daily; another 19 per cent have reported that it is collected once a week; and 37 per cent have reported that refuse is either not collected or collected rarely. Even if we admit an element of overstatement in the households' responses, these results speak of the unsatisfactory manner in which such services are provided by the concered municipal bodies.

Table 3.5

Frequency of Refuse Removal, 1989

(% household)

Cities	Daily	Few days a week	Once a week	Irregular	Not Cleaned	NR	Total
Varanasi	12	2	13	2	66	4	100
Vishakhapatnam	6	19	19	16	37	2	100
Gurgaon	34	3	1	-	61	1	100

NR - No Respose

Staff Deployment and Work Load

As stated earlier a norm of 2.8 sanitary workers per 1000 persons is considered necessary to take care of the refuse load in the urban areas. Few cities in the country meet these norms, and the sampled towns are no exception, although in Varanasi, the number of sanitary workers, (being 3.2) is higher than the norm. In the other two cities, viz. Vishakhapatnam and Gurgaon the numbers are 1.7 and 2.2 respectively.

It is important to point out that the staff norms have been set in relation to population but these bear no link whatsoever with either the areal size of cities or the quantum of refuse generated - both of which can make a noticeable difference to the efficiency level of staff and, in turn, of the municipal bodies. For instance, as table 3.6 shows, the work load per sanitary worker varies sharply between the three cities, and although Varanasi has 3.2 sanitary workers per 1,000 persons the fact that they have a larger load per capita as compared to other cities cannot be

ignored. It also means that an important part of the problem with respect to waste collection and disposal rests on the work load and the distribution of that work load within the cities, rather than only on the number of sanitary staff.

Table 3.6

Deployment of Staff, 1987-88

Cities	No. of sanitary workers	No. of sanitary workers per 1000 pop.	Load per worker (in kgs)
Varanasi	2555	3.2	172
Vishakhapatnam	1694	1.7	135
Gurgaon	316	2.2	87

Waste Transportation

Most cities in India use a combination of means for transporting waste and refuse from the collection points to the disposal/treatment depots. Initial collection is manual which includes collection of road refuse and collection from the dustbins. Wheel barrows are used to transport refuse from primary collection points to secondary collection points which are either mobile, detachable, or stationary containers. From these secondary points, refuse is transported in bullock carts, tractors, trailers, trucks, refuse compactors, to the final dumping grounds.

The level of mechanisation for transpporting refuse depends on the financial position of individual local bodies. In the three cities under consideration the

sophisticated refuse compactors are used in Gurgaon and Vishakhapatnam. Other cities use a combination of transport modes, as can be seen in table 3.7.

Table 3.7

Refuse Transportation, 1987-88

Cities	Means of trasporting the refuse	Refuse generated	Carrying capacity of vehicles	Refuse transported	Percent of refuse transported to carrying capacity of vehicles
		tons per day			
Varanasi	Pay loaders, tripper trucks, tractors	439	450	395	87.8
Vishakhapatnam	Tractors, compactors	230	250	161	64.4
Gurgaon	Truck, tractor, refuse compactor and bullock cart	26	26	21	80.0

According to table 3.7

i. the trucking capacity is greater than the quantum of refuse generated in the sampled cities. It indicates that there are no supply constraints in so far as the trucking capacity is concerned; and

ii. none of the municipal bodies are able to fully utilise the trucking capacity, the unutilised rate ranges between a high of 35 per cent in the case of Vishakhapatnam, and a low of 120 per cent in Varanasi. This gives yet another indication of the failure of the municipal agencies to be able to efficiently use their existing capacities.

Urban waste and refuse have traditionally been looked upon as "waste", and rarely used as an economic resource. Waste and refuse of various kinds were used, and continue to be used for "land filling", and the municipal bodies have not been able to put these wastes to better, more economic and productive use. Further, the costs of land filling by waste have not been accounted as incomes by the municipal agencies.

Income and Expenditure

Municipal bodies have different methods of charging for solid waste collection and disposal, and direct incomes from the disposal of waste are low. A few municipal bodies levy a "cess", often called a "sanitation cess"; in others charges for this service from a part of the property taxes. The position of incomes in the sampled cities is given in table 3.8 which shows that barring Vishakhapatnam which levies a sanitation cess and for which separate data are maintained by the Corportion of Vishakhapatnam, incomes from this source are almost insignificant, both in absolute and relative terms. Varanasi Nagar Mahapalika had a total income of Rs.6250 during 1987-88 from disposal of waste while Gurgaon's earnings amounted to Rs.61,951 during the same period. Far more significant is the fact that municipal expenditures on solid waste collection and disposal are extremely high, and consume 41 per cent of the total expenditure of Varanasi Corporation, 25 per cent of Vishakhapatnam Corporation, and 16 per cent of Gurgaon

Municipal Committee. Table 3.9 and 3.10 indicate that the expenditure on the service Table 3.8, far exceed the incomes earned from it with the gap between the income and expenditure being very large. Income accounts for only 10.8 per cent of the expenditure in Vishakhapatnam; 2.16 per cent in Gurgaon, and 0.02 per cent in Varanasi.

Table 3.8

Income from Refuse Collection and Disposal, 1987-88

City	Income (in Rs.)		
	Sanitation cess	Revenue from disposal	Total
Varanasi	-	6,250	6,250
Vishakhapatnam	40,89,000	-	40,89,000
Gurgaon	-	61,951	61,951

Table 3.9

Expenditure on Refuse Collection and Disposal 1987-88

City	Total expenditure of the local body (in lakhs)	Expenditure on refuse collection and disposal	% of expenditure on refuse collection and disposal to total expenditure
Varanasi	977.83	406.21	41.54
Vishakha-patnam	1502.81	376.79	25.07
Gurgaon	177.79	28.93	16.27

Table 3.10

Refuse Collection and Disposal - Gap Between Income and Expenditure, 1987-88

City	Expenditure (in Rs.lakh)	Per capita expenditure (in Rs.)	Income (in Rs. lakh)	Percentage income to expenditure
Varanasi	406.21	46	0.06	0.02
Vishakhapatnam	376.79	47	40.89	10.85
Gurgaon	28.70	20	0.62	2.16

It is thus evident that the local bodies face a number of problems in improving the solid waste collection and disposal service which include inadequate financial resources, labour problems, unscientific management practices and lack of cooperation from the residents. Any serious attempt at improving the service and its efficiency will have to take into account the local problems and their impact on the service.

IV

TRANSPORT

Cities in India, as in most parts of the world, evolved on a pedestrian scale for a large part of their history. The physical size and land use of cities were such that internal mobility did not require any automated mode of transport. Animal driven vehicles, such as tongas and ikkas, were the prevalent modes of intracity transport, especially for the rich and the aged.

The history of railways in India started in 1853 and the first motor vehicle arrived in 1898. The first bicycle entered around the same time. These advancements in transportation system technology made an overwhelming impact on the urban form and transport in India. The railways partly took the form of trams for intra-city movements; motor vehicles had their variants like buses, scooters and three wheelers, and cycles found their transformations in hand-driven rickshaws and cycle-rickshaws.

The impact of the different modes of intracity transport came in phases, gradually increasing the complexity of the transport mix. Most striking changes in the transportation services followed the close of World War II in 1945, and the independence of the country in 1947. The initial surge came in the form of bicycles in the 1950s when these became the principal mode of individual transport in cities like Delhi. This process was accompanied by a regular increase in the number of rickshaws.

The 1960s was marked by the growing use of scooters (two wheelers) movements within the urban areas. The three wheelers also multiplied as intermediate modes of public transport. Meanwhile, buses were introduced on a larger scale to meet the growing transport needs of cities and towns. The 1970s saw a marked increase in the role of buses for mass transport, a process which has successively assumed bigger dimensions. The 1980s witnessed growing use of cars for individual mobility, especially in the metropolitan cities.

With each new development, as described above, the management problems of urban transport have became complex and intractable. The basic issues that have surfaced as a result of increasing urban population today refer to the efficient management of the mass transport system, promotion of the right kind of transport modal mix, and rational division of labour between the public and private sectors in the provision of urban transport. All these call for serious deliberations.

Unlike the other services such as water supply, solid waste disposal, and health which fall into the categories of monopoly, merit or public goods and are, therefore, statutorily provided by the public sector agencies, such is not the case with transport services, particularly the intra-city services. In this sense, transport is not a service but an item of infrastructure. It is important to

recognise however, that irrespective of the nature and legal status of the transport services, the public agencies play an extremely important and vital role in transport services. In fact, the public role in inter-city public transport vis-a-vis other sectors is unmatched in scale and spatial coverage. Even at the intra-city levels, at least in metropolitan and large cities, the public transport system plays an extremely important role in terms of the total passenger traffic.

