



BACKGROUND NOTE ON URBAN WATER SUPPLY

**PRESENTATION
TO
NATIONAL ADVISORY COUNCIL**

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**GOVERNMENT OF INDIA
MINISTRY OF URBAN DEVELOPMENT**

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BACKGROUND

CONSTITUTIONAL PROVISION

"Water, that is to say, water supplies" falls within the legislative jurisdiction of the State Governments vide item 17 of the List II-State List under Seventh Schedule referred to in the Article 246(3) of the Constitution.

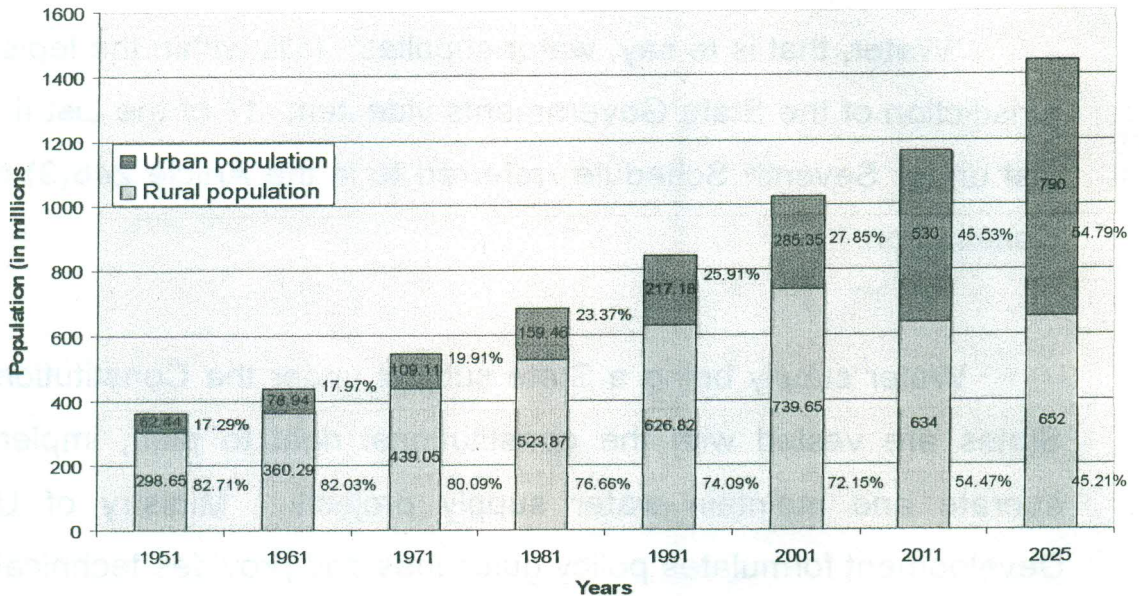
Water supply being a State subject under the Constitution, the States are vested with the constitutional right to plan, implement, operate and maintain water supply projects. Ministry of Urban Development formulates policy guidelines and provides technical and financial assistance to the States.

URBANISATION

As per 2001 census, out of total 1.02 billion population in India, the urban population living in 5161 towns was 285.35 million, constituting 27.85% of the total population. Of the 5161 urban agglomerations and other towns, 35 metropolitan cities account for about 110 million or 37% of the total urban population.

Assuming that the urban population would continue to grow at a rate of 3.1% per year, it is expected to increase to an estimated 549 million (41% of the total population) by 2021.

Urban population growth



Source: Census 2001, Planning Commission

Fig 1 - Urban Population growth

Rapid pace of urbanization has put enormous pressure on the urban areas, causing serious problems in urban planning, management and governance, particularly in large cities especially with respect to provision of basic amenities such as drinking water supply and sanitation.

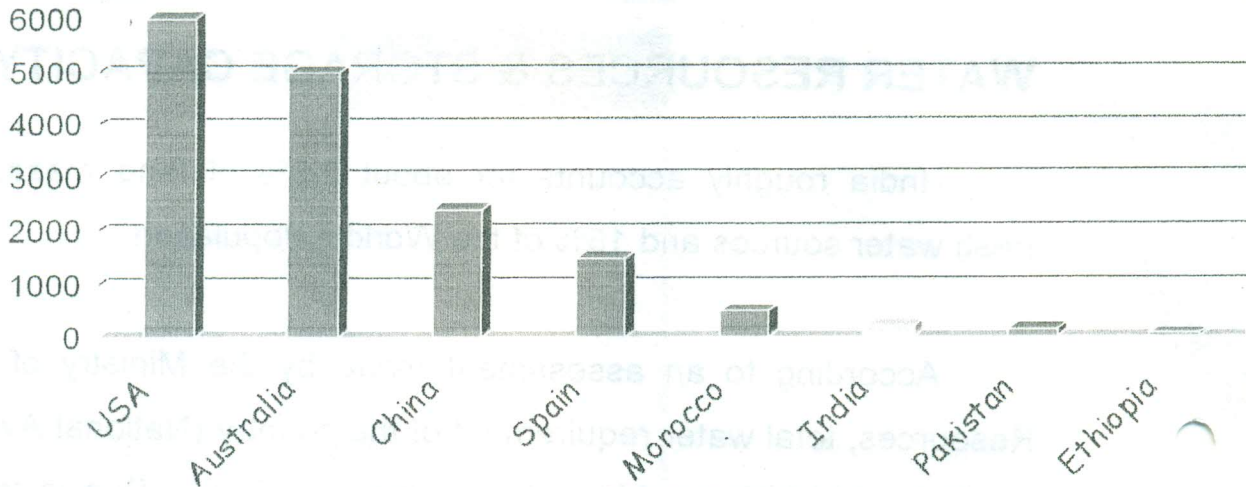
WATER RESOURCES & STORAGE CAPACITY

India roughly accounts for about 2.5% of land mass, 4.5% fresh water sources and 16% of the World's Population.

According to an assessment made by the Ministry of Water Resources, total water requirement of the country (National Average) would be 694 billion cubic metres in the year 2010. Due to regional imbalances and lack of cooperation among the states on sharing of surface water sources, shortage of water will be a fact of life in many regions.

