### **Research Paper**

#### Economics



## Urban Domestic Water Management: Sustainable Approaches

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#### ABSTRACT

Sustainable provision and availability of potable drinking water in India has remained a challenge and prominent issues. There have been several programmes and polices of the government exclusively dealing with providing safe drinking water to the people. Even if the State's allocation on water sector has increased extremely, but simultaneously it is found that a large segment of population in the country is deprived of their basic right to drinking water. In addition, concerted efforts have been taken by state and central government right from first year plan, but still nearly 10 percent of India's urban population is left with access of this safe water (NSSO 54th round). Freshwater is becoming a finite resource for many nations in the world. The United Nations expects that by the year 2025, 3 billion people in 52 countries will be affected by water scarcity and they will not have enough water to drink, for sanitation, or for household use. It is also projected that in 2025, the world's water sources will need to be enhanced and manipulated by 22 percent to meet the needs of society (UNDP 2004). The fact remains that the total water on the earth is not unlimited resource. Of the total water, 97 percent of water confined as marine water, 2 percent of water in the form of ice bar and the rest of the one percent as fresh water (Jyothi and Kirit parik, 1999). The continuous competition between the agriculture, industrial and domestic sectors on this one percent of fresh water has lead to reduction of qualitative and quantitative of water.

The NSSO 54th data were analysed to understand the sustainable domestic water supply. And whether the state provides potable water to the all section of urban people in an equitable, efficient and sustainable basis? What are the factors disturbing the sustainable water supply? This paper indented to address the issues like sustainability of drinking water supply, source of availability and distance moving to fetch the domestic water. In addition to take stock of both economic and environmental status since last one decade with respect to urban drinking water supply in India. The upshot is the need to take cognizance of economic and environmental considerations at all the three stages viz., planning, implementation and maintenance of the source to achieve sustainability.

It is concludes that most people access modern source than the traditional source. The distance move to fetch water has been mostly found to be within0.5 k.m. and above 30 percent of urban population is still accessing water resources with long distance and sole access had increased from 34.8 percent in 1988 to 41.3 percent in 1998.

### Keywords :

#### Introduction

Water is indispensable for endurance and needed for all aspects of life. The general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water related diseases. Innovative technologies, including improvement of indigenous technologies, and indigenous knowledge systems are needed to fully utilize limited water resources and to safeguard those resources against pollution.

Rapid urban population growth and industrialization are putting severe strains on the water resources and environmental protection capabilities of many cities. Special attention needs to be given to the growing effects of urbanization on water demands and usage and to the critical role played by local and municipal authorities in managing the supply, use and overall treatment of water, particularly in developing countries for which special support is needed. Scarcity of fresh water resources and the increasing costs of developing new resources have a considerable impact on national, industrial, agricultural and human settlement development and economic growth. Better management of urban water resources, including the elimination of unsustainable consumption patterns, can make a substantial contribution to the mitigation of poverty and improvement of the health and quality of life of the urban and rural poor. It is well known fact that a high proportion of large urban agglomerations are located around estuaries and in coastal zones. This leads to pollution from municipal and industrial discharges, combined with over exploitation of available water resources and threatens the marine environment and the supply of fresh water resources.

The extensive scarcity, gradual destruction and aggravated pollution of fresh water resources in many world regions, along with the progressive encroachment of incompatible activities, demand sustainable water resource planning and management. Such integration must cover all types of interrelated freshwater bodies, including both surface water and ground water, and duly consider water quantity and quality aspects. The multi - sectoral nature of water resource development in the context of socio economic development must be recognized, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydro-power generation, inland fisheries, transportation, recreation, low and flat lands management and other activities. Rational utilization schemes for the development of surface and under ground water supply sources and other potential sources have to be supported by concurrent water conservation and water waste minimization measures. However, priority must be accorded to flood prevention and control measures, as well as sedimentation control, where it's required. For sustainable source, pricing will better choice of urban water supply. In the case of urban areas, pricing will be possible only for house connection. An intricate problem which poses challenge is the mindset of the urban users with respect to water rates/charges since the general pattern through out history has always been to treat water as free good. The provision of this public utility of water on sustainable basis for domestic consumption is crucial one. Despite, the continuous efforts had taken by both state and central right from the first five plan, more than 10 percent of urban population still remain with no access to protected and adequate drinking water supply with reasonable distance (NSSO 54th round, 1988)

This paper indented to address the issues like sustainability of drinking water supply, source of availability and distance moving to fetch the domestic water. And why does India still not reached supply of necessary quantity and quality of water on sustainable basis? Further, this paper has also focused the status of water and water quality management strategies in India.