Bus Services and Intermediate Modes of Transport

Transport services in Indian cities today are a mix of state/municipality owned conventional buses and a variety of privately operated intermediate public transport (IPT) modes. The IPT modes include auto-rickshaws (3 wheelers), motor cycle rickshaws (4 seaters), tongas (horse drawn vehicles), tempos, cycle rickshaws and so on. Some of these provide point-to-point or limited stop services along fixed routes.

Although the conventional buses provide the cheapest form of urban transport, their use by the public is determined by the adequacy and quality of service. Buses ply on fixed routes, run at scheduled timings, and cannot attain much speed due to distance-graduated stops on the way. On the other hand, the IPT modes give service from the request point to the destination, are available at any time, and work out faster for short distances. These suit women, old and the sick in particular. Their occasional use is

economically feasible but regular unaffordable by most households.

Characteristics of Public Buses and Private Intermediate Public Transport (IPT) Modes in India

Attribute	Buses	IPT
Ownership	Public	Private
Route	Fixed routes, not necessarily based on profit	Flexible routes, service more frequent on profitable routes
Fare	Fixed, by distance slabs Cheaper for longer distances	Generally through bargaining Fixed for motorised vehicles in metropolitan cities
Timings	Fixed (late night service highly curtailed)	All time
Speed	Not very fast due to frequent stop points	Depends on mode; faster for short distances
Economy	Subsidised, concessions for special groups	Full fare for all, no concessions

Modal Split of Intra-City Transport

Several studies have been done in recent years on the nature of the transport facilities in the urban areas. A study of nine Indian cities conducted at the instance of the Ministry of Urban Development shows that personalised modes, such as bicycles, two wheelers and cars have assumed increased importance (Table 4.1). These account for one-third to over one-half of the trips generated, and to that extent the dependence of urban population on personalised mode of transport is significant. The choice ranges from bicycle, in the case of the relatively poor, to scooter/motor cycle amongst the middle class, and to car for

the comparatively better-off. The basic consideration is autonomy in mobility and flexibility in timing and routing. The factor of economy is equally involved for those who use bicycles. Quite often the journey by personalised transport is carried even over long distances. This is a distinct expression of the failure of public bus system.

Table 4.1

Modal Split in Some Selected City Corridors

City	Percentage of Trips by					
	Public transport (bus)	Three wheelers autos/ taxis	Rickshaws/ tongas	Bycycle	Two whellers autos	Cars
Ahmedabad	34	13	-	21	24	8
Pune	59	7	-	16	13	5
Kanpur	24	-	19	30	17	10
Jaipur	34	4	9	32	16	5
Lucknow	29	-	19	34	12	6
Coimbatore	72	2	-	13	8	5
Indore	54	7	-	16	14	9
Varanasi	39	5	20	21	11	4
Ludhiana	35	7	7	23	19	9

Source : Government of India, Report of the Study Group on Alternative Systems of Urban Transport, New Delhi, 1987.

Among the public modes of transport, the local buses hold a position of great importance in big cities. Depending upon the physical spread, distances involved and

topography in a city, this mode accounts for one-fourth to three-fourths of the passenger trips. Industrial cities, like Pune and Coimbatore, with undulating topography, record higher proportion on this count. On the other hand, in cities such as Kanpur, Lucknow and Varanasi, the percentage of passenger trips by bus is proportionately smaller. This is attributed partly to an unsatisfactory local bus service and partly to the availability of cheap rickshaw service. About one-fifth of the passenger trips in these cities are by rickshaw. With rise in income levels, as in cities like Ahmedabad, Pune and Ludhiana, the use of three wheelers/taxis has become quite frequent.

It is obvious that there is a general preference for personalised transport. This changes in favour of motorised vehicles with rise in income under consideration of convenience and flexibility in mobility. It is partly a reflection of the inadequacy and poor quality of service provided by the public bus system.

The role of public bus system and IPT modes in urban transport is brought under sharper focus when personalised transport is excluded from analysis. Available information for eight cities is provided in table 4.2 with their orientation. The data are somewhat dated but helps in building some broad generalisations.

Table 4.2

Estimated Provision of Public Transport in Various Indian Cities, 1977

	Calcutta	Delhi	Hyderabad	Kanpur	Jaipur	Agra	Meerut	Faridaba
Population in 1977 (million)	7.96	4.83	2.27	1.15	0.81	0.73	0.43	0.21
Nos. of vehicles per 1000 population								
- buses	0.33	0.47	0.26	0.03	0.09	0.17	N.A.	-
- minibuses/ tempos	0.09	0.03	0.01	0.43	0.29	N.A.	N.A.	N.A.
- tongas	-	0.41	3.50	1.58	0.50	0.66	1.35	-
- taxis	0.02	1.06	0.24	-	0.15	N.A.	N.A.	N.A.
- auto-rickshaws	-	3.52	2.60	0.03	2.17	0.06	-	-
- cycle-rickshaws	3.39	1.07	6.20	33.1	11.5	16.5	19.8	18.0

Source: Characteristics of Public Transport Demand in Indian Cities, TRR Supplementary Report 709, 1981.

It is now established that the public bus system is of critical importance to cities with a population exceeding two million. Its relevance is greater for administrative cities with large and regular passenger traffic between the residence and office. The number of autorickshaws (three-wheelers) is evidently high in million plus cities. Rickshaws are more common in cities with a population of around half a million or less. In bigger cities, rickshaws do not operate at the city level but get relegated to individual localities.

Thus, the factors relevant to urban transport include : (i) the city population size, its physical spread and topography, (ii) division of a city into an old congested part and the new outlying localities, and (iii) income level of the people. In case of metropolitan cities, an efficient bus service is a must. In respect of second or secondary cities, the bus service is more relevant for outer localities while the old congested part is to be served through the IPT modes only. Situation can be redeemed here through strict adherence to land use zoning and control on encroachments. In small cities, the IPT modes should be encouraged and facilitated. The use of bicycle can be promoted if the new localities are developed as work-cum-residence districts in any city.

According to a World Bank document, the measure of adequacy of bus system in the developing countries is one bus for every 2,000 persons or 50 buses for every one lakh persons. The Ministry of Urban Development in India places this norm at 75 buses for every one lakh persons. None of the cities listed in table 4.2 satisfy these norms. The situation is getting worse with the passage of time. .pa

Modes of Public Transport in the Sampled Cities

In this section, we have attempted to ascertain the respective roles of the different types of transport arrangements in Varanasi, Vishakhapatnam and Gurgaon. We have looked at the relative adequacy of the different arrangements in the context of the three cities.

The three sampled cities are characterised by the dominance of different modes of public transport systems (table 4.3.). Vishakhapatnam is noted for widespread and frequent use of buses and autorickshaws, Varanasi for cycle rickshaws and autorickshaws, and Gurgaon for cycle rickshaws. In simpler words, the local transport system of Vishakhapatnam is distinguished by the dominance of public bus, that of Gurgaon by the IPT modes, and that of Varanasi by a mix of the two.

The bus system in Vishakhapatnam is fairly developed and serves the three major categories of bus users in this city which include : (i) salaried group in the employees of the government departments and organised private sector, (ii) the labourers commuting from the resettlement colonies, and (iii) school children. The State Road Transport Corporation assesses the need of the city at 1500 buses by the year 1995 against the existing fleet of 346 buses. This requires a fast expansion programme. It raises questions regarding the possible involvement of private sector in this field.

Table 4.3

Modal Split in Intra-City Transportation,1987

City	Number of Vehicles					
	Bus	Taxi	Auto-rickshaw	Tempo(seven seater)	Cycle rickshaw	Tonga
Varanasi	42	138*	2973	326	14272	146
Vishakha-patnam	333	88	2929	-	9000**	-
Gurgaon	1	-	91	26	3225	25

* Taxi Jeep ** Estimate

Table 4.4

Vehicles Per 100,000 Population, 1987

Modes	Varanasi	Vishakapatnam	Gurgaon
Bus	5	42	1
Auto	339	372	63
Tempo	37	-	18
Cycle-rickshaw	1626	1125	2249
Tonga	17	-	17
Taxi	16	110	-

Table 4.5

Some Efficiency Indicators of Bus Service, 1987

	Varanasi	Vishakhapatnam	Gurgaon
Number of Buses	42	333	1
Fleet Utilisation (%)	90	95	100
Average number of passengers carried per day	10,000	100,000	2,000
Average distance covered per operating bus per day (in km.)	104	237	216
Passengers per operating bus per day	263	1,266	2,000
Revenue per passenger (in Rs.)	1.42	0.62	0.17
Expenditure per passenger (in Rs.)	2.15	0.63	0.24
Percentage of revenue to expenditure	66	98	71

In Varanasi, the bus service is adjudged as highly inadequate and inefficient. It has little relevance for the old congested parts of the city. Its major role lies in providing service to the outlying institutional, industrial and residential localities. Hence the transport strategies for the city have to be divided into two parts: one for the old part of the city and the other for outer localities.