As per data compiled by Ministry of Water Resources, the total annual surface water flow is of the order of 1869 Billion Cubic Metre (BCM). However, utilizable water is 690 BCM from surface sources, 396 BCM from ground water sources, totalling to 1086 BCM. As regards storage, 213 BCM storage capacity has so far been created by way of dams and additional storage capacity of 80 BCM is in the pipeline. Per capita storage availability in India is 207 cubic metre, which is far less compared to other countries.

cubic meters per
capita



India has 207 cubic meters per capita

US and Australia have ~5000 m³/capita;

Source: ICOLD data base

Fig 2 - Storage per capita in different semi-arid countries

Total annual renewable fresh water available stands reduced from 5177 cubic metres to 1820 cubic metres per person in India during the last 50 years due to increase in population. Any situation of water availability of less than 1000 cubic metres per year per capita is considered as scarcity condition. It is estimated that the per capita average annual fresh water availability may further reduce to 1341 cubic metres by 2025. Though India is not a water scarce country in so far as the national average of availability is concerned, but due to vagaries of monsoon and inadequate surface water sources in many regions, scarcity conditions are present in several

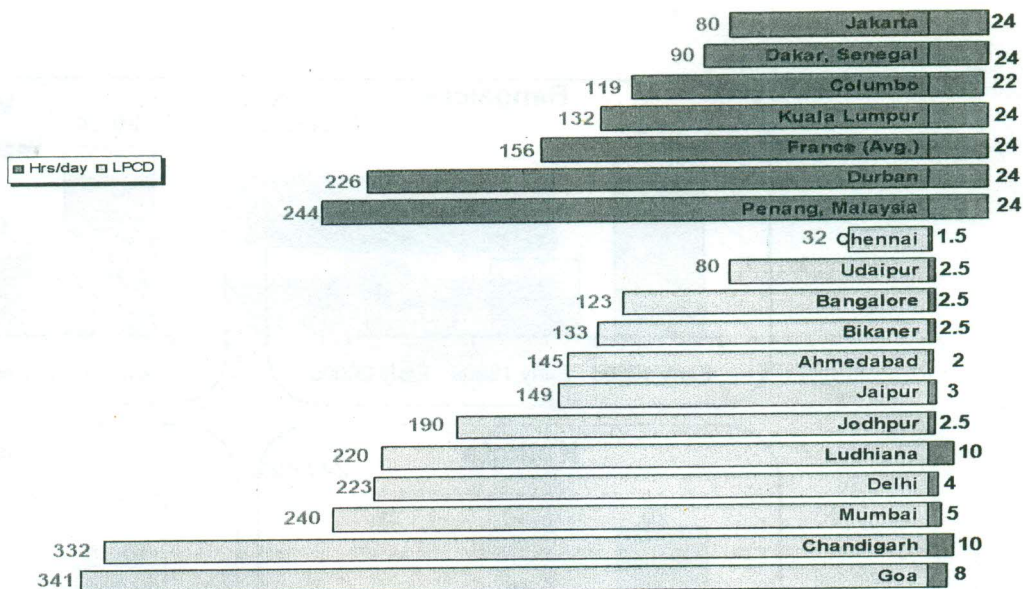
parts of the country. Equitable distribution of water for different regions of the country is possible only when there is adequate cooperation among different States to share this common resource .

ACCESS TO WATER SUPPLY

About 89% (233 million) of the urban population has reportedly got access to water supply. However, the coverage figures indicate only the accessibility. Adequacy, equitable distribution and per-capita supply may not be as per the prescribed norms.

The per capita norms of urban water supply is 40 lpcd in case of public stand posts, 70 lpcd in case of towns where house service connection is contemplated and 135 lpcd in case of towns contemplated with sewerage system and 150 lpcd in case of Metropolitan cities having population more than one million. A copy of the per capita norms as mentioned in the Manual on Water Supply Treatment published by the Ministry of Urban Development is enclosed Annexure I.

According to a Benchmarking Study carried out by the Ministry of Urban Development – Water Supply and Sanitation Programme of World Bank (MoUD-WSP) in 2004, on an average piped water supply per day is available for 1½ hours in Chennai and 1½ hours to 2 hours in Hyderabad and 2½ hours in Bangalore and 5 hours in Mumbai. The poor, particularly those living in slums and squatter settlements, are generally deprived of safe potable water.

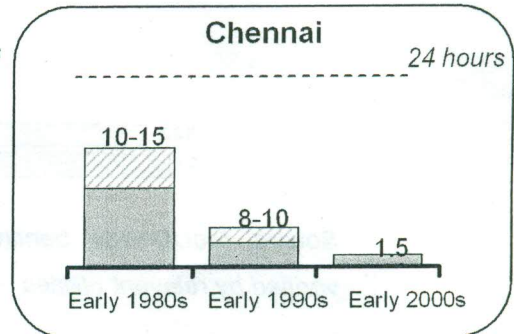
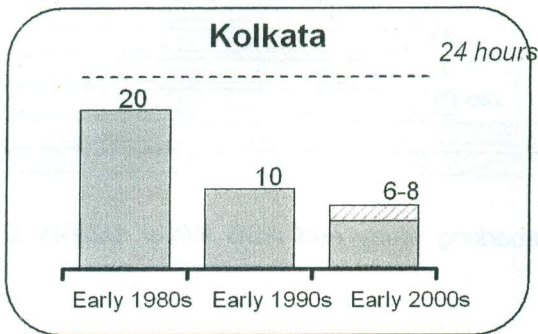
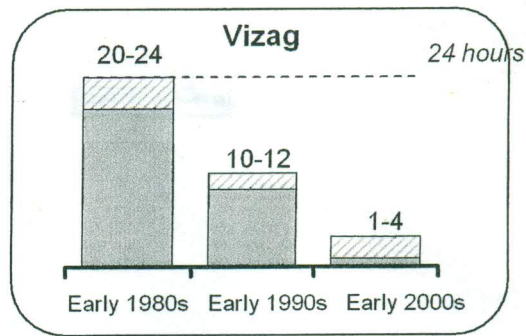
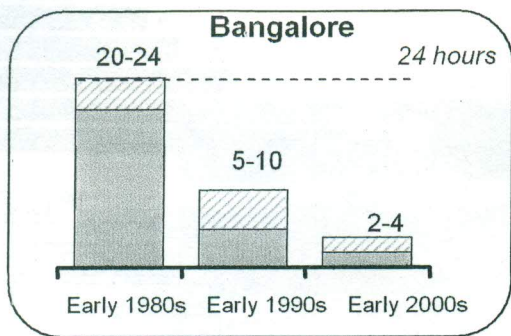


