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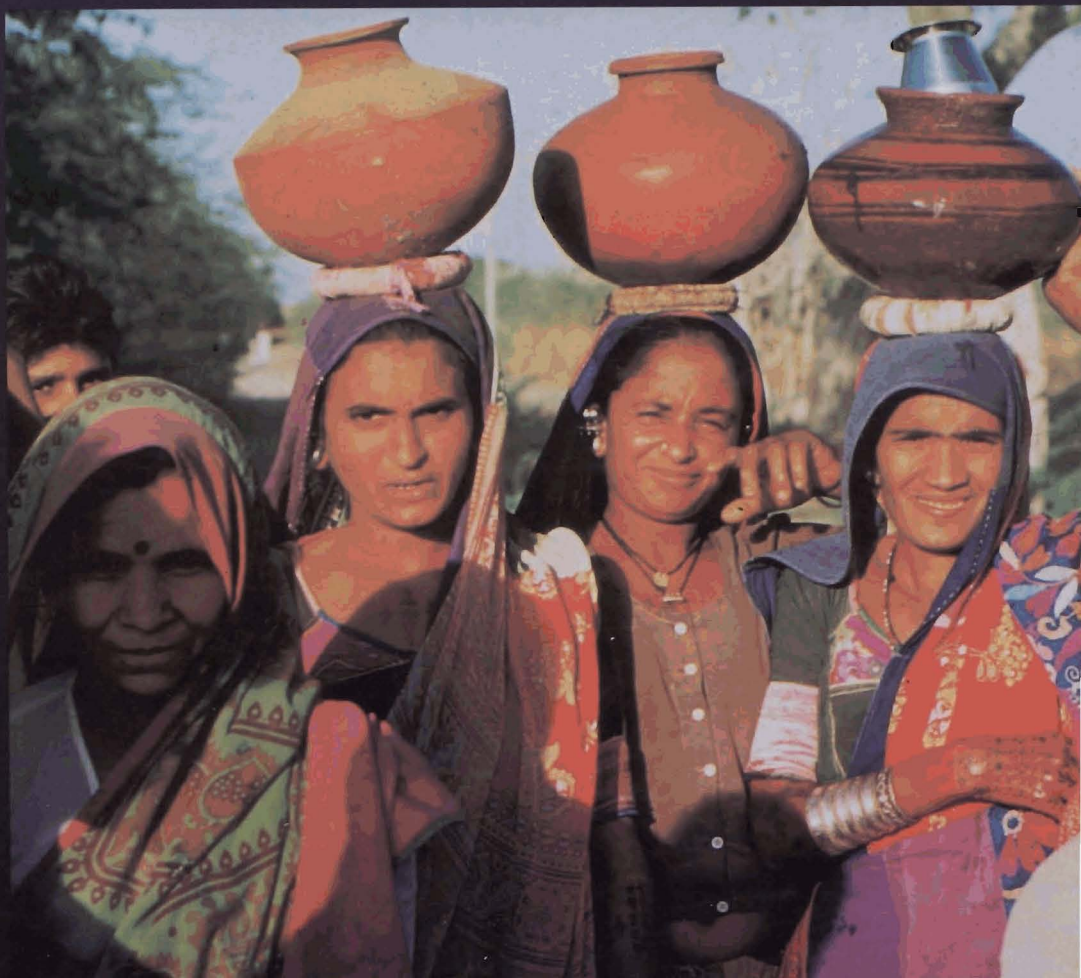
WATER RESOURCES  
MANAGEMENT

SOUTH ASIA RURAL DEVELOPMENT S

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# *Rural Water Supply and Sanitation*

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THE  
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BANK



# Rural Water Supply and Sanitation

World Bank  
South Asia Region  
Rural Development Sector Unit

in collaboration with

The Government of India  
Ministry of Rural Areas and Employment  
(The Rajiv Gandhi National Drinking Water Mission)

DANIDA (Danish International Development Assistance)

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# Abbreviations and Acronyms

AFARM	Action for Agricultural Renewal	O&M	Operations and Maintenance
AFPRO	Action for Food Production	PHED	Public Health Engineering Department
ARWSP	Accelerated Rural Water Supply Programme	PMU	Project Management Unit
CAPART	Council for Advancement of People's Action and Rural Technology	PRI	Panchayat Raj Institutions
CGWB	Central Ground Water Board	PWS	Piped Water Supply
CPHEEO	Central Public Health and Environmental Engineering Organisation	R&D	Research & Development
CRSP	Central Rural Sanitation Programme	RGNDWM	Rajiv Gandhi National Drinking Water Mission
ESA	External Support Agencies	RLEGP	Rural Landless Employment Guarantee Programme
GDP	Gross Domestic Product	RSM	Rural Sanitation Marts
GOI	Government of India	RWS	Rural Water Supply
GP	Gram Panchayat	RWSS	Rural Water Supply & Sanitation
HUDCO	Housing and Urban Development Corporation	SEU	Socio-Economic Unit
IEC	Information Education Communication	SGO	State Groundwater Organisations
IRC	International Reference Center	UP	Uttar Pradesh
lpcd	Liter per capita per day	VWSC	Village Water Supply Commnirtee
MIS	Management Information System	ZP	Zilla Panchayat
MNP	Minimum Needs Programme	ZPED	Zilla Panchayat Engineering Department
NAWDA	National Association for Water Resources Development Agencies		
NC	Non-Covered		
NGO	Non Government Organisation		
NREP	National Rural Employment Programme		

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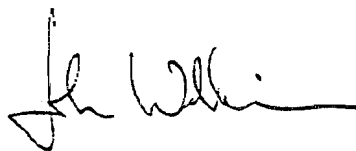


## **PREFACE**

### ***INDIA - Water Resources Management Sector Review Rural Water Supply & Sanitation Component Report***

India has invested much effort in bringing supplies of safe and clean water to the countryside in the half century since independence. and, in terms of the number of people that now have access to modern supplies of water, the achievement is indeed impressive. It is nonetheless true that there is a great deal of concern about both the quality and quantity of water reaching those who do have access, as well as the difficulties of those still without *my* access at all. Too many investments fail to take adequate account of the needs of water users, while maintenance is threatened by a shortage of finance and the concentration of responsibility in the hands of remote bureaucracies. One of the recurring themes in the Bank's five volume study of Water Resources Management in India, of which this study comprises one component, is the need to devolve decision-making powers down to the local level where end-users will have both the incentive and the opportunity to initiate prompt action.

I had the pleasure of participating in the Rural Water Supply and Sanitation Workshop held in Delhi in February 1997, jointly sponsored by the Rajiv Gandhi Rural Drinking Water Mission (Ministry of Rural Areas and Employment) and the Bank, at which a draft of this report was discussed. It was refreshing to witness the way in which the report's main themes already seemed to be owned by the Indian participants. One could hardly envisage a starker contrast with the stereotypical view of how the Bank first decides what should be done, then imposes this decision via conditionality, and finally relies on the government to force acceptance on an unwilling populace. Even though this stereotype is just that, and not a picture of how the Bank usually operates, one may still feel that the participatory and collaborative way in which this report was prepared with the Indian government as a partner and wide consultation during the process of drafting, provides something of a model. The report will surely contribute to the Bank's lending program in the water sector and to India's formulation of better policies in the sector.



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## PREFACE

India has achieved considerable success in providing safe drinking water to about 85% of her rural population by tapping ground and surface water through 3 million handpumps, thousands of water supply schemes and traditional sources. The Government of India is committed to provide safe drinking water facilities to all Not Covered and Poorly Covered habitations in the rural areas within the next two years and also increase the water availability level to the national norm of 40 lpcd to all the Partially Covered habitations by 2000 AD.

Despite the impressive coverage of provision of safe drinking water facilities in the rural areas, there are certain areas of serious concern. The issue of sustainability and maintenance of quality of water supplied are cited as the two major constraints in achieving the avowed objectives. Further, the entire programme, so far run almost totally managed by the Government, without the active participation of the stakeholders, has created a scenario, in which water is taken as a free(service) commodity and running the entire operation is a totally Government responsibility. This, inevitably has resulted in stifling the development of more efficient and lower cost options for service delivery and also denying an opportunity to the users in exercising their option as consumers to demand a better service.

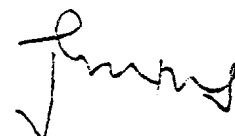
In the years to come, the rural water supply programme is sure to face serious challenges by way of meeting the expanding needs of a fast growing population, as well as the increasing demand of the population for higher service levels. Incidentally, the Working Group for the 9<sup>th</sup> Five Year Plan(1998-2002) of India for rural water supply and sanitation programmes has put the requirement of funds at a staggering amount of Rs. 40,000 crore, keeping in view the measures to be undertaken to sustain the water supply and sanitation services.

In the context of both the resource constraints and the competing demands on resources and inter se priorities, it is unlikely that the Government alone would be in a position to mobilise the projected demand of funds in a period of 5 years during the 9<sup>th</sup> Plan period. Given the circumstances, cost sharing by concerned institutions right from the users, Panchayati Raj Institutions, the State Governments and the Central Government has to be seriously considered. The cost sharing arrangement, so worked out would entail involvement of the users and the supporting agencies like the Panchayati Raj Institutions to own, operate and manage the drinking water supply systems.

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The adoption of the demand driven approach replacing the present supply focused approach is a pre requisite for evolving suitable cost sharing practices with active participation of the stakeholders. Public education and widespread communication, aimed at increasing the stakeholders' participation in the entire scheme of things and if reflected through appropriate cost sharing instruments, would convince all concerned of the appropriateness of the approach and would pave way for creating sustainable rural water supply and sanitation facilities in the country.

In this background, the report on the Rural Water Supply and Sanitation by the World Bank, as part of the Water Resources Management Work, dwells on the policy and constraints of this sector, institutional and financial issues related to sector reform process and advocates an approach to bring about radical reforms in the sector. As the Government of India, in association with the State Governments, is in the process of formulating and implementing rural water supply programmes with sharp focus on sustainability and quality during the Ninth Five Year Plan, the report is welcome as it would certainly give a filip to the sector reform processes initiated with tremendous optimism.



Palat Mohandas

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# Executive Summary

## Background

Since the beginning of the Sixth Five-Year Plan (1980–85) and the launch of the International Drinking Water Supply and Sanitation Decade, India has substantially increased its commitment to the water supply and sanitation sector. Sector investments have increased and presently constitute about 3 percent of the national budget. Of the total budget allocated to the sector, approximately 60 percent has been earmarked for rural areas. Although the constitution considers rural water supply and sanitation to be the financial responsibility of state administrations, central government funding constitutes 40 percent of total investment in the sector. Significant achievements in coverage have been realized, with over 75 percent of the rural population (or 520 million people) now provided with public water supply facilities. Achievements in sanitation coverage have been less extensive, due to the lower attention it received compared with water supply. Only 3.6 percent of the rural population is covered at present; however, actions to improve coverage of sanitation have been stepped up recently, through provision of subsidies and technical assistance for household construction of sanitation facilities.

National guidelines and investments in the rural water supply and sanitation (RWSS) sector, which have traditionally focused on extending coverage to rural areas, neglected to ensure that the quality of services to rural areas remained adequate. Public RWSS services today clearly do not adequately serve the needs of user communities. They are typically poorly designed and constructed, oftentimes designed and positioned at sites without consideration to community needs or preferences. Planning of RWSS services also takes place without due attention to resource availability or quality, and is rarely financially viable. The end result is a government dominated and target-driven service that has become unsustainable institutionally, financially and environmentally. There is growing awareness that in order to be effective, sector investments should be designed in accordance with the needs and demands of users. There should also be a transfer of ultimate ownership and responsibilities

to users and their communities, in order for the assets and services to be sustainable. It will be essential, moreover, to shift from the target-oriented, supply-driven approach which pays scant attention to the practices and preferences of end-users, to a demand-driven approach which provides users with the services they want and are willing to pay for.

The government now recognizes the need to improve the functioning and sustainability of the sector. Specifically, the government is committed to the following principles, as stated in the Eighth Five-Year Plan (1992–97): (i) water should be managed as a commodity; (ii) the provision of RWSS services should be based on expressed demand; (iii) emphasis should be placed on decentralization, user participation and private sector involvement; (iv) operation and maintenance should be managed at the local level with emphasis on financial sustainability; and (v) sanitation programs should be integrated with those of water supply. In

practice, however, these principles have seldom been reflected in sector operations for lack of effective mechanisms to translate the policy statements into action. A contributing factor that has impeded rather than aided in achieving the stated policy objectives of decentralized planning and implementation, demand-led investment, user involvement and cost recovery, has been the availability of unconditional RWSS sector funding from the central to the state governments. The target-oriented approach continues to guide activities and investments in the sector. Until the policy is linked to decisions regarding the investment program and effective mechanisms are established to guide sectoral operations, the coverage and quality of services will remain inadequate and sector viability, both institutionally and financially, will continue to deteriorate.

## **Sector Issues and Assessment**

### **Protection of Water Sources**

Protecting both the sustainable yield and quality of groundwater is critical to maintaining the sustainability of existing RWSS investments as well as to meeting future requirements with potable and affordable services. In addition to being the primary drinking water source for privately funded schemes, groundwater supplies 85 percent of the rural population served by public schemes. The need to protect groundwater for drinking purposes, however, has conflicted with the government's food security objectives and subsidies to the agricultural sector. These have encouraged the rapid and unregulated development of groundwater for irrigation. The result has been the over-extraction of groundwater and in certain localities, the depletion and contamination of groundwater resources.

Seasonal or permanent depletion of groundwater aquifers has serious social, financial, and institutional implications for the supply of drinking water in rural areas, including the need to continually replace dried-up water sources. Such replacement needs, particularly where requiring more complex and expensive technologies (such as a piped scheme from a more distant source or one requiring treatment facilities), have higher capital and recurrent costs, estimated on the order of 1,000 to 1,500 percent, compared with existing systems. The relatively advanced schemes, furthermore, are generally difficult to operate and maintain at the local level given the lack of technical skills, which would

threaten the success of the decentralization effort. Monitoring and evaluation of resources, abstraction and quality of groundwater are generally fragmented and driven by the interests and objectives of various agencies.

### **Institutional Performance and Issues**

The current emphasis on targets and norms encourages excessive investment, undermines efficiency, and deters the transfer of ownership to the institutions responsible for operations and maintenance. Government domination of sector services has limited the potential scope for participation by non-governmental organizations and, to an even greater degree, the private sector. The weak incentive structure in the sector, including lack of financial discipline, cost minimization or commercial culture, or orientation toward consumers, heightens the perceived risk to the private sector and curtails their potential involvement. Most important of all, village user communities have been insufficiently involved in the process.

One of the impacts of the sector's target-driven objective has been an inadequate planning and assessment process prior to investment. No attempt is made, for example, to assess the extent and status of privately-financed sources, even when they may constitute the primary drinking water source of a community. Neither are user preferences and willingness to pay for different levels of service ascertained. Effective planning is hampered by inherent institutional incentives to build more or better, rather than affordable and appropriate, schemes. Planning is further constrained by rigid design norms and lack of integration of environmental sanitation with water supply programs. Weak performance also extends to the quality of hydrogeological investigations, improper designs and construction, that have led to substantial cost overruns. Quality assurance and supervision activities are limited despite a comprehensive set of official controls. Monitoring and evaluation of central and state-financed programs by and large have been limited to ensuring that central government funding is allocated as required.

According to the recent 73rd and 74th constitutional amendments, the states are devolving activities and responsibilities for development to the panchayati raj institutions. The constitutional amendments envisaged that the RWSS sector (consisting mostly of hand or small power pumps) would lend itself better to a decentralized structure, with



engineers at the district and block levels to plan and implement programs. Decentralization to lower levels was also expected to facilitate integration of sanitation and water supply services, to ease the transfer of schemes to panchayats for operation and maintenance, and to engage user communities in sectoral decision making. Due partly to problems associated with financing from multiple sources, and the lack of managerial capacity to undertake demand-driven activities, the anticipated benefits of decentralization have not yet materialized.

Instead, though decentralization is only beginning in most states, there is evidence already that the process is fraught with difficulties. Decentralization has simply passed the problems inherent in the state level engineering agency on to the decentralized sector agencies. Even in states with relatively strong panchayat institutions, progress with decentralization has been inadequate. The impact of decentralization so far has been a wide distribution of responsibilities across agencies (without corresponding strengthening of inter-agency coordination mechanisms), and a weakening of accountabilities. State-level agencies by and large retain a limited role in technology selection, scheme sanctioning, monitoring and training. State public health engineering departments also conduct investigations and drilling, while the district zilla parishad engineering departments now plan and execute works. Poor liaison between departments and an inefficient financial and technical approvals process, however, inordinately delay the implementation of sectoral programs.

Though local level panchayats are now responsible for operations and maintenance of commissioned schemes, they are reluctant to assume this role. Reasons for this vary but include lack of managerial autonomy, inadequate staff and financial support from the state government, the typically low quality of the schemes planned and constructed without their participation, and a lack of ownership of the assets. In consequence, the state government continues to own the assets, supply the technology, and deliver the services. Despite these external factors, the panchayats themselves face many inherent problems, which inhibit them from taking advantage of the limited autonomy offered them under the constitutional amendments. These include a historical reliance on central and state guidance and funding, weak capacity, high politicization, and limited resources.

Responsibility for management and operation of rural sanitation, including waste disposal in small towns and provision of latrine and environmental sanitation services, have also been devolved to the gram panchayats. Environmental sanitation consisting mainly of sullage and storm drainage is funded largely under an employment-generation program and is not integrated with water supply programs. Due to limited capacity or interest in implementing what are typically scattered rather than comprehensive sanitation programs, progress under the government's rural sanitation program has been very slow.

Lack of integration of sanitation with water supply operations has compounded the managerial difficulties panchayats face in the sector. The inattention to hygiene practices, stemming from the failure to integrate sanitation programs with programs delivering health and hygiene education, prevents the realization of significant health and economic benefits. There is also little or no follow-up monitoring or evaluation of programs, and communities are unaware of, or lack access to, low-cost investment options. Absence of these programs curtail the emergence of demand for sanitation facilities in rural areas, thereby precluding improvements in current sanitation and hygienic practices. High subsidies provided by central and local governments for relatively expensive latrines, furthermore, inhibit the ability of local agencies to work toward financial sustainability of sanitation services.

### Financial Issues

Despite the significant gains in extending rural water supply, the increasing level of government investment has not been matched by a proportionate increase in coverage, and has become less efficient over time. The sector has experienced rising per capita costs due to the increased investment in the more expensive piped water schemes compared with handpumps, and increasingly inefficient procurement practices. Total capital investment requirements, to fully cover rural populations and restore functionality (i.e. repair or rehabilitation) of distressed schemes, are estimated to range from Rs. 170 billion to Rs. 200 billion as a lower bound. If, however, national RWSS objectives are to be achieved (i.e. that a minimal level of 40 lpcd is provided, all schemes are made operational, and fully depreciated schemes are replaced) within 10 years, the capital investment budget will have to be at

least two and a half times its existing level of Rs. 16–18 billion (US\$450–515 million) annually.

Achieving sector objectives will be challenging and will definitely require a significant improvement in the efficiency of government investments, but this will not be sufficient. Given fiscal deficit reduction goals and competing government priorities, substantial increases in government allocation are unlikely. At present, funding from external support agencies equals only 3 to 5 percent of the existing annual capital investment in the sector and is unlikely to have more than limited impact on RWSS asset creation in view of the enormous capital investment needs. Possibilities for direct investment by the corporate private sector is also limited, given the high inherent risk, long payback periods and low profitability of the sector. Supplementary financing from the private sector or capital markets could and will likely need to be forthcoming; however, private financing could be accessible only if sector operations are elevated to a commercial level, including strengthening of financial management processes. Necessary first steps will have to be the realization of full recurrent cost recovery from users, capital cost sharing by users and government, and a reduction in operational costs.

The broader concept of financial sustainability for the RWSS sector has yet to catch hold in India; and while the narrow concept of O&M cost recovery has been accepted as a policy objective, very little has been done to implement it. Except for some localities supported by externally-funded RWSS projects, fees for rural water services are typically indirect: many states include a nominal water charge in local building or land taxes. In almost all cases where rural water fees are actually levied, the amounts are nominal and charged only to households or commercial enterprises that are served by individual connections. No charges are levied to recover capital costs. The Central Water Commission reports that cost recovery of working expenses for rural water supply schemes in 1991–92 was about 1.8 percent, and less than 1.3 percent of total outlays if capital costs are factored in. In the absence of a separate accounting and financial reporting system for the sector, and the general lack of transparency, the amounts collected disappear into a general government fund rather than being applied directly for sectoral expenses. The inadequate financial accounting system further aggravates the ability to attend effectively to cost recovery concerns.

An estimated Rs. 29 billion (US\$830 million) is required annually to fund the appropriate level of operations and maintenance in the sector, excluding provisioning for depreciation of assets. This includes salaries, electricity (where required), chemicals and routine preventative maintenance as well as repairs. In absence of adequate cost recovery, the government is responsible for **adequately** funding O&M requirements, yet current funding allocations are grossly inadequate at about Rs. 2.5 billion (representing a twelfth of the estimated requirements). Funding constraints furthermore have crowded out allocations to the works component of O&M, due to absorption by the salaries and overhead component. Continued underfunding of operations and maintenance will have serious financial implications due to the resultant growing need for major repairs or rehabilitation, which typically cost more than preventive maintenance. Existing systems would also likely have to be replaced prematurely.

Total expenditure on local administration is about Rs. 170 per capita, or 6.6 percent of total government expenditure annually. According to a 1992 study of local government finances, local expenditure in 1986–87 as a percentage of total government expenditure was only 2.9 percent for rural areas. Clearly, financial resources and financial autonomy have yet to be devolved to the local level and do not match the responsibilities now under local jurisdiction. Gram panchayats are expected to assume the greatest responsibilities without adequate levels of personnel and financial resources, nor adequate financial autonomy. While self-financing through cost recovery will likely be difficult to implement, it could be achieved with appropriate policy and political support and a general shift in institutional and public perceptions regarding ownership, the need for cost effective operations and maintenance programs, and a reorientation of users' perceptions to one where they expect to pay for good quality services they want and can afford.

## Sector Reform Strategy

While the Eighth Five-Year Plan recognizes the key issues and problems confronting the sector, sector programs fall short of implementing the Plan. The reform **strategy proposed** here coincides almost verbatim with the points highlighted in the Plan. However, it goes much further to strengthen the Plan's

policy statements and identify actions required to implement the Plan. The recommended reform strategy has three objectives. First, is to **ensure an enabling environment** for reform, i.e. a policy framework that politically, legally and institutionally supports the reform process. Second, is to **establish institutional sustainability** by: clarifying and rationalizing the roles and responsibilities of the various sectoral agencies; strengthening the facilitation or implementation capacity of existing agencies, as appropriate given the identified roles; supporting the decentralization process and devolving of responsibilities to village water committees and the panchayat raj institutions, including involvement where appropriate of NGOs; and, achieving full participation of user communities in sectoral decision making and project implementation. Third, is to **establish financial viability and sustainability** by implementing policies and actions to achieve capital cost sharing, full recurrent cost recovery and reductions of operating costs. Finally, an important **resources management** objective — to ensure adequate quantities and quality of water resources for domestic needs — must also be addressed.

### Enabling Environment for Reform

Several factors pose major risks to reform of the rural water supply and sanitation sector. These include: (i) a waning willingness to charge for a good whose provision has traditionally been treated as a government responsibility; (ii) the pace at which the 73rd and 74th amendments to the Panchayat Raj Act are being implemented in each state; (iii) the pace and degree to which decentralization will occur; and (iv) the pace at which public administration or civil service reforms are undertaken. Each is highly subject to political will and the extent of government commitment. These constraints will have to be overcome through development of sector policy documents at state level particularly, and securing of commitment to the reform program.

The proposed strategy focuses on establishing an enabling environment to support strengthening of institutions and financial viability, which will serve the broader objectives of public administration reform. The general approach focuses on several themes. During a transition phase, financial conditionality with the allocation of central and state funds will need to be the major force driving the reform process at both state and local levels.

Conditionality for disbursement of funds must be explicitly defined, and strictly adhered to. This will be used to phase out the target-driven approach and government subsidies, and to phase in a demand-driven approach and full cost recovery. Public education and widespread communication will set the stage by convincing voters and politicians of the need and benefits of making and implementing difficult cost-sharing and cost recovery decisions. Implementation of a participatory demand-driven approach will ensure that users can directly influence the level of service they desire and can afford; and full cost recovery will ensure financial viability and sustainability. Finally, supporting public sector reform and institutional strengthening will ensure sustainability. External agencies can facilitate by supporting these reform efforts. Externally funded projects should be consistent with the recommendations of this report and should assist the Rajiv Gandhi National Drinking Water Mission and the state governments in its implementation.

### Institutional Sustainability

From an institutional perspective, the strategy recommends supporting the transfer of management and financial responsibility to the lowest appropriate level, i.e. the panchayat raj institutions and, in particular, user community groups. Transfer of responsibility would require corresponding provision of management and financial autonomy to local administrations and user communities, as adequate and appropriate for their roles. Given the responsibility and autonomy, these local groups will be tasked with overseeing planning and implementing sector activities. If required, these local groups would then be able to obtain a higher quality of services and minimize unit costs, through competitive selection of service providers among existing public agencies, non-governmental organizations, and the private sector.

Gram panchayats, and user community groups created under the panchayats, will require basic capacity strengthening for their new roles. They will also need sufficient incentives to increase their level of self-generated income and become more independent. In addition they will require: an understanding of the demand-driven approach and how to assess and meet community needs; the autonomy to prioritize and choose investments that best satisfy community needs; an ability to assess and appreciate the financial and

social implications of their investment decisions; and an understanding of available technologies and how and from whom to best procure them. The panchayat raj institutions, with their user community groups, can improve the administration and provision of basic services to rural areas if they are given the opportunity, support, and resources to do so.

Achieving institutional sustainability will also entail strengthening the general management capacity of state and local water and sanitation agencies while at the same time restructuring those organizations so that they may implement a delivery system oriented toward customer service. State and district RWSS agencies as well as the central agency will further need to build up a capacity to facilitate the formation, strengthening and operational activities of local level entities. Equally important is the need to encourage the participation of non-governmental organizations and the private sector by making the regulations and procedures governing procurement and contracts more flexible, and offering financial incentives in the form of preferential rates or tax incentives. NGOs, for example, play a critical role as facilitators for user community group formation and strengthening in the ongoing Bank-assisted Uttar Pradesh Rural Water Supply and Sanitation Project, as well as in various initiatives in other states.

### **Financial Viability and Sustainability**

Provision of water supply and sanitation services have an economic value not only to society but also to private users. Continued subsidization of sector services by the government distorts the signals to users of the scarcity value of water. It also undermines any efforts to promote a more efficient and sustainable use of water. Substantial central and state funding, moreover, encourages local administrations to make unbounded requests on behalf of their constituents, while discouraging the assumption of responsibility for operations and maintenance at local levels. Without an effective program to recover costs of providing water services, the government's objective of universal access to potable water and sanitation facilities will be an unattainable dream. The major objective of the strategy, therefore, is to achieve full cost recovery of operations, maintenance, replacement and capital costs in the long term. In cases where funds are borrowed to finance the investments, the annual interest payments would also be recovered from users.

During the transition period, the proposed strategy is to fully recover recurrent costs (i.e. O&M) immediately through user charges. The strategy further envisions an equal sharing of capital costs between state and center governments on the one hand, and panchayats and users on the other. For new schemes, a nominal 10 percent share of capital costs as a minimum will be required from users, as an equitable compromise between the old and new pricing regimes. The remainder of costs would be shared by the various governmental levels: 40 percent borne by panchayats out of their general tax receipts, and 25 percent each will be paid by center and state levels. For scheme rehabilitation and replacement, users and the three administrative levels will each bear 25 percent of the capital costs, making them equal partners in the sector.

The pre-defined capital cost sharing formula is expected to drive investments and serve as a financial conditionality for matching funding, as well as enable a more demand-driven approach to emerge. Capital cost contributions from users will encourage affordable investment profiles and more realistic user expectations, while matching government funding will be conditional on the implementation of tariffs to recover the full cost of operations and maintenance and establish an adequate replacement fund. Coming full circle, full cost recovery of both recurring and replacement costs will enable responsible local administrations to maintain assets properly and sustain adequate levels of services at affordable prices. In the long term, it will also ensure the financial viability and sustainability of investments in the sector.

Establishing financial viability and sustainability of the RWSS sector will be critical for attracting private sector financing for capital investments to bridge the gap between government resources and sectoral needs. This would be in addition to the already substantial own-financing of RWSS facilities by households and non-governmental organizations. The sector does not currently offer sufficiently attractive returns in either the short or the long term. Such disincentives discourage even government-supported credit facilities such as HUDCO and the Life Insurance Corporation of India which, despite mandates to support both infrastructure and rural development, invest only a minor proportion of their total portfolio in RWSS. The key to mobilizing market financing or inducing corporate interest in RWSS investments will be reforms to enable cost-reflective

**pricing** of services, plus the associated reforms discussed **above** to achieve a commercialised demand-oriented culture in RWSS entities to tailor operations to the needs of user communities, and structure investments according not only to community needs but also to their abilities to pay. In addition to user involvement in all **sectoral** decision making, it will be important to strengthen corporate financial management capabilities in the water agencies to instill financial discipline and effective handling of cost and pricing issues.

