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**The World Bank**

# Operation and Maintenance Expenditure and Cost Recovery

Policy Paper extracted from the World Bank Study on Review of Effectiveness of Rural Water Supply Schemes in India, June 2008

June 2008

# Operation and Maintenance Expenditure and Cost Recovery

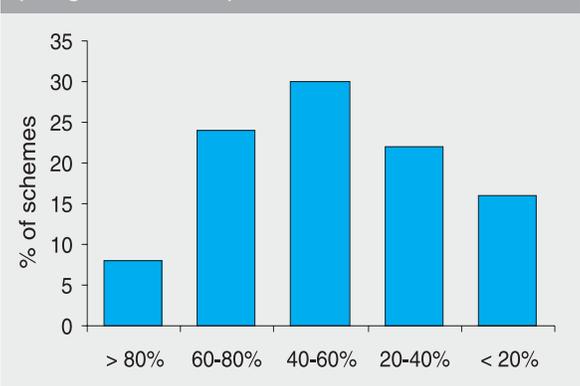
The operation and maintenance (O&M) expenditures incurred on rural water supply schemes in India is commonly much less than required and this has serious implications on their performance. This is one of the major findings of the 10-state study on the *Effectiveness of Rural Water Supply Schemes* undertaken by the World Bank at the request of the Government of India. The study also analyzed the issue of cost recovery, which is generally low, but differs across states, among technologies, and between demand-driven and supply-driven schemes.

## Expenditure on O&M

A comparison of actual expenditure on O&M in piped water supply schemes with the 'good practice (design performance) O&M cost'<sup>1</sup> shows that the former is only about a half of the latter on an average (Figure 1). In some cases (8 percent schemes), the gap between the actual O&M expenditure and the good practice O&M expenditure is more than 80 percent. Similarly, a comparison of the actual O&M cost of piped water supply schemes with cost norms (varying across states) shows that in about 60 percent of the schemes, the actual O&M cost is less than

<sup>1</sup> The good practice (design performance) O&M cost is defined as the cost that schemes would incur, if they run properly to meet the design LPCD level, provide water supply regularly, and carry out proper maintenance of the system.

**Figure 1** Gap Between Actual and Good Practice (Design Performance) O&M Cost

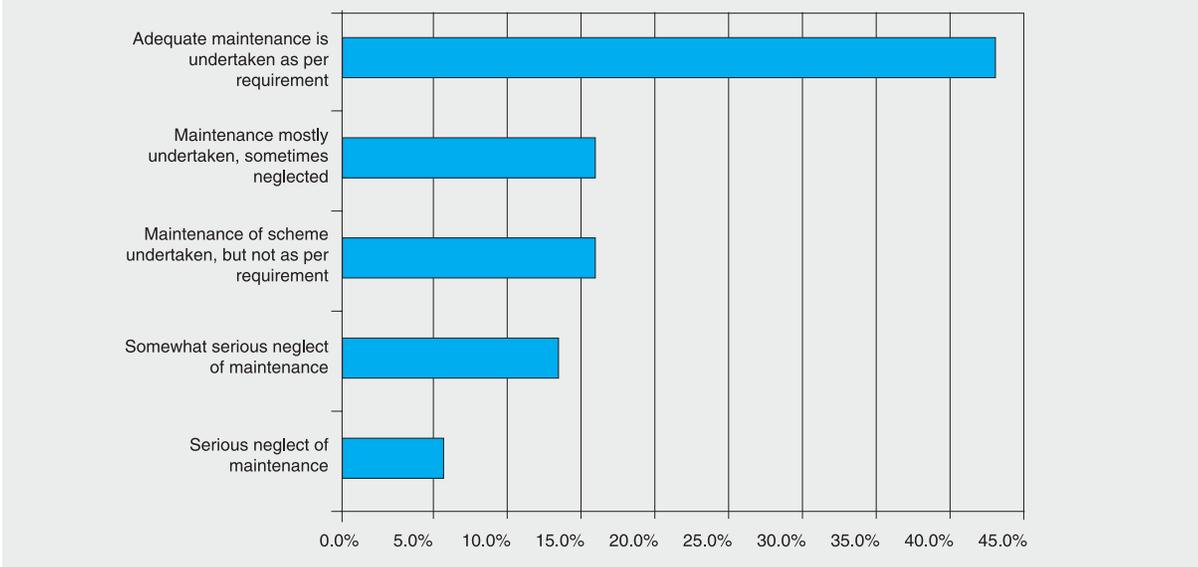


Source: Scheme survey data.

half the normative cost of the scheme. Evidently, not enough is being spent on the O&M of piped water schemes. The implication of insufficient expenditure on the O&M is that the schemes operate significantly below their capacity. While the design supply is in the range of 40 to 70 lpcd (liters per capita per day) or higher, the actual consumption of water from the schemes made by households is mostly in the range of 20 to 30 lpcd or lower.