In Gurgaon, the traffic on the Gurgaon-Delhi highway is taken care of by the Haryana Roadways and the Delhi Transport Corporation buses. This strictly is not the responsibility of the municipality. The main city has a compact structure for which personalised transport and cycle rickshaws/autorickshaws are adequate. Problems related to intracity movement of vehicles should be taken care by strict adherence to municipal laws.

Table 4.6

Percentage of Households by Mode of Transport Used Regularly, 1989

Modes	Varanasi	Vishakhapatnam	Gurgaon	Total
Bus	29	54	1	28
Auto	12	12	14	12
Tempo	5	-	2	2
Cycle-rickshaw	45	25	65	45
Tonga	3	-	14	6
Personal Vehicle	6	9	4	7
Total	100	100	100	100

Households' Preference for Different Modes of Transport

The above observations are supported by the data made available by the household survey. In Vishakhapatnam, 54 per cent of the households use bus services regularly. This is in sharp contrast with Gurgaon where only one per cent of the households depend on bus service and 65 per cent make use of cycle-rickshaw. Varanasi presents a mix of the two : 29 per cent of the households make use of the bus service and 45 per cent avail of the service provided by cycle-rickshaw. Evidently the three cities lend themselves to three different categories on the basis of their transport systems : (i) dominated by conventional bus system (Vishakhapatnam), (ii) dominated by IPT modes (Gurgaon), and (iii) characterised by a mix of the two (Varanasi).

Bus as a regular mode of transport is used in a larger measure by low income households (below Rs.1500 per month). Its use consistently declines and that of personalised transport distinctly rises with income levels (Table 4.7). The use of motorised IPT modes (auto-rickshaws/tempos) is relatively the highest among the middle income group and that of cycle rickshaws amongst the poor. Bus service is indeed most crucial to the poor and it does meet the objective of equity.

Table 4.7

Percentage of Households by Use of Transport by Income Groups, 1989

Mode of transport	Monthly income groups (in Rs.)							
	<1500	1500-3000	3000+	Total	<1500	1500-3000	3000+	Total
	% to mode of transport				% to income group			
Bus	51	31	18	100	38	22	23	28
Auto	3	54	43	100	1	17	24	12
Tempo	29	52	19	100	2	3	2	2
Cycle-rickshaw	43	41	16	100	51	46	32	45
Tonga	31	45	24	100	5	7	6	6
Personal Vehicle	21	33	46	100	3	5	13	7
Total					100	100	100	100

Tariff Rates of Different Modes of Transport

Tariff rates for buses are fixed by the agencies running the bus service. The user charges for buses in the sampled cities vary from 0.50p. to Rs.2.25 or more depending upon the distance travelled. Buses follow a stage-wise fare structure. Rates charged by auto-rickshaws are often regulated by the use of meters. More often the meters are non-functional and the rates are fixed through bargaining. The fares for cycle rickshaws are broadly agreed upon by their unions but in practice are finalised through personal bargaining. Table 4.8 shows the minimum payment made for the use of different modes of transport, as stated by the households.

Table 4.8

Minimum Payment Made for the Use of Transport, 1989

(in Rs.)

City	Bus	Auto-rickshaw	Cycle-rickshaw	Tonga
Varanasi	0.45	2.00	1.00	1.50
Vishakapatnam	0.50	2.30	1.50	-
Gurgaon	0.50	2.00	1.00	1.00-2.00

The minimum rates charged by the bus system is one half of that charged by the cycle rickshaws and one-fourth of that charged by auto-rickshaws. This differential improves in favour of the bus over long distances. Interestingly, the minimum charges made by different modes do not differ much between the three cities.

Monthly Expenditure on Transport

The average monthly expenditure in the surveyed households on transport in the sampled cities is around Rs.150 per household : Rs.166 in Vishakhapatnam, Rs.153 in Gurgaon and Rs.145 in Varanasi. This variation in expenditure on transport is due not only to the mode of transport used but also to the distance travelled. In Gurgaon and Varanasi, most people in the sampled households use their personal mode of transport for commuting to their place of work, on account of inadequate bus services. In Vishakhapatnam, on the other hand, the proportion of households using bus services is high and the distances to be covered are large.

Table 4.9

Mean Monthly Expenditure on Transport by Income Groups, 1989

Cities	Monthly Income Groups (in Rs.)		
	<1500	1500-3000	3000+
Varanasi	69	131	311
Vishakapatnam	43	174	297
Gurgaon	69	115	227

Expenditure on transport increases with a rise in income both in absolute and proportionate terms (Table 4.9). The low income households spend nearly 3 to 5 per cent of their monthly income on transport. This percentage is 5 to 8 per cent in the case of the middle income group. For the higher income group, the figures are in the range of 3 to 10 per cent. The poor spend the least on transport where the bus service is fairly well provided (Vishakhapatnam); the better-off spend the least in a city which is small in size although its transport system is dominated by IPT modes.

The study, in short, shows that --

- The preference for personalised modes of transport is growing rapidly in Indian cities. This is a product of three factors : a desire for flexibility in mobility, dissatisfaction with the public bus system, and relatively high charges by IPT modes. The process is being facilitated by rising income levels of the people.

- The transport requirements of different cities are conditioned by their population size, physical spread, and local topography. In addition, these requirements are not the same for the old congested and new outlying localities within the same city.

- Local bus service at the city level is relevant mainly to the metropolitan cities and also to some smaller cities if their spatial spread is extensive. In case of secondary cities, with a population of one-half to one million, bus service is pertinent mainly to new residential, institutional and industrial localities. Their old congested parts call for rationalisation of land uses and execution of municipal laws against road encroachment to facilitate the movement of IPT and personalised modes of transport. In small cities, IPT modes have to play the main role and conditions need to be created for their swift movement.

- Despite the indifferent quality of bus service in Indian cities, almost a half of the poor use this mode regularly. Consideration of equity seems to be important in this case. The service, is however, uniformly inadequate.

V

HEALTH INFRASTRUCTURE

By almost all indications, health infrastructure in India has grown phenomenally during the past three decades. It is evident from the fact that from a modest allocation of Rs.836 million for the health sector in the First Five Year Plan (1951-56), allocations in the Seventh Five Year Plan (1985-90) had reached Rs.664,915 million. The budgetory allocations have not only increased in absolute terms, but even on a per capita basis the step-up in the budget is significant.

These decades have simultaneously witnessed the emergence of a new hierarchy of health services, both in the rural and urban areas, with the result that it is hard today to find any district in the country which does not have a network of health services, including referral hospitals, dispensaries, health centres, mother-and-child care units and family planning clinics.

The expansion in the health network has occurred equally in the private fold which has entered the health services market in a major way. The participation of the private sector, significantly, is no longer limited to individual private medical practitioners, but extends to the establishment of hospitals, laboratories, and related services. The private sector has, set up in recent years a large number of nursing homes, polyclinics, and also large hospitals which are comparable in size and service to

similar hospitals in the public sector. In some places, the public sector undertakings, large industries, and universities have set up health facilities for captive usage.

Responsibility for Providing Health Services

The institutional arrangements in respect of health services are divided into two parts, namely, arrangements for (i) preventive services, and (ii) curative services. The statutory responsibility for preventive services in the urban areas rests with the municipal bodies. Thus, all municipal legislations lay down that the municipal bodies will provides vaccinations and take such measures as may be required for the prevention and control of communicable and dangerous diseases. In states like Gujarat and Maharashtra, the legislations further lay down that in addition to public vaccination, municipal bodies will also provide medical relief during epidemics and emergency situations. Of late, however, the private sector including the non-governmental organisations have started participating in preventive health services. The entry of non-governmental organisations in this sphere is particularly noticeable in the areas inhabited by the poorer sections.

The statutory provisions with respect to curative health services vary widely as it is only in some states, that the municipal bodies have the responsibility of running and managing the hospitals, dispensaries and other health outposts. For instance, the Karnataka municipal legislation

provides for the establishment and maintenance of hospitals and dispensaries, and maintenance of maternity homes and child welfare centres by the municipal bodies. In Maharashtra, maintenance of public hospitals is a discretionary function of municipal bodies. In other states, these are considered higher level functions, and therefore, fall outside the ambit of municipal governments. On the other hand, the presence of the private sector in the provision of curative health services is pervasive and overwhelming. Moreover, it is growing rapidly in most urban areas in response to market-determined forces such as the fast increasing urban population, the inability of the public institutions to augment the supply of health network, and the increasing dissatisfaction in most places with the public network of curative services. The statutory position in respect of health services is shown in the following table.