Full recurrent cost recovery and an annual contribution to a replacement fund are generally affordable for the vast majority of the rural population. If the **World Bank's** guideline of 3 percent of household income is used to determine affordability, cost recovery for basic **WSS** technology alternatives is generally affordable by over 80 percent of the rural population. In situations where the cost burden (*i.e.*, the capital cost share and full cost of operations, maintenance and replacement) for communities of the least expensive feasible technology generally exceeds a community's ability to pay out of incomes, then payment in-kind, user access to credit facilities, or a direct and transparent subsidy arrangement could be implemented. Where wide disparities exist between socio-economic groups of consumers, cross-subsidization may be an appropriate and practical option. A progressive tariff with different pricing tiers for different uses and different classes of customers can be considered at various administrative levels (*i.e.* the gram panchayat, district, or state) as appropriate. Such a tariff structure if well-designed, could support cross-subsidization from one region to another, from urban to rural areas, from one class of user to another, or from high to low consumption.

### Protection of Water Sources

Safeguarding the availability and quality of rural drinking water in India is also a priority need, for without appropriate mechanisms now to give rural drinking water effective priority over other uses and protect groundwater sources from excessive abstraction and contamination, the situation will deteriorate further and the costs of providing good quality drinking water will continue to escalate. Implementing

the National Water Policy that explicitly assigns drinking water priority over other uses is an important first step that most states have yet to take. Adoption of effective legislation and mechanisms to regulate and manage groundwater use and thus ensure a basic supply of rural (and urban) drinking water is a key associated need. **These** issues necessarily require a multi-sectoral and broader resources management perspective than is covered in this paper, which focuses on RWSS service delivery. Broader resource management issues are assessed in greater depth in the reports on "Intersectoral Water Allocation, Planning and Management," and "Groundwater Regulation and Management," also prepared as part of the Government of **India-World Bank Water Resources Management Sector Review (1998a and 1998b, respectively)** (subsequently published 1999).

### Plan of Action

The strategy recommends a number of critical actions to be taken by the central as well as the state governments. Table I below summarizes the key reform actions. A detailed Matrix of Recommendations is presented in Table 4.6, listing agencies responsible and proposed time **frame** for action. These recommendations are already the subject of encouraging follow-up by the Government of India, a number of states, bilateral and multilateral agencies, and **NGOs**. Subsequent to initial discussion cum dissemination at a national workshop<sup>1</sup> in February 1997 of an earlier draft of this report, and report revisions to incorporate the outcome of the national workshop, further workshops at **regional** and state are being organized by the **Rajiv Gandhi National Drinking Water Mission** to disseminate the final strategy recommendations as reflected in this report. The recommendations are also being incorporated at project level in **some** states, in the design of projects supported by the **World Bank**, and in various bilateral agency and NGO-supported activities. There is now a need to broaden implementation to a formal national strategy that encompasses all elements of the report in a comprehensive approach. This sector reform process is under energetic initiation by the Government of India and merits full support to achieve the intended turnaround in sector performance.'

<sup>1</sup> The national workshop on RWSS, held on February 20–21, 1997, was chaired by the Rajiv Gandhi National Drinking Water Mission. Proceedings of the workshop, including speech delivered by the Rural Development Secretary, Mr. Vinay Shankar, are reproduced in the Annex 1.

**Table I. Recommended Plan of Action — Summary****A. Establish an Enabling Environment**

**Objective:** To ensure a politically, legally and institutionally supportive environment that will facilitate the implementation of the reform process with particular emphasis on devolution of responsibilities to grass-roots levels and, in particular, user implementation, a demand-oriented approach, full cost recovery and financial sustainability (refer Sections B & C below).

**A.1. Public Awareness.** Implement a widespread public awareness campaign to promote water as an economic good and the need to charge cost-reflective prices and implement conservation activities.

**A.2. Give Priority to Drinking Water in Water Resource Use.** Strengthen and implement national and state policies giving priority to drinking water, and prepare state specific legislation to protect groundwater resources.

**A.3. Redefine and Reduce Government Role.** Develop and implement national and state RWSS policies defining the role of public sector in the RWSS sector, and guidelines for sector operations regarding financial and institutional aspects.

**A.4. Full Cost Recovery and Capital Cost Sharing.** Develop and implement national and state RWSS cost recovery and cost-sharing policy that defines situations in which the community will be eligible for matching government financing for new schemes and rehabilitation or replacement of existing schemes.

**A.5. Decentralize Responsibilities.** Devolve management autonomy to local level administrations.

**A.6. Institutional Strengthening.** Strengthen institutional capabilities, including development of MIS, financial systems, monitoring and evaluation systems, and training at all administrative levels to facilitate the devolution process.

**B. Ensure Institutional Sustainability**

**Objective:** Decentralize and strengthen RWSS agencies, defining clear mandates at each administrative level, devolving functions to the lowest appropriate level, and encouraging participation of NGOs & the private sector.

**B.1.** Enable Panchayat institutions and user community groups to assume the lead in decision making for RWSS.

**B.2.** Enable, promote and facilitate participation of NGOs and the private sector; define appropriate roles of these non-government as well as external agencies.

**B.3.** Strengthen institutional capabilities to undertake consumer orientation, policy development, planning, implementation, O&M, monitoring and evaluation, and promotion of health and sanitation.

**B.4.** Restructure public sector institutions.

**B.5.** Strengthen operational guidelines and procedures for RWSS agencies.

**C. Ensure Financial Viability and Sustainability**

**Objective:** Implement full cost recovery of operations and maintenance and replacement costs to ensure sustainability of sector investment. Implement a cost-sharing approach ensuring that the panchayat raj institutions and community are partners to make capital investment more efficient and transfer ownership. Encourage sector financing by rural credit facilities and private sector investors.

**C.1.** Implement a demand-driven approach.

**C.2.** Increase user charges to recover O&M costs.

**C.3.** Reduce O&M Costs.

**C.4.** Introduce and implement capital cost sharing policy.

**C.5.** Make RWSS agencies financially self-sufficient and strengthen their capabilities in financial management.

**C.6.** Re-prioritize Public Expenditures in RWSS.

**C.7.** Implement effective accounting and auditing procedures, billing and collection systems, standard financial reporting formats, and simple but well-defined financial management and accounting systems.

**C.8.** Amend existing legislation and regulations so that panchayat raj institutions and village water supply and sanitation committees are legally entitled to enter into financing and loan agreements with government-sponsored rural credit facilities or private sector financial institutions.

**C.9.** Establish a system for providing loan guarantees by the block and district panchayat raj institutions or the state, as necessary.

Table I. (cont.) Recommended Plan of Action — Summary
<b>D. Protect Water Resources</b>
<p><b>Objective:</b> Implement measures to assure priority usage of water resources to drinking water and to protect quality and sustainability of groundwater resources.</p>
<p>D.1. Define appropriate remedial measures to address water quality problems.</p> <p>D2. Design a strategy for developing water supply schemes in areas with water quality problems that meet safe drinking water requirements and acceptability (preference) of users.</p> <p>D3. Develop technology and other innovative options for solving water quality problems (fluoride, iron and arsenic) <b>both</b> at village and household level as well as for larger piped schemes.</p> <p>D4. Develop groundwater legislation and regulations, and develop regulators' capabilities to manage and protect groundwater resources.</p> <p><b>D.5.</b> Develop institutional capabilities for multi-sectoral water allocation, planning and <b>management, including</b> water <b>pricing</b> mechanisms. and features to prioritize allocation for drinking water and protection/ mitigation against pollution (refer GOI-World Bank, 1998).</p>





# Sector Development and Achievements<sup>2</sup>

## Evolution of policy framework

Water supply and sanitation were added to the national agenda during the first five-year planning period (1951–56). In 1954, the first national water supply and sanitation program was launched as part of the government's health plan. Central and state administrations provided equal funding mainly for rural piped water supply schemes, with limited provision for point sources such as wells and boreholes. Rural schemes were generally provided to population units of less than 5,000. During the initial years, the program realized only limited achievements, mainly because states lacked qualified staff to plan and execute projects, and materials were in short supply (Ghosh et. al., 1995).

During each of the three subsequent five-year plans, funding was allocated for the development and strengthening of state public health engineering departments. In recognition of the progress made, states were granted financial authority in 1968 to sanction rural water supply schemes (subject to defined limits). During this fifteen-year period, the program sought to support local community development and improve the welfare of backward classes. Rural water supply schemes were expanded to include small towns with populations less than 20,000, and priority was given to problem villages, where the scarcity of drinking water was deemed particularly severe.

The Ministry of Water Resources drafted a National Water Policy in 1987 to guide the planning and development of water resources throughout the country. This policy included a number of recommendations, which were subsequently issued by various state secretaries. These recommendations generally focused on the need for intro-

ducing: (i) water resource management and according domestic water supply the highest priority; (ii) design standards for groundwater structures to protect groundwater sources; (iii) water quality monitoring and mapping; and (iv) data management and evaluation.

The national policy guiding the rural water supply and sanitation (RWSS) sector today is contained in the Eighth Five-Year Plan (1992–97), which states: "Safe drinking water supply and basic sanitation are vital human needs for health and efficiency [given that] death and disease, particularly of children, . . . and the drudgery of women are directly attributable to the lack of these essentials." High priority was given to serving villages that did not have adequate sources of safe water (defined as more than 10 liters per capita per day-lpcd) and to improving the level of service for villages classified as only partially covered (10–40 lpcd). New guidelines for sanitation issued in June 1993 allowed a broad range of technology (direct and indirect

<sup>2</sup> This report is one of five reports undertaken jointly by the Government of India and the World Bank, under the India — Water Resources Management sector review program. The other four reports cover: (i) the irrigation sector, (ii) the urban water supply and sanitation sector, (iii) groundwater regulation and management, and (iv) intersectoral allocation, planning and management. A consolidated report covering these five subject areas of the water sector has also been prepared.

### Box 1.1. Maharashtra Groundwater Act

The Maharashtra Groundwater Act was developed in 1993 but was not officially endorsed and implemented until November 1995. The Act seeks to regulate groundwater exploitation to protect public sources of drinking water. The Act comprises: (i) regulations to register all public drinking water sources in a village; (ii) regulations and guidelines to apply for permission to sink a well, including measures to protect public sources of drinking water (and an area 500 meters from drinking water sources); (iii) regulations to declare water scarce areas and over-exploited watersheds, including measures to protect public sources of drinking water within such areas (through control of withdrawal from existing wells); and (iv) procedures to verify applications for new wells in over-exploited watersheds.

The development and implementation of the Act provides an initial legislative framework for protecting groundwater sources in Maharashtra. The Act, however, does not address comprehensive management needs. Although it does not preclude integrated water management, the Act neither promotes it. Water-logging, water quality, water pollution, end-use efficiency, allocation and environmental considerations, represent equally important challenges that will have to be addressed in the next revision of the Act.

single-pit, double-pit, and VIP latrines) and abolished the provision of subsidies to households above the poverty line. Households below the poverty line would continue to receive a subsidy of 80 percent.

The Eighth Five-Year Plan also identified several points of emphasis, these being that: (i) water should be managed as a commodity in the same manner as any other resource; (ii) the delivery of water services should be based on the principle of effective demand and should correspond to the standard of service that users are willing to maintain, operate and finance; (iii) local bodies (i.e., the panchayat raj institutions) should be responsible for operating and maintaining the system installed; (iv) local bodies should be free to levy and raise appropriate user charges for drinking water and sanitation services, undertaking operations and maintenance if not further investment, and be self-sustaining; (v) the private sector should be encouraged to construct and maintain schemes to the maximum extent feasible; and (vi) appropriate links should be forged between water supply and environmental sanitation.

These points address the challenges that have emerged in the sector. Moreover, the Eighth Five-Year Plan specifically emphasized the desirability of adopting an integrated approach to planning and implementation, which entailed the provision of primary health care, potable water, women's welfare, immunization and sanitation facilities, all in collaboration with local administrations and user communities. Technical support needs of local administrations and user communities were to be provided by district administrations.

Along with the National Water Policy and the recommendations of the Eighth Five-Year Plan several states

(Gujarat, Kerala, Maharashtra, Orissa and Tamil Nadu) have formulated their own water policies. Other states, in particular Andhra Pradesh and Rajasthan, are in the process of preparing their state water policies. Although a national or state water policy would be an important first step, the states will also need enabling legislation to facilitate implementation of the policy. One key piece of legislation would be for the regulation and management of groundwater resources (Box 1.1 summarizes by way of example, Maharashtra's Groundwater Regulation Act). Legislation on its own without the concurrence of the user communities, however, will not be effective (GOI–World Bank, 1998b). The several existing pieces of groundwater legislation in India, for instance, have had limited if any impact due to lack of acceptance by users. The passage of similar legislation by other states has met strong resistance from users. By contrast, the recent approach taken by West Bengal to involve user communities incrementally in regulation and management on a pilot basis, has led to greater understanding and acceptance by users of the need for such regulatory measures to ensure sustainability of resources. With such piloting and revised approaches now recommended by GOI–World Bank (1998b), the passage and adoption of groundwater legislation will now be easier.

### Sector developments, achievements and issues

#### Programs

Historically, most rural drinking water in India has been supplied outside the government's sphere of influence or responsibility. Community-managed open wells and

private wells, tanks, ponds and small-scale irrigation reservoirs, have been and continue to be the main source of rural drinking water. The first government-installed wells appeared in the 1950s as part of a policy to meet basic needs for drinking water. Since then, public service has increased, and the involvement of users and communities in rural water supply has decreased. The central government has played an important role in setting standards and providing funds and technical assistance for the sector. In 1972–73, the Accelerated Rural Water Supply Program (ARWSP) was initiated by the center to channel funds directly to the states. The purpose of the ARWSP was to provide water to problem villages inhabited by tribal peoples, harijans and other so-called backward classes. Subsequently, the 20–Point Minimum Needs Programme was established in 1975 to replace the ARWSP and give highest priority to problem villages.

The central government reintroduced the ARWSP in 1977–78, this time with funds provided by state administrations through the Minimum Needs Programme. These two programs sought to ensure that all rural areas received a minimum provision of safe drinking water. National norms were established defining the basic water requirement as 40 litres per capita per day (lpcd), with certain criteria for distance and number of persons per installation. Safe drinking water was defined as being free from biological and chemical contamination. These norms continue to guide both programs today, by determining the selection of villages or habitations that are eligible for government funds. With the Sixth Five-Year Plan (which coincided with the beginning of the International Drinking Water and Sanitation Decade in 1980), India deepened its commitment to rural water supply and sanitation. Prior to 1985, both rural and urban WSS were handled by the Central Public Health and Environmental Engineering Organisation in the Ministry of Urban Affairs and Employment, which provided state governments with technical support and advice. Thereafter, responsibility for rural water supply and sanitation became the responsibility of the Department of Rural Development under the Ministry of Agriculture.

The Central Rural Sanitation Programme was launched in 1986, with matching funding provided through the state's Minimum Needs Programme, and the National Technology Mission was established within the Department of Rural Development with the express purpose of providing

states with technical and scientific assistance. The National Technology Mission was renamed the Rajiv Gandhi National Drinking Water Mission in 1991, and was charged with covering in the most cost-effective manner, the remaining not-covered villages before the end of the Eighth Five-Year Plan. The Rajiv Gandhi Mission sought to develop replicable models for rural water supply through 55 intensive area-based projects (or mini missions) and five programs (or sub-missions). These programs tackled quality problems of excessive fluoride, iron, and brackishness and infestations of guinea worms, and promoted the conservation of water and recharge of aquifers. The 55 mini missions were concluded in early 1994, but some of the sub-missions, notably those experimenting with the application of technology, are still ongoing.

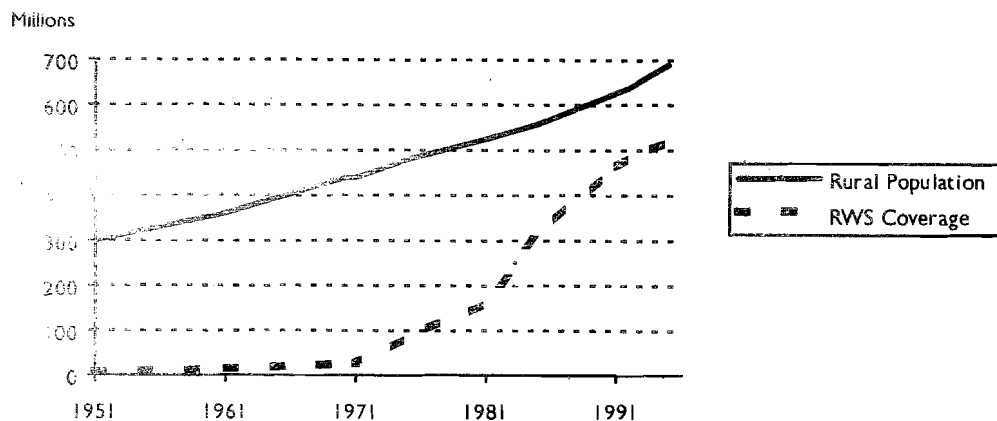
### Coverage

According to the Rajiv Gandhi Mission, access to public water supply by 1995 had been provided to 75 percent of the rural population (520 million people) since the first national water supply program was launched in 1954 (World Bank, 1996a). From 1954–55 through 1984–85 an additional 8.5 million persons in rural areas were served each year.

Increased investment during the International Drinking Water and Sanitation Decade, coupled with a change to hand pumps fitted on tubewells and borewells, dramatically increased total coverage. During 1985–86 through 1994–95, an additional 22.4 million persons in rural areas were supplied with water each year, resulting in a decadal increase of 264 percent (Figure 1.1). These figures were estimated assuming "equivalent full coverage." The reality was that while 95 percent of the rural population had access to a safe source of water in 1994, only 52 percent were fully covered (i.e. that they received 40 lpcd or more) and 43 percent were partially covered (receiving between 10 and 40 lpcd). Only 5 percent of the rural population had no access to publicly supplied water or received less than 10 lpcd.

Although useful, national coverage rates mask significant regional variations. Eleven of the 25 states and seven union territories each have rural populations that exceed 25 million, and the rural populations in six states approach or exceed 50 million (1991 census, Table 1.1). Service coverage rates vary widely from state to state, with full coverage ranging from 7 percent in Kerala to 78 percent in Bihar. Partial coverage ranges from 3 percent in Punjab to 85 percent in

Figure 1.1. Rural Water Supply Coverage in India, 1960-95



Source: GoI, 1996; GOI, 1996.

The percentage of the rural population that is completely unserved is as high as 39 percent in Punjab and equal to or less than the national average of 5 percent, in 14 states and all of the union territories.

An impressive number of installations have been constructed. According to the Rajiv Gandhi Mission, 2.1 million hand pumps have been installed on drilled tubewells and borewells, and 116,000 mini and regional piped schemes have been constructed. Mini and regional piped schemes supply 1.5 million standposts and 4.3 million house connections. Installed piped water schemes range from technically simple mini-piped systems (that pump water from a nearby source of groundwater to a small holding tank serving individual houses with public taps) to technically complex large regional schemes (that treat and pump water to several villages from a distant source of surface water). In 1996 approximately 75 percent of the population receiving public water were served by hand pump technology, while 25 percent were served by piped water schemes (GOI, 1996).

Efforts to increase sanitation coverage have been less successful. The Eighth Five-Year Plan sought to cover 5 percent of the rural population with sanitation services by the end of the period, but even this modest target was not achieved. By 1996, less than 4 percent of the rural population was covered by sanitation services (Indian

Social Sciences, 1996). Current coverage-driven strategies with subsidies for rural latrines have shown poor results. The provision of alternative delivery systems must be explored, and in this context UNICEF's rural sanitary mart approach holds promise (see Box 1.2). The private sector, with NGO assistance, could undertake all aspects of rural sanitation delivery. If necessary, central or state funds could be used to provide incentives or directly support their participation.

### Water Quality and Health

Water quality issues are gaining recognition as groundwater depletion worsens. The level of natural contaminants such as fluoride and arsenic, and chemical pollutants such as pesticides and insecticides, is high and rising. The lack of reliable data, however, makes it difficult to appreciate the magnitude and impact of the problem.

The GOI (1994b) Validation Survey reports that 142,000 habitations (70 million persons, assuming an average habitation of 500 persons) consume water that has excessive quantities of fluoride, iron, nitrate, arsenic and salinity. Unfortunately these results may not be fully reliable. In the case of one contaminant for instance, fluoride, its presence in groundwater was reported confirmed by standard laboratory tests, even though fluoride cannot be identified by sight or taste. The findings of the GOI (1997)

**Table 1.1. Population Not Covered, Partially Covered, and Fully Covered in India, by State, 1994**

State or union territory	Not covered		Partially covered		Fully covered		Total number
	Number	Percent	Number	Percent	Number	Percent	
Andhra Pradesh	1,066,336	2.19	21,583,212	44.26	26,118,513	53.56	48,768,061
Arunachal Pradesh	56,546	11.86	178,531	37.46	241,551	50.68	476,628
Assam	3,325,613	14.23	9,757,953	31.70	10,275,471	34.00	23,359,037
Bihar	2,328,623	3.12	12,441,909	18.26	55,377,470	78.62	68,148,002
Goa	35,640	5.00	402,814	56.52	274,088	38.47	713,542
Gujarat	367,391	1.30	9,123,206	28.72	22,795,749	69.98	32,286,346
Haryana	0	0	6,197,228	51.22	5,902,555	48.78	12,099,783
Himachal Pradesh	338,251	6.80	1,983,700	39.88	2,651,762	53.32	4,973,713
Jammu/Kashmir	360,426	8.06	2,585,877	57.84	1,524,871	34.10	4,471,174
Karnataka	927,565	2.69	18,544,599	53.70	16,014,821	48.00	35,487,085
Kerala	2,240,255	17.61	9,617,820	75.73	84,800	0.66	12,942,875
Madhya Pradesh	2,756,294	53.1	24,069,536	46.40	25,049,313	48.40	51,875,144
Maharashtra	405,984	0.83	15,887,754	32.29	32,914,024	66.89	49,207,762
Manipur	87,819	6.65	901,124	68.28	330,801	25.07	1,319,744
Meghalaya	211,518	14.78	424,804	29.68	794,921	55.54	1,431,243
Mizoram	6,408	1.22	444,269	84.57	74,643	14.21	525,319
Nagaland	175,991	23.03	456,735	59.76	131,614	17.22	764,340
Orissa	1,626,937	5.76	15,504,462	54.89	11,116,224	39.35	28,247,623
Punjab	5,643,498	38.66	465,904	3.19	8,487,588	58.15	14,596,990
Rajasthan	2,171,945	6.45	13,356,271	39.69	18,126,669	53.86	33,654,885
Sikkim	8,733	2.53	266,936	77.28	69,744	20.19	345,413
Tamil Nadu	233,372	0.57	29,421,871	71.65	11,409,861	27.78	41,065,104
Tripura	327,416	15.25	977,848	45.54	842,075	39.21	2,147,339
Uttar Pradesh	5,312,459	4.91	63,324,968	58.57	39,475,932	36.51	108,113,358
West Bengal	2,543,906	5.49	26,490,487	57.19	17,286,829	37.32	46,321,222
Andaman and Nicobar	1,327	0.62	37,497	17.59	174,380	81.79	213,204
D and N Haveli	—	—	—	—	—	—	—
Daman and Diu	—	—	—	—	—	—	—
Delhi	4,000	0.39	259,881	25.63	749,946	73.97	1,013,827
Lakshadweep	0	0	51,620	99.88	61	0.12	51,681
Pondicherry	—	—	—	—	—	—	—
<b>Total</b>	<b>32,564,303</b>	<b>5.26</b>	<b>283,758,818</b>	<b>45.81</b>	<b>303,105,720</b>	<b>48.93</b>	<b>619,434,854</b>

— Not available.

Source: GOI, 1994b.

Ground Water Sub-Group likely provide a more accurate picture of the problems affecting the quality of groundwater, this being that: (i) arsenic affects drinking water in West Bengal (estimated at 1,000 habitations or 500,000 persons); (ii) fluoride levels are high in Andhra Pradesh, Gujarat, Haryana, Karnataka, Punjab, Rajasthan, Tamil Nadu, and Uttar Pradesh (affecting 28,000 habitations or 14 million persons); (iii) iron levels are high in the northeastern and eastern parts of the country (affecting 58,000 habitations or 29 million persons); and (iv) salinity is high in Gujarat, Haryana, Karnataka, Punjab, Rajasthan, and Tamil Nadu.

Water quality concerns clearly have serious implications for the supply of rural drinking water and are important determinants of public health. Although several studies and pilot programs (sponsored by both the government and various external funding agencies) are under way, proposed solutions have had mixed success. Technologies developed and tested to remove fluoride and iron have shown satisfactory results in a laboratory environment. The complexity, high cost and inconvenience of these technologies, however, have constrained their implementation and sustainability. In general, government-financed rural sanitation programs have been poorly integrated in rural water supply programs, despite the stated policy. At the field level, rural water supply programs are not integrated with sanitation, nor are they integrated or coordinated with primary health care or education programs. The basic-needs approach, which spreads resources thinly to achieve coverage for all rather than quality and adequate water for some, should be reviewed because it may not optimize the potential health benefits that could be achieved by reducing waterborne or water-related diseases.

From a public health perspective India is in a transition phase. Some successes have been achieved, such as the notable achievement of eradicating guinea worm, mainly through a program that protected open dug wells. Other risks associated with bacteriological contamination and epidemics, though decreasing, are still relatively high. In addition, new risks are emerging from the rise in wastewater production (and its inappropriate or inadequate disposal) that accompanies the increased coverage and service levels. Environmental sanitation is essential for minimizing the vector-borne diseases that thrive in stagnant waters. India's RWSS programs in general have neglected environmental **sanitation** until recently, although many donor-assisted

programs have included this component. Integration of these programs is a must.

### User Satisfaction

Studies to determine whether consumers are satisfied with existing public RWSS services are rarely conducted. Although some donor-assisted programs have conducted utilization and functionality studies, these focus mainly on the knowledge, attitudes and practices of users rather than their satisfaction with existing services. Indirectly, these studies show that several variables affect user satisfaction with government provided services in rural areas: distance to and ease of access to services, quality and reliability of alternative sources, hours of service, and time between repairs. Users who are satisfied with government provided water do not necessarily use it for drinking and cooking if alternative traditional sources are easily accessible and more convenient. As iron and salinity levels rise, for instance, the use of public water for drinking and cooking decreases proportionally, subject again to the availability of alternative sources.

User satisfaction with sanitation facilities or displeasure at the lack of facilities, are typically correlated with demand for household latrines. The latter depends on population density, access to open space, and cultural and social factors. Where access to sanitation is accompanied by intensive information and health education campaigns, one usually finds that demand for sanitation facilities, use rates and also satisfaction are generally high, at around 80–90 percent. Where support for such campaigns is lacking, use rates can be as low as 10 percent. One can infer that demand and hence user satisfaction for sanitation facilities in India is very limited, given the abysmally low coverage rates.

### Protection of Water Sources

Drinking water for rural households is facing increasing competition. Approximately 90 percent of India's rural population rely on shallow or deep groundwater aquifers for drinking water. Whereas domestic use accounts for only 5 percent of total groundwater abstraction, irrigation accounts for almost 90 percent and industry for the remainder. The recent expansion and development of the agricultural sector have swelled the demand for groundwater-based irrigation. Groundwater currently provides half of the water used for irrigation and is abstracted from more than 15 million wells. Between 1951 and 1993, the estimated agricultural area

served by groundwater irrigation expanded from 6.5 million to 35.4 million hectares, an average annual increase of almost 13 percent.

The rapid development of irrigation is depleting groundwater resources, resulting in the need to replace dried up sources of drinking water. While in the aggregate only an estimated 30 to 35 percent of the potential groundwater resources are being exploited, increasingly more areas at regional and local levels are facing a scarcity of groundwater for domestic uses. In 144 districts in 10 states, groundwater is declining because the rate of withdrawal exceeds the annual recharge (Aims Research, 1996). Government agricultural subsidies exacerbate the situation by encouraging greater withdrawals than otherwise. Highly subsidized electricity tariffs and favorable investment terms offered for well construction have led to an indiscriminate and disproportionate abstraction of groundwater for irrigation. Without a change in government policy and intervention, the situation is likely to deteriorate even further.

In Haryana and Punjab, irrigation absorbs almost all of the potential groundwater, and exploitation rates are also high in Gujarat, Karnataka, Maharashtra, Rajasthan, Tamil Nadu, and Uttar Pradesh. The Central Ground Water Board classified 6 percent of all administrative blocks as "dark" in 1995, meaning that groundwater abstraction exceeds 85 percent of total annual recharge. This is an increase of 34 percent over the 1991 estimate of 4.5 percent, or an annual average of 6.8 percent. Using these estimates as a rough approximation of the affected population, as many as 37 million people were affected in 1995, an increase of 2.6 million persons each year since 1991. In 1994, the Rajiv Gandhi Mission found that a seasonal or permanent fall in the water table was evident in one-third of the habitations surveyed. This clearly has serious social, financial and institutional implications for the rural supply of drinking water, especially where alternative supplies require a more complex and expensive technology.

