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**KERALA RURAL WATER SUPPLY AND ENVIRONMENTAL SANITATION
PROJECT “JALANIDHI” (CREDIT 3431-IN)**

AND

**MAHARASHTRA RURAL WATER SUPPLY AND SANITATION PROJECT
“JALSWARAJYA” (CREDIT 3821-IN)**

June 27, 2013

IEG Public Sector Evaluation
Independent Evaluation Group

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Abbreviations and Acronyms

CAS	Country Assistance Strategy
ERR	Economic Rate of Return
ICR	Implementation Completion and Results Report
IDA	International Development Association
IEG	Independent Evaluation Group
KfW	Kreditanstalt für Wiederaufbau (German Development Bank)
KRWSA	Kerala Rural Water Supply and Sanitation Agency
PPAR	Project Performance Assessment Report
M&E	Monitoring and Evaluation
NGO	Nongovernmental Organization
O&M	Operation and Maintenance
PHRD	Population and Human Resources Development Grant from Japan
RWSS	Rural Water Supply and Sanitation

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KERALA RURAL WATER SUPPLY AND ENVIRONMENTAL SANITATION PROJECT

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Satisfactory	Satisfactory	Satisfactory
Risk to Development Outcome	Negligible to Low	Negligible to Low	Significant
Bank Performance	Satisfactory	Satisfactory	Moderately Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Moderately Satisfactory

MAHARASHTRA RURAL WATER SUPPLY AND SANITATION PROJECT

	<i>ICR*</i>	<i>ICR Review*</i>	<i>PPAR</i>
Outcome	Satisfactory	Satisfactory	Moderately Satisfactory
Risk to Development Outcome	Negligible to Low	Negligible to Low	Significant
Bank Performance	Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Borrower Performance	Satisfactory	Moderately Satisfactory	Moderately Satisfactory

* The Implementation Completion and Results Report (ICR) is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEG product that seeks to independently verify the findings of the ICR.

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To prepare a Project Performance Assessment Report (PPAR), IEG staff examine project files and other documents, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, and interview Bank staff and other donor agency staff both at headquarters and in local offices as appropriate.

Each PPAR is subject to internal IEG peer review, Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible Bank department. The PPAR is also sent to the borrower for review. IEG incorporates both Bank and borrower comments as appropriate, and the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

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IEG's use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEG evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEG website: <http://ieg.worldbankgroup.org>).

Outcome: The extent to which the operation's major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. *Relevance* includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). Relevance of design is the extent to which the project's design is consistent with the stated objectives. *Efficacy* is the extent to which the project's objectives were achieved, or are expected to be achieved, taking into account their relative importance. *Efficiency* is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension generally is not applied to adjustment operations. *Possible ratings for Outcome:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). *Possible ratings for Risk to Development Outcome:* High, Significant, Moderate, Negligible to Low, Not Evaluable.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes. The rating has two dimensions: quality at entry and quality of supervision. *Possible ratings for Bank Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. *Possible ratings for Borrower Performance:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Preface

This is the Project Performance Assessment Report for rural water supply projects in two states of India – the Kerala Water Supply and Sanitation Project (2000-2008) and the Maharashtra Rural Water Supply and Sanitation Project (2003-2009). The projects were selected for assessment because they have similar innovative community-led approaches to rural water supply and sanitation. They differ, however, in the way that each State Government chose to implement the project, thus constituting a good test of differing approaches. The findings from this review will contribute to the body of evidence for a planned IEG evaluation of World Bank support for water.

The \$89.90 million Kerala Water Supply and Sanitation Project was approved in November 2000, supported by an IDA Credit of US\$65.50 million equivalent. Following the Tsunami in December 2004, US\$10 million was reallocated to finance the rehabilitation and enlargement of a water supply scheme on the coast. The original closing date of December 2006 was extended twice for a total of 21 months to allow completion of the project in the Tsunami-affected area and to finalize beneficiary capacity-building. The project closed in September 2008 at which time 93 percent of the total planned project cost had been expended and US\$61.45 million of the credit had been disbursed. An amount of US\$12.27 million was cancelled because the Credit had increased in value to US\$73.43 million equivalent due to appreciation of the Special Drawing Right vis-à-vis the US dollar.