Table 5.1

Health Related Functions of Municipalities in Selected States of India

State	Obligatory functions	Discretionary functions
Andhra Pradesh	Public vaccination	-
Assam	Public vaccination Anti-malarial and other projects for improvement of public health	-
Bihar	Public vaccination Establishment of hospitals	-

Contd/....

State	Obligatory functions	Discretionary functions
Goa	Prevention and control of dangerous diseases	-
Gujarat	Public vaccination medical relief during epidemics	-
Haryana	Public vaccination Maintenance of hospitals and dispensaries	Grants-in-aid to hospitals/ dispensaries
Himachal Pradesh	Public vaccination Promotion of public welfare and health	-
Jammu and Kashmir	-	Measures to prevent the spread of dangerous diseases
Karnataka	Public vaccination Establishment of public hospitals/dispensaries Medical relief under special circumstances	Promotion of public health and child welfare Maintenance of maternity homes and child welfare centres
Kerala	Public vaccination	-
Maharashtra	Public vaccination Provide medical relief in emergency situations	Maintenance of public hospitals
Punjab	Public vaccination Promotion of public welfare and health	-
Tamil Nadu	Public vaccination	-
Uttar Prade	Public health Establishment of public hospitals/ dispensaries, maintenance of maternity homes/child welfare centres	-
West Bengal	Maintenance of public health/dispensaries and child welfare centres	-

Source : Municipal Acts of different states.

The result of this expansion and spread of health services is that there is today a wide hierarchy of health services in the urban areas functioning under different arrangements. These arrangements complement and supplement each other, and are often in competition with each other. As a general principle, the public provision is based on the overall demand for services, and the need for equity. It is also guided by the generally accepted principles of balanced spatial distribution so that the services are accessible from different parts of cities and towns. The private provision responds directly to normal market behaviour, and is determined wholly by market and demand considerations. Evidently, the purpose here is to capture as much of the market as possible.

It is in the light of this general background that we have discussed in this chapter the institutional aspects of health services, using the data from Varanasi, Vishakhapatnam, and Gurgaon. In view of the very limited information from the "supply side" of health services such as the number of users of different facilities in the public and private sectors, this study has relied on the household surveys for assessing the adequacy and viability of health services. Our attempt has been to understand the institutional set-up for health services, and come to grips with its adequacy, efficiency etc. For this, we have focussed our investigations on three main questions --

i. Who is providing the different types of health services? Is there a kind of a division or segmentation in the health services market?

ii. What is the population coverage under different types of health services?

iii. What kind of an institutional arrangement is preferred by the users, and for what reasons? What underlies the preference --service, cost, or easy accessibility?

It is useful to begin by pointing out that the institutional set-up in respect of health services in the three sampled cities is no different from the rest of the country. Preventive services are the statutory responsibility of municipal bodies of Varanasi, Vishakhapatnam, and Gurgaon. Municipal bodies in Haryana, in addition, as may be seen in the following table are also responsible for the maintenance of hospitals and dispensaries; in Uttar Pradesh, they are responsible for the establishment of public hospitals, dispensaries, and maintenance of maternity homes and child welfare centres.

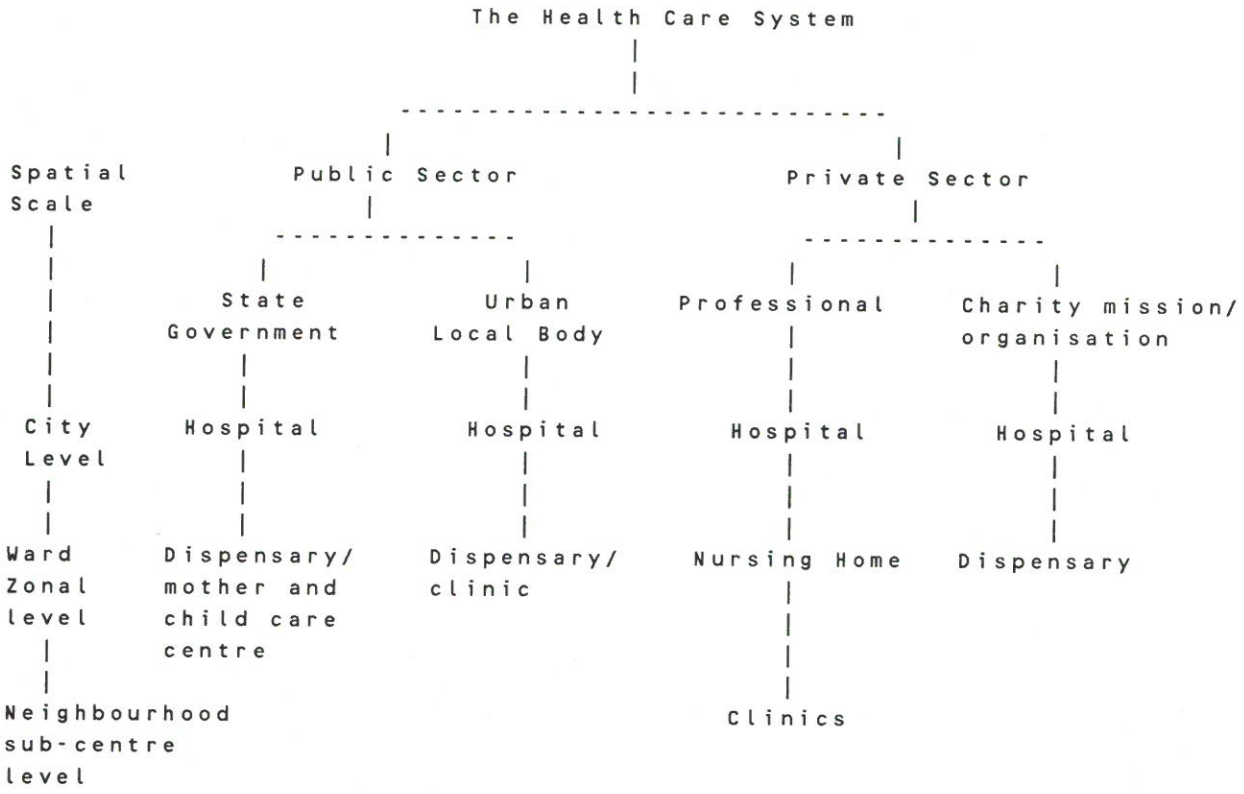
Table 5.2

Health Related Functions in the Sampled Cities

Cities	Obligatory functions	Discretionary functions
Varansi	Public vaccination Provision of public hospitals and other dispensaries Other public medical relief Veterinary hospitals	-
Vishakhapatnam	Public vaccination	-
Gurgaon	Public vaccination Maintenance of hospitals and dispensaries	Grant-in-aid to hospitals and dispensaries

It is useful to also mention that all the three sampled cities have a wide network of health services which include public hospitals and dispensaries, private nursing homes, hospitals and dispensaries, and of course, a number of registered private medical practitioners. In addition, there are the indigeneous medical practitioners, polyclinics, and medical laboratories. The approximate position in respect of the network of health services is shown in the chart below.

Hierarchy of Health Services in Urban Areas



Share of Public and Private Sectors

According to the survey, the responsibility for curative health services is shared between the public and private sector agencies in the three sampled cities. The

share of the public sector in preventive services is indeed very large. In Vishakhapatnam, the public provision reaches out to 92 per cent of the households; in Gurgaon, 87 per cent of the households use the services provided by the public sector, while in Varanasi, the proportion of households using the public sector services is 61 per cent. It is to be noted that within the public fold, there are substantial variations. For instance, in Vishakhapatnam, it is the Municipal Corporation that exercises a near-monopoly situation insofar as the preventive health care services are concerned; in Gurgaon, the state level health department and not the municipal body provides the preventive health services.

The overwhelming role of the public sector municipal bodies, state governments, and autonomous bodies in preventive health services is governed by the principle of "public goods", the non-provision of which can lead to negative externalities and affect a large section of the urban population.

In respect of curative health services, the position in respect of the institutional arrangements is highly variable. For one thing, the network of the health services is wide, covering generalised to highly specialised services. The range in the public fold encompasses, besides the general purpose hospitals, hospitals meant for the exclusive use of women and physically handicapped and mentally-retarded children, hospitals for diseases such as

tuberculosis, infectious diseases, mental care, and leprosy, and hospital for special categories of personnel such as those employed with the police and those who subscribe to employees insurance (ESI). The size of hospitals varies from small to large. On the private side, the services are smaller in scale and spatially scattered, but these are not interlinked.