## **Contributions of agencies outside government**

### **Non-Governmental Organizations**

NGOs have played a significant role in the RWSS sector in India over the past three decades. They have exhibited comparative advantages that other organizations lack. These include the capacity to: (i) reach the rural poor and remote

areas; (ii) promote local participation; (iii) operate at low costs; and (iv) adapt and be innovative when needed (Cernea, 1988). The initial involvement of NGOs in the sector came in the sixties with the famines in Bihar (1964) and Maharashtra (1969), when several NGOs (Action for Food Production (AFPRO), Action for Agricultural Renewal (AFARM), and others) were formed to provide technical services for compressed air-driven drilling for hand pumps. In this early period, NGOs functioned as (drilling contractors to state governments and donor-financed programs. The efforts of these NGOs convinced the donor community and the government to invest in hand pump programs for drinking water, especially in the chronically drought-prone areas of the country. NGOs like Swissteco and ELC Water Development Project, introduced new drilling technologies and integrated drilling activities with geophysical site investigations, yield testing, water quality testing and data banking.

The majority of NGOs contracted by the government come under the umbrella of the Council for Advancement of People's Action and Rural Technology (CAPART), because government financial regulations generally preclude direct contracting of NGOs. CAPART has had mixed experience with NGOs. On the positive side, NGOs have been able to penetrate remote areas, negotiate more favorable drilling prices (because they are not encumbered by government procedures), select sites without succumbing to local pressures, mobilize users and raise contributions (Daw, 1996). On the less positive side, most NGOs have been small-time contractors with no interest in working with people. Many have had little technical or management capacity and have used substandard materials, and in 1995 CAPART black-listed more than 500 NGOs for substandard work and financial irregularities.

Today, NGOs are involved in rural water supply activities in several states to varying degrees depending on their presence. Punjab has very few NGOs, whereas Maharashtra, Rajasthan, and Uttar Pradesh have a proliferation of NGOs, mostly in production-related fields. The most successful involvement is within donor-assisted projects where the institutional context is conducive, such as the World Bank funded project in Karnataka. The recently commenced World Bank-assisted Uttar Pradesh RWSS project, which has major NGO and user involvement aspects, is also worth watching. In these projects, NGOs have been used mostly as an intermediary between the community and the water agency, facilitating

project activities related to community mobilization, cost sharing, health education, and other non-technical activities. Other noteworthy activities are in the area of watershed development, where NGOs have taken a holistic approach to water resources development in areas as far-flung as the Gangetic delta of West Bengal and the Himalayan foothills. Out of a desire to develop water resources, a large number of NGOs founded the National Association for Water Resources Development Agencies (NAWDA) in 1982.

The Sholapur hand pump was developed by an NGO and later improved to become the India Mark II hand pump, one of the best, cheapest, and certainly one of the most commonly installed hand pumps in the world (Daw, 1996). When large-scale manufacture of the India Mark II was contemplated, NGOs moved away from the manufacture of hand pumps and concentrated instead on maintenance. Subsequently, NGOs in Orissa, Rajasthan, and elsewhere established one-, two-, and three-tier maintenance arrangements, aimed at decentralizing maintenance capability. NGOs participated in the formation of user groups and the provision of training to village artisans. Today, 29 independent hand pump maintenance projects with the active involvement of NGOs are supported by UNICEF.

Recently, state governments have been turning to NGOs for assistance in sanitation delivery. Central and state sanitation strategies explicitly call for NGO involvement in efforts to create awareness and demand and to promote health and hygiene. However, with the exception of a few success stories, as in Gujarat and West Bengal (in Safai Vidyalay, Ahmedabad, and in Midnapur, under the Ramakrishna mission), most sanitation programs have met with little success.

The relations between governments and NGOs need closer review. By and large, NGOs are reluctant to work in government schemes, considering government procedures too cumbersome. These same reservations extend to panchayat raj institutions, which NGOs consider to be inflexible adjuncts to state governments. The most common problem is that the very qualities that make NGOs attractive to donors—their capacity to organize and work with people—delay disbursement and project delivery. As a result, many donors are exploring possibilities for allocating only the responsibility for hardware (i.e. technical and construction activities) to NGOs. In the Uttar Pradesh RWSS project funded by the World Bank, for instance, the government agency retains a supervisory and disbursement role through

the project management unit but has no direct role in service delivery. Services are delivered by support organizations (NGOs, community-based organizations and the private sector) working in partnership with communities. This project though showing initial promise, is just beginning, and assessing the efficacy of the approach would be premature. However, such an approach could succeed if the project management unit supports participatory projects and collaborative decision-making, and if participating NGOs have the capacity and interest to deliver services, plus a willingness to meet the funding agency's requirements (for an example of how to assess NGOs on a sectoral or sub-sectoral basis, see World Bank, 1996b).

NGOs can provide an alternative to the public provision of services, freeing government agencies to concentrate on activities that they can and should do, such as formulating water policy, defining cost recovery mechanisms and establishing water quality standards. NGOs, however, may not always be able to undertake these new roles even if the public sector agrees to allow them to operate. Recommendations for greater NGO involvement have therefore to be made with circumspection, realism and based on local NGO capabilities.

### The Private Sector

Private initiatives continue to drive the construction and maintenance of traditional open wells and household latrines. Nationwide, the number of privately constructed latrines is almost twice the number constructed through government programs. The private sector is involved in the supply of materials and construction and, to a very minor extent, maintenance. Private consulting firms (and NGOs) are also engaged on a very limited basis by state sector agencies. Although operations are performed almost exclusively by government agencies, private sector involvement in construction under government contracts constitutes a substantial part of capital investments. Procurement of materials and construction services from private firms amounts to more than two-thirds of annual investment in the sector.

Borewell drilling and hand pump installation have been dominated by state water agencies. However, the private sector has been involved in groundwater development, and a huge network of private drilling contractors has been meeting the large demand for irrigation tubewells.



Qualified private drilling contractors should be more involved in the future, and the government should focus on groundwater investigations and on monitoring the quantity and quality of water.

The private sector's involvement in operations and maintenance is still very limited. Maintenance of installations is considered a government responsibility and generally is financed from central and state government allocations. Preventive maintenance has been neglected, and repairs have been carried out by government agencies. Local private contractors are a viable alternative to the public agencies and already have a presence in rural areas. Local private mechanics for instance, provide maintenance and repair services for farmers' irrigation tubewells. In line with the transfer of responsibility and ownership of schemes to local administrations and user communities, gram panchayats and village water supply committees must be strengthened so that they can request and select maintenance and repair services as needed, either from government agencies or from locally qualified private contractors.

For regional schemes, operations, maintenance and management are typically undertaken by state agencies, though operations and maintenance are not their primary responsibility. This is reflected in the allocation of both funds and staff. The benefits of proper maintenance are less visible and tangible than those of constructing new schemes. Regional schemes are expected to become more common in the future and alternatives to the present, often inefficient, system of management should be considered.

Although consulting firms have rarely been used, they could play a role in RWSS. Relevant skills and resources from universities, research institutes, and NGOs could supplement or even substitute the current functions of public agencies. An entry point could be multi-disciplinary fields-management, community participation, and rural water supply integrated with sanitation and health education-in which government agencies do not have in-house capacity. More investment is also needed in staff training and the supply of spare parts. Instead of building up this capacity in-house, it would generally be more cost- and time-effective to utilize the services of private consultancy firms. Private stakeholders-contractors, mechanics, masons suppliers and consultants-should be encouraged to explore the opportunities for participation in RWSS services, enabling government agencies to concentrate on strengthening the legislative and

regulatory framework, policy making, overall sector planning, and monitoring and evaluation.

### External Development Agencies

Several external multilateral and bilateral agencies provide assistance to the RWSS sector in India. The principal external support agencies include the bilateral agencies of the Netherlands, Denmark, Germany (KfW), and the United Kingdom (Dept. for Int'l Development, formerly the Overseas Development Agency) and multilaterals such as the World Bank, UNDP, UNICEF and the European Union. External donor assistance accelerated at the beginning of the International Drinking Water and Sanitation Decade, and during that period donor assistance accounted for almost 6 percent of total sector investment. Today development assistance constitutes only half that level.

According to information from the Rajiv Gandhi National Drinking Water Mission (GOI, 1994a) 12 states have received donor support, with loans from the World Bank and KfW constituting more than half of all financial assistance to the sector. Approximately 75 percent of the external financial resources have been allocated to projects or programs in four of the 12 states receiving assistance: Karnataka, Maharashtra, Rajasthan, and Uttar Pradesh. The development of the assistance provided by the major bilateral and multilateral donors is outlined only briefly here.

The central government has put forward three considerations for donors' regarding their assistance to India's RWSS sector: (i) rural water supply and sanitation should be considered as part of the social rather than productive sector, (ii) allocations to the sector should be increased and (iii) assistance should shift toward national program- focusing on institutional capacity building at all levels (Narayan, 1995). The main role of external support agencies, however, has been to provide demonstration and experimentation at the project level. Until now, most agencies have performed this role, with variations in the degree to which they have followed government policies or experimented with new approaches. Especially recently, most donor-assisted projects have emphasized innovative features as conditions for lending, such as user participation, cost sharing and cost recovery. They have also adopted an integrated demand-oriented approach to sector operations. A fundamental objective for recent Bank-assisted projects, for instance, is to make local institutions and communities

### Box 1.2. Sanitation Villages and Sanitation Gram Panchayats

In Midnapur, West Bengal, the Integrated Sanitation Project is changing the habits of people from open defecation to use of sanitary latrines (RWSSG-SA/UNICEF, Integrated Sanitation Project Midnapur, CASELET 2 Dissemination Notes). Project planners sought to create awareness and then presented a range of technical options from which to choose, enabling people to make informed choices. Subsequent arrangements were made for producing, delivering and installing hardware, and for catering to administrative and accounting requirements. No subsidies were envisaged or provided, even for the poor.

Today, 127 villages and 3 gram panchayats in Midnapur are fully covered with household latrines and declared to be sanitation villages and sanitation gram panchayats. This is a matter of extreme pride for them. An anecdotal report indicates that parents would prefer to give their daughters in marriage to such villages.

responsible for water supply and environmental sanitation by adopting an integrated demand-oriented approach with community participation, capital cost sharing and cost recovery as basic components.

UNICEF has been active in India since the late 1950s and, with field staff in 10 states, has the most staff involved in the RWSS sector. In the past, UNICEF provided drilling rigs and hardware for the extensive hand pump programs. It now focuses on community development activities. Today, UNICEF plays a major role in advocating policy development and reform, and serves as an intermediary between NGOs and the central and state governments. It also supports a broad range of pilot activities that serve major demonstration objectives. UNICEF's comparative advantages include its long presence in India and the continuity of its program.

UNICEF supports one of the most sustainable alternate delivery systems for sanitation. In West Bengal, the "Midnapur Model" has established rural sanitary marts —

a network of private production centers and retail outlets for sanitation products, coupled with publicity and social marketing (see Box 1.2). The strategy is a first step in the shift away from a subsidized government program. The approach is to have the private sector create retail marketing outlets that offer a wide range of sanitation products, including a package for the promotion of personal hygiene practices. The Midnapur project is based on the following key underlying assumptions: (i) resources for construction have to come from the users themselves; (ii) the emphasis is placed on advocacy to create demand for services; (iii) a focal point per village to serve as a responsive repository of information and liaison; and (iv) substantial resources are to be invested in training. Both technical and organizational or motivational training were envisaged, focusing on orientation training for youth clubs, panchayat members and village leaders. Training was also provided to village masons, drilling mistries, and women caretakers of hand pumps (see Box 1.3). The Midnapur case demonstrates that with

### Box 1.3. Women Masons

In Kerala and India as a whole, many poor women work as unskilled laborers in the construction industry, while men work as skilled masons (Kurt et. al, 1996). When the rural sanitation program in Kerala began with assistance from Danida and the Dutch, the lack of local masons slowed the pace of the program. Unskilled rural women from two panchayats were selected to learn masonry. Training focused not only on construction but also on financial management and cooperative work. The women proceeded to prove their capability in making cement bricks, constructing double-pit latrines, and generally extending their expertise into building construction.

In 1994, women masons constructed more than 1,000 latrines and produced more than 25,000 bricks. In the words of a 40-year-old participant of the program, "I was very puzzled and reluctant, and doubted the ability of the women when I first saw them. Once the work was over and found to be really well done, I breathed with ease. Nowadays when the women masons visit any areas where they are working, they are considered and treated as important persons."

sufficient promotion, even the poor can finance their own latrines. The central government has expressed interest in this approach, and some states (such as Uttar Pradesh) have already adopted it.

The Housing and Urban Development Corporation (HUDCO), which supports the construction of sanitary latrines as part of its urban housing program, is proposing to set up a network of district intermediate technology centers, to produce construction materials and train masons and other skilled persons. These will be expanded in time to each block. In the context of initial private sector reluctance, these centers could produce and supply a range of low-cost to more-expensive options keeping in view the possibility of functional upgrades. With assistance from UNICEF, various types of latrines costing from Rs. 300 to Rs. 3,600 have been developed. HUDCO via soft loans, could further assist in setting up private sector or NGO-operated sanitary marts, complete with marketing and publicity.

Support from Denmark and the Netherlands to the RWSS sector in India date from the early 1970s, initially focused mainly on technical support to identify problems and develop solutions on a pilot basis. Since the mid-1980s projects have been directed toward sustainable development and interventions, with an emphasis on non-technical aspects such as community involvement, cost recovery, health education and institutional building. Recent pledges of Danish assistance to integrated RWSS programs in Karnataka and Tamil Nadu, for instance, comprise programs that emphasize both a demand-driven approach and institutional

strengthening, with involvement of communities in all stages of project implementation (including cost sharing and cost recovery).

The impact of donor assistance on the policy, strategy and approach of the central and state governments is uneven. While progress on strategy and approach at the state level has been limited, it is clear that external assistance on project bases and for policy strengthening have influenced the development of the comprehensive policy statements presented in the Eighth Five-Year Plan. Other more discrete impacts have been achieved. In Karnataka, the Danish-assisted RWSS project resulted in a government order enforcing a 250-meter zone to protect wells containing drinking water. UNICEF's development of hand pump technology and marketing resulted in broad adoption of the India Mark II hand pump as the national standard. In Kerala, the Dutch and Danish-assisted project developed an effective and workable approach and a detailed methodology for delivering sanitation. Low-cost sanitation is now a priority in local development plans, with 15–20 percent of income earmarked for sanitation.

The experience gained from almost all donor-assisted projects shows the importance of emphasizing capacity building of stakeholders and other actors in the sector. However, changing from assistance for individual projects to long-term support for institution strengthening has not been firmly established among single donors, with the possible exception of UNICEF. In India, a major constraint is the limited financial role and limited leverage of donors.



# Institutional Framework and Sustainability

The institutional structure of RWSS in India is a complex one. It involves many institutions at national, state and local levels, often with unclear or overlapping responsibilities. Sector institutions are typically overstaffed and underskilled, which hampers them from effectively carrying out their responsibilities. Though in a few cases in some states user communities and the private sector are involved to a degree in decision making and implementation, the norm is one of public sector dominance (at higher levels of government, i.e. state and to some extent national rather than local administrations) and the presence of a supply-driven approach. The current institutional arrangements are widely accepted as inadequate to address the needs of user communities; however, only partial reforms have been identified to date to resolve the constraints. Experience internationally as well as in pilot projects in India demonstrate that better coverage of the rural population, and improved quality of service, can be achieved at lower cost through demand-oriented approaches and involvement of user communities in sectoral decision making, financing and implementation. The challenge is to establish the arrangements that will enable such approaches to emerge. These will inevitably entail a devolution of responsibilities to local governments and communities.

## Role and effectiveness of government agencies

### National Level

At national level, the Rajiv Gandhi National Drinking Water Mission (hereafter Rajiv Gandhi Mission or RGNDWM) formulates guiding policy, sets standards, and provides funds and technical assistance to the states. It allocates funds under the Accelerated Rural Water Supply Program (ARWSP) representing about 40 percent of total government financing to the RWSS sector, and supervises the Central Rural Sanitation Programme representing 30 percent of total RWSS financing. Despite its prominent role, the Rajiv Gandhi Mission faces several constraints in fulfilling

its mandate and applying leverage consistent with its financial clout.

First, the Rajiv Gandhi Mission has had limited influence to ensure consistency of state policies and strategies with the national policy. Regarding for instance, one component of the national strategy, Information Education Communication (IEC) strategy for undertaking public awareness campaigns, no state has yet implemented an integrated and participatory system of rural water service delivery nor constituted IEC cells within the state water agencies. Because provision of central funds to the states is not contingent on adoption of these strategies, target-driven norms continue to dictate water supply implementation, and latrines are constructed without regard to

creating awareness of their benefits or monitoring actual use. In the case of latrines, subsidies have weakened the initiatives in demand-driven sanitation programs such as in Midnapur, West Bengal, that had successfully pursued a strategy devoid of subsidies.

Second, the Rajiv Gandhi Mission itself, in allocating funds in the past, placed priority on coverage targets over and above sustainability of either the installation or the source (see GOI, 1994a). The Mission set the target to cover 3,000 non-covered villages and 150,000 partially-covered villages including hamlets by the Eighth Five-Year Plan, providing at least one spot source per 250 persons within a distance of 1.6 kilometers. An additional objective was the eradication of all guinea worm problems. The latter objective has been achieved, but a staggering number of not-covered and partially-covered villages are still without minimum coverage.

This relates to a third aspect, which is the key monitoring role played by the Rajiv Gandhi Mission. The methodology adopted for determining coverage by safe water has been questioned by the mission itself. Sanitation coverage has likewise been questioned, because the mission monitors performance only under the Central Rural Sanitation Programme and to some extent the Minimum Needs Programme, although latrines are being constructed under several other government programs as well as under donor-assisted programs. Given the practical difficulties of having a national agency in charge of monitoring at the field level (the Rajiv Gandhi Mission cannot assess the number of latrines constructed without subsidies), the Mission recently recommended devising a decentralized system of monitoring through panchayat raj institutions (GOI, 1996).

Fourth, given the size of the country and the diversity of issues confronting each state, a single professional covering several states, as is presently the case at the Mission, can do little more than communicate sporadically with the state-level engineering departments. At present, core staff have mainly technical backgrounds, and two consultants have been hired, one for human resource development activities and one for information education communication activities. There is currently no in-house capacity to operationalize the approach recommended in the Eighth and Ninth Five-Year Plans or provide guidance to states on the reform program. At the same time, insufficient use has been made of universities and the private sector to meet

skills needs, except for the hiring of a few short-term consultants in specialized areas.

A fifth and unfortunate lacuna is the lack of intersectoral coordination at the national level. Several cross-cutting issues (pollution of drinking water sources and overexploitation of groundwater, in particular) warrant better coordination with the Ministries of Water Resources, Forests and Environment, and Urban Affairs and Employment. Neither the proposed coordinating committee, nor the proposed interaction between the Central Ground Water Board and the Health Ministry for water quality surveillance, has materialized. The state advisory bodies have been constituted but have not gone beyond routine monitoring and procedural trouble-shooting, while district coordinating bodies have served only as conduits for central funds (GOI, 1994a).

Today the Rajiv Gandhi Mission is reviewing its role and attempting to reformulate its presence along the lines of a center of excellence, to disseminate findings on: operations and maintenance; water quality; human resources development; information, education and communication; financing and cost recovery; technology options; research and development; water resources management; and health education. As such, the Rajiv Gandhi Mission is evolving into an applied research-cum-information establishment capable of culling out and disseminating technological and institutional best practices. It should begin to take a decisive role in pushing states to adopt the sectoral reform policies identified in the Eighth and Ninth Five-Year Plans and in this joint GOI–World Bank strategy document. Mere directives from the center are a poor source of policy changes. To this end, the center should begin to use financial conditionalities to motivate and support the states to implement the required reforms (refer Chapter 3).

### State Level

States have primary responsibility for provision of water supply to communities. Typically there are two types of state-level institutions which implement rural water supply programs: a public health engineering department under direct control of the state government; and an autonomous water supply and sanitation board. With the exception of some of the north-eastern states and union territories, which have either public works departments or irrigation departments handling rural water supply, most

states have separate public health engineering departments charged with planning, investigation and design.

In some states (such as Gujarat, Kerala, Maharashtra and Tamil Nadu) the WSS Boards have been constituted to handle urban and rural water (and one state, Uttar Pradesh, formed a corporation), following the Third Five-Year Plan recommendation to form statutory water and sewerage boards. These autonomous bodies were empowered to negotiate loans, investigate and design works, and supervise construction of works. Though they are separate and autonomous entities, the boards are subject to state intervention on cost recovery and personnel management issues. Financing is overwhelmingly from the state government: for rural schemes, all capital costs and a substantial share of recurrent costs are covered by state grants; for urban schemes, local administrations are required to reimburse the boards for the cost of preliminary investigations as well as 12–15 percent for the cost of design and supervision, with shortfalls on recurrent costs borne by the state.

With the recent move toward decentralization, a mix of agencies have evolved, including state public health engineering departments, state boards and district engineering agencies. The institutional arrangements in 13 states are presented in Table 2.1. In each agency, functional responsibility is ascribed according to the nature of the water source (surface or groundwater), the type of scheme or technology (hand pump or power pump), the function performed (investigations and drilling, construction or operations and maintenance), and location (urban or rural). In some states, such as Maharashtra, the organizational matrix is complicated. The Groundwater Survey and Development Agency is responsible for hand pump programs, the Maharashtra Water Supply and Sanitation Board is responsible for piped water supply, the district is responsible for operating and maintaining all drinking water installations, and the Irrigation Department is responsible for drinking water sources downstream of command areas.

Despite the apparent organizational complexity, the national trend is to decentralize capital investment responsibilities to zilla parishad engineering departments at district and block levels, and operations and maintenance activities to district and, in many cases, gram panchayat levels. In Karnataka the state Public Health Engineering Department (PHED) consolidates, reviews

and makes recommendations on all water supply programs and is responsible for providing monitoring and technical support to the district engineering divisions that implement the schemes. The PHED also provides drilling services to the district, while the gram panchayats are responsible for operations and maintenance. Andhra Pradesh is the only state in which water supply and sanitation is the exclusive responsibility of the Panchayat Raj Engineering Department without technical oversight by the state-wide body.

### Local Level

Gram panchayats are the lowest tier in the local administrative framework and may be responsible for one or more villages or habitations. There are approximately 250,000 gram panchayats in India, each of which serves an average population of 5,000. Gram panchayats, however, vary substantially in size from state to state. In Kerala and West Bengal, gram panchayats are extremely large, with an average population of 21,600 and 14,800, respectively. In contrast, in Arunachal Pradesh they are quite small, with an average population of 700 (Oommen et. al., 1996). Table 2.2 provides the number and average population of India's districts, blocks, and gram panchayats by state.

Gram panchayats have the power to make by-laws and constitute statutory bodies with responsibility for handling government funds, collecting revenue and delegating responsibilities. This provides an opportunity for developing a working relationship between the elected body of local government and user committees or societies. Although, in principle, democratic representation would ensure community participation, in reality a number of problems must be addressed. Real community participation in decision making requires that the local community be active and informed so it can monitor and influence what the local government is doing. Especially when the local government is in a nascent state, several issues need to be addressed.

First, the Panchayat Raj Act is being implemented slowly, because it is subject to political negotiations in the states. Despite the provisions for including weaker segments of the community, social and cultural factors often restrict the voice and role of scheduled castes, scheduled tribes and women in local decision making. Second, the Panchayat Raj Act brings party politics down to the community level. Polarization and factionalism

**Table 2.1. Functional Responsibilities of Rural Water Supply Agencies in India, by State**

State	Key agencies	Rural water supply functional responsibilities
Andhra Pradesh	Panchayat Raj Engineering Department	Investigation, design, execution, operations, and maintenance
Assam	Public Health Engineering Department	Investigation, design, execution, operations, and maintenance
Gujarat	Water Supply and Sewerage Board	Investigation, design, and execution
Haryana	Public Health Engineering Department	Investigation, design, execution, operations, and maintenance
Karnataka	Zilla Panchayat Engineering Department	Investigation, design, and execution
	Panchayat raj institutions	Operations and maintenance
Kerala	Water Authority	Investigation, design, execution, operations, and maintenance
Madhya Pradesh	Public Health Engineering Department	Investigation, design, execution, operations, and maintenance
Maharashtra	Water Supply and Sewerage Board	Investigation, design, and execution (regional schemes, village schemes serving more than 2,000 persons)
	Groundwater Survey and Development Agency (Rural Development Department)	Investigation, design, and execution (village schemes serving more than 2,000 persons)
	Panchayat raj institutions	Operations and maintenance
Punjab	Public Health Engineering Department	Investigation, design, execution, operations, and maintenance
Rajasthan	Water Supply and Sewerage Board	Investigation, design, and technical sanctioning
	Public Health Engineering Department	Execution, operations, maintenance, and regional schemes
	Panchayat raj institutions	Operations, maintenance and spot-source schemes
Tamil Nadu	Water Supply and Drainage Board	Investigation, design, execution, operations, and maintenance technical assistance
	Panchayat raj institutions	Operations and maintenance
Uttar Pradesh	Jal Nigam Corporation	Investigation, design, execution (for all regions), operations, and maintenance (for regions not covered by Jal Sansthan)
	Jal Sansthan (District Engineering Section — Garwahl, Kumaon, Jansi regions)	Operations and maintenance (for specified regions only)
West Bengal	Public Health Engineering Department	Investigation, design, and execution
	Panchayat raj institutions	Operations and maintenance

Source: Ghosh et al., 1995.

make broader community participation difficult to attain and weaken the credibility of many gram panchayats. In the World Bank-assisted Uttar Pradesh RWSS project, only two out of 90 village water and sanitation committees chose the head of the gram panchayat as their chair. Third, the rules and regulations of the Panchayat Raj Act do not automatically ensure the involvement of all stakeholders, particularly rural women.

The block is the intermediate tier in the local administration framework. Although blocks did not exist in all

states prior to the 73rd amendment, they are currently being established nationwide. At present, there are approximately 5,000 block-level administrations nationally, each of which is responsible for an average population of 120,000. While blocks in the vast majority of states serve a population ranging between 100,000 and 150,000, in a few states, namely Andhra Pradesh and Arunachal Pradesh, they serve only 44,200 and 9,500, respectively (Oommen et. al., 1996). The district is the top tier of local government. There are approximately 500 districts



**Table 2.2. Number and Average Population by State Administrative Unit**

State or union territory	Rural population (millions)	Number			Average population		
		District	Block	Gram panchayat	District	Block	Gram panchayat
Andhra Pradesh	48.6	22	1,100	20,244	2,210,000	44,200	2,400
Arunachal Pradesh	0.8	12	79	1,158	62,800	9,500	700
Assam	19.9	23	199	2,486	866,300	100,100	8,000
Goa	0.7	2	*	183	345,000	*	3,800
Gujarat	27.1	19	183	13,256	1,424,400	147,900	2,000
Haryana	12.4	16	110	5,958	775,500	112,800	2,100
Himachal Pradesh	4.7	12	72	2,921	393,500	65,600	1,600
Karnataka	31.1	20	175	5,641	1,553,400	177,500	5,500
Kerala	21.4	14	152	990	1,529,900	140,900	21,600
Madhya Pradesh	50.8	45	459	30,922	1,129,800	110,700	1,600
Maharashtra	48.4	29	297	26,894	1,668,900	162,900	1,800
Manipur	13	3	9	166	443,800	147,900	8,000
Punjab	14.3	14	136	11,591	1,020,600	105,000	1,200
Rajasthan	33.9	31	237	9,185	1,094,800	143,200	3,700
Sikkim	0.4	4	*	148	92,400	*	2,500
Tripura	23	3	16	525	778,500	145,900	4,400
Uttar Pradesh	111.5	66	901	58,605	1,689,400	123,700	1,900
West Bengal	49.4	17	340	3,325	2,904,100	145,200	14,800
Andaman and Nicobar	0.2	1	n.a.	67	2,100	n.a.	3,100
D and N Haveli	0.1	—	—	—	—	—	—
Daman and Diu	0.1	—	—	—	—	—	—
<b>Total average</b>	<b>25.2</b>	<b>19</b>	<b>419</b>	<b>10,224</b>	<b>1,051,853</b>	<b>138,267</b>	<b>4,774</b>

\*Two-tier panchayat (district and gram panchayat).

— Not available.

Source: Institute of Social Science, Data Base and Information System. New Delhi.

nationally, serving an average population of just over 1 million. Districts vary between 2,100 persons in Andaman and Nicobar, 62,800 in Arunachal Pradesh, and 2.9 million in West Bengal (Oommen et. al., 1996).

Developing and strengthening the panchayat raj institutions and developing rural areas through local government are cornerstones of India's current policy. Initially, panchayat raj institutions were seen as vehicles for promoting democracy at the grassroots level. However, as macro planning strategies failed to address developmental needs across regions, sectors and economically

different sections of the population, panchayat raj institutions came to be seen as vehicles for providing more equitable local planning and area development. In 1978, the Mehta Commission recommended a two-tier structure, including the district and the mandal panchayat, which would represent a cluster of villages with a population ranging between 20,000 and 30,000. The commission also recommended making the district the primary unit of local government, where panchayat elections at both levels would encourage the official participation of all political parties. Three states, Andhra Pradesh, Karnataka, and West

Bengal, took steps to revitalize their panchayat raj institutions accordingly.