The \$268.6 million Maharashtra Rural Water Supply and Sanitation Project was approved in August 2003, funded in part by an IDA Credit (3821-IN) of US\$181.00 million equivalent. The project closed on schedule in 2009; the credit, which had increased in value due to the appreciation of the Special Drawing Right in relation to the US dollar, was fully disbursed. Total project costs amounted to \$286 million, or 110 percent of the planned amount.

This report is based on the Implementation Completion and Results Reports, Staff Appraisal Reports, legal agreements, project files, and discussions with Bank staff. An IEG mission visited India in February-March 2012 to discuss the effectiveness of the Bank's assistance with the Central Government and State Governments, project implementing agencies, nongovernmental organizations, and beneficiaries. The cooperation and assistance of central government and state government officials and staff, nongovernmental stakeholders, beneficiaries, and other interested parties are gratefully acknowledged.

Following standard IEG procedures, this draft was sent to the borrower for comments but no comments were received.

Summary

Providing safe drinking water to over 700 million people in more than 1.5 million villages has been and remains one of the biggest development challenges to the Government of India. India's National Water Policy (2002) has assigned the highest priority for drinking water supply. Successive Five-Year Plans since have stressed the imperative to develop water supply and sanitation systems rapidly.

The two projects covered by this assessment—the Kerala Rural Water Supply and Environmental Sanitation Project (also known as *Jalanidhi*-‘treasure water’) and the Second Maharashtra Rural Water Supply and Sanitation Project (known as *Jalswarajya* – ‘water self-governance’) — are among the second generation of water supply and sanitation projects that benefited from the lessons learned in the 1990s from Bank-supported rural water supply and sanitation projects in Maharashtra, Karnataka, and Uttar Pradesh. Both projects were in the first wave of India's Sector Reform Program that focused on replacing the former centralized, government-led model with decentralized local service delivery using a community-led approach.

The Kerala Rural Water Supply and Environmental Sanitation Project

The objective of the project was to assist the Government of Kerala in “improving the quality of rural water supply and environmental sanitation service delivery to achieve sustainability of investments.” This was to be achieved through: (a) establishing state capacity to implement a new decentralized service delivery model and building the state's capacity to manage and scale-up the new decentralized model state-wide; and (b) demonstrating that communities can plan, manage, build, and operate rural water supply and environmental sanitation, and finance operation and maintenance costs. A new autonomous agency, the Kerala Rural Water Supply and Sanitation Agency, was created to facilitate provision of rural water supply and sanitation at the local level. This was achieved by building the knowledge and capacity of communities using nongovernmental organizations (NGOs) and piloting community-led approaches. As a result, communities became empowered and were able to work with technicians to specify their own water and sanitation schemes and build them using mostly community contracting.

This decentralized, community-led approach built 3,663 village water supply schemes serving 1.13 million people, mostly through individual household connections. It exceeded the appraisal target of beneficiaries by 37 percent. It also led to the installation of 68,000 new latrines and upgrading of 24,000 existing latrines, exceeding targets by 92 percent. Improved environmental sanitation reached 507,000 people that were provided with either new or improved pit latrines. The total population of the villages practicing good environmental management is 246,000. The Government of India's prestigious *Nirmal Gram Puraskar* (Clean Village Prize) had been awarded to 76 percent of the project's villages. This achievement, however, can be only partly attributed to the project because of parallel government programs in sanitation.

Technically, over 90 percent of the water schemes have proved to be sustainable three to eight years after construction in terms of producing adequate volumes of water and distributing it to users' households through piped networks. Water schemes also have

proved to be reliable. Many communities have introduced sophisticated and affordable water tariffs to ensure equity of access and conservation of water resources. There were shortcomings in water quality, however. The planned water purification by chlorination was generally rejected by communities because of taste, but 70 percent of beneficiaries boil their drinking water.

The project was socially inclusive. Fifty-two percent of all participants contributing to capital finance of their own water supply were below the poverty line. Overall, beneficiary contributions to capital cost in cash and labor were US\$11.80 million, a tenth more than anticipated. Ten instead of the planned six tribal beneficiary groups participated in the project and they contributed US\$182,000 to capital costs in cash and labor.

Communities also fully covered short- to medium-term operational and maintenance costs—over 70 percent paid more than was required for current costs and have established sinking funds to address depreciation. There is concern, however, that some villages will have insufficient cash for major repairs, such as motor burn-out due to irregular power supplies, and for pipe breakages.

