22nd WEDC Conference: *Discussion paper* New Delhi, India, 1996

REACHING THE UNREACHED: CHALLENGES FOR THE 21ST CENTURY

Equitable user rates for sustainability

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FINANCIAL RESOURCES NEEDED for sustainable development of the rural water supply in India are estimated from expenditure data. The estimates show that the system is sustainable only if user financing is introduced. Since the rate affects the poorer and weaker sections adversely, Faulhaberian cross-subsidy is suggested and estimated from users above poverty line for all the states in India.

Several other reasons are suggested in justifying such a policy change. The most important amongst them are: (a) efficiency; (b) equity; and (c) sustainability. The increase in efficiency, it is argued, comes from both sides of supply and demand.

The equity argument is centered around the increased availability of services with better quality at a subsidised rate for users belonging to the group exempted from cost recovery. Sustainability is attributed to the better maintenance of the system and timely replacement of old systems using the resource generated from user charges.

International evidence on the validity of these hypotheses is very weak at least for health, education, water supply and sanitation. The case of rural water supply is even weaker mainly due to the dearth of research effort, theoretical as well as empirical, on these aspects. This paper looks at sustainable development and the relevance of user financing, a relatively unexplored area of research, in rural water supply and sanitation in India.

Methodology

An examination of the main sources of rural water supply shows that they are either from handpumps or piped water or a combination of both. However, comparable expenditure data for the states are available only for the combined system and that too from 1977 onwards.

In principle the capital expenditure on piped water supply can be obtained as a residual from the aggregate if the investments in handpumps are known. Unfortunately, this information is available only for selected years. As a result, only aggregate capital stock could be estimated and is shown below.

Replacement, operation, maintenance cost

The capital stock remains constant only if it is replaced by new ones when its life expires. In order to finance this, a certain amount of the capital cost should be collected periodically, say, annually. For calculation of this replacement cost, the capital invested in the sector and the average life of the system are needed.

But the Rajiv Gandhi National Drinking Water Mission (a Government of India agency responsible for the provision of public drinking water in rural areas) provides annual expenditure on two different accounts 1977 - 1978 onwards: (i) Accelerated Rural Water Supply Programme (ARWSP); and (ii) Minimum Needs Programme (MNP). From this expenditure, only a portion is spent on reproducible capital. According to the Mission, about 90 per cent of ARWSP and 60 per cent of the MNP expenditures contribute to the capital formation in the sector.

Using these proportions, the total capital cost is estimated for each year. Since the life of the system is assumed to be 15 years, we need only consider the capital expenditure starting from 1980/81. Capital cost thus obtained in a year is then distributed uniformly over the next 15 years, the average life of the system.

The sum of such distributed costs is taken as the replacement cost in constant prices. The costs in current prices are then arrived at by deflating with the appropriate price indices. (A table showing State-wise results is available with the authors.)

The second component of sustainability is the amount required for operation and maintenance (O&M) of the existing stock of capital. Since this is also not available on a comparable basis, it is taken as 6 per cent of the cumulated capital expenditure as suggested by the Mission.

The financial resources needed for keeping the total capital stock constant in India were about Rs. 1019 crores in 1994/95, which is about 64 per cent of the total expenditure (Rs. 1597 crores) on ARWSP and MNP for the year. Similarly, the O&M works out to be 34 per cent of the total money spent in the sector. If the priority is sustainability of the system, then the expenditure for the year 1994/95 is only enough to meet this purpose leaving very little for additional coverage and/or quality improvement.

But the actual allocation of expenditure of the states reveals that it goes mainly to additional coverage, very little for maintenance and hardly any for replacement. The poor maintenance of the system would result in cost escalation and shorten the life of the system causing very high failure rates. There exists some evidence to support this hypothesis. For example, all India data collected by the Mission during the period 1993-95 shows that only 90 per cent of handpumps are in working condition with a variation of 63 to 100 per cent among the States.

Similar estimates for piped water supply are not available for India but exist for the State of Kerala. A recent study by Price Waterhouse indicates that the failure rate

(''Unsatisfactory Schemes") in Kerala is about 25 per cent for schemes commissioned after the formation of Kerala Water Authority in 1984. In the case of older schemes commissioned before 1984 the rate is as high as 30 to 60 per cent.