Secondly, as the household survey shows, households have a tendency to use multiple services and there is no fixity in usage. Thus,

i. Less than one-fifth of the total households in Gurgaon and Varanasi, and less than one-fourth of households in Vishakhapatnam use only the publicly-provided services;

ii. Nearly one-third of the total number of households in Gurgaon and Varanasi and almost two-thirds of the households in Vishakhapatnam use only the privately-provided services; and

iii. 53 per cent of the households in Varanasi and 54 per cent in Gurgaon, and about 17 per cent of the households in Vishakhapatnam use both public and privately-provided services.

Table 5.3

Use of Public and Private Health Services in Three Sampled Cities, 1989

City	Percentage of households using health services in		
	Public sector	Private sector	Public and Private sectors in combine
Varanasi	16	30	54
Vishakha-patnam	20	63	17
Gurgaon	21	26	53

The survey further shows that a larger proportion of low-income households use publicly-provided services. In Gurgaon, over 70 per cent of households in the income-category of less than Rs.1,500 reported to be using the publicly-provided facilities; in Varanasi, this proportion was 62 per cent. The proportion of people using publicly-provided facilities, as table 5.4 shows, consistently declines as the income-level of households rises. In fact, none of the households in Vishakhapatnam with incomes of over Rs.3,000 reported to be using the public health facilities.

In terms of the extent of use of the private health services, the survey shows that these are widely used by households in different income categories. 47 per cent of low income households in Gurgaon, 36 per cent in Varanasi, and 66 per cent in Vishakhapatnam use privately provided health services. In higher-income households, these

proportions are evidently higher, in fact, significantly higher as can be seen in the table (5.4). These facts are important in as much as they indicate a strong public-private participation in the health services.

Table 5.4

Distribution of Households by Income Groups and use of Health Facilities in Public or Private Sector, 1989

Monthly income per household		Percentage of households depending on medical facilities exclusively in				
		Public Sector		Private Sector		Total
Less than Rs. 1500	Varanasi	64		36		100
	Vishakhapatnam	34	(47)	66	(53)	100
	Gurgaon	53		47		100
Rs.1500 To 3000	Varanasi	26		74		100
	Vishakhapatnam	17	(31)	83	(69)	100
	Gurgaon	47		53		100
Rs. 3000+	Varanasi	0		100		100
	Vishakhapatnam	10	(13)	90	(87)	100
	Gurgaon	26		74		100

Note: Figures in paranthesis represent averages.

Citywise differences in dependence on the public sector health facilities are striking. In Varanasi, about two-thirds of the poor households (monthly incomes of less than Rs.1,500) use public-sector facilities, and all households (monthly income Rs. 3,000+) look to the private sector for curative health services. The comparable proportions using the public sector facilities are one-third in Vishakhapatnam and one-half in Gurgaon. The percentage of the relatively better-off households using private sector facilities is 90 and 74 respectively. These variations indicate the preference of the different income group households to the

existing institutional arrangements. Varanasi represents a combination of these two conditions - the low income levels, which impel the poor to depend heavily on the public sector, and the low quality of service which drives most better-off households to the private sector services.

Rates charged by the private sector for providing health services vary considerably from one clinic/hospital to another as also from one ailment to the other. Public sector generally renders these services free of charge. Some charges are, of course, made for indoor treatment, diagnostic tests, and surgical operations. Even these charges are normally one-half to one-third of those made by the private sector for similar treatment.

Table 5.5

Minimum charges paid by Respondents for a Single Visit to Private Health Outlets in three Sampled Cities, 1989

(in Rs.)

Health Facility	Monthly Income Group	Varanasi	Vishakha-patnam	Gurgaon
Hospital*	Less than Rs. 1500	5	5 to 10	5 to 20
	Over Rs. 1500	5	5 to 30	5 to 30+
Nursing home	Less than Rs. 1500	N.A.	10	10 to 30
	Over Rs. 1500	20 to 40	20 to 50+	10 to 50
Clinic	Less than Rs. 1500	10 to 25	5 to 25	10 to 20
	Over Rs. 1500	20 to 30	10 to 30+	10 to 25

* Some charity/missionary hospitals and clinics provide free service.

The above table demonstrates that the minimum charges paid for a visit to the private health outlets are practically neutral to income levels. Private sector does not discriminate in favour of the poor because it is not guided by equity considerations. Data from all the three cities support this. One critical finding is that the low income households are not averse to making a payment of Rs. 5 for using private health outlets where they are assured of prompt attendance and services.

How much does a household spend on health care in a month? Responses to this question are only crude estimates, and some element of exaggeration cannot be ruled out. Therefore, data of this nature have to be analysed with all possible caution.

As per the sample data, the average monthly household expenditure on health care ranged from Rs. 109 in Vishakhapatnam to Rs. 188 in Varanasi. This is anything between 5 to 10 per cent of the average monthly household expenditure. The amount, spent by the low income households on health care ranges between one-fourth to one-half of that spent by the high income group. When related to the income level of various households, the middle income group households seem to be spending the most in proportionate terms.

Table 5.6

Expenditure on Health Care by Income Group in Three Sampled Cities, 1989

Monthly household income range (in Rs.)	Average monthly expenditure on health care (in Rs.) in		
	Varanasi	Vishakhapatnam	Gurgaon
Less than 1500	124	38	113
1500-3000	220	138	182
Over 3000	317	164	203
Average	188	109	178

Among the three sampled cities, Vishakhpatnam is noted for the lowest household expenditure on health. This is explained by the existence of a wide network of hospitals and dispensaries run by the Corporation/State Government, public sector undertakings, and large private sector industry. All these institutions provide medical facilities virtually free of cost. To that extent these services stand subsidised.

The survey team, in addition to its basic task of collecting data through structured questionnaires, held extensive discussions with the officials of municipal bodies, medical personnel in government hospitals, and people in administration. The state of the public health system was discussed and problems experienced in improving it were shared. The main problems constraining any reform are discribed below.

Overcrowding - In most cities, the government hospitals/ dispensaries are overcrowded. Patient/doctor ratio is far too disproportionate. The time given to a patient by the doctor is inadequate and the service is impersonal. Patients turn to private doctors who, including the poor, choose not to visit a public health outlet on considerations of big loss of time and indifferent quality of service.

Lack of maintenance of equipment - While the government hospitals/ dispensaries have medical equipment, which the private clinics and even nursing homes cannot afford, yet the patients are forced to resort to the private health outlets because much of it remains out of working order. There are no maintenance teams or standby arrangements in public institutions. As a result, patients are forced to seek the services of private clinics or polyclinics for diagnostic purposes.

Non-supply of essential medicines - The government hospitals/ dispensaries often lack adequate financial resources to disburse essential medicines to patients. They are asked to buy medicines against prescription from private chemists. This does not easily fit into the mental make up of most of the patients in India who believe that a visit to a health outlet is meant to get medicine and not prescription.

Procedural problems - In government hospitals/dispensaries there are frequent procedural delays. Each diagnostic service is scattered and crowded. To get tests done is a very time consuming process. This discourages even the poor patients, particularly if they happen to be daily wagers, from availing of this service from public hospitals.

Lack of finances - The quality of service in government hospitals/dispensaries has generally deteriorated over time due mainly to lack of finances. Although, the budget of the hospitals/dispensaries is given an annual raise yet it is meant mainly to cover the rising establishment expenses. Hardly any funds are made available for additional staff, equipment or medicines.

Indiscipline of staff - Another major hurdle in improving the quality of service is a tendency toward indiscipline among highly unionised staff. While the staff does not perform its duties to the satisfaction of the authorities, those incharge of various departments are unable to take a disciplinary action for lack of power or will to do so. Such an administrative culture is injurious to a dependable flow of service.

Analysis of the institutional arrangements in respect of health services shows that --

-- Despite an impressive expansion of the public health system in India since Independence, the private sector is playing an increasing role in the provision of health services. About one-half of the surveyed households in three sampled cities used the services of the public as well as the private sector for health care, one-third depended exclusively on the private sector, and one sixth on the public sector. There is a greater use of private sector services with the rise in income levels. In cities with lower income levels, dependence on public sector is higher.

-- There is a growing disenchantment with the public sector hospitals and dispensaries. This is explained partly by a visible fall in the quality of service in public sector and partly by a rise in the paying capacity and willingness of the the people to pay for this service.

-- Several factors explain the decline in the quality of service rendered by the public sector. Basic to the whole process has been the lack of financial resources to cope with the rising demand associated with a regular and rapid growth of population, and consequently of clients. Since health care is rendered practically free, hardly any revenue is earned in return. Dependence on government for grants and aid is heavy and

mounting but the capacity of the government to do the needful is highly constrained. Consequently, people are not served adequately and are impelled to look to the private sector.