Source: MoUD/WSP benchmarking study and ADB Water Utilities Databook, 1997. Figures verified by relevant utilities

Fig 3 - 'Water production in liter per capita per day' vs. 'hours of supply per day', in selected cities

The water supply distribution is intermittent in urban areas and the hours of supply vary from one and half hours to 6 to 8 hours in some cities depending upon the availability of raw water source, availability of power etc. Water production in litre per capita per day and hours of supply per day in some of the cities in India and abroad are indicated in Figure 3 above.

It has been observed from the data available from some important cities that the hours of supply have declined from 20 to 24 hours in early 1980's to 2 to 4 hours in Bangalore, 1 to 4 hours in Vizag, 6 to 8 hours in Kolkata and 1 ½ hours per day in Chennai in the year 2000. The decline in hours of supply in some selected cities is given in Figure 4

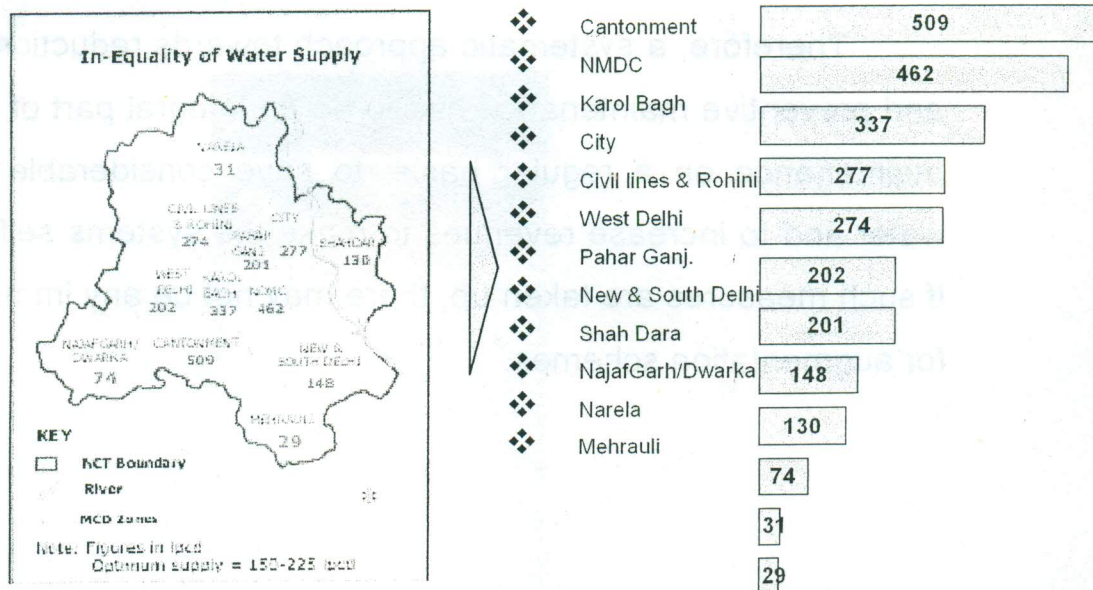


Source: Interview ASCI

Fig 4 – Decline in hours of supply over time

The case study conducted in Delhi indicated large inequalities in distribution of water in different parts of the city of Delhi with per capita supply varying from 509 lpcd in Cantonment area to 29 lpcd in Mehrauli. Figure given below depicts the inequality of water supply in Delhi.

LPCD in various parts of Delhi



Source: Ministry of Environment and Forests and GoNCTD, Planning Department

Fig 5 - Inequalities in distribution of water to different parts of Delhi

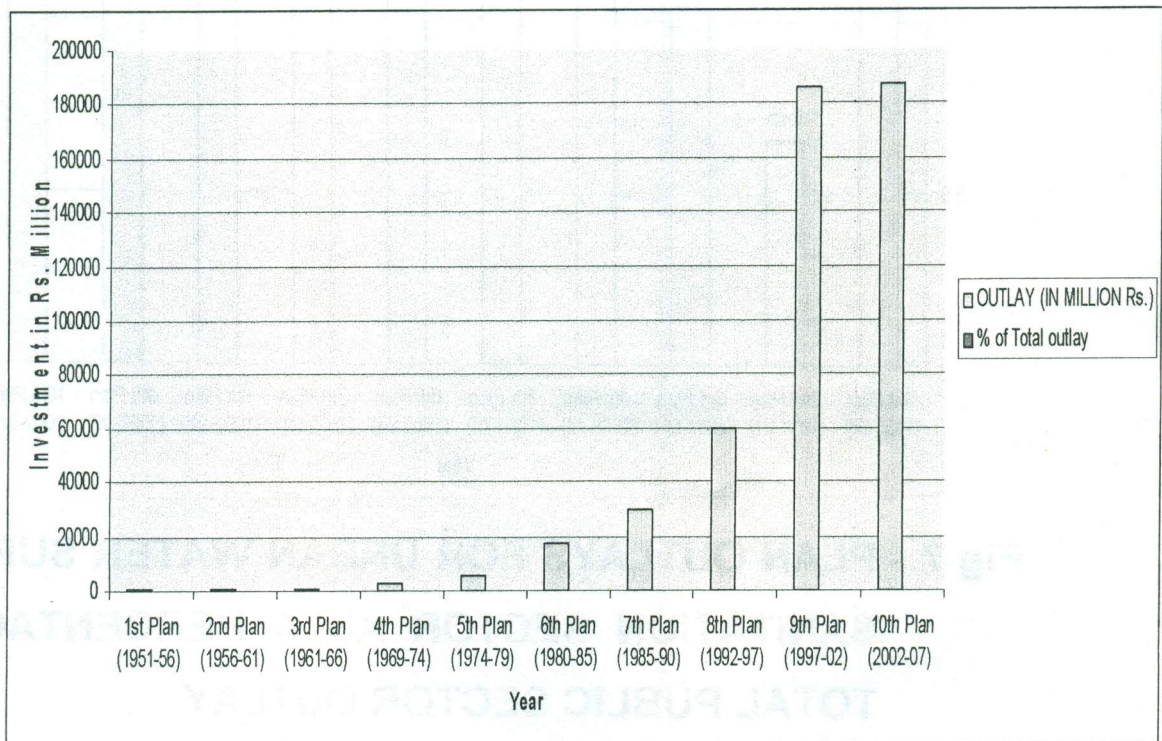
Several pilot studies conducted in the country have shown water losses due to leakage, pilferage etc, to be of the order of 20% to 50% of the total flow in the systems. It has been noticed that maximum leakage occurs in the house service connections, i.e., the tertiary distribution networks. Since water supply is by and large intermittent, during non-supply hours when the system is not under pressure, external pollution quite often gets sucked into the system through the points of leak, causing health hazards.