Constitutional amendments were proposed in 1989 and 1990 to establish local governments as the third tier of government nationwide. Neither of these amendments was passed. In December 1992, however, Congress finally passed the 73rd and 74th amendments to the Panchayat Raj Constitution Act. The 73rd amendment, which addressed rural panchayats, proposed a three-tier system of panchayat raj institutions: zilla parishads at the district level; taluk panchayats at the block level (although in some states block and taluks are not completely coincident); and gram panchayats at the level of a few villages. The 74th amendment, which addressed urban panchayats, proposed establishing a corporation at the state level constituted by municipalities, which in turn should be constituted by nagar panchayats as the lowest tier.

One of the most important provisions of the amendments was the delegation of power and responsibility to the panchayat raj institutions within the federal structure of the Constitution. State legislatures were empowered to provide the panchayat raj institutions with the power and authority necessary to enable them to function as institutions of local government. Responsibilities delegated under the 11th schedule of the constitution include overall responsibility for the preparation and implementation of plans for economic development and social justice. In rural areas, 29 subjects were added to the jurisdiction of panchayats, including responsibility for drinking water, minor irrigation, water management and watershed development.

Under article 243 (1), the state must constitute a finance commission to review and recommend measures for improving the financial position of panchayat raj institutions and enabling them to discharge their responsibilities. Finance commissions are expected to recommend an appropriate level of grant-in-aid, which is to be provided by both the central and state administrations. This will supplement the existing funds received from both central and state governments in conjunction with ongoing rural development schemes. Moreover, the panchayat raj institutions are authorized to levy and collect taxes, duties and administrative fees.

To date, the Panchayat Raj Act has been applied inconsistently across states. While some states have adopted its principles in their entirety, other states have ignored even

the major recommendations. Despite this variation, all states have passed the legislation needed to implement the amendments. All but three states have conducted elections for their panchayat raj institutions.

## Assessment of institutional performance

### Planning

Planning in India currently involves designing programs that meet coverage targets based on the government's norms of 40 litres per capita per day (lpcd) of safe water. With the assistance of district level agencies, the state water agency (either the public health engineering department or the water board) compiles a list of villages classified as 'not covered', 'partially covered' or 'fully covered'. Villages that are not covered or are considered problem villages receive first priority in the annual plans, while partially covered villages receive second priority. This classification process and its utilization are not without imperfections. During the Eighth Five Year Plan, for instance, 75,782 not-covered and 332,454 partially-covered habitations did not receive the minimum supply of water. The Ninth Five-Year Plan proposes to cover all uncovered habitations by 1997–98 and all partially-covered habitations by 2000.

The persistence of villages that are not covered or partially covered could be explained by a planning process which, as currently implemented, overlooks the need to provision for maintenance, rehabilitation and rejuvenation of existing facilities. The not covered category includes villages where schemes have fallen into disrepair, thus qualifying them for new construction. Poor assessment may mean, for instance, that costly piped water is provided to communities whose existing systems would need only minimum inputs to make them sanitary, while remote and poor areas continue without service. Moreover, coverage is provided primarily to main habitations while outlying hamlets, which generally house poorer and low-caste populations, are either not covered or poorly covered. A documented case study is that of eastern Uttar Pradesh (Pant, 1996).

At present, planning is supply-driven and neither takes into account user preferences (and ability to pay) for different levels of service, nor provisions for possible future demand arising from higher incomes and expectations. The lack of demand orientation constrains system performance and aggravates already inadequate service delivery to the

poor. In states such as Kerala, Maharashtra and Punjab for instance, severe under-estimation of demand for private connections has caused technical problems as increasingly more better-off households tap illegally into the under-designed systems. By drawing on water for higher per capita use levels, these households curtail quantities available to poorer households at the end of the pipeline.

At the block level the assistant executive engineer provides the first inputs for planning by verifying installations in the field and then applying a population criterion to determine the level of service for any one village or hamlet. For example, a habitation with more than 500 persons might qualify for a small power pump scheme, while a population of more than 1,000 might qualify for a piped water scheme with standposts. This accounting is limited to public sources. This assessment is then translated into a proposal for a new or augmented scheme with associated costs, which is then passed to the executive or superintending engineer for administrative approval. At this point, financial and technical considerations take over the planning process.

This approach has several constraints. Perhaps the most important is that it only assesses government installations, even though private and traditional wells may constitute the primary source of drinking water. Second, it is inflexible and does not lend itself to the consideration of alternative or appropriate designs. Third, it does not integrate water supply with environmental sanitation. Lastly, it has no latitude to accommodate the demands of users. These constraints are

due to the overriding strategy which bases planning on strictly followed water supply norms.

Despite recommendations for integration of water supply and sanitation, separate and distinct program funding makes it difficult for integration to be achieved. Central funding is through the ARWSP for rural water and through the Central Rural Sanitation Programme for sanitation. At the state and district levels responsibility is further divided, with sullage drainage projects being funded under Jawahar Rozgar Yojana, a program for alleviating rural unemployment. The result is that village drainage is always implemented independently from water supply, undermining the potential health and economic benefits of the integrated approach.

Clearly, the target-driven strategy underpins the observed poor sustainability of schemes, and a planning mechanism is needed to take into account the status of existing systems, level of service desired, and availability and affordability of resources (see Box 2.1). This can only be done in the context of a demand-driven approach in which the user groups take the lead.

### **Project Design And Physical Implementation**

Implementation, i.e. design, procurement and construction management of rural water supply schemes, has until now been the direct responsibility of state agencies. A sample evaluation survey conducted in 1996 found that 24 percent of the selected districts were not covered by

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#### **Box 2.1. Lessons from the Community Water Supply and Sanitation Project in Sri Lanka**

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Mirissa, a candidate for financing under the Sri Lanka Community WSS project, is a coastal fishing community located where all wells are brackish and drinking water is unavailable. Following a technical evaluation of the options, project managers decided to construct a well 400 meters from the coast at the bottom of a hill, although this was a costly solution. The inability of the users to pay for the schemes' operation and maintenance led to its subsequent closure by the government. Attempts by the Village Fishery Society to resolve the problem ultimately led to a decision to reopen the well and sell water to fishing boats. With the revenues obtained from the sale of water, they were able to sustain provision of their water supply from the well. Although the project for water supply and sanitation was designed with a community-based approach from the outset, the rules did not: explicitly address the need to respond to the demands of beneficiaries. Instead, they focused on providing services to communities that were determined to be "in need." The project therefore offered only a limited number of technical options and a minimum level of service. The Mirissa experience points to two lessons: first, the need for communities to understand the financial implications of investment decisions at the planning stage, and second, that once responsibility for management is transferred to the community, users can and do devise innovative solutions to sustain the schemes.

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satisfactory water resource investigations; 32 percent of the schemes were poorly constructed; and a large number of piped water supply schemes were broken as a result of inadequate initial design, substandard materials and workmanship, and insufficient maintenance (GOI, 1994b). If this situation persists, rural water supply schemes will continue to deteriorate, increasing the need for expensive rehabilitation.

Most engineering problems stem from inadequate data and assumptions regarding the quantity as well as the quality of water resources. In most states the design and corresponding capital cost estimates have to be within a maximum per capita standard, which can lead to use of sub-standard materials and technical solutions. For example, the advantages of high-quality components such as improved technical and economic feasibility, are not routinely considered once the cost of the individual components exceeds the maximum price schedules.

Procurement and tendering procedures are closely linked to the technical sanctioning of schemes, which is a responsibility of the state agency. The level of sanctioning is generally retained and controlled at the highest level in the organizational hierarchy. In several states the executive engineering level can only sanction costs up to Rs. 400,000, typically less than the cost of a minor village piped water scheme. Consequently, designs often have to be approved by a superintending engineer or even a chief engineer. These low ceilings constrain the smooth and timely execution of government as well as donor-supported projects. Typically the state agency procures materials centrally, guided by detailed technical specifications and tendering procedures. The materials are subsequently provided to private contractors who arrange hiring of labor. Due to inflexibility of government procurement procedures, especially in scheduling and scope of the project, serious delays in the execution and completion of projects are often experienced.

Quality construction will typically entail only minor additional expense and effort in the long term. In contrast, use of substandard materials and low-quality construction generally reduces the productive life of the structures and accelerates the scheduling of rehabilitation or replacement. Design and supervision staff, at the field as well as management levels, need to appreciate the importance of quality

control. The Indian engineering cadre has the capability of designing and executing high-quality schemes. Staff urgently need to be introduced to and trained in modern methods of quality control, and firm action must be taken against contractors who supply low quality materials or construct poor-quality work, and against supervisors who ignore substandard work of contractors.

Under the demand-oriented and client responsive approach envisioned for the sector, communities will have access to relevant information, and will exercise control or oversight at each stage of planning and implementation including over data, cost estimates, and rate schedules to support planning and design, tendering and evaluation procedures, and site-supervision reports. This should minimize the use of substandard materials and incorrect measurements when preparing work schedules and invoices.

### **Operations And Maintenance**

Despite the complexity in institutional arrangements, operations and maintenance arrangements can generally be categorized by type of technology: hand pumps, small piped systems or large piped systems.<sup>3</sup> Prior to the 73rd amendment, responsibility for operations and maintenance in each state was shared by either the water supply and sanitation board or public health engineering department and the engineering section of the district or block administrations. Following enactment of the 73rd amendment, the responsibility for rural water supply has devolved to gram panchayats. Responsibility in this context is poorly defined, although it always includes operations and maintenance and sometimes includes planning and implementation. In practical terms the enactment has meant a significant change in policy for hand pump and spot-source schemes. Both the Panchayat Raj Act itself and guidelines issued by the Rajiv Gandhi Mission in 1994, specify that gram panchayats are solely responsible for the operations and maintenance of hand pumps and spot sources. Not surprisingly, however, neither the Act nor the Rajiv Gandhi Mission assigns responsibility for large or regional piped water supply schemes to local administrations. Recent discussions suggest that responsibility for these larger schemes will likely be devolved to the block or district administrations.

<sup>3</sup>Traditional public sources, such as shallow tube wells or dug wells, are generally maintained by the community, with government intervention limited to chlorination.

**Table 2.3. Condition of Existing Rural Water Supply Schemes in India, 1994**

Type of technology	Total number installed	Require repair or rehabilitation		Defunct	
		Number	Percent	Number	Percent
Hand pumps schemes	207 1,569	459.887	22.2	254,000	123
Piped water schemes	1 16,324	44,565	25.8	—	—
Standposts	1,528,000	278.000	18.2	—	—

— Not available.

Source: GOI, 1994c.

The inadequacy of the existing operations and maintenance systems, and the reluctance of local administrations to take on responsibility for them, are well documented. A survey undertaken by the Rajiv Gandhi Mission in 1994 estimates that more than one-third of all hand pump schemes installed require either repair or rehabilitation (22 percent) or are completely defunct (12 percent), almost 26 percent of all piped water schemes require repair or rehabilitation, and 18 percent of all standposts are without taps. Over-exploitation of groundwater and adverse water quality may also contribute to the demise of some hand pump schemes. However, the poor condition of rural water supply schemes is primarily the result of inadequate and ineffective operations and maintenance. Table 2.3 provides a summary assessment of the condition of existing schemes.

**Hand Pumps.** Hand pump schemes account for 95 percent of the publicly funded rural water supply schemes, serving almost 395 million people (75 percent of the rural population). Publicly funded hand pumps are generally maintained by local administrations through a one-, two-, or three-tier arrangement involving the state agency in routine and major repairs. Piped water supply in the case of mini or small schemes are operated and maintained by local engineering departments only if ownership has been transferred to them. For the majority of piped schemes, particularly large regional schemes, responsibility for operations and maintenance remains with the state agency in charge of planning and implementation, often by default given the unwillingness of local administrations to assume management or financial responsibility. In Maharashtra, out of 250 piped water schemes constructed, 54% have been transferred from, and 44% are still being maintained by, the state water board. In West Bengal only 15 percent of such schemes have been handed over to the zilla parishads.

The operations and maintenance of hand pumps is neither technically nor financially beyond the abilities of communities to handle. The only possible difficulty may be a ready access to spare parts in some parts of the country, which would be improved when the government reduces its dominance over procurement of materials. In attempting to surmount this challenge, two major constraints must be addressed: first, is the irrelevance of some hand pumps facilities due to availability and reliability of alternative sources; and second, is the general disrepair of existing schemes. A critical consideration in addressing the first constraint is the potability or safety of the alternative sources. Continued expenditure to maintain the handpumps would be misplaced if the alternative sources are in fact safe. If they are not safe, the appropriate action would be to sensitize the community on the need for treatment of the water to safe levels prior to use, or for switching their water supply source to the existing scheme (presumably a safe source). In the second case, funds must be provided to restore the schemes to the designed standard. Government support to this effort should be through matching of local contributions, which should be set high enough to signal true commitment to the scheme by the community, and instill in them a sense of responsibility for the assets. Provision of matching funds (refer Chapter 3) should be conditional on full community awareness of the user involvement and asset transfer program, and community acceptance of asset ownership with the attendant responsibilities.

**Small Piped Schemes.** For mini and small piped schemes, which rely on powered pumps and spot sources, the situation and solution are similar to that of hand pumps. Technical skills required do not exceed the local capabilities. Operation is a simple procedure involving turning the pump on and off at scheduled times. Local mechanics or

contractors who service private irrigation pumps are available to undertake repairs and preventive maintenance, and spare parts are generally available. Local mechanics have the skills to repair broken taps, as well as leaks in the holding tanks and source pipe. Although the recurring costs are higher than for hand pumps primarily due to electricity costs, they are still affordable to local communities. The key challenge for these existing schemes would be to transfer ownership and responsibility for them to the communities.

**Large Piped Schemes.** Complications arise for large piped water schemes that rely on surface water sources and subsequently involve treatment processes. These schemes are technically challenging to operate and maintain, and the recurring funds required are substantially higher. These schemes may also transcend administrative boundaries, further complicating local capabilities to effectively maintain them. Advantages and disadvantages of existing institutional mechanisms (see Table 2.4) would need to be weighed against feasible alternatives. One option would be to maintain state responsibility for all large schemes irrespective of coincidence of coverage area with administrative boundaries. Another option would be for the state agency to retain responsibility for multi-jurisdictional schemes, and devolve O&M responsibility to the respective local level where service area and administrative (block or district) boundaries coincide. Under this option, there would be a need to strengthen the local agency with the requisite management and technical capabilities, including in procurement and contract administration to enable possible contracting out of functions. Given the ubiquity and likely increase of cross-boundary schemes, a third option can be considered comprising devolution of all schemes to local levels and strengthening institutional capabilities, either by strength-

ening cross-jurisdictional coordination mechanisms or creating and strengthening a new regional agency (which would be owned by the concerned jurisdictions).

State boards or authorities, however, offer the advantage of autonomy in principle only. Despite having the legal authority, state water boards or authorities in India are rarely allowed to make autonomous decisions, and are typically subject to government intervention on critical policy decisions, including setting tariffs, determining staffing levels, and gaining access to external sources of funding. If these disadvantages could be addressed, state boards or authorities could offer a viable transition or long-term institutional alternative for states (such as Kerala) that have invested heavily in large and regional piped water schemes. Table 2.5 provides a list of preconditions for choosing among alternative management arrangements for piped water schemes.

### Monitoring And Evaluation

The present RWSS monitoring and evaluation mechanism is inadequate for the needs of the sector. The system, which produces periodic reports at local levels and then aggregates them to state and central levels, captures the progress of program activities but does not assess scheme functionality or performance (availability, adequacy, quality of facilities or user satisfaction). Existing monitoring methods serve only one purpose: to verify the progress of physical and financial indicators to establish eligibility for central funding. Monitoring of groundwater resources is similarly driven by an underlying objective of identifying over-exploited areas, to which access to credit for further development would subsequently be restricted by the banking sector. Monitoring of water quality is a recent phenomenon

**Table 2.4. Advantages and Disadvantages of Existing Institutional Arrangements**

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>• A higher level of in-house technical expertise.</li> <li>• Potential efficiency gains as a result of economies of scale (labor mix, spare parts procurement, spare parts inventory, billing and collection).</li> <li>• Flexible tariff structuring that can support cross-subsidization (business versus household, urban versus rural).</li> </ul>	<ul style="list-style-type: none"> <li>• No consumer orientation.</li> <li>• An emphasis on a technical approach with numerical targets in which operations and maintenance have little priority.</li> <li>• A well-entrenched bureaucracy, which offers limited capacity for responsiveness and little flexibility.</li> <li>• Limited management and financial autonomy.</li> </ul>

**Table 2.5. Institutional Pre-conditions for Management of Rural Piped Water Schemes**

<b>Institutional alternative</b>	<b>Precondition</b>
<b>Local administrative agencies</b>	
In-house	<ul style="list-style-type: none"> <li>• Existence of a village water supply and sanitation committee (VWSSC).</li> <li>• Existence of an operations and maintenance section that reports to both the VWSSC and the panchayat raj institution.</li> <li>• Presence of policy and performance standards for O&amp;M.</li> <li>• Presence of a monitoring and performance evaluation system.</li> <li>• Presence of an appropriate incentive system.</li> </ul>
Service contract	<ul style="list-style-type: none"> <li>• Presence of procurement and contract expertise.</li> </ul>
<b>State agencies</b>	
Departments or branches, & State boards or authorities	<ul style="list-style-type: none"> <li>• Presence of a customer service section for responding to consumer inquiries and communicating with the public.</li> <li>• Management and financial authority to set tariffs, disconnect services make decisions on personnel matters.</li> <li>• Presence of an operations and maintenance section.</li> <li>• Presence of policy and performance standards for O&amp;M.</li> <li>• Presence of a monitoring and performance evaluation system.</li> <li>• Presence of an appropriate incentive system.</li> </ul>

initiated by the central government. As of April 1994, 115 district-based laboratories and 22 mobile labs for monitoring water quality were receiving central financing. As reported by GOI (1994a), however, this program lacks strong commitment or support of the state governments.

The monitoring and evaluation system should be tailored to the new institutional setting. Monitoring and evaluation are essential tools for stakeholders, ranging from users in the community to policy makers in central government agencies. The new system should include both quantitative and qualitative indicators of performance, to enable timely availability of information to support decision making and proactive responsiveness of provider agencies. A further need is for states to formulate state-level policies with appropriate regulations and guidelines for conducting monitoring and surveillance of water quality at the source, at the distribution points, and at the point of delivery to the consumer.

### **Decentralization to local levels**

Decentralization encompasses a variety of institutional structures, not all forms of which will result in adequate levels of

local participation. Devolution, the fullest extent to which decentralization can be taken, holds the most promise for participation of users. In devolved systems, the responsibilities and powers for a range of operations spanning more than one sector are assigned to local governments by the central authority. For RWSS in India, the trend is to transfer planning and implementation functions from state boards and public health engineering departments to zilla parishad engineering departments at the district and block levels. Operations and maintenance functions would be transferred to the panchayat raj institutions. By and large, state-level agencies have retained a limited role in scrutinizing technology and sanctioning projects, and they monitor and conduct training. In some states they still undertake hydrogeological investigations and drilling, although zilla parishad engineering departments are usually free to commission the use of departmental or outside rigs.

Because state public health engineering departments and water boards have a poor track record, decentralization is viewed as an opportunity to provide more responsive planning and delivery of services. One of the main arguments for decentralization is that the panchayat raj institutions can

accommodate local aspirations and needs better than the central government. As such the gram panchayats, as the lowest level of government, and together with the local community, should locate facilities, choose technology, and determine and monitor payments. Because they represent the local constituency, gram panchayats would more effectively own, operate and maintain the community assets constructed. However, as discussed later in this chapter, ownership and management must be community based and as free as possible from the bureaucracy and politicization still possible at panchayat levels. A community village water supply and sanitation committee (VWSSC) under the panchayat is desirable and will help shield water supply decisions from potential bureaucratic hurdles. Further, although there are also potential pitfalls with this as well, VWSSCs could operate independently of the panchayat in situations where their legal status is clear.

Despite the promise, decentralization to the district and block levels has posed several problems. First, is the split responsibility between administrative levels resulting in poor accountability. With public health engineering departments conducting investigations and drilling, zilla parishad engineering departments planning and executing works, and neither of these being responsible for operations and maintenance, there is little incentive for these departments to ensure that what they design and construct will function reliably and efficiently. It is no surprise, therefore, that gram panchayats are typically reluctant to assume responsibility (as assigned them) for operations and maintenance of the schemes. The second problem pertains to the weak coordination between public health and zilla parishad engineering departments and delays in according financial and technical approvals and sanctions, which inordinately delay implementation of works. Financial powers of executive engineers at the district level are often limited, necessitating the referral of many decisions back to the state agency. Third, is the weak interaction of state and district agencies with the panchayats, which limits the ability of the higher administrative levels to recover dues from the panchayats. In addition, the anticipated benefits of decentralization have not materialized because of financing from multiple sources (for example, sanitation funds are channeled through a range of separate programs that are independent from water supply activities), and inadequate

capacity to undertake effective operations and maintenance and other sustainable management activities.

These constraints are due in large part to a wide distribution of responsibilities across agencies and unclear lines of accountability. Other constraints, which are inherent in the "design and construct" nature of existing rural water supply agencies, are: poor hydrogeological investigations, a relatively high percentage of improper design leading to cost overruns, and limited quality assurance despite a comprehensive set of built-in controls. A number of functionality studies, such as those conducted by DANIDA-assisted projects in Tamil Nadu and Karnataka, have found that the quality of construction has deteriorated under decentralization, and this will have serious implications for service delivery performance and ongoing operations and maintenance.

In essence, the weaknesses associated with the supply-driven approach of the parent engineering agency are now being passed on to the decentralized district and local agencies. Karnataka, for example, is attempting to decentralize planning and design from the district to the block level, bringing these functions closer to the panchayats and hence the users. In reality, however, decentralization is having a positive impact only where the assistant executive engineer's subdivision has been strengthened and reoriented. The existing supply-driven context does not incorporate user demands and, ultimately, is not accountable to users.

Other problems are inherent to the make-up of the panchayats themselves. In consequence, the actual and potential roles of the panchayats in rural water supply and sanitation should be critically assessed. The first and most evident aspect is that gram panchayats are almost entirely implementing development programs inherited from state and central governments. They have little autonomy to implement programs of their own. Development priorities, and consequently grants-in-aid, are defined at the central and state levels, and gram panchayats can function only as effectively as permitted by those two tiers of government. In the guise of legislative control over grants, central and state governments continue to control the day-to-day functioning of panchayats (Meenakshisunderam, 1995).

The most conspicuous problem is the lack of financial resources. Karnataka for instance, allocates Rs. 100,000 to each gram panchayat (irrespective of the type



and kind of scheme) for operations and maintenance of the rural water supply and street lighting. Most of these funds are applied toward electricity costs, leaving very little for maintenance. Gram panchayats, unlike zilla parishads, are entitled to levy and collect taxes, but the collection rate is typically very low for water charges as for other government levies. As elected bodies, panchayats are reluctant to levy and collect water charges. The few revenues generated at panchayat level are from the rental of buildings and taxes on forests, common lands and ponds, rather than from water charges *per se*. Consequently, gram panchayats depend on grants from the state which, though accounting for 80 to 90 percent of their funds, are insufficient, thereby severely curtailing their development activities. These grants provide weak incentives for performance, and existing accounting systems do not promote transparency in the transfer and flow of funds. There are some exceptions, however. In Karnataka, gram panchayats use village water supply and sanitation committees (VWSSCs) to collect fees on their behalf. Prior to Punjab's recent step to provide water free of charge, it was a positive example of relatively high collection rates and low administrative costs, partly due to the opportunity available to village revenue officials to retain a percentage of the revenue as an incentive.

The third aspect is weak capacity. Training and capacity development are already being addressed by some state governments. West Bengal and Karnataka, for example, have comprehensive training programs for panchayat members at all levels, although their effectiveness has yet to be ascertained. Given the sheer numbers involved, tremendous resources must be invested in capacity building. A positive development for the first time in many states is the inclusion of women in panchayat institutions, because the 73rd and 74th amendments guarantee them a third of all seats. (West Bengal is even contemplating an amendment permitting a subcommittee composed solely of women to manage rural water supply.) A less positive factor, is the alarming number of problems evident in states where quotas for backward castes and women have brought in token namesake members, who belie the democratic process that brought them in. Furthermore, decentralization has strengthened vested interests in rural areas, and the bias in favor of coverage of main habitations as opposed to outlying hamlets is

related to the socioeconomic background of panchayat leaders (Pant, 1996).

Some state governments and some donor-assisted projects, such as the World Bank project in Uttar Pradesh, have recognized the danger of politicizing rural water supply through the panchayats. Often, panchayat members are private contractors participating due to party politics rather than personal interest, and there would be a need to countervail this by organizing users at the level of the installation or village. In West Bengal, for instance, the government is advocating the formation of user groups around spot sources, having seen the merits of this under the UNICEF-assisted project in Midnapur. Projects such as that assisted by the World Bank in Karnataka, have demonstrated the utility of establishing user groups (*i.e.* VWSSCs) that have a direct stake in maintaining a sustainable source of water, are ready to operate and maintain it and are resistant to political manipulations. These user groups need legal backing to be effective and may stand a better chance as subcommittees or standing committees of the panchayats rather than independent entities. In the forestry sector, for example, committees formed under a project assisted by the UK Department for International Development (DFID, formerly Overseas Development Administration) could not survive independently of the gram panchayats. In the World Bank-assisted project in Karnataka, the VWSSCs could only function if they were legally recognized as standing committees under the gram panchayats.

An effective demand-driven strategy would allow panchayats and VWSSCs to obtain the water supply and sanitation services they want and are willing to pay for. In the transition to a demand-driven strategy, district and block agencies will probably have to take the lead in working with gram panchayats or VWSSCs to assess the status of existing installations, prepare a plan of operations, and compile a list of technological options. They will have to do more than simply provide technical services, although NGOs or private sector agencies may be able to offer some of the technical support needed. Changing from a supply-driven to a demand-driven approach requires appropriately oriented and qualified staff and incentives. Appropriate mechanisms, as well as comprehensive orientation and technical training supported by central and state matching funds, are needed to facilitate communication between agency staff and users.

## Strengthening Community Participation

From a national perspective, community participation in public RWSS services has been negligible. According to GOI (1994a), no water supply program prior to 1994 was seen to offer a viable community participation model.<sup>4</sup> Even where the Panchayat Raj Act has been implemented, communities have only been marginally involved. In this respect, there has rather been a bureaucratization of the panchayats than a democratization of the program. The totally government-provided WSS systems have created a culture of dependence in which the water supply system is not perceived as common property. Adequate structural arrangements and procedures for community participation have not been introduced. In only isolated cases have voluntary agencies been involved and has participation been carefully built into the program.

The continued rarity of community participation is puzzling in the face of policy statements emphasizing the need for it. Narayan (1995), summarizing the experience gained from 121 RWSS projects around the world, identifies the key elements of successful community participation as user investment in capital costs, local ownership and control, and agency responsiveness to feedback. India's policy clearly contradicts these elements. First, water is provided free of cost (up to 40 lpcd), and users do not contribute to the capital costs associated with higher levels of service. Second, ownership of rural water supply installations is not transferred to communities—an abstract "feeling of ownership" is considered to be appropriate and sufficient, regardless of the concept's basic weakness. Communities do not have any control over what, when, where and how installations are provided. Lastly, mechanisms for communicating feedback from users to water agencies are poorly developed, with few offices to which to report defunct installations. In general, water agencies are not responsive to even this limited feedback. Evidently, the absence of these key requirements has to be addressed before successful community participation can be established.

Where community participation has been a component, mainly in projects with donor assistance or facilitated by

voluntary agencies, community participation has been more successful when it occurs throughout the project cycle than during a single stage. Participation is not effective when agencies retain control over the details of implementation, or when issues concerning physical infrastructure and technology are addressed more effectively than issues of social organization necessary for managing project works. The forms of user participation vary substantially, ranging from representational committees of users to committees dominated by the rural elite, and from direct involvement in construction to supervision of contractors.

Several realities must be considered when designing community involvement strategies for RWSS: (i) the social organization in Indian villages is often very heterogeneous with different caste groups and large disparities between rich and poor; (ii) local elite often dominate the public sphere, and politicization and factionalism often exist at the community level outside the sphere of local government; and (iii) social groups, such as low castes, middle castes and women, often prefer to reach consensus in their own groups before entering and voicing opinions and demands in the larger public domain such as the panchayat (see Box 2.2). On the positive side, powerful community members such as large landowners, merchants or politically connected individuals have good managerial skills for organizing collective action, have leverage outside the community to lobby for assistance, and are able to sanction shirkers (Hirschman, 1970; Wade, 1987). On the negative side, rich and powerful households often ensure their own supply of water to the detriment of others—for example, by placing standposts in front of their house or by using all available water upstream without regard for downstream users. The lesson is that sharing a common risk when cooperation fails is an important impetus to successful community participation.

Both the gram panchayats and user committees have important strengths and weaknesses, which offer opportunities as well as pose threats (see Table 2.6). The earlier experience from Karnataka (Box 2.2) illustrates this point, as well as the potential role of the gram sabha, a body not discussed in this report. In the World Bank project, the NGO Samuha sought to organize communities to undertake operations and maintenance. First, the primary organization

<sup>4</sup>Recent (post 1994) initiatives are now beginning to offer such examples, such as, the recently initiated World Bank-funded Uaar Pradesh RWSS project, modifications underway in the ongoing World Bank-funded Karnataka RWSS project, and some NGO and bilateral agency-supported initiatives.