The decentralized, community-led approach facilitated by the Agency has proved to be popular in Kerala and it expanded beyond the original project utilizing savings. It has quickly provided reliable rural water supply and sanitation. The community-led model for provision of water supply was more cost-effective in the use of resources than the alternative centralized, government-led approach. The cost of decentralized, community-led piped water supplies in Kerala is 70 percent of the government alternative, and much of the cost reduction was because overhead institutional costs were halved by using NGOs. The process is transparent and publicly-accountable. The economic rate of return was estimated by the Bank to be 19 percent.

While the Kerala Rural Water Supply and Sanitation Agency demonstrated adeptness and internalized learning from pilot studies, its performance toward the end of the project was less than its demonstrated potential. As the project expanded, the availability of experienced NGOs became a constraint to implementation. Executive management was provided by government, while line management was generally provided by contract staff. The main difficulties were the high turnover of senior government staff and retaining high quality contract staff because differential pay incentives compared with civil service jobs have been eroded. These difficulties were compounded by the fact that the new Agency remains dependent on donor funding to maintain 80 percent of its staff complement.

The project outcome, based on relevance, efficacy, and efficiency, is rated **satisfactory**. Relevance of the objectives and design was high. The objectives of improving the quality of rural water supply, the quality of rural sanitation, and sustaining these investments were all substantially achieved. Efficiency was also substantial. Risks to development outcome are rated **significant** because of unresolved institutional problems related to repair of major damage to community schemes. There is fragile government support for the Agency. Borrower performance is rated **moderately satisfactory** for this reason. Bank performance is rated **moderately satisfactory** as well.

Second Maharashtra Rural Water Supply and Sanitation Project

The objective of the Maharashtra project was “to improve access to potable water supply and environmental sanitation in the rural areas of Maharashtra.” In contrast to the Kerala experience, which created a new agency, Maharashtra implemented the reforms through a reform unit within the state’s Water Supply and Sanitation Department, the agency responsible for both urban and rural areas.

Commissioned water supply systems had reached 6.7 million people by project closure, 76 percent of the target. Most of this was through piped systems from wells and the majority of consumers had individual household connections. Work continued by the Department since then achieved the project target of 8.8 million people through commissioning water schemes in 2,985 villages by 2011, seven percent more than the project’s target. Average daily water consumption has increased from the baseline level of 27 liters per person to about 43 liters. An independent impact evaluation found that, on average, 5 percent more households in project villages compared with non-project control villages were likely to consume more than 40 liters per person per day. Before the project, 1,114 villages had to be supplemented by tanker water supplies in the dry season; this number was reduced to 133 villages by the end of the project. However, there was no systematic reporting of water quality or its changes over time.

Installation of household and school latrines increased the project’s population coverage of sanitation from 19 percent in 2003 to 77 percent in 2009. More recent data from the Department indicate coverage continued to grow after project completion to 79 percent in 2012. At the end of the project, 1,848 villages – 61 percent – had been certified open defecation free. By 2011 this had risen to 1,968 villages, or 65 percent. All schools in the project villages had full sanitation coverage. The Government of India’s *Nirmal Gram Puraskar* had been awarded to 43 percent of the project’s villages. However, this achievement can be only partly attributed to the project because of parallel government sanitation programs.

Sustainable water supply systems were built using the community-led model. A 2009 inter-village survey found that 99 percent of beneficiaries were satisfied with service levels provided by the community, and that tariffs were being collected and accounts maintained in 93 percent of villages. In most villages water tariff collection exceeded than current operation and maintenance costs. A second survey in 2009 undertaken by the Department on a larger sample found that 87 percent of water schemes three to eight years old were functioning and that financial sustainability was reported to be 60 percent. The 2009 survey also indicated that overall institutional sustainability was 70 percent based on eleven parameters that covered source, water supply system, finances, and intuitions. As in Kerala, irregular rural power supplies pose substantial risks to pumping equipment, and thus operation and maintenance.

While the new decentralized, community-led approach has become firmly rooted in communities, the Department could not build a strong supportive network with rural local governments because of inadequate staffing. It proved difficult to reorient local governments towards facilitating development of community-led water supplies. This was compounded by the difficulty in finding and retaining NGOs experienced and able to

work above the community level. In addition, several of the project's pilot studies to test innovative institutional approaches were reduced or cancelled, and monitoring and evaluation paid little attention to tracking institutional outcomes above the village level. Overall, the project significantly scaled back expenditures on capacity-building in favor of more water schemes.