The study indicates the percentage of unaccounted for water is varying from about 55% in Delhi to 15% in Udaipur.

Therefore, a systematic approach towards reduction of leakage and preventive maintenance has to be an integral part of operation & maintenance on a regular basis, to save considerable quantity of water and to increase revenues to make the systems self-sustaining. If such measures are taken up, there may not be any immediate need for augmentation schemes.

PLAN OUTLAYS AND INVESTMENTS

Water Supply being a State subject, funds for water supply and sanitation projects were provided up to Seventh Five Year Plan (1985 – 90) only in the State sector. The following figure indicates plan-wise outlays for this sector



Source: Planning Commission

Fig 6 - PLAN OUTLAYS FOR URBAN WATER SUPPLY & SANITATION SECTOR

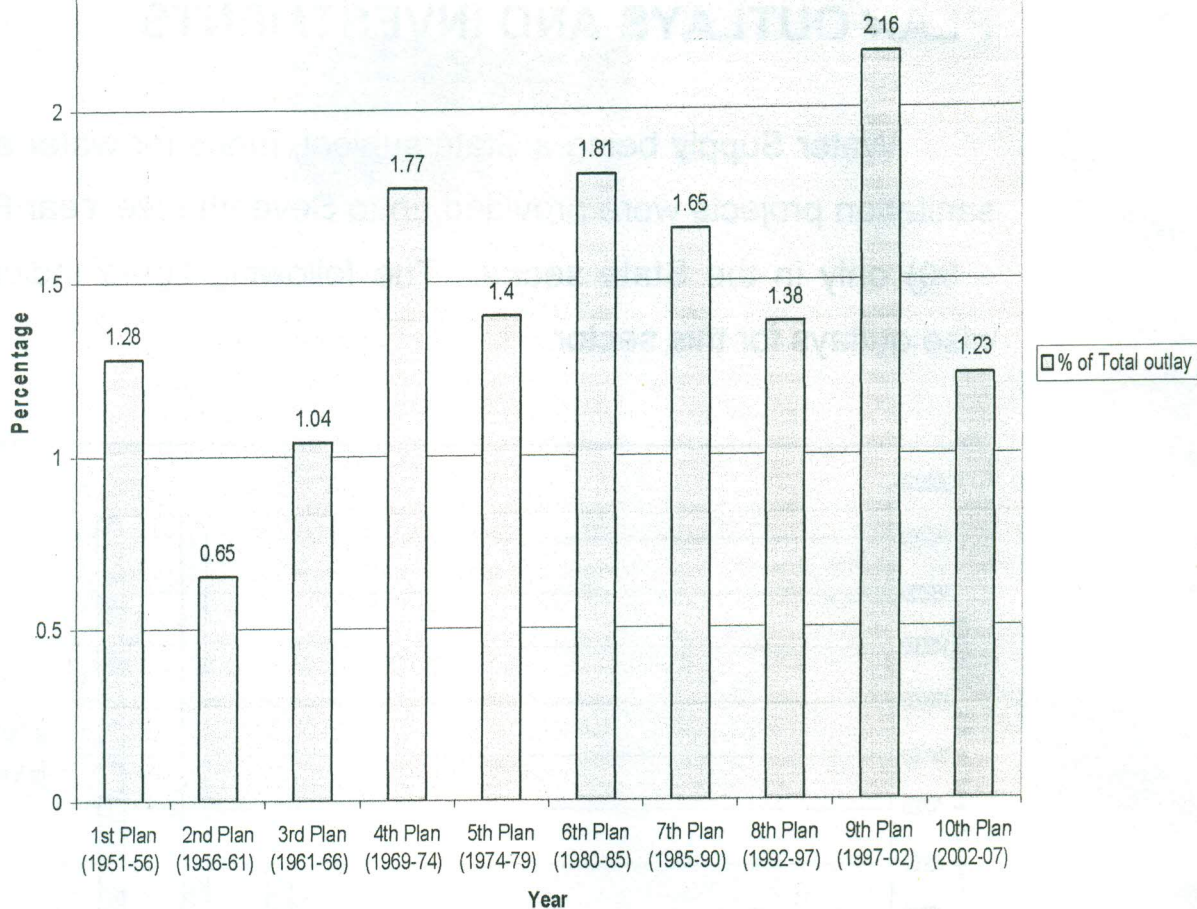


Fig 7 - PLAN OUTLAYS FOR URBAN WATER SUPPLY & SANITATION SECTOR AS A PERCENTAGE OF TOTAL PUBLIC SECTOR OUTLAY

The outlays for water supply and sanitation sector has increased from 1.28 per cent of the total plan outlay in the First Five Year Plan period to 1.23 per cent in the Tenth Five Year Plan period. Though the percentage outlays during the various plan periods have not followed a definite pattern, the actual outlays have been increasing over plan periods.