### Box 2.2. Local Organizations: Democratic, Representative, or Even Organized?

In the World Bank-assisted Karnataka RWSS project, village water and sanitation committees have been constituted as elected bodies, but a few influential persons tend to dominate the deliberations. However, many more community members participate and negotiate service through smaller caste-based and gender-based groups. Members belonging to underprivileged scheduled castes and scheduled tribes and women's groups prefer reaching internal consensus before raising issues in the elite-dominated forum. Although powerful community members exercise social influence through the committees, conflicts on issues affecting group interests, such as the location of standposts, cattle troughs, and dust bins, are generally resolved through the smaller informal groups (Khatri, 1994).

consisted of street groups (one male and one female representing 10–15 houses, with a total of 10–40 street groups in a village or small town). These street representatives then selected two representatives each from eight wards to participate in the village gram sabha. The gram panchayat presented its budget at the bi-annual meetings of the gram sabha. In theory, the gram sabha was supposed to approve the gram panchayat's priorities. The street groups were not registered, however, and Samuha found that the village and sanitation committees were not accountable once elected and that organized social pressure was needed. Despite the inherent conflicts between the two types of bodies, some of the strengths and weaknesses complement one another so

that a partnership could be more fruitful than an exclusive arrangement.

Village water supply and sanitation committees can and should be constituted as sub-committees under the gram panchayat or as self-standing organizations. Both institutional options have merit particularly if the user committees are constituted as statutory bodies, which would bestow legal rights and facilitate the transfer of responsibility for management. A disadvantage of the sub-committee structure, however, is the inherent risk that the control implicit in the gram panchayat's endorsement could subordinate the committee to party political biases. Experience shows that user committees that are free to

**Table 2.6. Strengths and Weaknesses of Gram Panchayats and User Groups**

Group	Strengths	Weaknesses
Gram panchayats	<ul style="list-style-type: none"> <li>Elected body with legal recognition, elections held in almost all states.</li> <li>Responsible for RWSS under provisions of the Act.</li> <li>Broader mandate that provides a platform for integrating RWSS into general water resource management at micro level.</li> <li>Established quota for representation of women, and scheduled castes and tribes.</li> </ul>	<ul style="list-style-type: none"> <li>Often dominated by local elite and subject to party-based politicization.</li> <li>Broader interest and mandate than RWSS, which can weaken interest and priority given to RWSS.</li> <li>Weak capacity.</li> <li>Training inputs required.</li> </ul>
Community groups	<ul style="list-style-type: none"> <li>Community of users with direct interests in RWSS.</li> <li>An alternative to highly politicized gram panchayats.</li> <li>Marginal groups allowed a bigger say.</li> <li>Stronger collective and group pressure to collect funds.</li> </ul>	<ul style="list-style-type: none"> <li>Statutory recognition needs to be given by the gram panchayat.</li> <li>Potential politicization at the village and intra-village level.</li> <li>Difficulties in deciding basis for committee formation because users usually utilize multiple sources.</li> <li>Require support for formation and strengthening of VWSSCs.</li> </ul>

decide their own rules and setup are better able to internalize and self-enforce rules and regulations; however, this is dependent on the proximity of the committee members to the immediate users they represent. If appropriate, user organizations should be free to operate as informal groups, allowing money to be contributed on a purely voluntary basis.

In the United Nations Children's Fund (UNICEF) project in Midnapur, West Bengal, informal user groups were organized around spot sources, which enabled them to collect water charges and maintain a replacement fund. Evidence from Karnataka is mixed. In some areas village water supply committees, though constituted long before the panchayats came into being, cannot now survive independently of the gram panchayats and need legal recognition to be viable. In other areas the committees themselves are controlled by a few influential people. Flexibility is crucial to the success of institutional arrangements at the grassroots level and to the delineation of the roles and responsibilities of gram panchayats and user groups.

As experience from Gujarat indicates, associations of user committees or linkages between these committees and interest groups with a broader mandate could prove to be very strong. This type of association can provide the leverage needed to deal with panchayat raj institutions and state governments, as well as other interest groups. It can also provide a platform for sharing experience and expertise.

Clearly, community participation will not happen on its own. Donor-assisted and NGO projects need to inject a participatory element into this process. Although long-term and intensive organizational inputs have been, and in general are, required, this support is not necessarily expensive. In the World Bank project in Maharashtra, activities that directly support community mobilization and organization cost around 3 percent of total investment per village, while in Kerala, the socioeconomic units established under Dutch–Danida schemes cost only 2.5 percent of total water supply expenses. In contrast, the advantages of investing in community participation are well documented

(Narayan, 1995). However, socioeconomic units or cells comprising field-level community workers, although part of various donor-assisted projects, have not been institutionalized within the government system. The major challenge is to develop the capacity and capability within government agencies to plan for, manage, coordinate, and, to some degree, mobilize and support both the gram panchayats and the user communities.

### Gender Considerations

Women generally manage domestic water, and an essential ingredient of community participation is to improve women's involvement in the democratic decision-making process. The Panchayat Raj Act contains special provisions for the representation of women — 30 percent of the members elected from scheduled castes, scheduled tribes and other backward castes must be women. However, panchayats (and the staff of water agencies) are still dominated by men, and women are often members in name only.

These problems could be overcome by making a clearly targeted effort to reach, motivate, involve, train and thereby empower women. In the Mahila Samarkhya program in Bundelkhand in Uttar Pradesh, women from scheduled castes and tribes have been trained as hand pump mechanics, encouraging them to voice their needs and concerns. On a much larger scale, the Self-Employed Women's Association involving thousands of women throughout the nation, has campaigned in Gujarat to involve women in rural water supply and sanitation. Issues in the association's membership campaign are that women and their work-related needs should be at the center of water sector policy and projects, that women should be involved in every stage of water-sector projects, that traditional and local sources of water that support women's access to and ownership of natural resources should be given priority over the development of new mechanized systems, and that women should be consulted before public water investments are finalized and made operational. Women's associations could provide a strong framework for community participation.

# Financial Framework and Viability

After 15 years of intensive construction of RWSS facilities, India now must consolidate the impressive achievements made. In future, financing and delivery systems for RWSS will have to meet the expanding needs of a growing population as well as the increasing demand for higher and better quality levels of service. In addition, they must provide enough funding to sustain operations and maintenance and make necessary replacements. The current financial arrangements, where the government finances all capital and recurrent costs and recoups little of these expenditures from water charges, has proven detrimental to the quality of the infrastructure and the services delivered. Sector investment needs continue to be large, both for new facilities to extend coverage to unserved communities as well as for the upkeep of existing facilities. There is a need for better mechanisms for raising and channelling funds to the sector, and without radical change in sector financing, the sector will be unsustainable both physically and financially.

## Financing of sector investments and operations

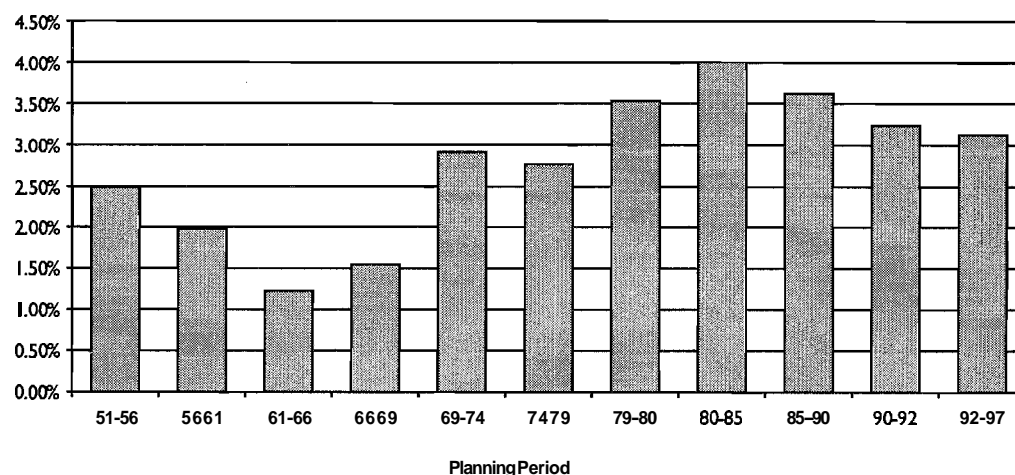
### Funding of sector investments

The central government remains financially committed to providing a minimum level of safe drinking water for all, and as a result it continues to shoulder the full capital cost of public water supply schemes that further this objective. The proportion of the government's total budget that has been allocated for water supply and sanitation since the First Five-Year Plan, has fluctuated between 1.2 and 4 percent of total expenditure between 1956–66 and 1980–85 (Figure 3.1). The current level of 3.1 percent is still considerable by international standards. Over the years, increasing priority has been given to rural areas within the sector (Figure 3.2), with allocations for rural areas ranging from 19 (in the period 1966–69) to 66 percent (1992–97) of total sectoral allocations. The amount allocated to sanitation in the Eighth Five Year Plan was Rs.

7.0 billion, or almost 7 percent of the allocation for rural water supply.

The central government played a minor role in financing sector investments initially, but since the Fourth Plan has played an increasingly prominent role despite the continued financial responsibility for the sector accorded the state governments (Figure 3.3). Central funding increased from 15 percent of sector investments during the Fourth Plan under the Accelerated Rural Water Supply Program (ARWSP) to more than 30 percent in the Fifth Plan, and has been progressively enhanced in subsequent Plans to reach a current level of about 40 percent. As discussed earlier, improved performance of the sector depends on decentralization to communities and local administrative levels. The increasing role of the Center in sector investments thus clearly presents a formidable hurdle to decentralized planning to the state and local levels.

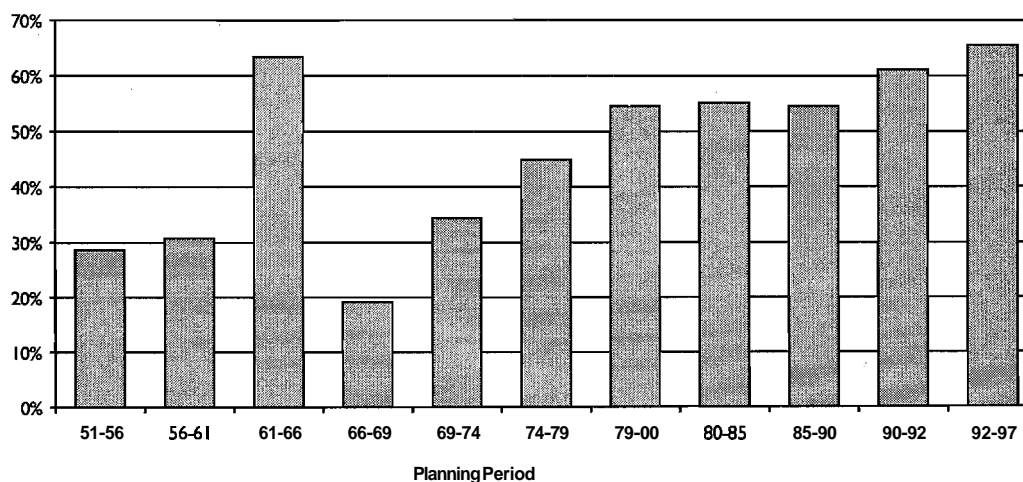
Despite the increasing level of government investment in the sector in constant terms, statistics show an absence

**Figure 3.1. WSS as a Percentage of the Central Government Budget, India, 1980–97**

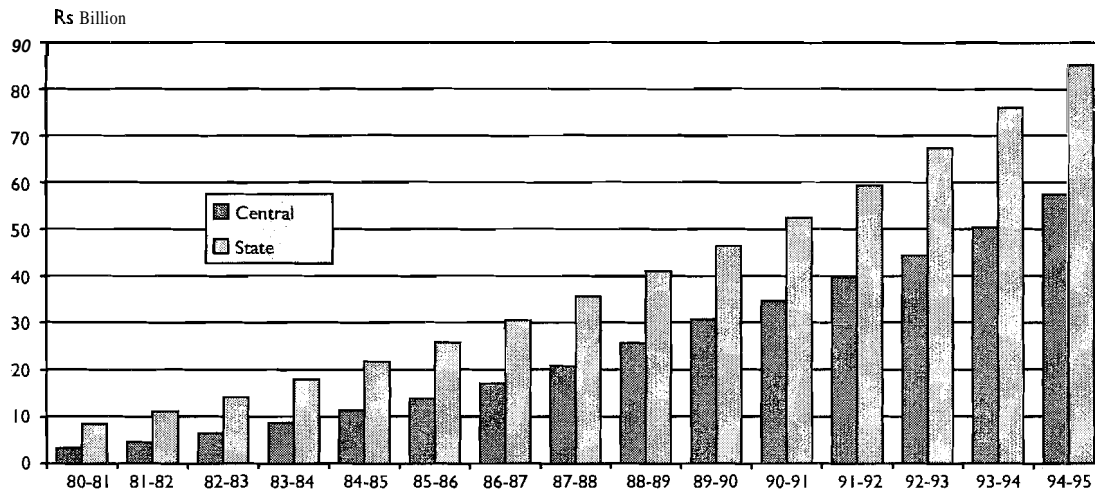
Source: GOI, 1996.

of corresponding improvement in numbers of communities served. The large 70 percent increase in capital investment per capita (1995–96 prices), from Rs. 570 in 1987–88 to Rs. 970 in 1993–94, was largely due to widespread use of relatively expensive technologies, rehabilitation and replacement of existing schemes, and inefficient procurement practices rather than to increased coverage. Using broad

capital cost assumptions and information on technologies utilized (adopted from GOI, 1996), the estimated funding requirement of capital investment per capita on a weighted average basis is roughly Rs. 630, whereas the average per capita cost actually incurred was Rs. 760 (Table 3.1). The difference — Rs. 130 per capita or 21 percent of the estimated per capita requirement — can be attributed to

**Figure 3.2. Rural Water Supply and Sanitation as a Percentage of India's WSS Sector, 1951–97**

Source: GOI, 1996.

**Figure 3.3. Central and State Allocations for Rural Water Supply and Sanitation in India, 1980–95**

Source: GOI, 1996.

either rehabilitation of existing schemes or inefficient procurement practices.

Notwithstanding the low efficiency of RWSS investments, the sheer magnitude of financial requirements to achieve full coverage appear much beyond the ability of the government to provide. The sector's capital investment needs are extensive and will continue to escalate (Figure 3.4). Assuming that the existing mix of technology appropriately reflects the needs of the existing rural population that remains unserved, Rs. 110 billion will be required to achieve 100 percent coverage given existing coverage norms. Rehabilitation of existing schemes will entail an additional Rs. 60 billion to Rs. 90 billion (assuming that 10–20 percent of all hand pumps and 20–30 percent of all piped schemes require major repair or rehabilitation). The total capital investment requirements thus range from Rs. 170 billion to Rs. 200 billion (US\$5–6 billion) in 1997.

The estimates of required sector funding do not take into account several critical factors — population growth,

replacement of defunct assets or worsening resource conditions. Assuming an annual rural population growth rate of 2.6 percent (Ghosh et. al., 1995)<sup>5</sup>, the additional requirement in 1997 alone would be Rs. 11 billion. The additional cost of replacement would range from Rs. 17 billion to Rs. 25 billion annually, depending on whether the designed life of the schemes would in fact be attainable in absence of adequate operations and maintenance funding. In the worst case physical-resource-constrained situation, in which water quantity and quality problems required a graduation from hand pumps to piped water systems, the capital investment per capita cost would be 13 times higher. Assuming 5 percent of the rural population (or 35 million persons) experienced water quality problems and 10 percent of these were switched to supply from piped water systems, an additional Rs. 6.3 billion annually would be required. The scenario could be taken one step further to include investments to increase the levels of service delivered to communities. Several states already have or are

<sup>5</sup>The Ghosh et. al. (1995) growth rate estimate is likely to be an upper bound for the range of rural growth outcomes in India, and would thus lead to an overstatement of the estimated RWSS sectoral investment requirements.

**Table 3.1. Capital Cost Assumptions, by Type of Technology**

Type of technology	Population served	Life span	Production capacity liter./ minute	Source	Capital cost per capita (rupees)	Allocated weighting (percent)
Hand pump	250	10	3.65	Groundwater	160	75
Mini piped water scheme	750	15	10.95	Groundwater	500	5
Small piped water scheme	2,000	20	29.20	Groundwater	1,500	5
Regional piped water scheme	5,000	25	73.00	Surface water	2,500	15
Town piped water scheme	10,000	30	200.75	Surface water	3,500	>1

**Note:** Estimated weighted average is Rs. 630.

**Source:** State rural water supply agencies, and GOI. 1996.

considering increasing the basic requirement for safe water from 40 to 55 litres per capita per day (lpcd). Such a decision on a national scale would entail an additional Rs. 165 billion (US\$4.7 billion) in total.

Although the broad assumptions and the methodology employed are overly simplified, this exercise clearly demonstrates that, under the sector's current financing arrangements, sector objectives are not realistically attainable given limited government resources, increasing cost of providing basic and improved levels of service, and increasing need to reinvest in existing schemes. To provide 40 lpcd to the entire population within 10 years, ensure that all schemes are operational, and that fully depreciated schemes are replaced, the capital investment budget will have to be at least 2.5 times its existing level of Rs. 16 billion to Rs. 18 billion (US\$515 million) annually. Based on historical trends it appears likely that the government will continue to increase the budget allocation for the sector to keep pace with inflation and general economic growth. However, given deficit-reduction objectives and competing government priorities, it is unlikely that future allocations will increase substantially. Other funding sources and mechanisms will have to be developed.

### **Funding of Operations and Maintenance**

Management and financial responsibility for RWSS operations and maintenance has been divided among various institutions at different administrative levels. In each case, the specific responsibilities are poorly defined, and despite absence of cost-reflective prices the requisite funding has not been made available by government for O&M activities.

Operations and maintenance are financed instead by all three administrative levels through several funding mechanisms that lack transparency and accountability. Moreover, poorly defined expenditure classifications, inadequate presentation of expenditures by functional responsibilities, and inconsistent presentation both among and within states, all make it extremely difficult to estimate the level of public sector funding that has or is being spent to support operations and maintenance.

Operations and maintenance are commonly funded by state administrations through their Non-Plan budgets for recurring expenditures as well as from various national and state development programs. Under state Non-Plan budgets, funding is generally limited to salaries for approved staff, with substantially smaller allocations for recurring goods and services. Financial support from national and state development programs, such as the National Rural Employment Programme, the Rural Landless Employment Guarantee Programme, and the Jawahar Rozgar Yojana, is commonly distributed to each state based on a formula that takes into account regional disparities but is based largely on population distribution. Each state adds matching funds if required and distributes them to district administrations, which in turn distribute them to gram panchayat administrations.

Spending is generally at the discretion of gram panchayats, which do not impose habitation norms or allocations for specific activities and sectors. Development program funding is targeted to increase employment and labor-intensive public works. It does not in principle



support operations and maintenance, although funds are often used for major repairs, rehabilitation, and replacement of existing schemes and for construction of new schemes. These expenses are typically included under operations and maintenance. Program reporting formats vary from state to state and do not provide sufficient or consistent detail.

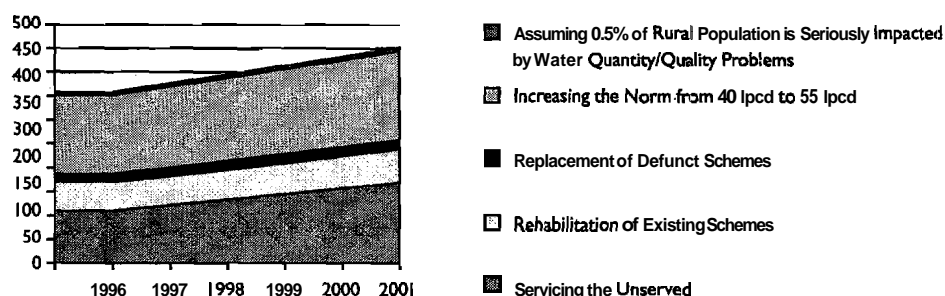
In 1986 the central government prescribed expenditure norms for maintenance of water supply schemes (Table 3.2). These norms were recommendations only, and states were not compelled to adopt them. Each state is still responsible for determining and adopting norms that take into account its own situation. Concurrently, a maximum 10 percent of the planned capital investment budget provided by each state under the Minimum Needs Programme was earmarked for operations and maintenance, as was 10 percent of funds provided through the ARWSP in 1988–89. Under these two programs, the government invested Rs. 10.0 billion in operations and maintenance between 1988–89 and 1994–95. In constant 1995–96 prices, however, the investment has fallen 40 percent from Rs. 4.9 per capita (of the population covered) in 1988–89 to Rs. 3.5 in 1994–95. This decline does not take into account the substantial increase in coverage.

In addition to program allocations, various states have provided gram panchayats with a specific allocation for

operations and maintenance. This amount, which ranges between Rs. 100,000 and Rs. 150,000 per gram panchayat per year, is provided as a lump sum that has no relationship with the size of population served, the technology implemented or the actual costs. For gram panchayats with electricity-driven schemes, the allocation includes the cost of electricity. However, the electricity used for water supply schemes is not separated from electricity used for other purposes so that, in practice, gram panchayats charge the total cost of electricity against the allocation for water supply. In the villages visited this means that very little is left for other expenses that would ordinarily be incurred as part of operations and maintenance. In summary, although gram panchayats have been given responsibility for RWSS, they have not, in absence of cost-reflective water charges, been allocated as a substitute, concomitant financial resources with which to discharge that responsibility.

The Rajiv Gandhi Mission (1996) has estimated that Rs. 10 billion (US\$286 million) per year is required to maintain all public water supply schemes. This is almost four times the current allocation of Rs. 2.5 billion. This amount apparently only covers repairs. Staff costs, as well as recurring costs including electricity, are allocated separately under the Non-Plan budget and represent about 60–75 percent of the total cost of operations and maintenance. Based on broad cost assumptions, an estimated Rs. 29 billion (US\$830 million)

**Figure 3.4. Potential Sectoral Capital Investment Requirements in India, 1996–2001**  
(billions of 1996 rupees)



**Table 3.2. Government Operations and Maintenance Expenditure Norms, by Type of Technology**

Technology alternative	Expenditure norm
Open tubewell	Rs. 45–Rs. 60 per well per year.
Hand pump	Rs. 400–Rs. 500 per pump per year (currently Rs. 600 per pump).
Gravity-fed piped water supply	Hilly areas: 75 percent of capital cost Desert areas: 8.0–9.0 percent of capital cost
Pumped piped water supply	5 percent of capital cost (excluding electricity).

Source: GOI, 1996.

would be required annually to fund the appropriate level of operations and maintenance (Table 3.3). This includes salaries, electricity (where required), chemicals, and routine preventive maintenance as well as repairs. Continued underfunding of operations and maintenance will continue to have serious financial implications in the future, because major repairs or rehabilitation cost more than preventive maintenance, and existing systems will have a shorter operating life and have to be replaced prematurely.

The government has attempted to address these problems through provision of ad hoc funding (GOI, 1994a). However, adequate O&M will be possible only when ownership is transferred so that sector institutions are responsible and accountable and have an adequate level of resources (see Box 3.1). Full cost recovery is the essential concomitant to this.

### Local Administration Financing

Local administration finance and the general ability of local administrations to take on the financial management responsibilities for operations and maintenance need criti-

cal examination in view of the emphasis on decentralization. Local administration finances are generally classified under four broad headings: self-generated revenue, shared revenue, grants and loans (see Box 3.2). Self-generated revenue comprises taxes (such as property and house taxes, professional taxes, vehicle taxes, various taxes associated with agricultural activities, and entertainment taxes), tolls and fees. Also included are revenues derived from locally administered commercial activities and landholdings and general contributions from the public. Shared revenue is the proportion of national and state taxes that is allocated to local administrations. Grants are provided by the state for establishment costs (primarily salaries), maintenance of assets, and implementation of national and state-funded rural development programs. Loans, although uncommon, do exist. In Bihar and Uttar Pradesh, local administrations receive financing from the state panchayat finance corporation for a broad range of activities.

Gram panchayat receipts from central and state governments, in 1989–90, ranged from 0.1 percent of total state

**Table 3.3. Operations and Maintenance Cost Assumptions, by Type of Technology**

Type of technology	Capital cost per capita (rupees)		Population	Operations cost per capita per year (rupees)	Maintenance cost per capita per year (rupees)
Hand pump	160	10	250	0	8
Mini piped water scheme	500	15	750	25	17
Small piped water scheme	1,500	20	2,000	70	37
Regional piped water scheme	2,500	25	5,000	117	50
Town piped water scheme	3,500	30	10,000	175	58

### Box 3.1. Kerala Water Authority—Potential Improvement in Operations and Maintenance Management

Kerala Water Authority operates 38 urban water supply, 2 urban sewerage schemes and 1,415 rural water supply schemes. In 1991–92 A. F. Ferguson and Company analyzed operating expenses of a representative sample of 373 schemes as part of a cost and revenue study. The study found that the direct cost of operating these schemes increased as the size of the scheme decreased so that the smallest rural schemes had the highest operating costs per unit volume of water produced. The most critical factor was the high cost of labor. Almost 50 percent of the operations and maintenance costs of rural water supply schemes was spent on the wages of pump operators. A review of 28 rural water supply schemes revealed that all schemes employed at least one full-time pump operator, more than half employed two, and several employed more than two. Rural water supply pumps, however, are normally operated for only 3 to 5 hours a day in northern districts and 6 to 7 hours a day in southern districts. Where demand requires that pumps be run for only a few hours a day, it is obviously not cost-effective to employ one, two or even more full-time operators, as was the practice in Kerala. To improve both the efficiency and the cost-effectiveness of operations and maintenance, the independent study recommended that the Kerala Water Authority train local bodies (administrations) or local voluntary (user) groups, giving them full responsibility for operations and maintenance. Kerala Water Authority would only serve as a technical advisor or "referral point" for major repair and maintenance problems. The local body or voluntary groups would also collect water fees in exchange for a service fee.

income and revenue in Madhya Pradesh (Rs. 0.5 per capita), to almost 8 percent in Uttar Pradesh (Rs. 53.2 per capita) (Table 3.4). Receipts of grants from the central and state level also varied considerably across states, ranging from Rs. 49 per capita in Uttar Pradesh to Rs. 0.04 per capita in Madhya Pradesh, with a distribution skewed toward the low figure. The most self-generated revenue was achieved in Kerala (Rs. 26.9 per capita) followed by receipts in Gujarat, Goa and Punjab.

The role and responsibilities of block administrations, particularly those related to financial management, vary substantially from state to state (Table 3.5). In some states such as Andhra Pradesh and Gujarat, block level administrations play an important role in financial management. This is because the relative income levels at block level, as a proportion of the population which they serve, are substantially greater than at gram panchayat levels. In other states, block administrations generally have a more limited, if not negligible, role. Blocks normally rely more heavily on grants than do gram panchayats, and this curtails their use of tax instruments despite their authority to levy taxes.

Districts commonly play a major role in the administration of local finances. State comparisons of district finances are not readily available; however in one state, Maharashtra, the districts were allocated approximately

Rs. 164 per capita, substantially more than the average Rs. 12 per capita allocated to the gram panchayats. As in other states, district revenues in Maharashtra are composed largely (96 percent) of national and state grants. Based on this assessment, if the most favorable situation is projected nationally, gram panchayats would account for Rs. 53.2 per capita or 2 percent of total government expenditure in 1989–90. Block and district administrations would account, respectively, for Rs. 90.0 per capita (roughly 4 percent of total government expenditure in 1989–90) and Rs. 164.2 per capita (8 percent in 1988–89). Districts also have authority to levy taxes though they rarely use such powers. Their taxing authority is poorly defined, making them hesitant to set a precedent of taxing communities where none exists.

Local administration financing is typically structured so that either the block or the district has the primary role in financial management, while the other plays a more administrative role and therefore is accorded financial responsibility for an administrative budget only. If the administrative budget is 25 percent of total finances available to the other two administrative tiers, then total local administration expenditure is about Rs. 170 per capita or 7 percent of total central government expenditure annually. Table 3.6 compares local administration finances. This

### Box 3.2.A Detailed Look at Gram Panchayat Finances in Kerala, 1990–91

Kerala has a rural population of 21.4 million, which is almost 74 percent of the state's total population. There are 14 districts, 152 block administrations and 990 gram panchayats. Each district serves an average population of 1.5 million, each block serves an average of 140,900 people, and each gram panchayat serves an average of 21,600.

For fiscal 1990–91, the total income for gram panchayats amounted to Rs. 45.1 per capita or Rs. 967 million, of which 70 percent was self-generated, 30 percent was comprised of grants, and less than 1 percent was provided by loans (Government of Kerala, 1996). The main sources of self-generated income were building taxes and surcharges (21 percent), professional taxes (12 percent), entertainment taxes (7 percent), income from market fees (2 percent), property sales taxes (22 percent), donations (1 percent), and miscellaneous (27 percent). Other minor taxes and fees, including service taxes, entry taxes, property taxes, vehicle taxes, and fees for licenses, made up less than 2 percent. During the same fiscal year, total expenditures amounted to Rs. 43.7 per capita or Rs. 937 million, of which 26 percent was spent on salaries, 25 percent on public works, 2 percent on education, 3 percent on water supply, 6 percent on electricity, and 38 percent on other purposes.

If 20 percent of the expenditure is related to new schemes or rehabilitation and major repairs of existing schemes, in addition to direct expenditures on operations and maintenance, then Rs. 3.5 per capita in 1990–91 was spent by gram panchayats on rural water supply.

best-case scenario substantially exceeds the findings of Datta (1992), which estimates local administration expenditure in 1986–87 to be 6 percent overall and 3 percent for rural local administrations (Datta, 1992; Bagchi et. al., 1992). Local administration expenditure is typically below 15 percent of total government expenditure in developing countries, compared with 20 to 35 percent in industrial countries (UNDP, 1993).