The annual expenditure on minor repair and maintenance as a proportion of the total capital cost of a scheme should be about 2.5 percent for

**Figure 2** Level of Maintenance of Piped Water Schemes (Data for Eight States Combined)



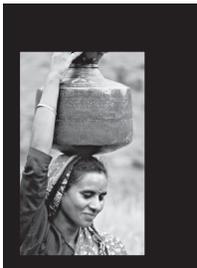
Source: Scheme survey data.

proper scheme maintenance, but it is about 1.3 percent for single village schemes on an average, and the corresponding figure for multi village schemes is still lower at about 0.4 percent. The scheme survey reveals that about 45 percent of the piped water supply schemes are carrying out breakdown maintenance, rather than

schedule maintenance. The majority of the schemes reported that adequate maintenance was not being done, and about one-fifth reported serious or somewhat serious neglect of maintenance (Figure 2).



**The operation and maintenance expenditures incurred on rural water supply schemes in India is commonly much less than required and this has serious implications on their performance**



The situation is much the same for handpump schemes. The norm for the expenditure on the repair and maintenance of handpumps may be taken as Rs 1,600 to Rs 3,000 per handpump per year, or higher, depending on the local condition. The average expenditure being incurred in various states is commonly below this range, indicating that adequate maintenance of the handpump is not being done. This has led to frequent breakdowns of handpump schemes. This is also responsible for many handpumps getting defunct before completing their useful life. The survey of handpumps undertaken in the 10-state study reveals that handpumps were not

functional, on an average, for 18 days in a year in Uttar Pradesh, 15 days in a year in West Bengal, and 12 days in a year in Orissa. According to the preliminary results of the Habitation Survey undertaken in 2003, about 28 percent spot sources are defunct in Kerala. This proportion in some of the other states covered in the study is 17 percent for Tamil Nadu, 14 percent for Maharashtra and Karnataka, and 10 percent for Uttarakhand. Information from other sources<sup>2</sup> indicates that in Karnataka, 19 percent of the handpumps are defunct.

### Cost Recovery

In handpump schemes, there is hardly any cost recovery. In piped water supply schemes, the extent of O&M cost recovery is on an average about 46 percent. The recovery of the O&M cost is relatively higher in community-managed schemes at an average of 71 percent, and lower in government/public utility-managed schemes, at about 21 percent. In Gram Panchayat-managed schemes, the average cost recovery is about 52 percent. State-wise, the cost recovery is best in Punjab, followed by Maharashtra and

Kerala, while it is worst in West Bengal followed by Tamil Nadu, Orissa, Andhra Pradesh, and Uttarakhand. In West Bengal, Tamil Nadu, Orissa, and Andhra Pradesh, the average cost recovery of piped water schemes ranges from 1 percent to 21 percent. A comparison across types of schemes reveals that the level of O&M cost recovery is higher in mini water schemes (58 percent) and low in multi village and regional schemes (37 percent) (Figure 3).

