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REACHING THE UNREACHED: CHALLENGES FOR THE 21ST CENTURY

Pricing of water — mechanisms and policy

Rakesh Mehrotral and Naresh Kumar, India

WATER IS THE basic need of mankind. No life can survive without potable water. Fresh water available from rivers, lakes and subsurface is only 0.02 per cent of the total. The sources of water are getting depleted and there is further strain due to discharge of untreated or inadequately treated waste waters. Hence the cost of providing wholesome water escalates day by day.

Water is scarce in quantity and quality. However, there is utter lack of appreciation on the part of the public about the tremendous costs and efforts required in making drinking water available to them.

In India, execution of new water supply schemes and augmentation are the responsibility of state level water supply and sewerage boards / local self government departments. Such schemes require large financial outlays. Judicious use of financial resources and measures to recover the costs are a must to make the system sustainable.

The water supply sector in India has not been performing very well, perhaps due to the following reasons:

- Pricing mechanism is poorly organized — tariff rates not reflecting the true market situation.
- High maintenance bills (including wages / salaries and also power charges), resulting in high unit costs.
- Poor revenue realisation performance compared to the demand for tax / user charges.
- Heavy losses due to old system of infrastructure (e.g., corroded pipe lines and leaking joints), pilferage and theft.
- Large component of the slum / poor population necessitating increase in provision of the services without adequate financial return.

Water supply utilities are facing crisis due to the impact of high costs and low returns on one hand, and resource constraints of State governments on the other hand. A large flow of investments into the sector and stringent conditions imposed by lending financial institutions have provided a compulsive element in initiating fiscal reforms.

Efficient and effective management of water supply and sewerage undertakings is most essential for satisfactory functioning and financial viability of the organization. These utilities should be treated like business enterprises involving managerial skills and engineering knowledge to make it successful in service, safety and financial consideration.

Timely and adequate generation of revenue is a must for meeting annual recurring operation and maintenance costs as well as debt servicing expenses. Very often Indian municipalities are unable to pay the loans because the expenditure exceeds water charges. For a certain Maharashtra town, the revenue per connection is Rs120 a year, as against expenditure of Rs 1300 a year for each connection (Patwardhan, 1993).

Theory of cost

The costs involved in operating a water supply system can be classified into two heads, namely:

Fixed cost

Fixed cost is mainly concerned with borrowed money fro the financial institutions for implementation of the project. The mode of debt servicing or repayment depends on the financing pattern of financial institutions. The fixed cost contains mainly:

- The repayment of principal amount borrowed.
- The repayment of interest on borrowed capital.

Variable cost

Variable cost deals mainly with operation and maintenance cost of the system and also sinking fund for the future replacement of the system. This cost mainly includes:

- Administrative expenses like salaries and wages.
- Repair and maintenance charges.
- Chemicals and consumables.
- Electricity charges.
- Depreciation charges.

Different mechanisms available for cost recovery

The different possible tools available for cost recovery are:

- Water tariff.
- Advance registration / connection charges.
- Water benefit tax.
- Water tax as a percentage of rateable value where the properties do not have a metered water supply or water tax on the basis of floor area.
- Water kiosks system for revenue generation through stand posts.
- By internal cross subsidization by diverting other sources of funds like octroe for water supply purpose.

- One time development charges / water utility service charges collected through Land Development Authority.

Variable tariff design criteria

The main objectives of tariff setting are:

- To recover the cost of supplying water to make the water supplying entity financially viable.
- To ensure efficient use of water by the consumers to conserve precious and valuable water resources.
- To ensure access of all groups to basic minimum need.

The following are the important aspects to be considered while deciding the appropriate tariff structure:

Table 1. Calculated water tariff based on different alternatives for a town in Punjab (1995-6)

- Level of cost recovery planned to be achieved in tune with prevailing policy of the State Government.
- Extent of recoveries targeted from various income groups and cross subsidies, etc.
- Quantum of loans, rate of interest, mode of repayment, whether it is based on equated instalment method or equal principal repayment method, etc, the component of grant-in-aid by Government in States such as Maharashtra for towns with population 15000—30000, is 50 per cent of project cost (Patwardhan, 1993), whereas in Punjab it is 30 per cent. The rest is financed through loans from LIC, HUDCO and market borrowing.
- The quantity of water produced yearwise, expected O&M costs, design period of the project.
- Frequency of revision of rates to take care of inflation rates, fluctuation of production of water and the expected political scenario.
- Basic minimum need criteria, social angle and affordability, willingness to pay for water services.

