

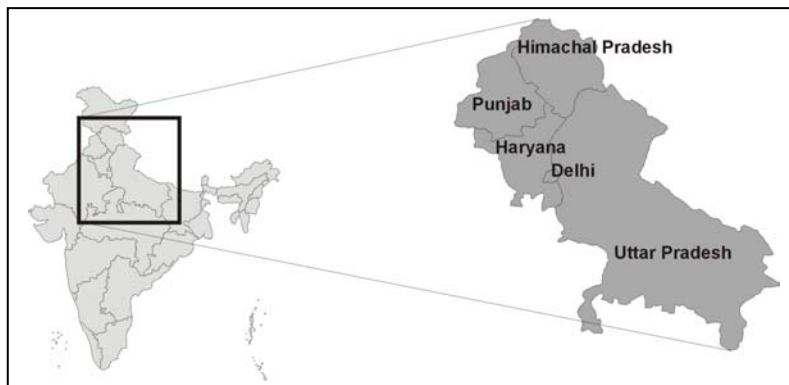
The cost of water, pricing and its impact on the consumers in Delhi

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Introduction

The period from 1900 to 1995 saw a six-fold increase in the consumption of freshwater, and according to some estimates about a third of the world's population lives in areas with moderate to high water stress. According to the GEO 2000 report India falls under the category of high water stress with 40% of the total freshwater of the country being utilised (UNEP, 1999). However, in the case of Delhi opinions are divided upon the availability of water for the city. While some people argue that Delhi has water in excess to its requirements and wastes the precious resource others feel that there is a shortage of water in the city and that new sources need to be explored. However most people agree that the quality leaves a lot to be desired. Further the price charged by city's water board for its services does not cover the actual price of the water being supplied. This paper will examine the overall water situation in Delhi and the effect of the tariff structure on the consumer and also the impact on conservation of water.

Sources of Water in Delhi

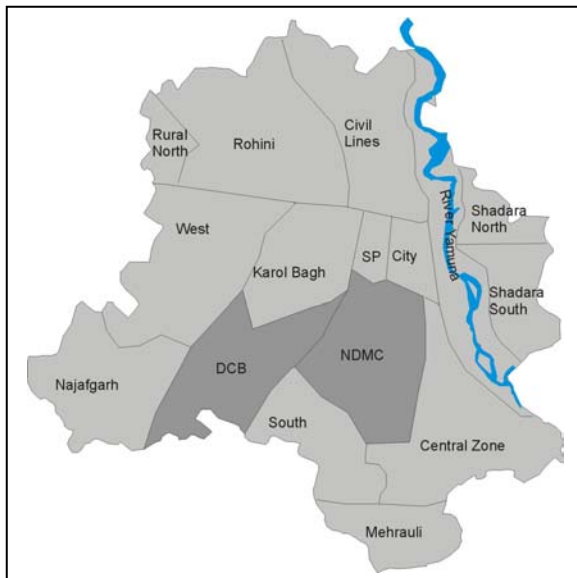


Delhi receives drinking water from four main sources River Yamuna, the Bhakra Nangal Dam (which in turn gets its waters from the rivers Sutlej, Beas and Ravi), Upper Ganga Canal and from the groundwater

aquifers of Delhi (DJB, 1999; Agarwal and Narain 1997). The total installed capacity of these sources together is 2637million gallons per day (MLD), a shortfall of about 682 MLD (DJB 1998). In order to bridge this gap and to fulfil future needs for water the government of Delhi has also been negotiated with the neighbouring states of Haryana, Himachal Pradesh (HP) and Uttar Pradesh (UP) to supply the city with more water. The sources expected to supply water to Delhi are the Renuka Dam - HP, the Tehri Dam, the Lakhwar Vyasi Dam and the Keshau Dam in UP (HUDMA, 1993; DJB internal circular). Of all these possible future

sources only the Tehri Dam has been built so far and therefore it may be a while before there is water available from the other sources (HUDMA, 1993). Apart from this the Government of Delhi also plans to line the Western Yamuna Canal where the losses through conveyance are estimated at 30 % of the total water carried (DJB internal circular). The Delhi Jal Board (DJB), the organisation in-charge for the treatment and distribution of water in the city, has also planned to sink more ranny wells in the bed of River Yamuna to supply the city water. Further, the DJB also has been trying to increase the awareness on water conservation, and banning the use of potable water for non-potable purposes. Apart from this, the DJB and some non-governmental organisations in the city are also encouraging water harvesting.

The Quality of Water



However, quantity is not the only issue when it comes to Delhi water. There are a number of issues that can be brought up with reference to the quality also. River Yamuna flows through the neighbouring state of Haryana before entering Delhi. On its way it passes both industrial and agricultural areas, picking up both pesticides and other pollutants as it flows (Agarwal, 1997). As has been mentioned earlier River Yamuna is a major source of drinking water for the city. However it is not

only the water from this river that is considered poor in quality. The groundwater also leaves a lot to be desired. According the Central Pollution Control Board (CPCB, 1995) traces of pesticides can also be found in the groundwater of Delhi, another source of drinking water for the city. Further, in parts of the city the groundwater also has a high fluoride and nitrate content. Except for a few aquifers the water in most parts of Delhi is saline and therefore not very palatable (CGWB, 1996). Apart from the chemicals in the water due to lack of proper sewage treatment facilities in the city's sewage finds its way in the river from where it infiltrates into the aquifers (Ahmed, 1998). However the chemical content of the water is not the only problem with the water of the city. The water in the city is also contaminated with a

variety of bacterial and viral strains that give rise to a number of gastro- intestinal problems to those who consume the water (Ahmed, 1998).