This brings one to the conclusion that rural water supply is not sustainable even after using a very restricted definition. Hence sustainability of the system with increase in the coverage and quality services becomes extremely difficult unless additional resources are generated either from within the sector or from the budgetary transfers of the government.

Rate of recovery with cross-subsidy

No evidence exists in India on the impact of user financing on rural water supply, although there are a few studies on the willingness to pay. These studies are only reflections of the effective demand for this basic good but do not reveal the ability to pay for the services.

However, cross-country evidence of user fees in the provision of health services indicates that it reduces the rate of utilisation among poorer and weaker sections. Since the extent of its effect is unknown, introduction of any user rates in rural areas must exclude the poorer households, at least in the beginning, on welfare as well as on equity grounds.

This essentially involves a subsidy to the poorer users either from a general taxation or a cross-subsidy from the users or a combination of both. Interestingly enough the example used by Faulhaber for defining cross-subsidy is also from drinking water, a simplified version of which is presented below for our purpose.

Suppose there are 'n' groups of consumers to be served in a rural location, say, a village. They can be served from a single system, or from 'n' separate systems or 'm' sub-systems. Since the sub-system serves more than one group of consumers,'m' should be less than 'n'. If 'm' is equal to 'n' every group is served by a separate system.

Let C(Q) be the cost of provision of single system which provides water supply for all the groups; $C(q_i)$ be the cost of 'i' th system where each group is supplied by a separate system; and $C(q_j)$ is the cost of providing of 'j' th sub-group. The stability of joint and separate supply depends on the following condition:

$$c(Q) \leq \Sigma\, C^{n}_{i=1}\ (q_i)$$

$$\leq \Sigma^{m}_{j=1} C\ (q_j)\ ,\ m < n$$

In other words the single system of provision is stable only if the joint cost is less than the stand-alone cost. This condition clearly indicates that cross- subsidy for the poor cannot exceed the stand-alone cost. If it exceeds the stand-alone cost then the groups will defect and the cross-subsidy would be ineffective.

In order to compute the cross-subsidy, users have to be divided into two groups, one belonging to above poverty line and the other below poverty line. State-wise rural poverty estimates have been used for the grouping of users. This information is not available for 1994/95, the year for which the cross-subsidy is to be designed. To overcome this problem, the poverty indicators based on 'Headcount Ratios' were projected for the year 1994/95 from the estimates of 1977/78 and 1987/88.

These ratios were applied for the exclusion of the users below the poverty line. (A table showing the rates of recovery, with and without cross-subsidy, for replacement and O&M costs is available with the authors.)

At the all India level, the annual per capita rate of replacement cost with cross-subsidy comes to about Rs.36 and for operation and maintenance Rs.19. This would mean that the rate for full cost recovery is about Rs. 55/-. The impact of this on an average household of size 5 is about Rs.23/- per month. This seems to be affordable and likely to be acceptable if yard-taps are provided wherever feasible so that travel costs can be reduced considerably.

Summary and conclusions

Replacement, operation and maintenance cost of reproducible capital in rural water supply in 1994/95 has been estimated from aggregate expenditure data relating to the period 1980/81 - 1994/95. The estimates show that the system is sustainable along with additional coverage and improvement in quality of drinking water supply only if user financing is introduced.

Since user rates affect the poorer and weaker sections very adversely, Faulhaberian cross-subsidy is estimated by excluding the users below poverty line. The cross-subsidised rate for full cost recovery comes to be about 23 rupees per household in rural India. This is implementable if yard-taps are provided so that indirect cost of travel time for getting water from public taps can be reduced considerably.

Even with this change in policy, some states need budgetary transfers for meeting the high cost of potable water due to the peculiar hydro-geological conditions and topography.

Another important task, which is completely ignored in the present context, is to devise institutions for the successful implementation of user financing. Social experiments to date must be critically reviewed for lessons to be learnt for local adaptation. From this angle, the recent Karnataka experiment of cost sharing and recovery in rural water supply and sanitation should be evaluated for adoption elsewhere in the country.