For the first time, a modest allocation of Rs.68.00 crore was made in the Eighth Five Year Plan under the new scheme known as "Accelerated Urban Water Supply Programme (AUWSP)" as Central assistance in addition to the State Plan funds for covering towns with less than 20000 population as per 1991 Census. In the Ninth Five Year Plan, an allocation of Rs.294.00 crore was made under the scheme, whereas in the Tenth Five Year Plan, this amount has been raised to Rs.900.00 crore. The year-wise allocation, amount released and number of towns covered during the 10th Plan are given below: -

(Rs. in crore)			
Year	Allocation	Amount released	No. of towns covered
2002-03	121.95	121.95	223
2003-04	140.00	131.56	154
2004-05	150.00	146.00	207
2005-06	95.24		
Total	507.19	399.51	584

As it would be seen from the above, a total amount of Rs.869.19 crore has been provided for AUWSP so far since the 8th Plan period averaging to about Rs.75 crore per annum for 1244 towns out of 2151 eligible towns as per 1991 Census.

As per various estimates, there has been a huge gap between the resource requirement and availability of funds for the water supply and sanitation sector. The India Infrastructure Report – 1996 prepared by Rakesh Mohan Committee on Commercialisation of Infrastructure Projects had estimated an annual requirement of more than Rs.22000 crore for water supply and sanitation projects in the

country during the period 1996 – 2005 as per details given in the table below:-

REQUIREMENT OF FUNDS AND INVESTMENT GAP

(Rs. in crore)

Sector	1996 – 2001	2001 – 2005	1996-2005
Water Supply	59767	58893	118660
Sanitation	51362	50488	101850
Total	111129	109381	220510
Annual Requirement			22051
Annual Average Provision made for Water Supply			4000

Source: India Infrastructure Report – 1996 (Rakesh Mohan Commission)

The Working Group on Water Supply and Sanitation constituted by the Planning Commission for the 10th Plan had also assessed that the total requirement of funds for the 10th Plan for water supply and sanitation would be of the order of Rs.53,719.60 crore. Tentative outlay for the plan period, however, included Rs.18, 749.27 crore in the State sector and Rs.1330 crore (Rs.900 crore for water supply and Rs.430 crore for sanitation) in the Central sector totaling to an outlay of Rs.20, 079.00 crore.

Viewed in this background, it would be observed that there is an estimated deficit of Rs.33, 640.00 crore for the urban water supply and sanitation sector during the 10th Plan period, if assessed against

the projections made by the Working Group on Water Supply and Sanitation set up by the Planning Commission and about Rs.80,000.00 crore if compared to the Rakesh Mohan Committee.

Apart from Plan funds, HUDCO has, since its inception (in 1970) sanctioned loan assistance of Rs.10, 393.06 crore for 389 water supply projects in various parts of the country up to January 2005.

States have also been receiving multilateral and bilateral external assistance for water supply and sanitation projects. Since 1981, funds received for 17 completed projects have been of the order of Rs.7821.60 crore.

In addition, external assistance expected for 10 ongoing projects will be of the order of Rs.3682.60 crore.

CENTRAL ASSISTANCE

(i) Centrally Sponsored Accelerated Urban Water Supply Programme (AUWSP)

As already stated, Central assistance in the form of a Centrally Sponsored Scheme known as "Accelerated Urban Water Supply Programme" (AUWSP) was launched in March 1994 in order to supplement the efforts of the State Governments for implementing water supply schemes in the small towns with population less than 20,000 as per 1991 census. The funding pattern under the scheme is on 50: 50 sharing basis between the Central and State Governments. The State Government contribution includes 5% from the concerned Urban Local Bodies (ULBs). A copy of guidelines of AUWSP is given at Annexure II.

Under this programme, water supply schemes have been approved for 1244 towns (up to 31.3.2005), at a total estimated cost of Rs.1821.84 crore to benefit a population of about 14.31 million.

Under the approved financing pattern of the scheme, projects costing on an average of Rs.1.5 crore are being taken up, half of the project cost being funded by the Central government. Due to various inadequacies in the format and pattern of assistance, details of which have been mentioned subsequently, so far only 477 projects have been commissioned. Remaining 767 schemes approved are in

various stages of implementation. State-wise details of funds released and the towns covered are in the Annexure III.

(ii) Mega City Scheme

This scheme known as Infrastructure Development in Mega Cities was taken up in 1993 in the five mega cities (Kolkata, Mumbai, Chennai, Hyderabad and Bangalore) with a population exceeding 4 million. Under the scheme, Central assistance is provided for taking up all types of infrastructure projects including water supply. Central assistance in the form of grant is given to the extent of 25% of the project cost with equal share coming from the State and the remaining 50% to be funded by institutional finance/ULBs/implementing agencies.

Because of the economy of scale due to large population of Mega Cities, the scheme is so structured that it is expected to create a corpus of revolving fund for making water supply projects self-sustainable over a period of time. 199 water supply projects have been sanctioned under this scheme at a total cost of Rs.2638.65 crore (*Bangalore – 7 projects, Chennai – 19 projects, Hyderabad – 124 projects, Kolkata – 40 projects and Mumbai – 9 projects*).

(iii) Tax Free Municipal Bonds

Central Government has also provided fiscal incentive in the form of permission given to nodal agencies/para-statal/ULBs to issue Tax Free Municipal Bonds. So far, permission for issuance of

tax free municipal bonds worth Rs.727.30 crore has been issued since 2001 – 02. Details of permission granted for issue of municipal bonds are given at Annexure IV. The amount available for tax free municipal bonds is too meager to fill the gap between the demand and resources available for the sector.

INADEQUACIES / SHORTCOMINGS OF THE ONGOING CENTRAL SECTOR SCHEMES.

(a) Tokenism

On an average, Central assistance for the water supply projects (through AUWSP and Mega City schemes) in the last 10 years has been of the order of Rs.100 crore per annum. This is required to be distributed among the eligible 2160 towns, as selected and prioritized by the State Governments. Since the number of towns are too many and the allocation of funds meager, it has been too thinly spread to have any meaningful impact, as would be evident from the fact that in the last 10 years 1244 projects have been sanctioned for a total Central assistance of about Rs.760 crore.

(b) Exclusions

As per the guidelines and norms approved for the AUWSP and Mega City schemes, water supply projects can be taken up only in towns with population more than 4 million or less than 20,000 leaving more than 3000 cities and towns with 20,000 plus and less than 4 million population as ineligible to receive central assistance.