-- The growing popularity of the private clinics and nursing homes is related partly to the failure of the public system and partly to its easy accessibility, personal touch and quick service. People from all income groups avail of their service. Even the low income group is not averse to a reasonable payment for health service if its quality and expediency is assured.

-- Nevertheless, government hospitals and dispensaries remain in use with the poor for no charges are made. Nearly one-half of the low income households depend exclusively on them for treatment. These health outlets are important also for providing a viable alternative in the absence of which the private sector could be unduly exploitative. Above all, only public institutions provide emergency health services; the private sector is simply wary of it. Preventive health services are primarily the domain of the public sector. Over 85 per cent of the immunisation cases in the three sampled cities were handled by public sector agencies.

-- The problems of the public sector can be solved through better planning and management. If maintenance of hospitals and government hospitals' equipment is improved and various services streamlined, the government hospitals in most cities will become more effective and efficient. Indications are that such reforms are slow to materialise. In the absence of any improvement in the service level of public sector institutions, the private sector will flourish and take over the health care services more by default than by any planned policy or action of the government. This has already taken place to a great extent.

-- Alternatively, a system can be evolved wherein the public sector can concentrate more on primary health care, sanitation, health education, immunisation, specialised treatment and emergency services and private sector can be encouraged to take care of curative services. Affordability does not appear to be a major issue; it is the access and quality of service which are more critical under the emerging scenario.

VI

PROVISION OF URBAN SERVICES: SUMMARY AND CONCLUDING REMARKS

During the past few years, wideranging issues relating to the efficient provision of urban services have come to occupy the attention of planners and practitioners. The main underlying contention is that urban population in India has been increasing at a rapid rate and has, in the process, overwhelmed the financial, organisational and management capacities of the municipal bodies and other agencies to be able to meet the requirements of services such as water supply, solid waste disposal, primary health, and street lighting and other similar civic services. In many cities and towns, the pressures of urbanisation have been so severe that effective use and management of even the existing services has become difficult. In several places, the existing institutional arrangements have virtually collapsed with the result that there are today large segments of population with either no services or very inadequate levels of services, suggesting that the entire issue of service provision be reexamined and reappraised.

Two other factors have brought this issue to planners' attention, the first being the extremely weak financial base of municipal and other public bodies which have the statutory responsibility in respect of these services. For a number of reasons such as the access of municipal bodies to sources of revenues that have become inelastic over time, their inability to effectively use the instrument of user charges, local resistance to adjusting the tax rates etc,

the resource position of most municipal bodies is in a shambles. Very few municipal bodies are in a postion to balance their budgets and few, if any, can claim to have the capacity to generate resources internally. Given this overall scenario, it is being argued that alternatives to the existing institutional arrangements should be explored and experiemented with.

Secondly, the current climate where the economy is being opened up and the initial inhibitions to involving the private sector are being shed has also helped planners and practitioners to consider alternatives to the existing institutions in the area of basic services. Suggestions have been made to involve the private sector in the provision of services such as roads, power, health, education and a host of other similar services.

It is in the light of this general background that this study was carried out to firstly, explore the roles of the various agencies, both public and private, in the provision of four services namely water supply, solid waste disposal, primary health, and transportation, and, secondly, ascertain the users perceptions about the effectiveness of the different institutional arrangements including the satisfaction levels etc. This study, which is based on the data and surveys of three cities, namely Varanasi, Vishakapatnam and Gurgaon has been revealing in many ways, and it is useful to recapitulate some of its major findings.

Perhaps, the most important finding of this study is the important role that the private sector plays in the provision of urban services. All along, there has existed in the country a strong notion that the municipal bodies alone are responsible for the provision of services such as water supply, solid waste disposal, primary health etc. It is presumably based on the general visibility of the staff of municipal bodies and public agencies in the urban areas. The field level data show that municipal bodies reach out to --

i. 80 per cent of population in respect of water supply;
ii. 90 per cent of population in respect of solid waste disposal services, and
iii. 30 per cent of population in respect of primary health care services (municipal and government provided).

The balance of the population is served by sources other than the municipal and other public agencies. This fact is important to be recognised particularly by those who still believe that the private sector plays no role in the provision of such services.

Further, it is important to note that reaching out does not necessarily mean that the services are adequate or efficiently provided. For example, as pointed out in the preceding sections, water supply norms are met in only Varanasi which happens to be located on the banks of a perennial source; in the other two cities, water supply

falls short of the minimum norms laid down by the Zakaria Committee. Inadequacies are more severe in the case of solid wastes where, according to the surveys, wastes in many areas are collected once a week, in others by gangs organised periodically, and in yet others rarely.

It is equally important to note that a significant proportion of urban population, while relying on public provision, keep their options open to the use of private sector provision of services. As would have been noted from the respective sections, about 37 per cent of the population of Varanasi and nearly 20 per cent of Gurgaon use both the public and private provision of water supply. In other services too, a somewhat similar situation exists, testifying to the significant place that the private sector has come to occupy in these services.

The private sector has a far bigger role in health (curative) and transport services. Nearly 30 per cent of households in Varanasi, 63 per cent in Vishakapatnam, and 26 per cent in Gurgaon reported to be using the health services provided by the private sector agencies. As far as the transport services are concerned an increasing reliance on intermediate modes of transport was reported from all three sampled cities. There is no public transport worth mentioning in Gurgaon although in Vishakapatnam, public bus system carries over 100,000 passengers a day, and are an important source of intra-city mobility. Varanasi which has a long history presents one example where mass transport has

not been able to make any inroads because of the inflexibility in bus designs and the land use patterns.

What it means is that it is wrong to hold the notion that municipal agencies enjoy or exercise a kind of monopoly in the provision of services. Other arrangements have already come in place and are playing an important role in this area. The legal and statutory provision in this sense have lost their relevance in the context of these services.

When this overall position is analysed with respect of households falling in different income categories, and how those households exercise their choice between different types of arrangements, the findings of this study are most telling. According to the study, low income households (less than Rs.1500 per month) stand grossly discriminated in all the four services, although in different ways. For instance as briefly alluded to earlier, they have very poor access to water supply and solid waste collection services; their supplies are inadequate and intermittant, and moreover, the burden of these services on the low income households is high (i.e., proportionate to their incomes). In respect of health while the proportion of households using the public services is high, it is so because the private provision is outside of their affordability limits. At the same time, the very fact that nearly 47 percent of households use the privately provided services demonstrates their total disenchantment with public services. Thus the

view that the public sector is more sensitive to the service needs of poor households is not borne out by the field studies. The private sector, as would be expected, makes no distinction between the income levels of users, and is neutral to the income or other attributes of the user community.

A third very important finding worth emphasising is that there are multiple institutional arrangements in respect of both health and transport services. There is a whole hierarchy of health services both in the public and private sectors, and the relationships between them are extremely complex. What is important here to note is that the principles which govern the participation of public and private services are very different from each other - public provision is governed by the need for spatial and income equity, and, of course, for extending highly specialised and exclusive services (eg. burn treatment). The private sector is atomistic in character, and based on capturing a share of the market and responding to the market forces. Because of the flexibility and the general perception that the private sector will be specific to the demands, the share of the private sector in health services is on the rise.

Transport services belong to a different category of goods altogether. Bus or mass transit requires a threshold of traffic which, if not available, discourages its introduction or expansion. Also, there are several other determinants such as the topography, land use, areal size of

cities, the traffic pattern in terms of peak and non-peak hours etc. which determine the nature of the transport system. This study confirms that the institutional arrangements are most likely to be different between different cities, and the entire question of public-private provision has to be contextual.

A few important points are worthy to take note of when we are reassesing the overall question of the future institutional set up for these services. Firstly, it must be recognised that the pressures of urbanisation are unlikely to subside in India. A notable feature of the urbanization pattern in India is that much of the increase has in the past taken place in the existing settlements where the pattern of land use is given, which have sections that are old and where changes in respect of service delivery are not easy, and where the systems have become aged and technologically obsolete. Some of the strain on services is, therefore, inevitable irrespective of the nature of the institutional set up.

A second point worth mentioning is that each of the services discussed in this study has to pass through the various stages of planning and implementation before it is delivered to the user, and at least in some of the services, it is conceivable to have different institutional arrangements for different stages. For instance, in transport where the private sector plays a decisive role,

the public sector can exercise itself in terms of fixing of realistic fares, or delineating the routes and enforcing safety and environmental norms. Likewise, in water supply, there is no reason why the same institutional arrangement has to persist for the production of water and the distribution of water. Such decisions should evidently be taken on the basis of the relative efficiencies of the different institutional arrangements.