The Pricing of Water

Most of the residents in Delhi pay for their water either through the flat rate system or the increasing block tariff. Of the total only about 30% of the consumers are charged according to actual meter readings (DJB databases). In the case of the flat rate system charges are based on the assumed consumption according to the dwelling type. In the case of the increasing block tariff the charges are according to meter readings. However, the charge even at the highest block does not equal the cost of supplying water to the customers. The price being charged for consumption of this level is Rs. 4.50/Kl (kilolitre)(table 1) while the cost of water is about Rs. 4.65/KL. Further, this estimated cost of water does not include the depreciation costs. Therefore the DJB may need to increase the cost of water beyond this level to even recover the full supply cost of water. Further about 60 % of all consumers consume less than 30KL a month. Therefore in order to recover the cost of water there would be a need to charge the correct price for water at earlier consumption blocks.

Table no.1: Water Tariffs According to the Block Tariff System.

Amount of Water (KL/month)	Charges (per KL)
0 – 10	0.35 paisa + 50%
11 – 20	Rs. 1.00 + 50%
21 – 30	Rs. 1.50 + 50%
above 30	Rs 3.00 + 50 %

Source: Schedule of Rates, 1998 - 99, DJB

On the positive side that the block tariff system in Delhi does not have much of a negative impact on bulk connections. It has been often been stated that in areas where a single meter serves a number of houses, and the charges are based on the block tariff system there is no link made to number of consumers on a single meter. This results in a disadvantage to consumers in these areas. However in the case of Delhi, for those consumers where a single meter serves a number of households this problem may not be an issue. This is because the charge levied on the bulk meter is calculated by the total number of occupied dwellings

connected to the meter. Therefore, assuming all dwelling units connected to a single meter have a similar consumption pattern, the charges are the same as those connected to the individual meters.

Actual Water Supply in Delhi

The opinions on the availability of water in Delhi are divided, while according to some there is enough water to fulfil the needs of the people of the city others believe that there is not enough water in the system and that Delhi needs more water. As far as the customers of the water are concerned their main worry is of enough water reaching their houses to satisfy their daily needs. However, what is interesting is the fact that the supply of water does not just depend on water available in the pipes itself, which may be low, but on the pressure it is available at, the area in the city the dwelling is situated, the electricity available to pump the water, and the number of illegal connections on the main pipe. The result is often that the amount of water available to those connected to the system is low. This results in a very low consumption of water from the piped water system, and finding alternate sources of water. In such a case those with a metered connections actually stand to gain in comparison to those paying on the flat rate system. This may become even more pertinent when the charges of water are raised to cover full costs. This question may become even more important as there are a greater percentage of the people being charged on the flat rate system in the lower income groups, unless this group is charged the minimum rate.

Water Conservation in the City

According to the DJB the water supply is short by about 682 MLD and with the population of the city growing there will be a need to transport more and more water from the neighbouring states to meet the growing demands. Apart from importing water another possibility is to try and conserve the water that already exists in the system. However, the present cost of water is too low to encourage conservation. The price, in the case of Delhi, may be only one factor; there is also little awareness on conservation devices and methods to conserve the water. This problem has often been voiced by the officials often Delhi Jal board, who while agreeing that an increase in the price of water is needed to cover costs, felt that education towards the

conservation of water is equally important as this would be needed to reduce the wasteful use of water by the residents of the city. While a few efforts are visible in the form of advertisements, as yet they have had little effect on the consumers. This is especially important as a number of households depend on alternate sources of water, especially the depleting groundwater table to supplement their water needs. Another problem that seemed to come out while talking to the people customers was the poor understanding of the billing system for water. There is therefore also a need to educate the customer on the billing system.

Conclusions

There seems to be little water available in the system and the cost of supplying water from the various sources shall keep increasing with the distance from Delhi and the extraction price. Therefore there may be a need to look at ways to conserve water. Further as leakage accounts for 30% of the total water supplied in the system there is a need to reduce leakages in the future. At present the use of pricing, as a tool (as has been acknowledged by the officials of the DJB) will not be relevant. This is largely as the price of water is rather low, as well as people seem to have little awareness of how they are being charged, therefore it may be important to increase the awareness of the consumers on the issue. Attached to this issue is the need to encourage metering, as it can be seen that while a large number of households do have meters attached the percentage of working meters is rather negligible, with the people actually being charged by the meter in the surveyed areas being less than 10% of the total connections. Customers need to be made aware of ways to conserve water, and there can be incentives given to encourage conservation of water. Finally it must be said, in the case of Delhi the increasing block tariff system does not have an adverse effect on those who are connected to the bulk meter. According to information received from the DJB the amount of water available is so low at most times of the year that by paying the flat rate system consumers are often paying for water, which they may never be consuming.

Abbreviations

MLD	Million Liters per Day
HP	Himachal Pradesh
UP	Uttar Pradesh
DJB	Delhi Jal Board
KL	Kilo Liter

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