The GOI Tenth Finance Commission has recommended that the central government provide states with an ad hoc grant of Rs. 100 per capita for rural areas to be distributed to panchayat raj and local administrations over a four-year period — 1996–97 to 1999–2000 (GOI, 1994e). This initial step was equivalent to only 0.4 percent of total central government expenditure in 1994–95, the year in which the grant was recommended. Obviously, this percentage will decline each year as annual government expenditures increase. At the state level, some major steps are being taken. The State Finance Commission in West Bengal recommended in 1995 that 25 percent of the state tax revenue be devolved to the panchayat raj institutions and local administrations, in addition to the system of transfers and grants already in place (West Bengal State Finance Commission, 1995). This recommendation translates to 9 percent of the state's total expenditure in 1994–95, or almost 16 percent of self-generated revenue. Although still to be implemented, it is certainly a step in the right direction.

Gram panchayats require not only basic support but also sufficient incentives to increase their level of self-generated income and become more independent. Moreover, they require the autonomy to prioritize and choose investments that best satisfy community demand. From a management perspective, they need to understand what trying to meet community needs will entail and the financial and social implications of doing or not doing so. They need to understand and assess the available technology and the merits of alternative methods of procurement. If panchayat raj institutions are to administer and provide better basic services to rural areas, they must be given the opportunity, support, and resources to do so.

### Cost recovery and financial sustainability

Poor cost recovery in the sector is primarily due to negligible tariff levels which do not reflect actual costs and are not routinely evaluated and adjusted for inflation. Poor collection rates, weakly transparent accounting systems and weak financial management, exacerbate an already critical situation. In general, water is supplied from public standpipes or wells as a public service. This policy, except in the case of externally supported projects, means that capital costs for rural water supply are fully financed by the government and that very few rural areas, if any, charge for public water. Although much has been said in favor of cost recovery, very

**Table 3.4.A Comparison of Gram Panchayat Finances, Selected Indian States, 1989-90**

State	Total income per gram panchayat (rupees)	Self-generated revenue		Shared revenue		Grants		Loans		Total income per capita (rupees)	Percent of state income (percent)
		Thousands of rupees	Percent	Thousands of rupees	Percent	Thousands of rupees	Percent	Thousands of rupees	Percent		
Andhra Pradesh	101,145	6.1	15.0	2.7	6.6	31.87	78.5	—	—	40.60	4.7
Goa*	107,022	14.1	49.6	—	—	6.7	23.5	0.9	3.1	28.38	1.0
Gujarat	56,053	15.2	55.2	0.8	2.8	11.6	42.0	—	—	27.56	2.3
Haryana	23,363	9.7	88.8	—	—	12	11.2	—	—	10.90	0.9
Himachal Pradesh	17,593	8.4	86.7	0.1	1.4	1.1	11.1	0.1	0.9	9.68	0.5
Kerala	684,702	26.9	85.6	—	—	4.6	14.5	—	—	31.43	3.2
Madhya Pradesh	1,299	0.4	92.6	—	—	0.0	7.9	—	—	0.48	0.1
Maharashtra	22,706	8.2	68.3	0.8	6.5	3.0	25.2	—	—	120.1	0.9
Orissa	14,942	0.3	14.4	—	—	2.0	85.3	0.0	0.3	2.39	0.2
Punjab	34,465	12.4	47.1	0.3	1.1	13.5	50.9	—	—	26.42	1.8
Rajasthan	186,103	2.0	4.9	—	—	38.4	95.1	—	—	40.37	4.9
Tamil Nadu	8,651	1.0	33.3	1.0	31.8	1.1	34.9	—	—	3.12	0.3
Uttar Pradesh	80,274	1.2	2.2	2.5	4.7	48.8	91.7	0.8	1.4	53.22	7.9

— Not available.

\*Total does not equal 100 percent

Source: Oommen and Datta, 1995.

**Table 3.5. Block Administration Finances, Selected States, 1989–90**

State	Total income per block ('000 rupees)	Self-generated revenue (percent)	Shared revenue (percent)	Grants (percent)	Loans (percent)	Average block population ('000)	Total income per capita (rupees)
Andhra Pradesh	3,978.0	0.6	2.8	96.6	—	44.2	90.0
Gujarat	10,869.0	11.2	5.4	79.9	3.5	147.9	73.5
Haryana	84.0	29.8	—	70.2	—	112.8	0.7
Himachal Pradesh	82.0	100.0	—	—	—	65.6	1.3
Orissa	113.0	—	—	100.0	—	—	—
Punjab	521.0	56.3	7.0	36.8	—	105.0	5.0
Rajasthan	49.0	56.5	4.8	38.7	—	143.2	0.3
Tamil Nadu	5,564.0	4.4	5.1	90.5	—	—	—
Uttar Pradesh	267.0	52.2	—	47.8	—	123.7	2.2

— Not available.

Source: Oommen and Datta, 1995; Oommen et al., 1996.

little has been done to achieve it. Unfortunately, the meagre proceeds from water fees are not necessarily used to support operations and maintenance, and the system generally suffers from a lack of transparency.

The fee structure for rural water in India is complex in addition to being inadequate to meet the costs of supply. In almost all cases, rural water fees are charged only to households or commercial enterprises with individual

connections, and not to communities accessing water through public standposts. Property and house taxes in many states include a small water tariff. In Maharashtra for instance, the tariff ranges between Rs. 18 and Rs. 150 per household. In some states there is a one-time fee charged for a private household connection. For externally funded projects, the connection fee ranges from Rs. 100 in some villages in Karnataka to Rs. 1,800 in villages in

**Table 3.6. Local Administration Finances, Selected States, 1989–90 (Rs. per capita)**

State	Gram panchayat income per capita	Block-level income per capita	District-level income per capita 1988–89	Total local administration income per capita
Andhra Pradesh	40.6	90.0	32.7*	163.3*
Gujarat	27.6	73.5	25.3*	126.3*
Haryana	10.9	0.7	—	—
Himachal Pradesh	9.7	1.3	—	—
Maharashtra	12.0	44.1*	164.2	220.3*
Orissa	2.4	n.a.	—	—
Punjab	26.4	5.0	—	—
Rajasthan	40.4	0.3	—	—
Tamil Nadu	31	n.a.	—	—
Uttar Pradesh	53.2	2.2	—	—
Average	64.9	27.1*	74.1*	170.0*

— Not available. \* Estimated.

Source: Oommen and Datta, 1995; Oommen et al., 1996.

Maharashtra. In Haryana, the state charges Rs. 1,000. In all cases, this is over and above the cost of the hardware investment, which is considered the sole responsibility of the household in question.

In addition to the connection fee, households are generally charged a recurring tariff. In Maharashtra, the tariff for unmetered domestic connections ranges between Rs. 101 and Rs. 300 annually, whereas for metered domestic connections it ranges between Rs. 0.6 and Rs. 1.2 per cubic meter. In contrast, in Kerala, unmetered domestic connections are charged Rs. 204 annually, whereas metered domestic connections are subject to a minimum charge and a progressive tariff for any consumption in excess of 10 cubic meters (Rs. 2.3 per cubic meter for 11–30 cubic meters; Rs. 3.5 per cubic meter for 31–50 cubic meters; and Rs. 4.6 per cubic meter for more than 51 cubic meters). In externally funded projects, a periodic water tariff is also charged to recover the costs of operations and maintenance. In Karnataka, household connections cost between Rs. 10 and Rs. 20 per month, while stand posts cost between Rs. 1 and Rs. 10 per month. In Maharashtra, each household with a connection is charged Rs. 15 monthly.

The presence of household connections is somewhat contrary to existing policy. National norms do not address household connections, and public schemes do not include household connections in either the technical or the design specifications. Illegal connections are considered to be inevitable. From a technical perspective, however, illegal connections account for a higher level of consumption than is provided under the national norms, thereby reducing the level of service for users downstream or at the perimeter of the service area. This affects poor people who often live in relatively undesirable areas.

For all these reasons, it could be expected that the number of house connections would be minimal. The Rajiv Gandhi Mission reports, however, that 4.3 million houses in rural areas receive water from public piped water schemes. If each house connection serves an average household of five persons, a population of 21.5 million persons (or almost 17 percent of those served by public piped water schemes) are served by household connections. In Kerala specifically, there are 584,000 piped water supply connections of which 91 percent are domestic, 9 percent are commercial, and less than 1 percent is industrial. Again, if each connection serves an average household of five persons, 2.7 million persons (or more

than 25 percent of the population served by public schemes in Kerala) have a private connection.

The GOI (1996) reports that in 1991–92, cost recovery of working expenses for rural water supply schemes was equivalent to 1.8 percent, and less than 1.3 percent of total outlays if capital costs are factored in. Even in the more idealized externally-aided project setting, cost recovery of operations and maintenance is nominal at best: in such projects, receipts of only 10–30 percent of total billings were observed. Compliance appears to be fairly high where local taxes or fees contribute directly to local finances. In Kerala, where rural and urban connections are not accounted for separately, collection rates for connections, whether domestic or business, are very high, ranging between 85 and 95 percent (see Box 3.3). The Kerala Water Authority does not have as much trouble collecting from individual households or industrial customers as it does from gram panchayats that manage water supplied by standposts or from state authorities or boards that operate and maintain schemes. State-run schemes collect 15–30 percent of billings. Collection rates differ largely because the Kerala Water Authority has no recourse when gram panchayats refuse to pay, because cutting off the water supply to an entire community is considered politically unacceptable. Obviously in cases where sufficient incentive or motivation exists, collection rates can be substantially improved.

Based on broad assumptions about both costs and the existing mix of technology, the weighted average cost of operating a public scheme is Rs. 22 per capita per annum. Maintenance requires an additional per capita Rs. 16, and a replacement fund requires Rs. 32 per capita, for a total weighted average per capita annual recurring cost of Rs. 71. In 1991, actual working expenses per capita ranged between almost Rs. 4 in West Bengal and Rs. 79 in Arunachal Pradesh, representing an average of Rs. 13 per capita for all India and less than 18 percent of the estimated requirements (GOI, 1996). Current allocations are clearly inadequate to support an appropriate level of operations and maintenance.

### **Willingness and Ability to Pay**

So long as the government continues to promote water as a social right without community obligations, the public will be reluctant to pay for what it feels is a government responsibility. They will also be reluctant to pay for a low quality

**Box 3.3. Kerala Water Authority—Improvement in Billing and Collection Rates**

The Kerala Water Authority was established in 1984 as an autonomous body responsible for regulating and providing public water supply and sanitation services in the state of Kerala. In 1995 it provided piped water to more than 16 million persons, 74 percent of whom were urban based and 46 percent rural based. Of those served, roughly 25 percent have house connections in urban areas (329,172 connections), compared with roughly 10 percent in rural areas (203,389 connections). The remaining population is served by standposts. In 1990–91 revenue was comprised of state grants (52 percent), water user charges (45 percent), and other income (3 percent). However, increased competition for limited government funding has encouraged the Kerala Water Authority to become more self-sufficient. In 1994–95 the proportion of revenue received from water user charges increased to almost 54 percent of total revenue, partly as a result of successful lobbying for substantially higher tariffs and partly as a result of improved billing and collection rates (A. F. Ferguson and Co., 1992). In 1989–90 outstanding customer receivables were 54 percent higher than those due at the end of the previous fiscal year. During 1991–92 billing and collection practices were studied, and recommendations made to improve these practices. Subsequent to implementation of the recommendations, collections from domestic, commercial, and industrial connections averaged 98 percent. In addition, in 1994–95 a portion of the arrears incurred by local administrations for standpost charges and bulk water supply from state allocations, were recovered prior to their distribution. With the proceeds from the government transfer, the collection rate of current local administration billings increased from 7 percent in 1993–94 to 81 percent in 1994–95, and again to 116 percent in 1995–96.

service, which in this case has been brought about by free provision of service and the resultant lack of funds for O&M. It has been demonstrated repeatedly in many countries that the general public is willing to pay for reliable and safe water supply and sanitation services. Thus the major constraint to implementing a cost recovery strategy is the political unwillingness to charge for water.

Assuming a political willingness to charge, willingness to pay will depend on the availability of alternative and traditional sources, the quality and level of service provided, and public perceptions of the associated health and other benefits. The ability to pay will be governed by the technological sophistication of the infrastructure investment.

Adopting the view of the World Bank, UNICEF and many bilateral donors that water supply and sanitation services are affordable if the cost falls within 3 percent of incomes, analysis shows that while handpumps and mini piped schemes would on average be affordable to the poor, small and regional piped schemes would not (Table 3.7). With only about 22 percent of the rural population below the national poverty line (GOI, 1996), affordability of RWSS schemes (which are largely on the lower end of the technology spectrum) would not be problematic. But this underscores the need to tailor the investments to the needs of the communities. A demand-driven investment strategy is critical to ensure appropriateness of investments.

**Table 3.7. Affordability of Various Technologies, in 1996 Prices and 1995/96 Income Projections, India**

Technology	Annual cost per capita (rupees)			Percent of poverty line income	Percent of average income
	Operations and maintenance	Replacement fund	Total		
Hand pumps	8	16	24	0.7	0.5
Mini piped water scheme	42	33	75	2.3	1.5
Small piped water scheme	107	75	182	5.5	3.6
Regional piped water scheme	167	100	267	8.1	5.3

Source: Department of Statistics (1994) and National Council of Applied Economic Research (1997).



## Private sector financing

Individuals and communities are vital and essential sources of financing for RWSS, and in some states are actively engaged in own-financing of some investments. A household field study in Kerala, for instance, estimated that 46 percent of all households in panchayat areas depend solely on their own open well or borewell (Kerala Water Authority, 1992). The study also found that an additional 23 percent of all households rely on their own wells in conjunction with another private source. Thus almost 70 percent of all households surveyed rely to varying degrees on sources that have been privately developed. While Kerala may be unique in the magnitude of private sector investment, due to its favorable hydrological conditions that offer substantially more opportunity for privately developed sources than do the semi-arid or desert conditions found in several other states, the fact remains that households and private organizations all over India have and will continue to make major investments in private sources as a matter of basic necessity and desire for convenience, improved performance, and higher level of service. Users and main beneficiaries of capital investment in the sector have an obvious and critical stake in ensuring that their service requirements can be satisfied; in the short term they offer the only practical alternative to increasing the amount of government allocations. Cost sharing can and must be implemented, and specific proposals are developed in Chapter 4.

Own-financing notwithstanding, limited scope exists to mobilize market finance or induce corporate interest in

RWSS investments without a change in sector policies to enable cost-reflective pricing of services. The sector does not currently offer sufficiently attractive returns in either the short or the long term. This contrasts with the substantial private sector investment evident in a wide range of manufacturing and other service sectors.<sup>6</sup> High-risk, long payback periods and pricing limitations of the RWSS sector as presently structured, serve as serious disincentives to potentially interested parties. Such disincentives discourage even government-supported credit facilities such as HUDCO and Life Insurance Corporation of India which, despite mandates to support both infrastructure and rural development, invest only a minor proportion of their total portfolio in RWSS. In Kerala, where the rural population accounts for 73 percent of total population, loans from these two corporations for rural schemes accounted for only 15 percent of the total approved financing provided by these agencies to the Kerala Water Authority in 1996–97.

The key to corporate involvement in the RWSS sector lies in implementing reforms to achieve a commercialized demand-oriented culture in RWSS entities to tailor operations to the needs of user communities, and structure investments according not only to community needs but also to their abilities to pay. This will entail greater community involvement in decision-making regarding all sectoral activities including investments, technologies and pricing (including the funding of infrastructure replacements). The sector will need to introduce and strengthen corporate financial management capabilities in the water agencies to instill financial discipline and effective handling of cost and pricing issues.

<sup>6</sup> At least two-thirds of all sector investments are channeled into goods and services procured from the private sector



# Strategy for Sector Reform

**T**o address the major issues confronting the sector, the government's approach must be modified to enable consistency between program implementation and the prescribed policy. This means implementing a decentralized, user participatory, demand-driven approach including cost-sharing and full cost recovery, and maximum implementation by users at grass-roots levels, thereby ensuring that the public receives the services it desires in an efficient, equitable and sustainable manner.

## Goals and components

The recommended strategy has three service management goals and one resource management goal:

- To establish **an enabling environment**, meaning a situation that politically, legally and institutionally supports reform of the sector;
- To ensure **institutional sustainability** by supporting the process of decentralization and devolution of responsibilities for RWSS to the panchayat raj institutions, local administrations and users, and by strengthening the advisory capacity of existing sector agencies;
- To ensure **financial viability and sustainability** by implementing cost-sharing and cost recovery policies; and
- To **protect water resources**, in particular groundwater, by developing planning, resource management and technological practices to protect or improve the availability and quality of groundwater for rural water supply.

The strategy relies heavily on the use of central and state funding to drive the reform process. As such, conditionality for disbursement of central funds to state administrations and of state funds to panchayat raj institutions and local administrations should be defined explicitly in terms of conditions that must be met and activities for which funding can be applied. The policy needs, strategy considerations, and critical interventions recommended for

each goal of the reform strategy are presented here, and suitable activities are identified for which matching central and state funding would be eligible.

## Enabling Environment

The framework contained in the Eighth-Five Year Plan, which serves as a guide to required reforms in the sector, needs to be translated into policy statements at state level. The policy and thrust of its implementation features should emphasize the core themes emerging from this report: devolution of responsibilities to grass-roots levels and, in particular, user involvement and implementation; a demand-oriented approach; full cost recovery, cost sharing and financial sustainability; and progressive adjustment of government's role to be a facilitator rather than an implementor in the RWSS sector. The policy statement subsequently needs to be implemented through well identified interventions. The strategy is to ensure a politically, legally and institutionally supportive environment that will advocate and facilitate the implementation of policies and enable the reforms to proceed.

Four interventions are recommended. First, a widespread campaign should be launched to communicate the message that water is a scarce resource and must be managed as an economic good to ensure universal access and efficient use and allocation. This campaign will include mass media campaigns, public education, and targeted training to inform the rural (and urban) population of the need to charge for water and the benefits of doing so, and

to convince politicians of the public's willingness to pay for a safe and reliable supply of water. Matching central funding may be provided to support public communication. Second, groundwater legislation should be developed and implemented to ensure that priority is given to drinking water and the protection of its source.

Third, a state Action Plan should be developed and implemented to devolve responsibilities as defined by the Panchayat Raj Act (including rural water supply and sanitation). This plan would ensure that decision making, management and financial autonomy are equally devolved. And fourth, activities that strengthen institutions (including development and implementation of management information systems, financial systems, performance-based incentive systems, monitoring and evaluation systems, and management training) are needed to support public sector and civil service reform and improve the overall monitoring, accountability, and transparency of the sector. The campaign would emphasize the new user and demand-oriented approach. Matching central funding may be provided to support state management training and management information systems.

### **Institutional Sustainability**

Two policies are needed to support institutional sustainability. A national RWSS sector policy is needed to define the role of the public sector, and a state policy is needed to define the role of the state in keeping with the principles defined in the national policy. It is essential that these policies are not only developed but also implemented. The strategy is to develop and implement a state RWSS decentralization policy that: (i) clearly defines the mandate and roles of state, district, and block administrations and panchayat raj institutions, with emphasis on the increased role of the users and a progressively diminished role of government to one of facilitator rather than implementor; (ii) decentralizes sector functions to the lowest appropriate level; (iii) restructures and strengthens the state, district and block administrations, to provide support services to panchayat raj institutions, specifically the gram panchayats and, most importantly, the village water supply committees; and (iv) facilitates the participation of NGOs and the private sector.

Five interventions are recommended. First, existing public sector institutions should be restructured so that

they are oriented to consumer service and serve their major clients (the panchayat raj institutions, specifically the gram panchayats and their village water supply and sanitation committees). Second, institutional strengthening activities should be supported to improve the responsible agencies' functional capacity in policy development, planning, implementation, operations and maintenance, monitoring and evaluation, and health and sanitation promotion. Matching central and state funding may be provided to support training. Third, a monitoring system should be implemented to ensure that national drinking water standards are adequately monitored and safeguarded. Matching central funding may be provided to support water quality monitoring systems. Fourth, ownership of rural water supply assets should be transferred to panchayat raj institutions. Matching central and state funding may be provided to support rehabilitation and replacement. Finally, the procedures governing contracts and pre-qualifications need to be improved, as do the procedures for monitoring and evaluating NGOs and the private sector.

### **Cost Recovery and Financial Sustainability**

Policies are needed at state and national levels to ensure full recurrent cost recovery, cost sharing and the sector's financial sustainability. At the national level, a RWSS cost recovery and cost-sharing policy is needed to define the situations in which a community will be eligible for matching government financing for new schemes and rehabilitation or replacement of existing schemes. At the state level, a RWSS cost recovery and cost-sharing policy is needed to support the principles defined in the national policy. The strategy has three objectives: (i) to recover the full cost of operations, maintenance and replacement, (ii) to share capital costs so that panchayat raj institutions and the community are partners, capital investment is efficient, and ownership is transferred, and (iii) to encourage rural credit facilities and the private sector to invest in the sector. The proposed strategy will accomplish these goals through the use of well-defined financial conditionalities, whose basis will serve the broader objectives of public administration reform. Strict adherence to conditionalities will be critical to the strategy's success.

Four interventions are recommended. First, a demand-driven approach should be implemented to ensure

an affordable supply of public water and sanitation. Matching central and state funding may be provided to support new construction. Second, remedial measures are needed to address drinking water not satisfying national and state standards, and these measures should be eligible for matching government financing or transparent subsidies. Third, institutional strengthening activities should be supported to improve the efficiency of investment and expenditure in the sector and overall financial management of sector agencies. Matching central and state funding may be provided to support management and financial management training. Fourth, tax incentives should be provided to encourage the participation of NGOs and the private sector. Matching central and state funding may be provided to support soft loans and guarantees.

### **Transition Phase**

During a transition phase, financial conditionality is proposed to phase out the existing norm and target-driven approach and government subsidies to the sector, and phase in a demand-driven approach and full cost recovery. Public education and widespread communication will set the stage for difficult cost sharing and cost recovery policies to be announced and implemented, by convincing the voting public and politicians of the benefits to them of a financially sustainable service. The goal of the public education campaign will be to enlighten the public about: the process of capturing and delivering potable water; the associated costs; the need to recover those costs from users to ensure and maintain a safe, reliable and efficient service for all; and the need to economize on use of water to ensure its continued availability in the future. This would dispel the belief that water is a free resource from the government.

The duration of the transition period will depend on the ability of sector agencies, district or block administrations, and gram panchayats to reorient or restructure themselves, the successful implementation of cost recovery and cost-sharing policies, and the general availability of matching funding. Fundamental to success will be the degree to which these efforts translate into the creation of strong user groups in the form of village water supply and sanitation committees (VWSSCs). Once the transition phase is complete, the sector should be fully self-sufficient. Transparent subsidies will only be provided in two

situations: one, to serve the very poor or two, to match funding for implementing an expensive technology beyond the general affordability of the community that is deemed necessary to address serious problems of water quantity or quality.

### **The demand-driven approach**

A demand-driven approach is essential to promote efficient capital investment and sustain existing investment. The institutional interface will be the grain panchayat on one side to ensure legal grounding, and on the other a users' (water supply and sanitation) organization to ensure users' full participation in decision making. Demand for services will be expressed through the users' willingness to organize for RWSS, their willingness to prepare a Gram Plan that includes RWSS, and their willingness to share in the capital cost and pay the full cost of operation, maintenance and replacement. Variants within this approach can be considered depending on the capacities of panchayat raj institutions and the grass-roots organizations. It is likely that maximum effectiveness will be achieved where the VWSSCs rather than the panchayat raj takes a larger implementation role. Decentralization should not be seen as merely transferring the government role to local government levels, but as a process of transferring decision making and implementation to the users. Institutional sustainability would also be more expediently assured if it is supported by external development agencies and with increased participation of NGOs and the private sector. Externally-supported projects should incorporate full policy (elements of the strategy to bolster GOI's efforts at policy reform. Support of NGO and private sector participation would be facilitated through increased flexibility in government procurement and contract regulations and procedures, and through provision of concessional financing or beneficial tax incentives.

Gram panchayats, and/or the user WSS groups, will require management and other functional training and support to enable them to assume their new role as planners, implementors and chief caretakers of RWSS facilities. Public funds should be allocated for this purpose from existing sector commitments to ensure timely availability of resources. Technical assistance and training would be required

for: enhancing the participatory process; procurement and contracting; operations and maintenance; billing and collection; and financial management and reporting. The staff of existing state or district water agencies, NGOs and private sector organizations would be the agents for dissemination and training to the panchayats.

District and block level administrations will also require support for strengthening management capacity particularly in the areas of: management information systems, and financial and performance monitoring and evaluation systems to improve overall sector management, accountability and transparency. Development of human interaction and participatory skills would be critical. This would be especially important in locations with no or weak NGOs or private sector capacity. As the utility of such skills are cross sectoral, care should be taken to avoid replication of skills that may be present in other government departments. Where available, staff from departments such as health, family welfare or social welfare as well as other personnel (such as extension workers, block development officers, universities, NGOs, private firms) should be involved.

District and block engineering sub-divisions should be proactive during the transition phase in assisting the gram panchayats to establish water supply and sanitation committees and to undertake participatory inventories of RWSS assets. They should also provide technical services to Gram Plan preparation, preparation of technological options and cost estimates, detailing of cost sharing arrangements, supervising geophysical investigations and scheme implementation, and coordinating health and hygiene education.

State-level RWSS agencies would also require major re-orientation toward a demand-driven, client-oriented and participatory culture and establishing themselves as facilitators to the panchayats and user WSS groups. This would be especially critical where such agencies had responsibility for regional piped schemes, to ensure the levels and quality of service that users desire and are willing to pay for. Community specialists or sociologists should be employed at managerial level by the agencies, with mandate to administer staff training programs in local government procedures and community participation techniques, and to develop approaches for providing services to local

governments and communities. Where necessary, consultants or training institutions should be engaged to provide training programs for engineers. Water agencies should support the introduction, communication and facilitation of methodologies for community-based planning, implementation and operations and maintenance of RWSS at district, block and VWSSC/gram panchayat levels. These would include rapid rural appraisals, participatory rural appraisals, community self-surveys, cost sharing approaches and mechanisms, payment systems, training of user groups in contract management, and training of local mechanics.

### Key Steps to Implementation

The first step will be for the gram panchayat, users, the state water agency, and an independent entity such as a consultant, to compile an inventory of WSS assets. Existing assets in good operating condition will be transferred immediately to the appropriate panchayat raj institution. The panchayat will own new schemes from the outset and, through its village water supply and sanitation committee (WSSC), will have full responsibility for management, financial management, operations and maintenance, rehabilitation, replacement, and augmentation or expansion. With these new ownership roles and responsibility for the facilities, local agencies would then be free to determine operational and management arrangements in-house or by choosing among existing sector agencies, NGOs or the private sector for support services or as partners. For schemes in need of repair and rehabilitation, the gram panchayat and/or VWSSC will negotiate with the water agency based on the outcome of the participatory inventory taken. For large regional or small-town piped water supply and sanitation schemes (which represent 1 percent of all RWSS schemes and service 15 percent of the rural population covered by public facilities) the state and district level administrations or sector agencies should be responsible for planning, implementation and operation and maintenance.

Particularly important, a users' water supply and sanitation committee (WSSC) should be established at scheme, village or panchayat level to be the main body for planning and managing RWSS.<sup>7</sup> The dual organizational structure of

<sup>7</sup>The number of water supply and sanitation committees (WSSC) per community will depend on population size, social structure of the community, and the community's perceived need to organize. The WSSC can be newly constituted under the gram panchayat, or its functions relegated by the gram panchayat to an existing voluntary organization through appropriate by-laws. The establishment of the committee would be a precondition for access to central or state government financial assistance.

WSSC and gram panchayat is suggested to provide the flexibility needed to accommodate the varying local conditions across India. The gram sabha will be summoned, and a staff member of the water agency at the district or block level, or an NGO or private consultant, will present the options along with their positive and negative aspects. A schedule for organizing the village WSSC will be agreed and followed. Adequate time must be allowed for this process, which means that no conditionalities should be tied to a time frame for completing the inventory.

The village water supply and sanitation committee will prepare a Gram Plan encompassing all public water and sanitation services to be provided by or within the jurisdiction of the gram panchayat. The Gram Plan will assess the needs and demands expressed by different social groups within the villages and habitations of the gram panchayat, provide all stakeholders with information, ensure that water supply is integrated with environmental as well as household sanitation, facilitate the transfer of ownership of existing RWSS assets from the state agency to the gram panchayat (if applicable), and provide a basis for assessing the eligibility for matching financing from the gram panchayat, state and central levels.

The village WSSC, with the community and users, will prepare and implement the water Gram Plan. Technical and organizational guidance and support can be obtained from block or district administrations, sector agencies, NGOs or private firms as desired. Simple formats and guidelines for assessing the condition of public facilities will be provided by block or district administrations or sector agencies with appropriate guidance from state agencies. These formats and guidelines will provide a uniform basis for assessing the eligibility for matching financing throughout the state.