Model for water tariff

An iterative model for pricing of water tariff as a function of the capital cost and variable cost for a town in Punjab (population 20058 in 1995-96), taking into consideration the following factors is given in Table 1.

- Water production cost has been considered as a function of capital cost and operation and maintenance cost.
- Different scenario have been worked out based on water production cost, transmission cost, interest component, annual cost versus annual tariff realisation and a simple linear relationship has been worked out.
- The water tariff rate and its sensitivity has been worked out in relation to the various components of capital cost and variable cost.

Discussion

The price of water or water tariff is the rate levied for the water supplied to the consumers in order to develop sufficient revenues to provide for operation and maintenance and also for debt servicing.

Water has traditionally been perceived as a public good which should be supplied free or at a nominal price. In India water is becoming more and more a scarce commodity since the price has been kept at minimum level being the most essential commodity of mankind. But now the time has come to commercialise urban water supply schemes without unduly burdening vulnerable sections. In this concept the entire cost is required to be recovered by adopting appropriate pricing structure, i.e., the pricing structure adopted must attempt to distribute the cost of supply of water equitably to all consumers in relation with the benefit they derive or the expenses incurred to the system. While deciding the pricing structure the following points are to be taken into account:

- For any water supply scheme, the pricing structure should be such that the 100 per cent recovery should be ensured with a minimum financial burden on the poorest.
- Factors such as "capacity to pay", "benefits derived" and "proportionate cost of service" have to be considered.
- The rate must be high enough to fetch the necessary revenue and at the same time not excessive as to discourage consumers from making use of water or opt for alternative sources, which ultimately affect the pricing.
- Pricing systems should be quite attractive, otherwise beneficiaries will explore the possibilities of their own alternative arrangements of water supply.
- The poorest of the society will be provided with basic minimum requirement of water at the minimum price, say up to 10 kl per month for a 5 member family at a subsidized rate; consumption above 10 kl will be charged at a higher rate and the tariff slab above 20 kl will be still higher.
- The disparity in the income level and potentiality for payment, of various groups in the society being very wide, there is enough scope for charging on a differential basis, i.e., by sliding telescopic tariff based on actual consumption;
- Non-domestic users such a industries and institutions could be utilized for the purpose of cross subsidizing the weaker sections.
- While fixing the pricing structure, yearwise fixed and variable cost should be taken into account and also the government subsidies, if any.
- Water tariff should be designed after taking into account all the policy scenarios, whether only O&M costs are to be recovered or debt and interest are also to be realized. For three Punjab towns with population 10000 - 20000 the tariff rates have been calculated to be in the range Rs 1.39 per kl to Rs 5.38 per kl for different recovery scenarios ranging from recovery of O&M to recovery of all capital with interest (Naresh Kumar, 1996). One simple illustration is given in Table 1.

Public subsidy and cross subsidization

It is not a correct notion that the public does not have the capacity to pay. To augment supply a large number of households invest in booster pumps, borewells and other sources. For Baroda it was found that Rs 3 per kl is being spent on non-municipal sources.

For new colonies the capital cost of water supply projects could be recovered by adding development charges to the cost of land / building.

Effective financial management will be possible, if we define the quantum and type of financial support available from the Government. It is better to have a higher component of grant-in-aid for water supply projects of small towns but leaving the Municipality to realize all the O&M expenses from the users.

For new colonies the capital cost of water supply projects could be recovered by adding development charges to the cost of land / building.

If supply is to be augmented, the consumers will pay higher tariff due to consumption going up in to higher slabs beyond 10 kl. This will improve realization per kl consumption without resorting to any extra levies on existing connections.

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