(c) Not linked to Efficiency or Reform

The Central assistance under the ongoing schemes is in the form of outright grant, provided the equal matching share of the State

Government is made available. It does not incentivise the ULBs to undertake any reform in order to improve the working efficiency of the water utilities and to make them self-sustaining.

(d) Inability of State Governments / ULBs to raise their share of 50%,

In many small towns and cities, the State Governments and ULBs are not able to raise 50% of their share as required under the approved pattern. The financial condition of the small ULBs is also such that they are not able to access funds from the market. As a result, they are not able to participate in the Central sector schemes in a meaningful manner.

EVALUATION OF AUWSP

The Ministry of Urban Development has entrusted evaluation studies about performance of the ongoing AUWSP in the four regions of the country to various institutes like Anna University, Chennai, Indian Institute of Public Administration, New Delhi, National Institute of Urban Affairs, New Delhi and National Environmental Engineering Research Institute, Nagpur in 2003. Some major important findings and recommendations of these studies are as follows: -

(a) Although in most of the schemes funded under AUWSP, raw water source is surface water, in case of tube well water, however, it has been noticed that sustainability up to design period of the project is not possible due to recurring droughts.

(b) There have been delays in completion of the schemes due to –

- (i) Non-release of funds by the State Governments to the implementing agencies;
- (ii) Lack of coordination amongst various departments;
- (iii) Delay in getting electricity connections;
- (iv) Frequent transfer of officials involved in the implementation of the projects; and
- (v) Inadequacy of staff; etc.

(c) Most of the ULBs / water utilities are suffering from financial difficulties. Water tariffs, wherever levied, are too low to even meet the recurring operation and maintenance cost.

(d) Training of field engineers and staff should be an integral part of the water supply projects so that their skills are upgraded to efficiently manage, operate and maintain projects created under the schemes.

(e) There has been lack of community participation in the implementation of the schemes.

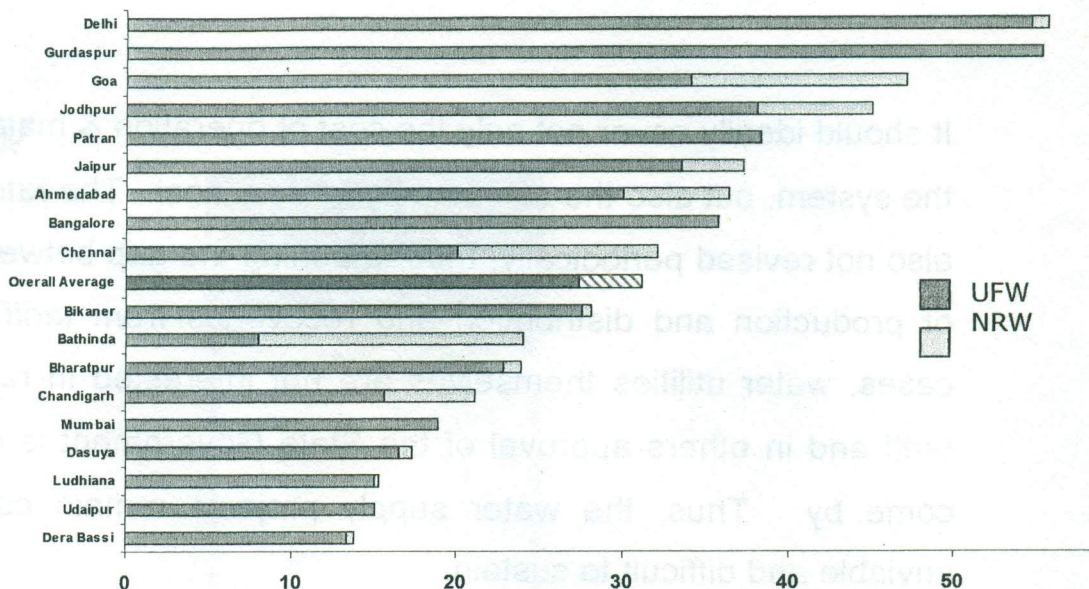
PROBLEMS IN URBAN WATER SUPPLY

(i) Operational Inefficiencies

Inadequate attention to critical aspects of Operation & Maintenance of water supply systems in several States often leads to deterioration in the useful life of the plants and systems by 55% to 60% necessitating pre-mature replacement of many components. As a result, even after creation of such assets by investing millions of rupees, these are not able to provide efficient and uninterrupted service to the installed capacity level.

Distribution networks, in many cities, are old and leaking and in most cities, household connections are unmetered and wherever these are, the meters are more often than not, faulty. As a result, urban water supply systems in the country waste large amount of water. In some cities, the unaccounted for water and non-revenue water could be as high as 50% of the total supply.

The situation of Unaccounted for Water and Non-Revenue water in selected cities in the country is depicted in Figure 8 below:



Source: MoUD/WSP benchmarking study. Figures verified by relevant utilities

Fig 8 - Percentage of Unaccounted for Water and Non-Revenue Water in selected urban areas

Key issues that contribute to poor Operation & Maintenance of the water supply plants and distribution networks have been identified as:-

- Lack of finances – even to take up metering of household connections
- Inappropriate system design
- Inadequate training of personnel
- Non-adoption of latest O&M technologies
- Overlapping responsibilities among various agencies