The Gram Plan will include a map of each village and habitation that delineates service areas, existing sources and water points, waterlogged or water-prone areas, areas with specific environmental sanitation requirements, and competing uses of groundwater. Mapping is essential because it provides basic information for broad planning and development, allows anticipated population and economic growth to be taken into account, and enables basic services to be integrated at the village level. The Gram Plan will take into account the requirements for drinking water, competing uses of water, and recharge measures necessary for plan-

ning and developing watersheds. It will also incorporate the sanitation requirements of public institutions such as schools, public health centers, and anganwadi (preschool) centers within the gram panchayat.

Cost-sharing principles and financing arrangements should be clear to all and agreed on early. Preliminary design and estimates of the capital investment costs, the O&M costs, and the replacement costs will be prepared for each feasible option. This will include both construction of new schemes and rehabilitation and replacement of existing schemes. The ultimate choice of option will be based on the users' explicit understanding of the anticipated benefits or service levels, their share of the initial investment costs, and the implications of full cost recovery in the long run.

Based on the preliminary designs and cost estimates, the village water supply committee and gram panchayat will determine the feasibility of implementing the desired plan. Amendments and changes will be made and a final plan produced. The state and central administrations will provide matching funds as a proportion of the estimated cost of a basic level of service up to a ceiling determined by the state. Separate principles will be determined for sharing the expenses for latrines in schools, public health centers and community centers. Based on the final Gram Plan, a board comprising block and district development committees as well as representatives from the state water agency, will assess eligibility for support. The agreed plan will be implemented.

For household sanitation, comprising mainly latrines, the demand-driven approach will rely on a social marketing strategy, where government funds are used to create demand through a public awareness and education campaign, to strengthen private sector delivery mechanisms, and to support development of a range of appropriate and affordable technologies. The approach will include: (i) demonstration programs that incorporate approaches that have been tested, such as the UNICEF sanitary marts program that target whole villages and habitations (not individual households), which have been selected for their demonstration potential, and that recruit representatives of NGOs, youth clubs, and other local organizations in addition to community health guides and male and female health workers; (ii) alternative delivery systems, such as a network of production centers, retail outlets for sanitation products,

**Table 4.1. Framework for Decentralization of RWSS Functional Responsibilities**

Functional responsibility	Hand pumps	Mini and small piped water supply	Environmental sanitation	Regional or town piped water supply
Policy	State	State	State	State
Planning	Village water supply committee (WSSC) and gram panchayat	WSSC, Gram panchayat, block or district	WSSC, Gram panchayat, block or district, and state	VWSSCs, Block, district and state
Implementation	VWSSC, Gram panchayat, block or district	VWSSC, Gram panchayat, block or district	WSSC, Gram panchayat, block or district	Block, district and state
Operations and maintenance	VWSSC, Gram panchayat, block or district	WSSC, Gram panchayat, block or district	WSSC, Gram panchayat, block or district	Block, district and state
Monitoring and evaluation	WSSC, Gram panchayat, block or district	Gram panchayat, block or district, state	WSSC, Gram panchayat, block or district, and state	Block district and state

and training of local masons, that are supported by grants, soft loans or tax incentives; and (iii) a range of low-cost to more-expensive latrines that are available on the market. Central and state funding should be clearly earmarked to encourage NGOs to establish initial facilities, and well-defined performance indicators should be developed for monitoring these campaigns and programs.

### Decentralization of Functional Roles

Substantial institutional reforms, bolstered by strong political support, are clearly required. To reorient the structure and functioning of RWSS agencies, functional roles will have to be decentralized to the lowest appropriate level as detailed in Table 4.1. Functional roles and responsibilities must be defined, restrictive sanctioning limits for each level must be reviewed and changed, and institutional space must be created to encourage NGOs and the private sector to participate.

As Figure 4.1 illustrates, only sector agencies that restructure or reorient themselves appropriately will be able to provide the services that users and communities desire and are willing to pay for. A new organizational equilibrium is necessary for their long-term sustainability, both as important partners and as competitors in the RWSS sector. The new organizational structures will enable the new priorities that are required: a shift from the

past public sector and supply-driven approach oriented to construction and lacking institutional and financial sustainability, to a user and demand-driven approach with emphasis on customer service, community participation and sustainable operations and maintenance.

### Incentives for Reform

The incentives and disincentives for stakeholders to accept and participate actively in the reform process are of paramount importance. Table 4.2 lists incentives and disincentives for the different stakeholders. Clearly, what is an incentive for some can be a disincentive for others. The recommended interventions try to address these conflicts.

### Cost Recovery and Financial Sustainability

Cost recovery of capital and recurrent expenditures through user fees is a critical action for financial sustainability of the service. Cost-reflective tariffs would induce more realistic service expectations from users and a more affordable pipeline of investments from the service provider. Furthermore, local administrations would be enabled to properly maintain assets and sustain service levels. Where the cost of the least-cost technology alternative generally exceeds the affordability of an individual community, payment in-kind or a direct and transparent subsidy should be explored. Where widespread economic disparities are



found, cross-subsidization may be an appropriate and practical option. A progressive tariff with different pricing tiers for different uses and different classes of customers can be considered. A well-designed tariff structure could support cross-subsidization from one region to another, from urban to rural areas, from one class of user to another, or from high consumption to low.

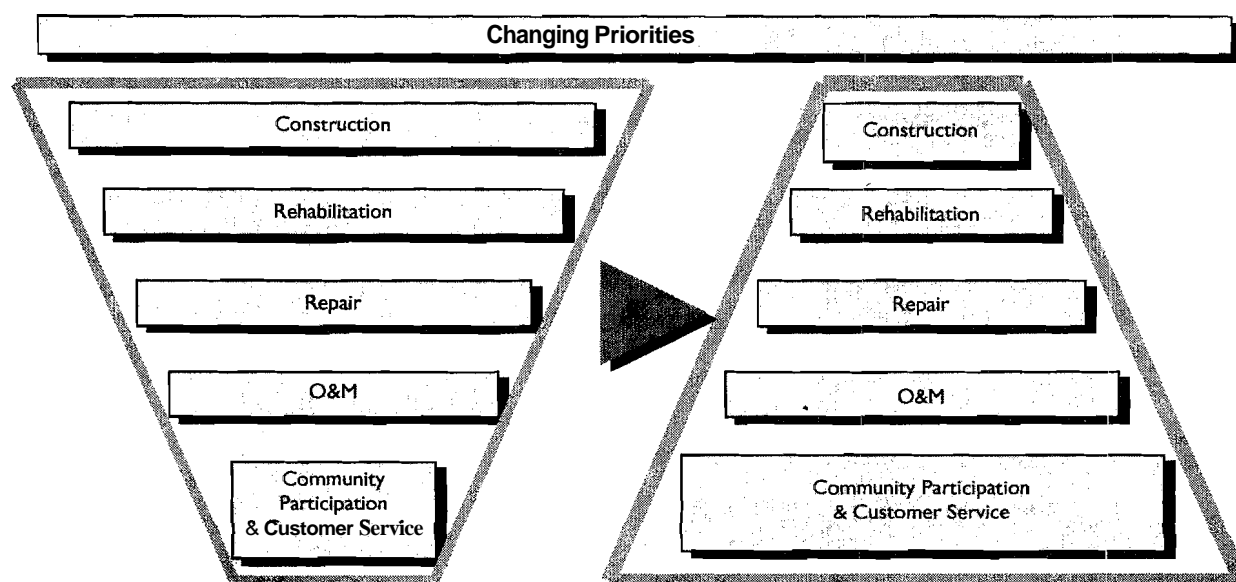
The strategy here calls for full cost recovery of operations and maintenance expenditures, and a gradual move toward recovery of capital and replacement costs. In the long run all costs, including for capital and replacement, will be fully recovered. During the transition phase, responsibility for 50 percent of the capital investment cost will be shifted from central and state governments to the panchayat raj institutions and users. A pre-defined proportion of the capital investment cost will be recovered from users, serving as a financial conditionality for central and state government matching capital investment. As an equitable compromise between the old and new strategies, a nominal 10 percent share user contribution is proposed for any new schemes identified for construction during the Gram Plan process. For rehabilitation or replacement of existing systems, a 25 percent share contribution from users is proposed, making

all involved parties equal partners. The proposed cost-sharing framework is presented in Table 4.3.

In order to accomplish the objectives of the transition phase, cost sharing conditionality is fundamental to the entire strategy. Cost sharing will provide an opportunity to: (i) extend service coverage and make the best use of limited central and state government resources; (ii) use central and state funds to induce capacity building toward greater client-responsiveness; (iii) use central and state funds to induce implementation of a participatory planning process; (iv) engage users and communities in the process to demand affordable assets and services; and (v) encourage management responsibility, efficiency in procurement and investments, and sustainability of operations and the infrastructure.

The proposed cost-sharing formula is financially feasible and, if properly implemented, will enable the transition phase to be implemented over a five to seven year time frame. Current central and state allocations to the sector are sufficient to provide matching funding, to achieve full coverage based on existing norms and current population levels, to repair and rehabilitate existing schemes to facilitate transfer of ownership, and to undertake the proposed institutional strengthening activities. Under this proposal,

**Figure 4.1. Changing Priorities of Sector Agencies**



**Table 4.2. Stakeholder Incentives and Disincentives and Proposed Interventions**

Stakeholder	Incentives	Disincentives	Recommended interventions
Users, VWSSCs and Gram panchayats	<ul style="list-style-type: none"> <li>Control over the timing, location, and type of scheme</li> <li>More reliable and better quality services</li> </ul>	<ul style="list-style-type: none"> <li>Need to pay for services</li> <li>Responsibility for operations and maintenance</li> <li>Responsibility for schemes that were designed without user participation and may not satisfy user and community needs</li> </ul>	<ul style="list-style-type: none"> <li>Training and support offered to VWSSCs and gram panchayats, in developing Gram Plans that includes RWSS</li> <li>A participatory inventory and asset evaluation with third-party review before transfer of ownership and responsibility</li> <li>Matching central funds available for eligible new construction and rehabilitation or replacement</li> <li>Management autonomy to set tariffs and procure goods and services from the supplier of their choice and at prices they are willing to pay</li> </ul>
State agencies and district administrations	<ul style="list-style-type: none"> <li>More efficient capital investment</li> <li>Potentially reduced subsidy to the sector</li> <li>Increased public satisfaction with sector services</li> </ul>	<ul style="list-style-type: none"> <li>Lack of political support</li> <li>Financial conditionality</li> <li>Difficulty in effecting institutional reform and adjusting staff levels and mix as necessary</li> <li>Cost of institutional strengthening activities and software support</li> </ul>	<ul style="list-style-type: none"> <li>Central policy framework as precedence</li> <li>Central matching funding for institutional reform and strengthening</li> <li>Public education and mass communication to inform the public and gain political support</li> <li>Matching central funding for public education</li> <li>Rajiv Gandhi Mission to monitor and support the reform process</li> </ul>
Central government	<ul style="list-style-type: none"> <li>More efficient capital investment</li> <li>Potential reduction in subsidy to the sector</li> <li>Increased public satisfaction with sector services</li> <li>Sector policy objectives met</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>	<ul style="list-style-type: none"> <li>Financial conditionality</li> </ul>
NGOs and the private sector	<ul style="list-style-type: none"> <li>Potential for increased involvement in supply of RWSS goods and services</li> <li>Potential for increased involvement in RWSS planning, implementation, O&amp;M</li> <li>Potential for increased involvement in participatory Gram Plan preparation</li> <li>Potential for involvement in providing institutional strengthening and training support</li> </ul>	<ul style="list-style-type: none"> <li>Unreceptive and inflexible government procurement and contracts</li> <li>More smaller customers (gram panchayats and user groups) rather than central or state agencies</li> <li>Absence of viable working network for distribution of goods and service</li> </ul>	<ul style="list-style-type: none"> <li>Improved and more flexible government procurement and contracts</li> <li>Financial incentives—loan guarantees, loans on preferential terms, and tax incentives—to encourage new entrants to the sector</li> </ul>

**Table 4.3. Cost-Sharing Framework (percent)**

Participant	Current situation	Proposed share formula for new construction	Proposed share formula for rehabilitation & replacement
Users		10	25
Panchayat raj institutions		40	25
State administration	60	25	25
Central administration	40	25	25

**Table 4.4. Matching Grants as a Percentage of Total Local Administration Revenue, 1996–97**

Technology	Annual capital cost per capita (rupees)*	Local administration's 40% WSS expenditure share per capita (rupees)	Local administration total revenue per capita (rupees)**	Matching grant as a percentage of total revenue
Hand pumps	80	32	735	4
Mini piped water systems	100	40	735	5
Small piped water systems	150	60	735	8
Regional piped water systems	167	67	735	9
Town piped water systems	175	70	735	9

\* Capital cost per capita and proposed financing period (hand pumps, 2 years; mini piped water systems, 5 years; small piped water systems, 10 years; regional piped water systems, 15 years; and town piped water systems, 20 years).

\*\* 17 percent of projected 1996–97 central government total expenditure / projected 1996 total population.

the central and state administrations will provide matching funding for 50 percent of the capital investment needed during the transition period. This would amount to between Rs. 85 billion (US\$2.4 billion) and Rs. 100 billion (US\$2.9 billion) over a period of 5–7 years which, given the government's current annual allocation of Rs. 16 billion (US\$457 million) to Rs. 18 billion (US\$514 million), would be feasible within the transition phase.

With central and state government matching funds and self-generated funds, the level of local administration expenditure would equal roughly 13–17 percent of total government expenditure.<sup>8</sup> This expenditure level is common in developing countries and more importantly, would be a major step toward ensuring that panchayat raj institutions and local administrations have sufficient financial autonomy and

an adequate level of resources to fulfill their responsibilities. Local administrations round the world typically spend between 15 and 20 percent of total expenditure on basic water supply and sanitation services. As Table 4.4 illustrates, the proposed cost-sharing formula for India is well within international norms.

Local administrations should be apportioned a defined share of central and state taxes and be encouraged to improve their level of self-generated income. State finance commissions should clearly define the type and level of taxes or fees that local administrations may levy and offer policy guidelines. Local administrations should also be encouraged to explore external sources where additional funding is justified. An assessment of credit-worthiness and the financial feasibility of the undertaking will

<sup>8</sup> Assuming that the current level of local administration expenditure ranges from 2.9 percent of total government expenditure (based on 1986–87 expenditure levels) to the optimistic estimate of 6.6 percent (based on 1989–90 expenditure levels), and further assuming that the recommendations of both the Tenth Finance Commission and the West Bengal State Finance Committee are implemented nationally.

**Table 4.5. State versus Local Administration Finances**

Type of revenue	State finances, 1993–94	Local administration, estimated 1989–90	Local administration, proposed situation
Self-generated revenue	58	20	50
Tax	37	5	25
Non-tax	21	15	25
Central transfer	42	80	50
Taxes	16	5	15
Grants	15	75	15
Loans	11	0	10

Source: Oommen and Datta, 1995; West Bengal State Finance Commission, 1995.

help to sustain the activity. Assistance in the form of credit guarantees and preferential rates may be necessary to facilitate the process. Linkages with parastatal credit facilities should be established. Table 4.5 illustrates the existing structure of state and local administration financing and presents the proposed situation.

### Proposed plan of action

In line with the recommended strategy, the following Plan of Action reflected in the Matrix of Recommendations (Table 4.6) addresses each of the critical goals. The Action Plan summarizes the actions discussed in this chapter and various detailed recommendations also contained in Chapters II and III. It also assigns responsibility as required to users, appropriate government level or the private sector, and proposes a time frame for action. The time frame has been classified as urgent (0–2 years), short term (1–3 years), medium term (3–5 years) and long term (>5 years).

These recommendations are already the subject of encouraging follow-up by the central government, a number of states, bilateral and multilateral agencies and NGOs. Subsequent to initial discussion cum dissemination at a national workshop in February 1997<sup>9</sup> of an earlier draft of this report, and report revisions to incorporate the outcome of the national workshop, further workshops at regional and state are being organized by the RGNDWM to disseminate the final strategy recommendations as reflected in this report. The recommendations are also being incorporated at project level in some states, in the design of projects supported by the World Bank, and in various bilateral agency and NGO-supported activities. There is now a need to broaden implementation to a formal national strategy that encompasses all elements of the report in a comprehensive approach. This sector reform process is under energetic initiation by GOI and merits full support to achieve the intended turnaround in sector performance.

<sup>9</sup> The national workshop on RWSS, held on February 20–21, 1997, was chaired by the Rajiv Gandhi National Drinking Water Mission. Proceedings of the workshop, including speech delivered by the Rural Development Secretary, Mr. Vinay Shankar, are reproduced in the Annexes.

**Table 4.6. Detailed Matrix of Recommendations**

Recommendation	Responsibility	Time frame
<b>A. Establish An Enabling Environment</b>		
<b>Objective:</b> To ensure a politically, legally and institutionally supportive environment that will facilitate the implementation of the reform process with particular emphasis on devolution of responsibilities to grass-roots levels and, in particular, user implementation, a demand-oriented approach, full cost recovery and financial sustainability (also refer Sections B & C below).		
<b>A.1. Public Awareness:</b> Implement a widespread public awareness campaign on the scarcity value of water to convince voters and politicians of the need to: (i) levy water charges on those users in proportion to benefit received ( <b>industry, farmers</b> , large consumers); (ii) ensure sufficient resources to maintain investment and assure an adequate level of service for all; (iii) limit reliance on limited government funding; and (iv) eliminate subsidies for water supply (with possible transparent targeted subsidies for impoverished groups)	Central and state Governments	Urgent
<b>A.2. Give Priority to Drinking Water in Water Resource Use:</b> Amend the National Water Policy, formulate state water policies, and prepare groundwater legislation, to give clear priority to drinking water over other uses.	Central and State Governments	Short term
<b>A.3. Redefine and Reduce Government Role:</b> Develop and implement national and state policies defining the role of each administrative level of the public sector in the RWSS sector, including policy on cost recovery, elimination of latrine subsidies, the level of commitment for initial service coverage, rehabilitation and replacement, expansion, and <b>O&amp;M</b> .	Central and State	Urgent
<b>A.4. Full Cost Recovery and Capital Cost Sharing:</b> Implement O&M cost recovery and cost sharing policies for demand-led investment in the RWSS sector, defining eligibility criteria for provision of matching government funds to communities for new schemes and rehabilitation or replacement of existing schemes.	Central and State	Urgent
<b>A.5. Decentralization of Responsibilities:</b> Devolve management responsibilities and resources to the panchayats and <b>VWSSCs</b> , with appropriate authority and incentive to generate their own revenues.	State	Short term
<b>A.6. Institutional Strengthening:</b> Implement institution strengthening activities (including development of management information systems, financial systems, monitoring and evaluation systems), management <b>training</b> to directly facilitate decentralization to district and block levels as appropriate, and civil service <b>reforms</b> necessary to ensure the sustainability of the former.	State	Short term
<b>B. Ensure Institutional Sustainability</b>		
<b>Objective:</b> Implement a state RWSS decentralization strategy emphasizing a user-driven demand-oriented approach, maximizing the role of users in decision making and implementation, and shifting government's role to one of facilitator rather than service provider, by: clearly defining the mandate and roles of users as well as state, district, and block levels; decentralizing functions to the lowest level appropriate; reorienting district and block administrations to support the gram panchayats and <b>VWSSCs</b> ; & facilitating participation of <b>NGOs</b> and the private sector.	State	Short term

**Table 4.6. (cont.) Detailed Matrix of Recommendations**

Recommendation	Responsibility	Time frame
<b>B. (cont.) Ensure Institutional Sustainability</b>		
<p><b>B.1. Enable panchayat institutions and user groups to assume the lead in RWSS decision making:</b></p> <ul style="list-style-type: none"> <li>Establish village water supply and sanitation committees (VWSSCs) associated with under the gram panchayats;</li> <li>Have VWSSCs and gram panchayats prepare an inventory of all public water supply and sanitation assets within the gram panchayat (as part of the Gram Plan);</li> <li>Have VWSSCs and gram panchayats assess the condition of all assets in accordance with issued standards, with assistance provided by the block and district administration;</li> <li>Have VWSSCs and gram panchayats prepare cost estimates to rehabilitate or replace public water supply and sanitation assets to achieve the service levels designed and comply with issued cost standards, with assistance provided by the block and district administrations;</li> <li>Transfer ownership of existing assets to the panchayat raj institutions, which will make a formal commitment to provide matching funding for rehabilitation or replacement of existing schemes in accordance with the Gram Plan: 25 percent by local administrations, 25 percent from state agencies, and 25 percent from central agencies;</li> <li>Have VWSSCs along with the gram panchayats prioritize works, in line with available funding (25 percent must be raised from user contributions and the gram panchayat's own resources);</li> <li>Have district and local administrations and VWSSCs prepare a Gram Plan for water supply identifying not covered and partially covered areas as well as water quality, rehabilitation and replacement, augmentation and environmental sanitation needs;</li> <li>Undertake a participatory validation of not covered and partially covered habitations (taking into account private sources).</li> </ul>	State, District, Block, Gram Panchayat and VWSSCs	Short to medium term
<p><b>B.2. Enable, promote and facilitate participation of NGOs and the private sector;</b> define appropriate roles of these non-government as well as external agencies:</p> <ul style="list-style-type: none"> <li>Prepare an inventory of registered and qualified NGOs for panchayat raj institutions and sector agencies and revise current government regulations to allow panchayat raj institutions and sector agencies to recruit NGOs;</li> <li>Provide private sector preferential financing to encourage private sector involvement in RWSS delivery, support and O&amp;M services;</li> <li>Allow block and district engineering departments, NGOs, and the private sector to provide maintenance and repair services on a (cost reflective) contract basis to the responsible local administration;</li> <li>Have external support agencies focus on supporting institutional reform of the water agencies necessary to support and consolidate the decentralization process as well as consolidate the coverage already achieved.</li> </ul>	<p>State and District</p> <p>Central and State</p> <p>State</p> <p>Central and External Support Agencies</p>	<p>Urgent</p> <p>Short term</p> <p>Short term</p> <p>Urgent</p>

**Table 4.6. (cont.) Detailed Matrix of Recommendations**

Recommendation	Responsibility	Time frame
<b>B. (cont.) Ensure Institutional Sustainability</b>		
<b>B.3. Strengthen institutional capabilities</b> in consumer orientation, policy development, planning, implementation, O&M, monitoring and evaluation, and promotion of health and sanitation:	State	Urgent, Short term
<ul style="list-style-type: none"> <li>Develop participatory guidelines and manuals for planning; recruit, transfer and train staff within existing cadres to strengthen capabilities, supplementing them with NGOs &amp; private consultants;</li> </ul>		Short term
<ul style="list-style-type: none"> <li>Offer training to staff in design and supervision.</li> </ul>		Medium term
<b>B.4. Restructure public sector institutions.</b>	State	Short to long term
<b>B.5. Strengthen operational guidelines and procedures for RWSS agencies:</b>		
<ul style="list-style-type: none"> <li>Develop standard operations and maintenance procedures and communicate them to the responsible local administrations;</li> </ul>	State	Short term
<ul style="list-style-type: none"> <li>Improve design and specifications to reflect the field situation and make programs responsive to user needs;</li> </ul>	State	Medium term
<ul style="list-style-type: none"> <li>Update approval and sanctioning procedures to fit the decentralized roles and responsibilities (more sanctioning powers to lower levels);</li> </ul>	State	Short term
<ul style="list-style-type: none"> <li>Strengthen pre-qualification criteria so that only qualified suppliers, consultants, contractors, and NGOs are involved;</li> </ul>	State	Medium term
<ul style="list-style-type: none"> <li>Implement transparent procurement procedures that consider quality as well as cost criteria</li> </ul>	State	Short term
<ul style="list-style-type: none"> <li>Improve quality control through formal procedures and guidelines and provide opportunities to conduct independent quality audits and involve local communities (users) in site supervision;</li> </ul>	State	Urgent
<ul style="list-style-type: none"> <li>Develop and implement a monitoring and evaluation system with indicators also covering activities other than physical implementation.</li> </ul>	Central and State	Urgent
<ul style="list-style-type: none"> <li>Development and implement a system ensuring that national drinking water standards are adequately monitored and adhered to.</li> </ul>	Central and State	Short to medium term
<b>C. Ensure Financial Viability and Sustainability</b>		
<p><b>Objective:</b> Implement full cost recovery of operations and maintenance and replacement costs to ensure sustainability of sector investment. Implement a demand-driven, cost-sharing approach ensuring that the panchayat raj institutions and VWSSCs are partners to make capital investment more efficient and transfer ownership. Encourage sector financing by rural credit facilities and private sector investors.</p>		

**Table 4.6. (cont.) Detailed Matrix of Recommendations**

Recommendation	Responsibility	Time frame
<b>C. (cont.) Ensure Financial Viability and Sustainability</b>		
<b>C.1. implement a demand-driven approach:</b>		
<ul style="list-style-type: none"> <li>• Have VWSSCs and gram panchayats, assisted by block and district administrations, prepare preliminary design and cost estimates for alternative public water supply and sanitation schemes, combining the least-cost technology and the minimum service level to constitute the least-cost option that will be used to determine the level of matching funding;</li> <li>• Have village water supply committees and gram panchayats choose the level of service they wish and raise sufficient funding for the full incremental cost;</li> <li>• Have village water supply committees and gram panchayats prioritize works eligible for matching grants in accordance with available funding (a total of 50 percent, of which 40 percent must be raised from the gram panchayat's own resources and 10 percent from user contributions).</li> </ul>	Village Water Supply and Sanitation Committees, Gram Panchayats, and the State	Urgent to short term
<b>C2. Increase user charges to fully recover O&amp;M costs:</b>	State, District and Panchayats	Urgent
<ul style="list-style-type: none"> <li>• Increase water charges and bulk water prices to fully recover O&amp;M cost (as well as cover replacement costs);</li> <li>• Improve assessment and collection procedures;</li> <li>• Introduce indexing mechanisms to automatically adjust water charges to inflation and cost increases.</li> </ul>		
<b>C3. Reduce O&amp;M costs:</b>	State, District and Panchayats	Short to medium term
<ul style="list-style-type: none"> <li>• Transfer O&amp;M responsibilities to local bodies (panchayats institutions) and their VWSSCs;</li> <li>• Encourage participation of local operators and contractors;</li> <li>• Use local materials and labor;</li> <li>• Reduce overhead components of O&amp;M activities.</li> </ul>		
<b>C4. introduce and implement capital cost sharing policy:</b>	Central, State, Panchayats	Short term
<ul style="list-style-type: none"> <li>• For new schemes, implement capital cost sharing of 10% by users, 40% by panchayats, and 25% each by central and state governments;</li> <li>• For scheme rehabilitation and replacement, implement capital cost sharing of 25% each by users, panchayats, central and state governments.</li> </ul>		
<b>C.5. Make RWSS agencies financially self-sufficient and strengthen their capabilities in financial management:</b>	State, District and Panchayats	Short to medium term
<ul style="list-style-type: none"> <li>• Allow RWSS agencies to retain proceeds from water charge price;</li> <li>• Fully fund O&amp;M and other recurrent expenditures from revenues;</li> <li>• Provide access to RWSS agencies to receive training in financial management;</li> <li>• Minimize recourse to state Treasury;</li> <li>• Facilitate access to additional sources of revenue for panchayats and other RWSS agencies.</li> </ul>		



**Table 4.6. (cont.) Detailed Matrix of Recommendations**

Recommendation	Responsibility	Time frame
<b>C. (cont.) Ensure Financial Viability and Sustainability</b>		
<b>C.6. Re-prioritize Public Expenditures in RWSS:</b> <ul style="list-style-type: none"> <li>• Give top priority to adequate O&amp;M funding;</li> <li>• Give high priority to institutional capacity enhancement, including investments/expenditures to make systems more user-responsive and performance-oriented.</li> </ul>	State, District, Panchayats	Urgent
<b>C.7.</b> Implement effective accounting and auditing procedures, billing and collection systems, standard financial reporting formats, and simple but well-defined financial management and accounting systems.	State	Urgent to short term
<b>C.8.</b> Amend existing legislation and regulations so that panchayat raj institutions are legally entitled to enter into financing and loan agreements with government-sponsored rural credit facilities or private sector financial institutions.	State	Medium term
<b>C.9.</b> Establish a system for providing loan guarantees by the block and district panchayat raj institutions or the state, as necessary.	State	Medium term
<b>D. Protection of Water Resources</b>		
Objective: Implement measures to assure priority usage of water resources to drinking water and to protect the quality and sustainability of groundwater resources.		
<b>D. 1.</b> Define appropriate remedial measures to address water quality problems.	Central	Short term
<b>D.2.</b> Design a strategy for developing water supply schemes in areas with water quality problems that meet safe drinking water requirements and acceptability (preference) of users.	Central	Short term
<b>D.3.</b> Develop technology options for solving water quality problems (fluoride, iron and arsenic) both at village and household level as well as for larger piped schemes.	Central	Short term
<b>D.4.</b> Develop groundwater legislation and regulations, and develop regulators' capabilities to manage and protect groundwater resources.	State	Short to medium term
<b>D.5.</b> Develop institutional capabilities for multi-sectoral water allocation, planning and management, including features to prioritize allocation for drinking water and protection/mitigation against pollution (refer GOI-World Bank, 1998).	State	Short to medium term



# Key documents from the Workshop on Rural Water Supply and Sanitation Strategy, February 1997

## **I. Program**

### **2. welcome speech by Mr. Vinay Shankar, Secretary, Ministry of Rural Areas and Employment, GOI**

### **3. Recommendations from the four working groups:**

- Group 1: Policy Issues — Financial Viability, Cost Recovery
- Group 2: The Institutional Framework: Sector and Community Institutions — NGOs
- Group 3: Institutional Framework — Service Delivery
- Group 4: Water Resources — Water Collection — Technology Options

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# **WATER RESOURCE MANAGEMENT STUDY**

**World Bank/ Government of India**

## **WORKSHOP ON RURAL WATER SUPPLY AND SANITATION STRATEGY**

**February 20-21, 1997**

**Venue : Central Soil & Materials Research Station (CSMRS)  
Olof Palme Marg, Hauz Khas, New Delhi**

### **PROGRAMME**

#### **20 February 1997**

<b>0830</b>	Registration
<b>0930</b>	Welcome address by Secretary <b>MRA&amp;E</b>
<b>0945</b>	<b>Introductory</b> remarks - Mr <b>Keith Oblitas</b> /Ms Christina Wood, World Bank
<b>1000</b>	Presentation of Draft <b>Report</b> - Mr. V <b>Rehoej</b> and Team (Consultants) (15 mins for each of the four major <b>themes</b> in the <b>report</b> ) <ul style="list-style-type: none"><li>• Policy Issues-Financial Viability - <b>Cost</b> recovery</li><li>• <b>Institutional</b> framework - Sector and Community <b>Institutions</b> - NGOs</li><li>• Institutional framework - Service Delivery.</li><li>• Water <b>Resources</b> - Water Collection - Technology Options.</li></ul>
<b>1100</b>	Tea
<b>1115</b>	Plenary Discussion
<b>1200</b>	Views of other <b>government agencies</b> <ul style="list-style-type: none"><li>• <b>Ministry</b> of Water Resources</li><li>• Ministry of Urban Affairs &amp; <b>Employment</b></li><li>• <b>Ministry</b> of Health</li><li>• Planning Commission</li></ul>
<b>1300</b>	Group <b>Formation</b>
<b>1315</b>	Lunch
<b>1415</b>	4 Working <b>group</b> session on the major themes (brief presentation by selected <b>persons/Consultants</b> on the four selected themes in the <b>working</b> groups followed by the sessions)
<b>1530</b>	Tea
<b>1545-1730</b>	Working group session and <b>finalisation</b> of group <b>reports</b>

#### **21 February 1997**

<b>0830</b>	<b>Presentation</b> of <b>two</b> working groups in the Plenary <b>followed</b> by discussion
<b>1000</b>	Tea
<b>1015</b>	<b>Presentation</b> of <b>two</b> working groups in the Plenary <b>followed</b> by discussion
<b>1145</b>	Tea
<b>1200</b>	Plenary discussion & Concluding <b>remarks</b> and closing speech
<b>1330</b>	Lunch

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DRAFT WELCOME ADDRESS BY SECRETARY (RURAL DEVELOPMENT) ON  
THE OCCASION OF WORLD BANK/GOVERNMENT OF INDIA WORKSHOP ON  
RURAL WATER SUPPLY AND SANITATION STRATEGIES ON 20<sup>th</sup> FEBRUARY,  
1997

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It is a great pleasure to be with all of you on the occasion of National Workshop on Rural Water Supply and Sanitation Strategy organised jointly by the Government of India and the World Bank. As we are in the process of finalising strategies and policies for the 9<sup>th</sup> Plan, this Workshop has a special significance.