Essentially the exercise attempted here is to seek answers for a hypothetical question viz. why is that India still not having achieved total provision of potable water supply on a sustainable basis. Whether a solution lies in a holistic approach by means of identifying the socio-economic and environmental problems with respect to urban domestic water supply? Authentic secondary information from the National Sample Survey Organization is used besides the research studies made by social scientists in India have been utilized towards answering the question posed.

#### Sustainability of Urban Water Supply

Sustainability is an often-quoted example in environmental economics. In the absence of alternate for dinking water the question of sustainability becomes ever more significant one. There are two basic opinions that have come forth in this circumstance. Provision of water by means of creation of source through scientific identification, installation of hand pump/stand post and operating and maintaining the system continuously is one way of looking at the sustainability aspect. Lack of finance makes the system unsustainable. Therefore to achieve sustainability rationalize water tariffs to improve revenue position thereby meet the operation and maintenance costs. The other argument emphasizes the traditional water supply systems. Rain water harvesting, watershed management and check dams are means of traditional methods of achieving sustainability. The issue is modern (mission) approach versus traditional method or the blend of both. remains the issue to resolve to understand the complex question of sustainability.

The prior argument brings forth certain questions for further arguments. What are the relative merits of modern (mission) over the traditional drinking water sources? Is it possible for the State (through mission approach) to achieve the set target of providing a source of drinking water across all habitations in the country? Is there a need to combine both traditional and modern methods towards the ultimate goal of provision of drinking water? Mission approach keeps the ground water source as its base, while the traditional systems are more flexible depending upon the prevailing local hydrological conditions. State considers that water provided through hand pump, stand posts, and house service connection taps are water in lake, tanks and ponds are not protected and unsafe. The fact remains that 50 per cent of water supplied in urban India depend largely on groundwater source (Ankit Patel and Sunderrajan Krishnan-www.nrlp.iwmi.org)

#### Material and methods

The National Sample Survey Organisation (NSSO) has had conducted several rounds of survey from time to time, the 44th, 49th and 54th rounds are noteworthy from the point of view of drinking water and sanitation. Of which, 54th round conducted during 1998 focused exclusively on these aspects. This paper is mainly based on secondary data were used for this purpose.

#### Analysis and Discussion

The analysis of NSSO 54th round data yield some intrusting information such as access, distance to move, usage pattern, insufficiency, quality of principle and supplementary source across modern and traditional source of water. These rounds notably details pertaining to drinking water and sanitation in this country.

Table 1: Percentage distribution of household availing
modern and traditional source, with reasonable distance
and sole access in different rounds (Urban)

Rounds	Sourc	е	Distance		Sole access		
	Modern	Traditional	Within premises	<0.5 km	0.5 km<	Urban	% changes
44 <sup>th</sup> (1988)	89.3	10	58.3	40.1	1.5	34.8	-
49 <sup>th</sup> (1993)	88.9	9.6	66.2	35.9	0.9	40.2	5.4
54 <sup>th</sup> (1998)	91.4	7.3	65.7	33.2	1.1	41.3	1.1

Source: Data computed from table 2, 4 and 5, NSSO 54th round.

Table 1 shows that the percentage distribution of household availing modern and traditional source, with reasonable distance and sole access in different rounds. There is ample evidence to explain that the access to modern source had increased to 91.4 percent in 1998 from 89.3 percent in 1998. Over the last one decade, it is understood that dependence on modern source by households has been on the increasing trend at the diminishing rate, while the access to traditional source as principle recorded fall during the some period. This is due to introduction of modern or mission source. In addition, to know that the dependence on traditional source as a principle source for drinking has been declined as a result that the traditional sources neglected by the state and stakeholders. Thanks to mission approach replacing traditional source, but the traditional water source is the main water resource for recharging of ground water while modern source are depends.

Another important policy variable such as distance and sole access are presented in the table. It is evident that the accessibility of public sources had increased to 65.7 percent in 1998 from 58.3 percent in 1988. It is implies that after introduction of modern source has lead to reduce distance moving to fetch the domestic water. Despite the concerted efforts of the central and state programmes, above 30 percent of urban population is still accessing water resources with long distance. Another interesting results that availing the sole access (own source) had increased to 41.3 percent in 1998 from 34.8 percent in 1988 at diminishing rate. But the urban population has been increased over a period. As results, the water crisis will emerged in urban.