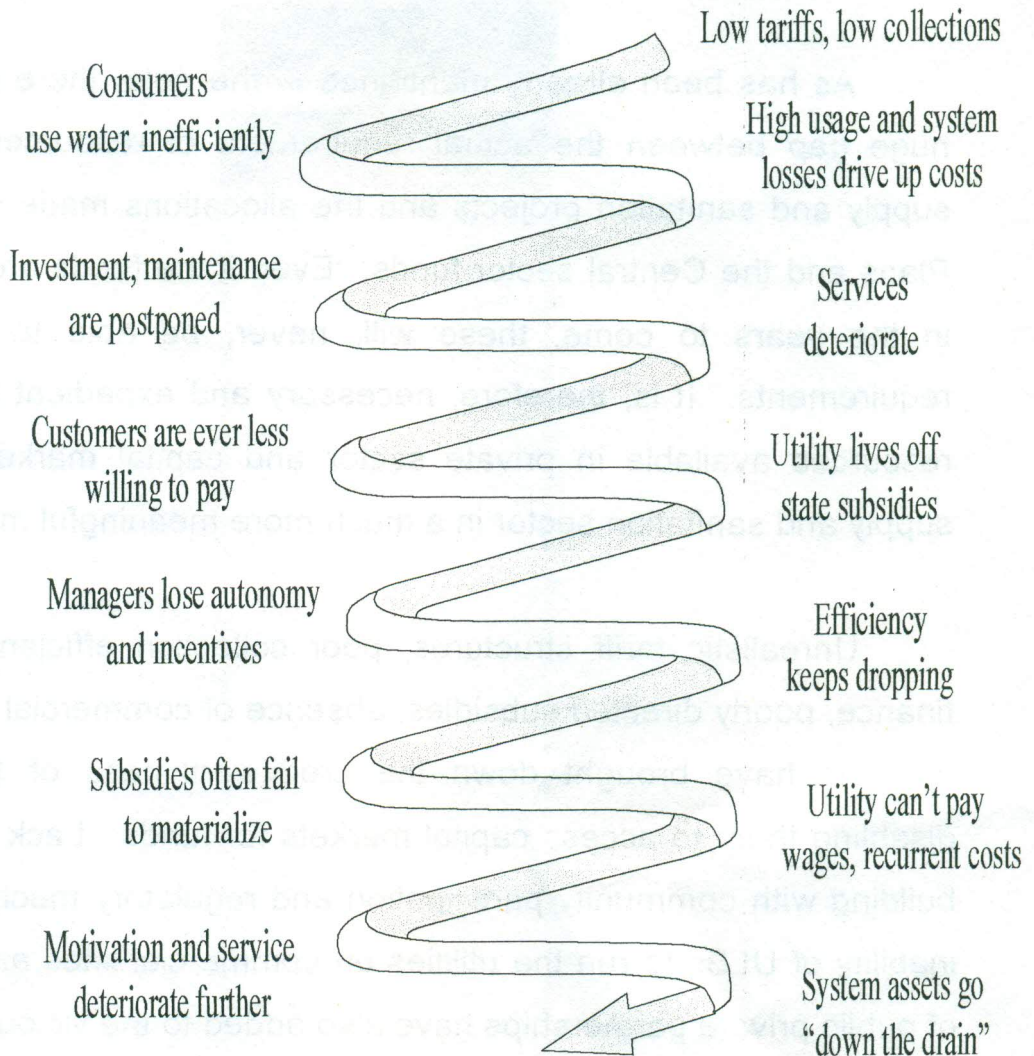
(ii) Uneconomic Tariff Structure

In most of the cities in India, water tariff is so low that it does not even cover the cost of operation & maintenance of the services.

It should ideally cover not only the cost of operation & maintenance of the system, but also the capital replacement cost. The rates fixed are also not revised periodically, thus, widening the gap between the cost of production and distribution and recoveries from tariff. In many cases, water utilities themselves are not interested in raising water tariff and in others approval of the State Government is not easy to come by. Thus, the water supply projects remain commercially unviable and difficult to sustain.

Low tariff and low collections lead to vicious cycle in which the consumers are tempted to use water inefficiently and higher usage and system losses drive up costs. Since all the utilities suffer from financial problems, they tend to postpone investments in maintenance, which lowers the quality of service. Consumer confidence and willingness to pay goes down with the deteriorating services, creating a vicious cycle in which the utilities look for government subsidies and grants.

Inefficiency leads to Vicious Cycle



Poor Services for All

In the circumstance, it would appear that fixation of reasonable tariff is a necessary pre-condition to improve the service quality; consumer satisfaction and financial viability of the service providers, which in most cases are the ULBs or para-statals.

(iii) Financial Problems

As has been already mentioned in the note, there has been a huge gap between the actual requirement of resources for water supply and sanitation projects and the allocations made in the State Plans and the Central sector funds. Even if the funds are enhanced in the years to come, these will, never, be able to match the requirements. It is, therefore, necessary and expedient to leverage resources available in private sector and capital market for water supply and sanitation sector in a much more meaningful manner.

Unrealistic tariff structures, poor collection efficiency, lack of finance, poorly directed subsidies, absence of commercial accounting systems have brought down the creditworthiness of the utilities disabling them to access capital markets for funds. Lack of capacity building with community participation and regulatory mechanism and inability of ULBs to run the utilities on commercial lines and absence of public private partnerships have also added to the vicious cycle.

THE WAY FORWARD

In order to ensure universal access to safe drinking water to all the citizens in urban areas, it is necessary to introduce operational, financial and institutional reforms, besides improved resource management, which would lead to water conservation and avoidance of wastage of water.

A. Reform linked Central Assistance

(i) *National Urban Renewal Mission (NURM)*

It has been the considered view of the Ministry of Urban Development that the problem facing the urban water supply sector is not just of inadequate resources, but more importantly that of better management of the assets created and efficient utilization of the water available in the systems.

In the reform strategy, which is now worked out, the Government of India proposes to use its resources in a focused manner to incentivise, leverage and support the reform efforts at the States and ULBs level. The intention is to work in partnership with States and ULBs to ensure universal access to services by providing incentives for improved utility efficiency and creating an enabling regulatory environment.

This is sought to be achieved through the proposed new scheme of "National Urban Renewal Mission (NURM)". The thrust of the scheme is to accelerate the process of development of infrastructure services in 60 select cities with effective linkages between asset creation and asset management, through reforms along with delivery of civic amenities and provision of utilities with emphasis on access to the urban poor. The projects to be taken up under NURM are Water Supply, Sewerage and Sanitation, Solid Waste Management, Road Network, Urban Transport, etc. In order to access funds under NURM, the States / ULBs are required to undertake the stipulated mandatory and optional reforms, details of which are given at Annexure V. A sum of Rs.2800 crore has been allocated in the current financial year for the Sub-Mission on Urban Infrastructure and Governance.