India has achieved **considerable** success in providing safe drinking water to about 85% of **population** by tapping ground and surface water through **3 million** handpumps, thousands of water supply schemes and traditional sources. The Government of India is committed to provide 'safe drinking water **facilities** to all Not Covered and Poorly Covered habitations within next two years and enhance water availability level to the national norm of 40 lpcd to all the **Partially** Covered habitations by 2000 AD.

Despite, impressive coverage of provision of safe **drinking** water facilities in **the** rural areas, there are areas of serious concern. The Government provided water **supply** programmes, without the active participation of the stakeholders,, have **created** expectation that water is a **free** commodity and the functionality of the **installations** is a **Government** responsibility. This approach **discourages** the development of more **efficient** and **lower** cost options for service delivery **anti** deny the opportunity to the users to exercise their power as consumers to demand a better service. The re-emergence of a large number of not covered and poorly **covered** **habitations** is due to government driven operation and **maintenance** practices.

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In future the **rural water supply** programme will face substantive challenges in terms of meeting the expanding needs of a growing population, as well as the increasing demand of the population for higher service levels. The Working Group for the 9<sup>th</sup> Five Year Plan for rural water supply and sanitation programme assessed the requirement of a staggering amount of Rs. 40,000 crore keeping in **view** the measures to be undertaken to sustain the water supply and sanitation services.

In the context of resource constraints and competing demand on resources and priorities, it is unlikely that the Government alone would be in a position to mobilise the above required funds in a period of **5 years** during the-9<sup>th</sup> Plan period. Given the circumstances, cost sharing by concerned institutions right **from** the users, Panchayati **Raj** Institutions, the State Government and the Central Government has to be **explored**. The cost sharing **arrangement** would ensure involvement of the users and the supporting agencies like **Panchayati Raj** Institutions to own, operate and manage the drinking water supply systems.

The problem of cost recovery and **sustainability** is controversial, but in the midst of the of the controversy there is **significant** consensus. Few would deny that current approaches are inadequately contributing to **sustainability** sector development. The resources which **are** available to the sector **must** be used to the **best** possible effect, and all available resources, including those in **communities**, must be mobilised. Much of the argument is over methods and approaches of development.

In this background, I appreciate that **the** Workshop rightly recognise **a** key policy issues of financial viability and cost recovery, **institutional** sector reforms to

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translate policies into **implementable** programmes and technology options to **support** such approaches to provide cost effective Rural Water Supply systems to **the** rural communities.

Major **shifts** and emphasis on policy towards greater cost recovery through **user** financing may mean radical restructuring within the **sector** itself. In many **cases**, **fundamental** changes may be required in the **relations** between the communities, **Panchayati** Raj Institutions and sector institutions like Public Health-Engineering Departments. There is a need to **establish** an enabling environment to **convince** all concerned to facilitate implementation of necessary policy changes to **advance** the sector reform process.

I understand' that promising signals emanates from the pilot **experiments** involving community **participation** with cost sharing instruments. There is a **need** to nurture these pilot experiments with care **so** that these projects serve as visible demonstration entities to convince all concerned about the desirability of embarking on **policy** shift from supply driven approach to demand **driven** approach. .

73<sup>rd</sup> amendment of Constitution provides an opportunity to involve and empower Panchayati Raj Institutions with adequate technical, **financial** and managerial powers to own and manage the systems. **While** 73<sup>rd</sup> amendment **provides** **an** institutional **framework** for sector **reforms**, additional steps are required **to** make them **functional** through concomitant devolution of finances. The State Government and the State Finance Commission needs to be convinced in order to **develop** principles to ensure the devolution of proportionate level of **financial resources** to the **Panchayati** Raj Institutions and provide them **with sufficient** incentive and latitude to **increase** their **own** resources to enable them to discharge **their** responsibilities.

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The Workshop rightly identified water technology option as a key issue for deliberation. As ground water source supports 85% of the drinking water systems, evolving suitable technology options will be of great relevance in the context of depletion of ground water level and deterioration of ground water quality.

Conservation of water, recharge of aquifers by adopting micro watershed approach in co-ordination with Central Ground Water Board and other concerned Departments, promotion of site specific water harvesting structures, enactment of a suitable Legislation on the lines of the **Model Bill** circulated by the Ministry of Water Resources and the Maharashtra Ground **Water(Regulation for Drinking Water Purposes)** Act, 1993 to **regulate** and control exploitation of groundwater, **particularly** in grey, dark and over-exploited zones are some of the important measures for ensuring suitability of drinking water sources.

Water **quality** issues are increasingly gaining recognition by sector agencies across the country. In the growing depletion of ground water sources, the development of agricultural and **industrial** activities aggravate the water quality problems in some of the areas. There is a need to put in place an effective water **quality** control, monitoring and surveillance systems and remedial instruments to ensure provision of safe water.

I am sure this National Workshop, with its congregation of knowledge and expertise and with the political leadership given by the Centre and State Governments for assuring the basic minimum services before the turn of the century, will make a **significant** contribution to the solution of varied problems associated with drinking water and sanitation for our people.



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I wish the National Workshop every success and hope that the recommendations from the Workshop will get translated into national and state policies and concrete action plans for implementation within a fixed time **frame**.

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## **WORKING GROUP I : POLICY ISSUES - FINANCIAL VIABILITY, COST RECOVERY**

### **MAIN CONSTRAINTS/PROBLEMS**

1. SUPPLY DRIVEN APPROACH
2. LACK OF COMMUNITY PARTICIPATION/INVOLVEMENT IN PLANNING, EXECUTION AND O&M
3. NO COST RECOVERY

### **REMEDIAL MEASURES**

1. FOR **MAKING** THE PROCESS DEMAND DRIVEN, 10% CAPITAL COST CONTRIBUTION SHOULD BE OBTAINED **UPFRONT**

IF NECESSARY PRIs CAN OBTAIN LOAN

IN EXCEPTIONAL CASES, A TRANSPARENT SUBSIDY FOR THE CAPITAL COST CONTRIBUTION MAY BE GIVEN

2. 1% OF **THE OUTLAY (TO BE RAISED TO 5% OVER TIME)** IN RWSS SECTOR SHOULD BE EARMARKED FOR:

- IEC
- PUBLIC EDUCATION
- AWARENESS CREATION
- HEALTH EDUCATION
- HRD ACTIVITIES

3. SCHEMES SHOULD BE HANDED OVER TO PRIs

- **WITHIN ONE YEAR** FOR SPOT SOURCES
- WITHIN TWO YEARS FOR PIPED WATER SUPPLY SCHEMES

PRIs SHOULD BE FREE TO SET TARIFF FOR FULL COST RECOVERY OF **O&M** AND CAPITAL COST CONTRIBUTION

**PRIs** SHOULD BE **STRENGTHENED ORGANISATIONALLY** AND FINANCIALLY

SUBSIDIES TO BE PHASED OUT OVER THE TRANSITION PERIOD

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## WORKING GROUP - I

### **POLICY ISSUES - FINANCIAL VIABILITY, COST RECOVERY**

1. **WATER IS A SCARCE RESOURCE AND HENCE NEEDS TO BE MANAGED AS AN ECONOMIC GOOD**
2. **PARADIGM SHIFT FROM SUPPLY DRIVEN TO DEMAND DRIVEN APPROACH**

### **RECOMMENDATIONS**

**10% CAPITAL COST CONTRIBUTION SHOULD BE MADE BY USEWGP**

**IF NECESSARY GP MAY OBTAIN LOAN FROM FINANCIAL INSTITUTIONS SUCH AS - LIC, HUDCO, NABARD AND IFC**

**INFRASTRUCTURE FINANCING SHOULD BE INCREASED**

**AFTER THE TRANSITION PHASE THIS SHOULD BE INCREASED GRADUALLY TO 50%**

**IN DIFFICULT SITUATIONS THE TRANSPARENT SUBSIDY CAN BE GIVEN TO COVER CAPITAL COST CONTRIBUTION**

**WHERE MORE THAN 55 LPCD IS DEMANDED 50% OF THE INCREMENTAL COST SHOULD BE RECOVERED**

**SIMILAR APPROACH SHOULD BE ADOPTED IN THE CASE OF URBAN LOCAL BODIES WHERE NO CAPITAL COST CONTRIBUTION IS RECOVERED**

**AT THE FINAL STAGE OF DESIGN OF SCHEMES, PRIs, NGOs, VWC SHOULD BE INVOLVED**

3. **POLITICAL UNWILLINGNESS TO CHARGE FOR RWS.**

### **RECOMMENDATIONS**

**1% OF THE OUTLAY (TO BE RAISED TO 5% OVER TIME) IN RWSS SECTOR SHOULD BE EARMARKED FOR:**

- IEC
- PUBLIC EDUCATION
- AWARENESS CREATION
- **HEALTH EDUCATION**
- **HRD ACTIVITIES**

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PROVISION SHOULD BE MADE IN THE LEGISLATION TO SET TARIFF IN ORDER TO COVER FULL O&M COST AND CAPITAL COST RECOVERY

FOR OLD SCHEMES SUBSIDY SHOULD BE PHASED OUT WITHIN A PERIOD OF THREE YEARS

FOR NEW SCHEMES THERE SHOULD BE NO SUBSIDY FOR O&M

WITHIN FIVE YEARS, THE OBJECTIVE SHOULD BE TO SET THE TARIFF STRUCTURE TO COVER THE REPLACEMENT COST ALSO.

#### **4. DEVOLUTION OF CONCOMITANT MANAGEMENT AND FINANCIAL AUTONOMY.**

#### **RECOMMENDATIONS**

THE PRIs SHOULD BE FREE TO FIX THE TARIFF STRUCTURE SUBJECT TO MINIMUM LEVELS FOR DIFFERENT TYPES OF SCHEMES TO COVER THE O&M COSTS, CAPITAL COST CONTRIBUTION AND REPLACEMENT COST.

THE REQUIREMENT OF FUNDS FOR PRIs IN THIS REGARD SHOULD BE BROUGHT TO THE NOTICE OF STATE FINANCE COMMISSIONS SO AS TO PROVIDE FOR ADEQUATE DEVOLUTION OF FINANCIAL RESOURCES.

#### **5. ABILITY OF CENTRAL/STATE GOVERNMENT TO IMPOSE CONDITIONALITY TO DRIVE SECTOR REFORM PROCESS GIVEN LACK OF POLITICAL SUPPORT**

#### **RECOMMENDATION**

**THE** GOVERNMENT OF INDIA SHOULD IDENTIFY **THE** MINIMUM REQUIREMENTS FOR EFFECTIVE PERFORMANCE **AND** THROUGH DISCUSSIONS WITH STATE GOVERNMENTS OBTAIN THEIR CONSENSUS AND THEREAFTER IMPLEMENT THEM

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**Water Resources Management Sector Work:  
Rural Water Supply and Sanitation**

**The Institutional Framework:  
Sector and Community Institutions-NGOs**

a presentation

by

***Group 2***

21st February 1997

New Delhi

**Structure of Presentation**

- Enabling Environment
- Transfer of ownership of assets
- Increased Non Govt involvement
- Demand driven approach

## Public Education

- Public campaign, which is broad in scope, to emphasise the need to charge for water-start at the user level
- One useful selling point is to explain that cost sharing by the community increases the size of the cake
- Have to overcome the credibility gap between the promise of better service and past performance

## Transfer of Assets

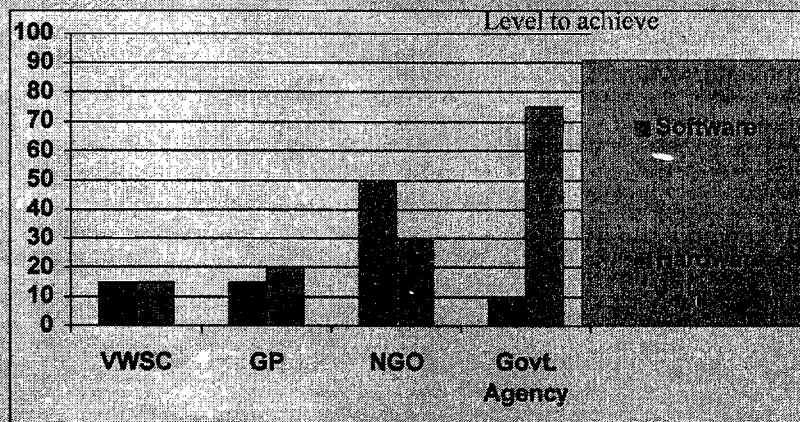
- Devolution of financial powers to PRIs a prerequisite; also need to allow them to borrow
- State Finance Commissions to perform their role
- Equal sharing of cost of rehabilitation schemes by Users, Panchayats, State Govts and GOI



## Asset Condition and Inventory

- VWSC to negotiate with State body vis a vis existing condition of assets to be transferred
- VWSC prepares inventory of existing assets as part of Gram Plan
- NGO assists in both these activities and also does requisite capacity building for VWSC in advance

## Software - Hardware Mismatch



## Priority to Software

- A reversal in resource allocation is necessary: at present, new construction takes precedence over rehabilitation, rehabilitation over repair, repair over O&M and O&M over community participation/health education!
- RGNDWM should substantially increase software funds at the expense of hardware

## Role of NGOs

Main Role	Present Problems	Future Strategies
As support organisations	Usually only 'software' support  Lack of NGO inventory	Using NGOs as single window assistance to communities for both 'hardware' and 'software' services Active network of NGOs, with rating by an independent body. NGOs to be viewed in 'professional' terms



## Role of NGOs (contd)

Main Role	Present Problems	Future Strategies
	Relationship with client (VWSC) somewhat illdefined	A negotiated agreement(MOU?) needs to be established, keeping in mind the delicate relationship between the two

## External Agencies and Private Sector

- ESAs should focus on supporting institutional reform in water utilities to support the decentralisation process
- Incentives to private sector by way of tax benefits etc for coming into the sector could be considered

## Role of VWSCs/Users

Main Role	Present Problems	Future Strategies
Village level ownership	Usually not given much importance by Govt agencies, who have a Panchayat phobia	To be the managing body, as opposed to the GP. Useful if statutory (as in UP) but need flexibility on this
Encourages true community participation, especially of women	Vested interests of GP inhibits this	Democratically elected with representation from SC/STs and women

## Criteria Change

- NC/PC village selection criteria inconsistent with demand driven approach
- Villages to be 'candidates' for funding rather than be assured of a scheme because they are of the right classification. Ceteris paribus, NC/PC could get priority
- Gram Plan should be necessary for accessing govt funds

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And finally...

Unless there is  
strong political  
commitment to  
sector reform, it will  
be an uphill task!



Thank You

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**INSTITUTIONAL FRAMEWORK - SERVICE DELIVERY  
RECOMMENDATIONS OF THE SUB-GROUP-I11**

At the outset there is no reservation to change from a supply driven approach to demand driven approach, however the Sub Group felt that there are certain pre-requisites that might be necessary in this transition phase.

Firstly the awareness has to be created among the users to come forward and participate as a community. In creating this awareness media, specialised NGOs and voluntary organisations can play vital role.

The Sub Group deliberated and came up with following steps to devolution of adequate management autonomy and resources to the Panchayati Raj Institutions:

1. Formulation of a suitable legislation - it was felt that change in the system should be authenticated by a suitable legislation by every State so that Panchayats have sufficient authority to discharge the responsibility in the new scenario. For example, they must have the power to realise water cess, penalty the defaulters, etc. The framework of this legislation should be evolved by each State based on local conditions.
2. There is need to have a transparent policy in respect of the responsibility of the service agency as well as the rights of the users and the cost to be shared by them. This policy also may have regional variations. The Sub Group feels that such a policy should be evolved by the States themselves.
3. The Group recommends the following steps to be followed in planning and execution of a water supply scheme.
  - a) Preparing a inventory of all the water sources in consultation with villagers
  - b) Carrying out the pre-feasibility level study and to zero on the preferred options.
  - c) Preparing engineering design comprising of the salient features of the proposed schemes alongwith cost computation.
  - d) Discussions with the users and informing them about their shared costs.
  - e) Preparing a formally conceptualised scheme followed by detailed engineering.
  - f) Taking some token contribution as earnest money and signing of MOU between the service agency and the local

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body.

- g) Completion of remaining instalments of the users contribution progressively with the implementation of the scheme.
- h) Tendering procurement of materials and implementation procedures.
- i) Training of the maintenance agency / personnel:
- j) Accreditation procedures for the maintenance personnel.
- k) Hygiene education to the users.
- i) Training in accounts, maintenance of inventory and other procedures

4. In implementation of the O&M it should be choice of the users (village-level committees or scheme-level committees) either give this to government agency or any other agency.

Proper quality control has to be ensured at every stage, for example, materials, construction standards, inspection of third party may also be practised. Similarly on O&M stage the Sub Group felt that third party inspection / auditing should be encouraged to have an idea of the level of quality of service being provided by the service department.

The Sub-Group shared their concern regarding the cost recovery aspect whereas as a matter of principle the Sub-Group agreed that there should be some level of cost sharing by the end users and users should know of the scheme after they are translated to the ground. The Sub Group felt that there is need for adequate political will and motivation to the end user to change from the present scenario of free but inadequate service to paid and sustainable service.

In conclusion, the Sub Group agrees that the approach presented in the draft report and recommends that the devolution and decentralisation of providing water services which are presently provided in a centralised manner.

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GROUP IV : WATER RESOURCES - WATER COLLECTION - TECHNOLOGY  
OPTIONS

**GROUND WATER LEGISLATION**

1. There is an Urgent need for Ground Water Legislation to protect the quality and sustainability of the drinking water sources/aquifers keeping in view the declining trend of the water levels.

(i). Ground Water Legislation exists in one form or the other in some states, needs to be implemented. There is an urgent need for implementation in all the states.

(ii) Indiscriminate exploitation of Ground Water needs to be controlled by Government order. Heavy Penalty be imposed for Non-compliance.

(iii) The Ground Water Legislation be implemented as early as possible preferably within one year.

**NATIONAL WATER POLICY**

(i). National Water Policy clearly spells out the overriding priority of drinking water in inter-sectoral allocation. State water policy to adopt a similar approach.

(ii) A State level Water Resources Management Committee at the highest level needs to be constituted to oversee the implementation of state water policy.

**ACTION PLAN :**

Each state will work out the overall availability and demand of water for all sectors.

The requirement for drinking water should be ensured based on cost benefit analysis and socio-economic considerations.

Short, Medium and Long term planning for the overall water management be adopted.

**3. WATER CONSERVATION AND MANAGEMENT KEEPING IN VIEW  
SUSTAINABILITY OF THE WATER RESOURCES :-**

(i) Unintelligent and over use of water resources water wastage be avoided in all sectors.

(ii) Ground Water recharge programme be strengthened.

(iii) Conjunctive use of ground and surface water be encouraged.

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(iv) All efforts be made for adoption of appropriate technologies for preventing evaporation and seepage losses in all areas specially in drought prone areas.

v) In coastal areas where ground water salinity is increasing, ground water extracition be stopped immediately and appropriate technological measures to be adopted for preventing ingress of sa inity.

(vi) Wherever ground water/surface water quality is polluted due to enhanced agricultural and Industrial advancement, appropriate technological measures to be taken to prevent and control pollution of water sources.

#### 4. ENVIORNMENTAL CLEANLINESS AROUND WATER SOURCES.

(i) Sanitary protection to all water sources be ensured.

(ii) Sanitary surveys of all drinking water supply sources should be carried out and appopriate measure be taken to protect the sources.

(iii) Sanitation upgrading approach for preventing pollution of water sources be adopted.

(iv) Surface drainage, sullage water should be suitably disposed off without polluting drinking water sources.

(v) Drinking water quailty survellance with active involvement of the community to be adopted by the department of health to prevent and control water and sanitation related diseases and that should be a part of the drinking water survellance programme.

#### 5. COST EFFECTIVE, USER AND ENVIRONMENTAL FRIENDLY TECHNOLOGY.

(i) Traditional water sources, wherever feasible, be adopted and protected with appropriate technology using locally avisilable materials and skills.

(ii) As chemical contaminants in water sources are on the increase, e.g. flouride, arsenic, salinity, Iron etc, appropriate and effective eco-friently technogical measures should be adopted.

(iii) Infrastructural development and capacity building for water quality control by the proulder agencies be strengthened.

(iv) An interministerial Group be constituted to examine the existing National Drinking Water Quality Standards and recommend any changes, if required.

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CONSTRAINTS,:-

1. No control over Ground Water Exploitation
2. Awareness on water conservation and management along the community is inadequate'
3. Deterioration of the quality of water resources
4. Inadequate adoption of community based cost effective technology (IES)

REMEDIAL MEASURES :-

1. Immediate enactment and implementation of Ground Water Legislation
2. IEC support to be strengthened
3. Quality control of water sources and surveillance mechanism with involvement of community to be strengthened
4. Popularization and adoption of cost effective community based technology.



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## ANNEX 2

# Selective List of Persons Met

### Government of India

Mr. Vinay Shankar	Secretary, Ministry of Rural Areas & Employment
Ms. Krishna Singh	Adviser, Planning Commission
Mr. P. Mohandas	Director, Rajiv Gandhi National Drinking Water Mission (RGNDWM)
Mr. Arun Kumar	Additional Secretary, Ministry of Water Resources
Mr. D. N. Raju	Deputy Secretary, Dept. of Econ. Affairs, Ministry of Finance.
Mr. D. K. Bhalla	Deputy Secretary, RGNDWM
Mr. A. R. Subbiah	Deputy Secretary, RGNDWM
Mr. K. Mazumdar	Assistant Adviser, RGNDWM
Mr. C. Ganapati	Deputy Adviser, RGNDWM
Mr. V. Raghu	Deputy Adviser, RGNDWM
Mr. R. M. Deshpande	Assistant Adviser, RGNDWM
Mr. D. Chandi	Assistant Adviser, RGNDWM
Mr. K. Moorty	Assistant Adviser, RGNDWM
Dr. Shusheela	Consultant, RGNDWM
Mr. I. C. Aggarwal	Consultant (TM), RGNDWM
Mr. R. K. Jain	Consultant (MIS), RGNDWM
Mr. J. Chandar	Consultant (TM), RGNDWM
Mr. P. C. Sharma	Research Officer, Ministry of Rural Areas & Employment
Mr. D. Kittu	Chief Hydrogeologist, Central Ground Water Board
Mr. Z. Hasan	Member, Central Water Commission
Mr. R. P. Sharma	Adviser, Ministry of Environment & Forestry
Mr. Unnikrishnan	Deputy Secretary, Ministry of Health
Mr. B. B. Uppal	Deputy Adviser, Ministry of Urban Areas & Employment

### Government of Maharashtra

Mr. V. Ranganathan	Principal Secretary, Water Supply Department
Mr. S. V. Shelkikar	Chief Engineer, Maharashtra Water Supply & Sewerage Board
Ms. Malini Shankar	Director, PPMU, Maharashtra RWSS Project,
Mr. S. K. Patil	Chief Engineer, Maharashtra RWSS Project,
Mr. S. V. Wagh	Superintending Engineer, Maharashtra WSS Board

## Government of Punjab

Mr. B. Singh	Secretary, Public Health Education Dept. (PHED)
Mr. Aurora	Secretary, Local Government and Urban Affairs
Mr. B. R. Bansal	Chief Engineer, PHED
Mr. A. Singh Dhillon	Joint Director, Rural Development Department
Mr. T. R. Aurora	Superintending Engineer, PHED
Mr. K. J. Rai	Superintending Engineer, PHED
Mr. S. S. Ubhi	Superintending Engineer, PHED

## Government of Kerala

Mr. B. John	Minister for Irrigation and Water Supply, GOK
Ms. Krishna Veni	Managing Director, Kerala Water Authority (KWA)
Mr. V. Kurian	Accounts Member, KWA
Mr. S. M. Vijayanand	Special Secretary, Panchyati Raj
Mr. T. Ram Meena	Joint Secretary, Water Supply
Mr. A. K. Apooty	Director of Panchayats
Mr. R. Nair	Add'l Development Commissioner, Rural Development
Mr. S. M. Vijayanand	Special Secretary, Panchayati Raj

## Government of Karnataka

Mr. M. R. Srinivasamurthy	Secretary, Department of Rural Development
Mr. S. M. Panchagatti	Secretary, Irrigation Department
Mr. M. R. Vijaykumar	Director, PPMU
Mr. K. B. Basappa	Director, Panchayat Raj
Mr. G. M. Vijaykumar	Superintending Engineer (acting CE), PHED
Mr. Shrirol	Joint Controller, Finance
Mr. V. Rao	Chief Engineer, Irrigation Department

## Government of West Bengal

Mr. M. N. Roi	Joint Secretary, Finance
Mr. S. N. Ghosh	Principal Secretary, Rural Development & Panchyat Raj
Mr. Prasad Ray	Secretary, PHED
Mr. D. M. Kanwar	Secretary, Minor Irrigation Department
Mr. A. K. Gupta	Principal Secretary, Finance and Planning
Mr. Mukerjee	Chief Engineer, PHED

## Government of Uttar Pradesh

Mr. R. B. Bhaskar	Secretary, Urban Development Department
Mr. V. K. Gupta	Chief Engineer, UP Jal Nigam
Mr. J. A. Jain	Chief Financier, UP Jal Nigam
Mr. P. Iyer	Special Secretary, Department of Rural Development
Mr. Kawatra	Principal Co-ordinator, State Planning Commission
Mr. S. Sanyal	Secretary (Management), UP Jal Nigam
Mr. S. Deshpande	Joint Secretary, Jhana Prabodhini
Mr. J. P. Shukla	Unit Co-ordinator — HRD, UPRWSES Project
Mr. V. K. Agarwal	Unit Co-ordinator — Technical Unit, UPRWSES Project

## Government of Rajasthan

Ms. Krishna Bhatnagar	Principal Secretary, PHED
Mr. B. K. Gupta	Chief Engineer, PHED

## NGOs

Mr. Acharya	Director, Action Aid
Mr. Y. P. Singh	Director, Sulabh
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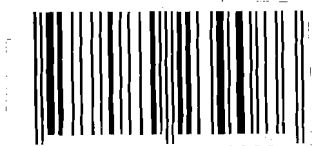
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