#### Table 2: Distribution of household reporting insufficiency of drinking water supply (Percentage)

Zone	Percentage of households reporting insufficiency DW for some part of the year	No measures taken	Water supplied by local authority by vehicles and supplied charitable bodies	Water obtained from neighbours	Water purchase
South	18.98	17.53	11.65	31.7	5.5
North	15	10.87	4.57	43.77	8.47
Central	7.7	8.05	3.35	19.9	0.2
West	15.7	10.45	8.4	26.1	6.1
East	10.73	27.17	5.83	24.77	8.17

Source: Data computed from table 9, NSSO 54th round

Table 2 shows that distribution of household reporting insufficiency of drinking water supply. It is not unusual to find households facing problem of insufficiency of water during summer months i.e. from April to June. The NSSO 54th round brought out certain interesting facts of scarcity of potable water. The problem of insufficiency was evident in all the zones range from 15.7 to 18.98 percent, while compared to other zones in the country, the south and west zones started to face the insufficiency of water from January onwards.

# Table 3: Distribution of households reporting in relation to measures taken when water was insufficient period

SI.No.	Measures	Urban
1	No Measures taken	17.2
2	Water supplied by local authority by vehicle	7.5
3	Water supplied by charitable bodies	0.7
4	Water obtained from neighours	23.8
5	Water purchase	5.8
6	Others measures	45.1

Source: Data computed from table 8, NSSO 54th round.

Table 3 reveals that distribution of households reporting in relation to measures taken when water was insufficient period. Information is available on the measures taken towards solving scarcity by the local body. Only 17 percent of the total respondents expressed that there were no measures taken in this context. About 7.5 percent expressed the measures taken by the local bodies. Just 5.8 percent of the respondents purchased water at the all India level, water purchased is the highest in the state of Rajasthan where the water scarcity so high. It is implies that scarcity create the new market for natural resource. And about 23.8 percent obtained water from the neighbouring households. Less than one percent agreed the role played by the voluntary organisation.

# Table 4: Perception's of sample respondent about the quality of principal source of drinking water (Percentage)

Porception's about quality	Urban		
Ferception's about quality	Modern	Traditional	
Known to be polluted	1.03	7	
Having bad taste due to unknown causes	1.6	7.06	
Cloudy due to unknown causes	1.17	11.7	
Clean but contain excess of iron or other material	4	0.56	
Having other defects	2.43	2.22	
Of satisfactory level	89.5	76.24	

Source: Data computed from table 12, NSSO 54th round.

Table 4 shows that Perception's of sample respondent about the quality of principal source of drinking water. It could be observed that more than 10 percent of sample households reporting poor quality of water, which is supplied by the state. Contrary to the claims made by the state agencies that modern schemes are safe and provide potable water with adequate treatment of water to large section of population, the reality is different. It is evident from the NSSO data that the respondents complained about the quality problems even from the modern schemes such as hand pumps and stand posts.

#### Conclusion

Water is still treated as a free good, to be used liberally and to be despoiled with impunity. Pricing water to reflect its scarcity value can encourage users to be more prudent in its use. The price of water should also include opportunity costs and environmental impacts of its use. Such kind of price reforms will encourage resource conservation on the one hand and provide additional support for the fund starved municipal service providers or the other. Better pipeline management can curtail water losses. Domestic wastewater can be reused and recycled for agricultural and industrial purposes. Subsidies on rune electricity and agricultural water supply that encourage wasteful use of water must be reassessed. The NSSO 54th round data has been observed that most people access modern source than the traditional source. The distance to move to fetch water has been mostly found to be within 0.5 km. Another interesting result, that availing the sole access has increased but at a diminishing rate. It has been observed that percentage of households reporting insufficiency has been highest in the south zone. To compensate for water insufficiency, a major measure was to obtain water from the neighbors.

#### REFERENCES

GOVERNMENT OF INDIA: National Human Development Report 2001 (Planning Commission, New Delhi, March 2002). J Jyoti, P. and P. Kirit (1999): "Clean water Environmental Governance-I", Indira Gandhi Institute of Development Research, Mumbai. J Ramasamy R., Iyer (2003): Water – Perspectives, Issues, Concerns", Sage Publications, New Delhi J Ravichandran M and S. Boopathi (2007): "Environmental Management: Issues in potable water in rural Tamilnadu", Concept Publiching Company, New Delhi, pp 62, 73. J UNITED NATIONS DEVELOPMENT PROGRAMME: "Clean Water-An Agent of change" Choices Vol.12, NO.1, March 2003.