Finally, it is necessary to bear in mind that the participation of the private sector has come about as a result of the growing disatisfaction with the public provision. It has also made its entry in areas and spheres where a need was felt to supplement the publicly provided services. It does not necessarily follow from the above that the weaknesses of the public sector are a natural strength of the private sector. Nor should it be taken as the principal justification for involving the private sector in a major way. The private participation must come from within its own strength, and not from the weaknesses of the older existing systems.

VII

RECOMMENDATIONS

Delivery of Urban Services : Alternative Management Options

The discussions in the preceding sections are a testimony to the fact that provision of services in the Indian cities and towns is a complex and challenging task. The public sector institutions continue to be the major providers of basic services such as water supply and waste collection and disposal although they are unable to provide the services satisfactorily. The public sector is also indispensable, to some extent, in the Indian context where a significant proportion of the population is poor and is dependent on the publicly provided services. While there is no doubt that the poor have benefited from the existing institutional arrangements, the economic costs of doing so have been heavy. The government is increasingly finding it difficult to bear the burden of subsidization and, therefore, there is an urgent need to consider remedial measures. At present, however, a general scenario of low level of urban services, both in quantity and quality, prevails.

The provision of urban services varies with size, function and also physical characteristics of the city. In general, the level of urban services is far from satisfactory and calls for serious and critical deliberations over the management options. In particular:

a. to allow the present system to continue and make

serious efforts to improve the operational, financial and managerial efficiency of the public sector;

b. to reckon that the public sector has very limited capacity to improve and to transfer the task of urban service provision to private sector;

c. to promote competition between the public and private sectors in provision of all urban services; and

d. to involve the private sector in urban services through management contracts under the exclusive purview of the public sector.

The assumptions underlying each of the above listed options differ. The first goes partly by the thesis that it is not feasible to shift to a new system and partly by a feeling that there is a scope for improving the existing system and partly by a feeling that there is a scope for improving the existing system. On the contrary, the second option stipulates that the existing system has some inherent administrative and financial constraints which cannot be overcome by any reform; hence a choice in favour of private sector becomes justifiable. The third option takes the position that an introduction of competition between the public and private sectors may give the necessary shake-up to the public system and stimulate it to be more dynamic. Finally, the last option assumes that the major failure of the public system lies not in laying out the services but in their subsequent management, especially in recovery of

charge. The private sector may be invited to handle this aspect with its characteristic efficiency.

The alternative institutional arrangements for the four services under consideration are discussed below.

Water Supply

Evidence from the three sampled cities indicates that there is a heavy dependence on the public sector for supplying water although the quality of service is unsatisfactory. The poor do benefit from the existing institutional arrangements as water supplied through public standposts is free. At the same time those of the poor who do not have access to the public supply system pay substantially more for water than those with municipal connections.

Quantity and duration of supply emerged as the most crucial aspect of the service for the people. Critical to the improvement of this service is the mobilisation of additional resources through its proper pricing and full recovery against billing. Setting tariff for water is as much a political decision as an economic one and hence the role of the public sector remains paramount in respect of this service. Another important reason for keeping this service with the public sector is its crucial nature and also the fact that it has the characteristics of 'natural monopoly'.

The private sector can be involved in this service for functions such as meter reading, billing and recovery through 'management contracts'. The private sector can also be involved in the management of decentralised systems such as tube-wells, treatment plants etc. Maintenance of trunk lines, distribution networks, detection of leakages are also functions where contracting out can be considered.

Solid Waste Collection and Disposal

Garbage disposal, at present, is entirely in the charge of the public sector in the three sampled cities. The service, however, suffers from inefficiencies some of which are built within the institutions themselves. The highly unionised staff create immense problems for the management. The department managing the system often does not have personnel trained in public health. There is also lack .pa of maintenance of transport and equipment which render the service inefficient.

This is a service where the involvement of the private sector can be encouraged. A gradual shift to contract system wherein the various localities are assigned to different firms or contractors can be considered. An adverse reaction from the strong unions of the sanitary workers will, however, have to be overcome. Therefore, the change over to a different system will have to be done in a phased manner. A beginning can be made with the outer localities, the newly developed localities, and, in general, in areas not yet served by the municipal bodies on a regular basis.

Health

The role of the private sector is very significant in the health services despite the large network of hospitals and dispensaries run by the government which provide services either free of charge or at very nominal charges. Although the poor have gained more by the public sector provision, a preference for the private doctor remains universal. The most critical considerations in health services are 'effective treatment, convenient access, short waiting time and reasonable charges'. The private sector, though charges more, does score over the public sector on all these counts. Even the poor are willing to make reasonable payments for a quality service. Hence there is a reason to promote the private sector

A kind of complimentarity between the public and private sectors exists in health services and can be promoted. The public sector can concentrate on providing preventive health services such as immunisation, fumigation etc. which involve negative externalities. Some diagnostic services and cure of more serious and chronic ailments can also be provided by the public sector, as it would especially help the lower income groups. The private sector can focus more on providing general medical services, minor surgery and specialised hospitals.

Transport

The relative share of the public and private sector in transport services depends to a large extent on the size of

the city and its topography. Hence the management options in transport are subject to local conditions. City bus services are predominantly in the public sector although the quality of service is not very encouraging. Private sector involvement in bus services can be, therefore facilitated. Specified routes and areas can be operated by them. The private sector operators would be able to overcome the inflexibility that exists in the public sector system. The private operators would be able to adapt the size of the buses and the frequency to suit the city and its changing demands with greater ease. The IPT is entirely in the private sector and the public sector should play only a regulatory role in its operations.

The management options for the provision of urban services have, therefore, to be service specific and also city specific. The chart below summarizes the management options for individual services.

In summary, it can be stated that the choice of the management option of whether to improve the existing system or opt for a new system must take into account the problems of the individual cities, the management capability, and the public response. Involving the private sector in urban services through contracting out seems to be a positive option.

Management Options in Provision of Urban Services

Service	Nature	Major Considerations	Present Management mode	Main Constraints	Recommended Management Options
Water Supply	Natural Monopoly	Quantity and duration of supply	Public	Lack of funds to maintain and augment the system	Mainly Public, with contracting out of functions such as meter reading, billing and collections to the private sector.Running of tubewells as well as treatment plants can also be given to the private sector.
Solid Waste Management	Public Good	Regularity in collection and disposal	Public	Management problems, including inappropriate managerial staff, unionised sanitary staff, outdated and ill maintained equipment	Gradual privatisation beginning with outlying areas and newly developed localities, especially areas not yet covered by the local body.
Health	Merit Good	Effective treatment, convenient access, short waiting time	Public and Private	Lack of adequate staff, equipment and medicines at public health centres as also the inadequacy of funds to maintain and augment the service. High cost of private services.	Preventive services in public sector. Emergency, diagnostic and certain chronic illness hospitals in the public sector. Curative services mostly in the private sector.
Transport	Essential service	Affordable, easy access and availability, speed	Public (bus system) and Private (IPT modes)	Inefficient bus services, parts of the city not covered by bus system. High cost of IPT modes.	Part privatisation of bus services (specific routes and areas). Public sector to mainly play a monitoring role.

Options for Private Provision of Services :

Private involvement in municipal services may be distinguished under two broad categories:

a) those under which the private parties bear no financial/ commercial risk, namely the contract for provision of services, the management contract, and profit sharing system;

b) those in which the private party bears all or part of such risk, namely, the concession and the lease.

Operation Contracts

This type of legal arrangement, is a contract with an enterprise for the provision of those well-defined services necessary for good operation of the service. The private enterprise may be contracted for operations such as the cleaning of sewers, collection of household refuse, maintenance of transportation vehicles etc. The enterprise could also commit itself to deliver the whole service or to manage its entire operation. Under this system, the enterprise is compensated for the specific task or is given a fixed fee. In this arrangement the municipality remains legally responsible for the service and continues to manage the service in its name and collect fees from the users. The contract will often provide for a remuneration proportional to the number of service units furnished (length of sewers cleaned, household refuse tonnage collected). Other compensation formulae can be worked out.

Management Contracts

This contract is almost an extension of the above form of contract. The manager is charged with all the tasks

connected with the delivery of the public service, including billing and collection of fees from users and is the employer of all personnel used in the service. The public authorities do not intervene in the management of the service but control the manager according to the provisions of the contract. In this form also the public authority is legally responsible for the delivery of the service and bears all the financial/commercial risks. The manager's remuneration is composed generally of a fixed annual amount or a fixed proportion of revenue collected.