Operational efficiency of water utilities is sought to be achieved through some specific mandatory reforms to be undertaken by States/ULBs, which include levy of reasonable and adequate user charges so that operation & maintenance cost of the water utilities is fully recovered within a time frame of five years. Mechanisms to strengthen consumer voice have been envisaged through reforms which mandate Public Disclosure Law, Community Participation Law and association of ULBs in city planning function. This should not only increase consumer confidence in the water utilities, but also ensure better compliance in the payment of water tariff and surveillance over the distribution network to prevent any pilferage, theft or wastage. Setting up of regulatory mechanisms as envisaged

in the reforms should also help in more efficient delivery of services in the sector.

Adoption of modern accrual based double entry system of accounting should improve fiscal discipline and creditworthiness of the ULBs enabling them to access market capital.

Setting up of regulatory mechanism, improvement of credit worthiness of ULBs, public disclosure of their accounts, community participation and recovery of adequate water tariff should improve the confidence of the community in the water utilities leading to Public Private Partnership models in the sector.

Structural reforms and Administrative reforms provided in the basket of optional reforms are expected to result in the professional management of water utilities, their capacity building and autonomy in their functioning.

(ii) *Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT)*

As mentioned above, the mission area under NURM scheme consists of only 60 cities and towns. For the remaining about 5000 urban areas, an omnibus scheme known as the “Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT)” has been proposed with an annual outlay of Rs.700 crore in the current year’s budget. Under this scheme also, the cities and towns proposing to access funds for urban infrastructure improvements will have to undertake mandatory as well as optional reforms.

Under the scheme, the States are authorized to prioritise cities and projects to be provided assistance. The scheme will be implemented through a State level nodal agency.

(iii) *Viability Gap Funding*

In addition, an outlay of Rs.600 crore has been made in the current financial year for Viability Gap Funding to support Public Private Partnership (PPP) projects in the urban infrastructure sector. Water supply and sanitation projects with Private Sector participation can access funds under this scheme.

Guidelines for utilization of Viability Gap Fund are being finalized by the Ministry of Finance, which also has a provision of Rs.1500 crore in the current financial year for various infrastructure projects. These guidelines will also be made applicable to the Viability Gap Fund provided to the Ministry of Urban Development.

TOWARDS BETTER RESOURCE MANAGEMENT

Storage Capacity

As per information received from the Ministry of Water Resources, there are about 4050 completed large dams in the country and 475 are under various stages of construction. The live storage capacity of the existing projects is around 213 billion cubic meters (BCM), which is about 11.4% of the available water resources potential of the river basins of the country. Projects under construction are likely to add another 76 BCM, while 108 BCM will be contributed by the projects under contemplation, as per information furnished by the State Governments. Even with the completion of the contemplated projects, it would, thus, appear that the storage capacity achieved will still remain under 20% of the water resources potential of the country. In the absence of proper storage facilities, the water is being wasted. There is, therefore, an urgent need for creation of more storage capacity in the country.

Artificial Recharge of Ground Water

Annual replenishable ground water resources in the country are assessed to be of the order of 432 BCM. Of this, about 71 BCM is available for domestic, industrial and other uses and about 361 BCM for irrigation. As per estimates made by the Ministry of Water Resources, net draft per year out of the available ground water

resources is about 150 BCM or less than 42%. At the macro level, thus, the drawal of ground water resources is within the comfortable levels. There are, however, about 673 over-exploited and 425 critical blocks / taluks / water sheds, where ground water resources are extremely over-exploited.

Over-exploitation of ground water not only depletes the water table, but it also increases brackishness and addition of contaminants like Arsenic, Fluoride, Iron and Manganese, etc. which are extremely injurious to health.

In order to mitigate this situation, Central Ground Water Board of the Ministry of Water Resources is engaged in the promotion of artificial recharge of ground water by utilizing monsoon runoff on the basis of availability of surplus flows. This initiative needs to be pursued with the seriousness that it deserves, particularly, in the over-exploited and critical water sheds.

Rain Water Harvesting

The Central Ground Water Board under the Ministry of Water Resources has formulated guidelines for roof top rain water harvesting. These guidelines have been circulated to all the States and main construction agency of the Government of India, viz., the Central Public Works Department (CPWD) for adoption and promotion of rain water harvesting.

The Ministry of Urban Development has modified the Building Bye-laws in the National Capital Territory of Delhi vide notification issued in July 2001, making the provision of rain water harvesting mandatory in all the new buildings of plot size of 100 sq.m. and above. The Town and Country Planning Organisation (TCPO) of the Ministry of Urban Development has prepared Model Building Bye-laws, which have been circulated to Urban Local Bodies and Development Authorities for adoption. As per the said bye-laws, rain water harvesting for new buildings of plot size of 100 sq.m and above need to be made mandatory.

State Governments, Development Authorities and Urban Local Bodies need to be persuaded to promote and implement provisioning of rain water harvesting in new buildings, if necessary through suitable amendments in the Building Bye-laws.

Recycling of Waste Water

Increasing pressures on fresh water resources have prompted emergence of waste water reclamation, recycling and reuse of water as integral parts of water resources management strategy. A major catalyst to propagate waste water reclamation, recycling and reuse is the need to provide alternative water sources to satisfy water requirements for irrigation, industries and other non-potable applications.

Suitable financial incentives / disincentives will have to be designed by the Central and State Governments as well as Urban

Local Bodies and water utilities for the industries, commercial establishments and similar other agencies to adopt/practice waste water reclamation, recycling and reuse. In fact, it should be made mandatory, *albeit* in phases, that large industries and commercial establishments should meet atleast 50% of their known potable water requirements from reclaimed water. Similarly, for irrigating crops including horticulture, watering public lawns / gardens, flushing of sewers, fire fighting, etc., reclaimed water should be utilized. Simultaneously, an awareness campaign needs to be launched in the community, particularly amongst the school children to inculcate the habit of conserving water and prevent its wastage.

In conclusion, however, to ensure urban water security on a long term sustainability basis, it would appear that Government of India will have to put in place an effective framework for establishing permanent water entitlements based on understanding(s) among the concerned States and suitable mechanisms for the administration and fulfillment of rights and obligations arrived at. Without this, there will continue to be areas of surplus and scarcity and / or drawal of water by stakeholders in violation of the priorities laid down in the National Water Policy.