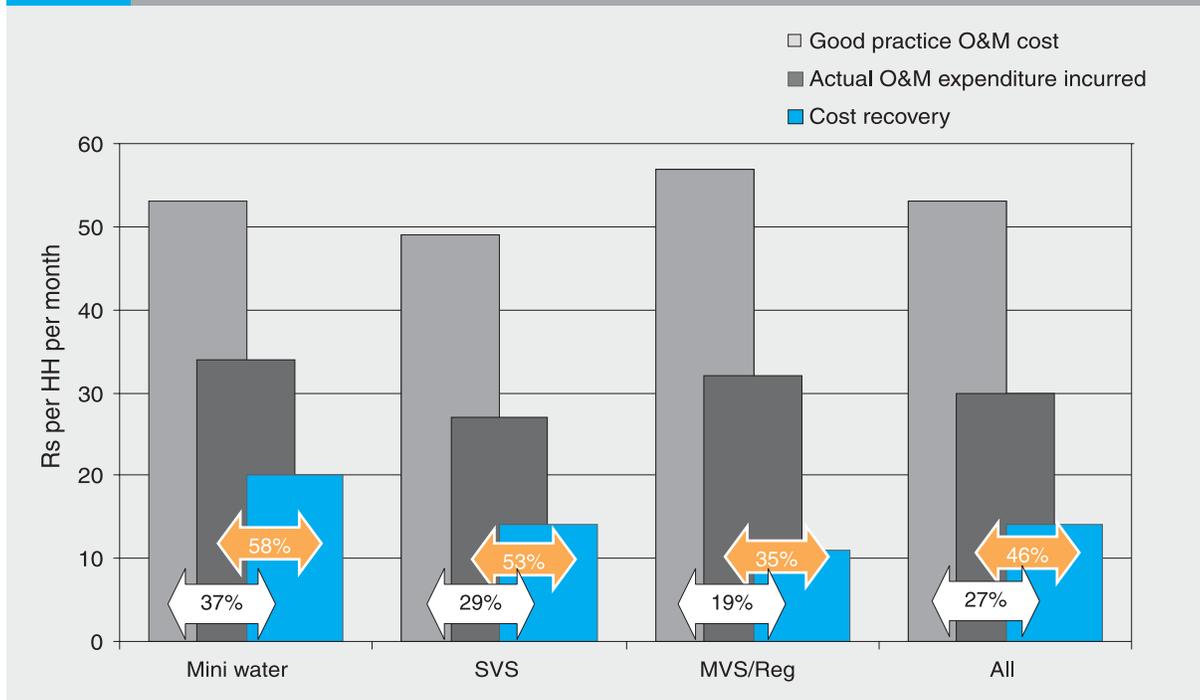
It needs to be emphasized that the O&M expenditure incurred for piped water schemes is much less than the requirement for the proper maintenance of schemes. Accordingly, the revenue realized from the households is fairly low in relation to good practice (design performance) O&M costs, that is, the expenditure on the O&M needed for the proper functioning of schemes.

On an average, the O&M cost recovery is 46 percent of the actual O&M expenditure incurred, but only 27 percent of the good practice O&M. The revenue realization is also low in comparison to the O&M cost norms (this is evident since the actual O&M incurred is



<sup>2</sup> Rural Water Supply and Sanitation: A status report, Karnataka Rural Water Supply and Sanitation Agency, Rural Development and Panchayati Raj Department, Government of Karnataka, 2004.

Figure 3 O&M Cost Recovery in Piped Water Supply Schemes



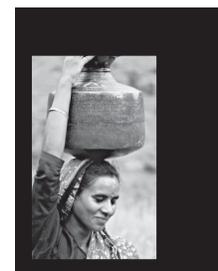
Source: Survey data for piped water supply schemes.

commonly less than the norm). In multi village schemes, for instance, the O&M cost norm is about Rs 60 per household per month whereas the revenue realization is on an average about Rs 11 per month. Cost recovery bears a positive relationship with the amount of expenditure incurred on O&M (Figure 4). Survey data reveal that the average expenditure on the O&M is about Rs 27 per household per month in piped water schemes that collect less than Rs 10 per households on average. It is Rs 36 per household per month for piped water schemes that collect more than Rs 30 per household.

The low recovery of cost is not due to unaffordability, but has much to do with household reluctance to pay and the inability of the scheme management to collect the charges. The fact that standpost users are not charged at all in many piped water supply schemes is also responsible for low cost recovery. In Tamil Nadu and Andhra Pradesh, most rural households access water supply through a standpost (or mini water tank). About 80 percent of such household in Tamil Nadu and about 90 percent of such households in Andhra Pradesh are not charged for water. The consequence is obviously a low recovery of the O&M cost. The situation is

similar in West Bengal and Orissa. Piped water is accessed predominantly through standposts rather than private connections, and about

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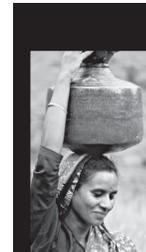
80 percent of standpost users in Orissa and more than 95 percent of standpost users in West Bengal are not charged. In the survey, the management of various piped water supply schemes expressed the opinion that for generating more revenue, collection efficiency needs to be improved and charges should be imposed on standpost users.