Concession Contracts

In this form of contract the public authority contracts out the delivery of a public service to a private enterprise under its own control, including all the costs and risks involved. In this arrangement the concessionary bears the start-up costs e.g., construction of the network of pipes, purchase of equipments. During the period of contract, the concessionary runs the services at his own risk and cost, chooses and controls the personnel necessary for the operation of the service, modernizes the facilities at his own cost and also buys all the necessary tools and materials. The private enterprise is compensated directly for the start-up costs through collection of user fees. These fees permit them to cover the capital costs and make profit. Concessions are awarded for a long period of time. At the end of the concession period, the facilities become the property of the public authority.

The main advantage of this system is that it relieves the public authority of financial burdens while assuring efficient service. But the private enterprise may call upon the public authorities to support them when financial difficulties arise. Sometime the private enterprise may be required to carry out investments for which no full cost recovery can be expected. Or the public authority may be reluctant to allow an increase in rates. So, the public authority may be compelled to provide subsidies, give lower cost credits etc., to allow the private enterprise to continue the service.

Lease System

In this arrangement the lessee receives already existing facilities and has to provide management and operation of the public service and advance only the operating funds. The lessee operates the public service at his own commercial risk by bearing deficits and benefitting from profits. Remuneration comes from fees which he levies on the users and payments are made to the lessor (public authority) to cover debt service or other costs relating to the financing of facilities, their renewal and extension. The lessee has the full legal responsibility to deliver the service and is at liberty to choose the technical means for the purpose.

The lease contract usually contain detailed provisions on setting and adjusting rates as well as on the exercise of

control by the public entity over the operation of the service and over the accounts of the lessee.

In this arrangement the lessee does not have to make the initial investments to build the facilities, and so the contract is for a shorter duration as the lessee only brings in working capital which can balance the investment in a shorter period.

Joint Ventures

This is a system of association of public sector with the private sector. There are many possible ways through which such arrangements may be initiated.

The public authority can create a joint venture with one or more private enterprises. It can then contract with this company under one of the systems described above. The public authority may secure an interest in an existing company delivering a public service. This may be done through receipt, or purchase & stock from such a company.

Under ideal circumstances, the joint venture should reconcile both the community and the private interest. While the rendering of the public service for profit is recognised, the profit aim is checked by the public service nature of its activity. On the other hand, at least part of the profits revert to the community.

Role of the National and State Governments

The case study of the three cities presented in the

report has highlighted the fact that, despite being a major provider of urban services, the public sector's ability to improve and augment the existing services is limited. The present institutional arrangements for delivery of urban services, though varied over the country, does not seem to be able to cope with the growing demand for urban services in the cities.

In order to manage the demand for urban services, concerted efforts on the part of the national and the state governments are necessary in the following areas:

i. Financing of urban infrastructure
ii. Fiscal measures
iii. Strengthening the capacity of local governments
iv. Legislative and institutional reforms

Institutional Financing of Urban Infrastructure :

One of the crucial aspects of urban services requiring intervention of the national government, relates to financing of urban services. The total finances required for investments in core urban services have been estimated to be anywhere between Rs. 25,000 crores (NCU report, 1989) to Rs.40,000 crores (NIUA estimates). Investments, at the lower estimates, are beyond the present capacity of the urban local governments, through its internal means as indicated in this study. The present institutional arrangement for financing urban infrastructure is also unlikely to cope with such a large requirement.

National government has hitherto paid little attention to the requirements of the urban areas. In the absence of any support for urban area, it is quite likely that infrastructure bottlenecks will impede urban productivity and in turn affect the national growth as well. It is proposed that national government's role should be enhanced in financing urban infrastructure in the following two ways:

a. Increasing plan allocation for urban infrastructure development through a programme on Integrated Urban Infrastructure Development. Under such a programme, efforts will have to be made to provide budgeting and extra-budgetary support to the tune of Rs. 1500 crores per annum for urban infrastructure investments.

b. Creation of a network of specialised financial institutions to meet the requirements of urban infrastructure. While the Seventh Five Year Plan had made an explicit provision for an Urban Infrastructure Bank, its implementation has been only as a window in the Housing and Urban Development Corporation. The total lending by HUDCO for urban infrastructure in the past couple of years has been on an increase, but it is nowhere near the required levels. In addition, the financial viability of the project and the debt servicing abilities of the local governments are also not given due importance under the present institutional systems.

In order to provide greater access to the urban local governments and the private sector enterprises that are likely to be promoted in provision of urban services, it is necessary for the national government to establish a specialised urban infrastructure finance institution or create a mechanism for refinancing infrastructure lending by other financial institutions. The experience in recent past, with regard to housing finance institutions, suggests, that it is possible to set up a commercially viable infrastructure finance institution within a short period of time, if the national government provides appropriate institutional support and adopts facilitative policies.

The requirements for urban infrastructure is large and varied, both according to the nature of service as well as city size. The capacities of the local governments are also limited to formulate technically appropriate and financially viable projects. It is thus necessary to provide both technical support as well as financial support to the local bodies. A regional network of financing institutions, that can work closely with the local governments, is essential. At present, in each state there exists an industrial development corporation and industrial finance corporation. The professional skills available at these organisations may be utilised in the initial stages of establishing regional institutions.

Fiscal Measures :

As the study clearly highlights, there is a significant role to be played by both the public and the private sectors in providing urban services. However, for the private sector, the primary motive is of profit generation and unless conditions to this effect are created, it is unlikely that one would see a significant involvement of this sector in provision of urban services.

Thus in addition to creation of financial institutions to which the private sector would also have access, it is necessary to provide some fiscal incentives to them as well.

Such fiscal incentives could be in the form of accelerated depreciation allowances, as has been done in case of energy conservation measures. Other possible incentives would be to introduce investment allowance schemes for capital investments in urban infrastructure by the private sector. These investment allowances may be offset against current profits of the enterprise.

The exact quantum of the above fiscal incentives would depend on their net effect on the rates of return of investments. Such returns in turn are contingent upon appropriate pricing of urban services. It is thus crucial to permit the local governments and the private enterprises involved in delivery of urban services, to levy appropriate prices to recover the costs of investments.

Strengthening the Capacity of Local Government

Efforts to privatise urban services do not imply abdication of the responsibilities of the local governments. In fact, the local governments would need to play a far more important role in monitoring and regulating the activities of the private sector. Depending upon the nature of privatisation adopted for a particular service, the local government officials will need to have the requisite expertise in dealing with private sector enterprises. For example, in case of contracting out of services, the local governments will need to be very clear about the type of contracts to be awarded, the design of the specific terms of reference, drafting of appropriate contract documents and devising suitable evaluation criteria for the award of the contract.

The local governments must also shed some of their present inefficiency in operations and maintenance of services. The reported leakages of upto 25 per cent in the water supply system need serious attention. The ability of the local governments to set appropriate rates or charges for the services are limited, but their performance regarding collection of these low charges is quite poor. A performance linked incentive scheme for municipal staff may help induce some efficiency in delivery of services.

Legislative and Institutional Reforms :

The state governments are to play a major role, in light of the Seventy-Third Constitutional Amendment referred to as the Nagarpalika Bill. Just as the state governments will now be required to identify mechanisms for devolution of funds to the urban local bodies, it must also provide for a greater autonomy to these urban local bodies for mobilizing resources.

The present municipal legislations in every state suffer from the mismatch between the range of obligatory functions of the municipal bodies and their ability to generate resources. Rather than taking away these obligatory functions from the municipal bodies, as is being done in many states, it is prefered to enhance the power of the local governments to mobilize the requisite resources. The present legislations at the state level need to be suitably modified to provide autonomy to the municipal governments to set their own taxes and rates as approved by the elected local governments.

The other important agenda for reforms at the state level is with regard to the institutional arrangements for urban services. In many states, there are multiple agencies dealing with urban services. With separation of functions such as design and construction, operations and maintenance and collection of revenues, it has become difficult to coordinate the activities of these agencies. While it would

be ideal if all the core services are provided and managed by the urban local governments, the various parastatal organisations that have been established by the state governments need to be involved in operational aspects of the delivery of urban services. Such organisations, in the long run, may be able to compete with private enterprises in delivery of urban services.

Conclusion

At the beginning of this report, we have stated that the existing institutional arrangements for the provision of essential services are grossly inadequate, overstructured and overstrained. The case study of three cities has demonstrated that while the public sector is the dominant agency in providing these services, it is unlikely that in its present structure, these institutions will be able, to meet the growing demand for urban services. As we have highlighted in this chapter, there is an important role to be played by the national, state and local governments as well as the private sector in meeting the challenges of rapid growth of population and activities in our cities. It is only through such concerted efforts that the high productivity of the cities can be maintained and adequate quality of life can be assured to its residents.