### Policy Direction

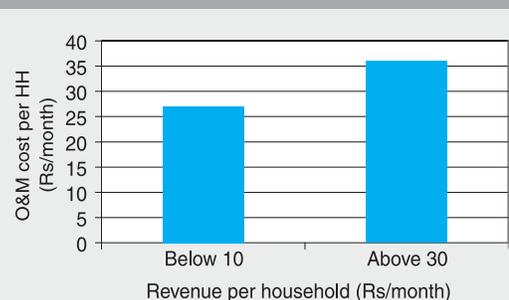
The low expenditure on the O&M of water supply schemes can be traced to inadequate fund allocation and low cost recovery from beneficiary

households. Obviously, this calls for greater efforts at cost recovery and the allocation of more funds for the maintenance of schemes so that their useful life can be extended. To improve operations as well as cost recovery, the ownership of single village schemes

The desirable state to achieve is one in which the O&M cost needs to be properly assessed and fully recovered through user charges. State-wise, uniform cost sharing principles need to be worked out



**Figure 4** Revenue Collection and the O&M Expenditure per Household, Piped Water Schemes



should be handed over to the Panchayati Raj Institutions (PRIs) and/or user committees, after proper rehabilitation, and their O&M costs should be recovered from user charges. To ensure the success of such ownership transfers, training should be provided to the PRIs on technical, accounting, and procurement procedures. Similarly, multi village schemes and regional schemes may be unbundled into smaller schemes at the village level and the responsibility handed over to the Gram Panchayat/village community with contractual agreements and performance improvement targets between user groups and the bulk water providers. The desirable state to

achieve is one in which the O&M cost needs to be properly assessed and fully recovered through user charges. State-wise, uniform cost sharing principles need to be worked out, irrespective of types of programs or sources of financing. For high cost schemes, it is not necessary, nor desirable, to recover fully the O&M cost through user charges. Rather, a transparent criteria needs to be developed to determine 'affordable' contributions, including a criteria for socially disadvantaged groups.

The O&M requirements in excess to affordable contributions should be provided through a transparent state subsidy scheme.

This Report has been prepared by Smita Misra (Sr. Economist, SASDU, World Bank), the Task Manager of this study.

The study was carried out under the overall guidance of Sonia Hammam, Sector Manager, Water and Urban, SASSD, World Bank. Data analysis has been undertaken by Professor B.N. Goldar and his research team at the Institute of Economic Growth, Delhi and the consumer survey was carried out by the ORG Centre for Social Research (a division of A.C. Nielsen ORG MARG Pvt Ltd). Comments and inputs at various stages of preparation from the following World Bank persons are gratefully acknowledged: Michael Carter, Rachid Benmessaoud, Clive G. Harris, Alain R. Locussol, Francis Ato Brown, Alexander E. Bakalian, Oscar E. Alvarado, G.V. Abhyankar, R.R. Mohan, S. Satish, N.V.V. Raghava, and Catherine J. Revels (WSP-SA). Special thanks are due to the Department of Economic Affairs, Ministry of Finance, the Department of Drinking Water Supply, Ministry of Rural Development, and the Rajiv Gandhi National Drinking Water Mission for their interest and collaboration in the study. Comments and data inputs during the preparation of the Report are gratefully acknowledged from R.P. Singh and M. Nagaraju (DEA), Bharat Lal and R.K. Sinha (RGNDWM) and their team, and the respective State Government officials.

The Report has been discussed with the Government of India but does not necessarily bear their approval for all its contents, especially where the Bank has stated its judgements/opinions/policy recommendations.

## Policy Papers

This is one of the six policy papers that have been prepared on the basis of the World Bank study on Review of Effectiveness of Rural Water Supply Schemes in India (June 2008). These policy papers, published along with the Report, are on the following themes:

- Paper 1:** Willingness of Households to Pay for Improved Services and Affordability
- Paper 2:** Inefficiency of Rural Water Supply Schemes in India
- Paper 3:** Multi Village Water Supply Schemes in India
- Paper 4:** Operation and Maintenance Expenditure and Cost Recovery
- Paper 5:** System of Monitoring and Evaluation
- Paper 6:** Norms for Rural Water Supply in India



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