Like Kerala, the decentralized, community-led model for provision of water supply was more institutionally and financially efficient than alternative government supplied schemes. The overall capital cost was 38 percent of the traditional government schemes and they are a third cheaper to operate and maintain. Public institutional costs in the project were about a quarter that of a typical government project and, when the cost of the NGO and support organization needed to organize community schemes is taken into account, total institutional costs were half that of the traditional alternative. The economic rate of return of the project was estimated to be 23 percent.

The project outcome is rated **Moderately Satisfactory**. Relevance of objectives was high and design was substantial. The achievement of the infrastructure objective was substantial. Efficiency was modest however, due primarily to inefficiencies in implementation. Risks to development outcome are rated **Significant** because of the questions on funding longer-term operation and maintenance and the risks posed by only modestly prepared local governments. Borrower performance overall is rated **Moderately Satisfactory**, as is Bank performance.

Major Findings and Lessons

Overall, the two projects have increased access to reliable rural water supply and sanitation. An independent impact evaluation of the Maharashtra project found that communities that achieved water supply improvements and sanitation coverage for the majority of the population reduced water contamination, had better child health indicators, and had lower cost of illness and coping costs. This applied to both project and non-project villages. Thus, irrespective of the approach (centralized and government-led or decentralized and community-led), increasing access to water and sanitation can improve environmental health.

While the Maharashtra community-led project was only modestly superior at increasing service coverage compared with the state's water schemes, both projects clearly show that the decentralized, community-led approach reduces investment costs and is cost-effective. However, both projects show that there is considerable concern about the ability of community-managed water projects to cope with major repair costs likely in the medium- to long-term. Further, the community-led approach to rural water schemes that requires communities to contribute to capital costs may not be feasible in villages with low ability to pay.

Both projects chose state agencies to manage the community-led process. In Maharashtra rural water supply was a reform unit within the Department that covered both urban and rural water supply. It successfully facilitated community-led service delivery with villages, but was notably less successful at building capacity in local government and fostering decentralization; few institutions willingly collaborate in their own demise. In

Kerala the new Rural Water Supply and Sanitation Agency was autonomous and included all activities related to the provision of rural water supply and sanitation. All the state's rural water supply and sanitation engineers had been transferred to local government. As a result of this devolution of technical skills, the Agency devolved decision-making and budgeting authority to the village Panchayats and did not substitute for them.

The Kerala management model was associated with better results. However, it must be recognized that the states' socio-economic differences give Kerala an advantage. Kerala is crowded and villages are closely-spaced, communication is easy, literacy is very high, the political system empowers communities, and rural incomes are the highest in India. In contrast, Maharashtra has about a third of the population density, villages are widely separated, making communication difficult, literacy is lower, the political system is more centralized, and rural incomes are less than two-thirds of Kerala's.

There are five specific lessons from this assessment:

- **Improving the quality of rural service delivery to increase access to water supply and sanitation improves environmental health.** It is effective irrespective of the approach used, be it decentralized and community-led or centralized and government-led.
- **Given a supportive institutional environment, decentralized, community-led water supply and sanitation projects can be both effective and less costly in providing new rural infrastructure.** However, some repair problems may be beyond communities' capability.
- **Government line agencies that have traditionally delivered services through a centralized, government-led approach face challenges in supporting decentralized, community-led rural water supply and sanitation approaches.** Creating a new and lean autonomous agency with a narrower rural focus can facilitate partnerships between local government and communities.
- **The limited availability of experienced NGOs to facilitate community capacity-building can constrain adoption of the community-led approach for rural water and sanitation service delivery.** Both projects had problems with finding experienced NGOs when they rapidly scaled-up and moved to more remote areas.
- **There is a role for public or private support agencies to provide much-needed expertise and technical support to trouble-shoot community-owned water schemes.** Where this is missing, communities have difficulty in planning and managing major maintenance and budgeting for it.

Caroline Heider
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1. Background and Context

1.1 India's National Water Policy (2002) has assigned the highest priority for drinking water supply needs followed by irrigation, hydro-power, navigation and industrial and other uses. In the successive Five-Year Plans and the intervening annual plans, efforts have been made to develop water supply and sanitation systems rapidly, and water resources projects are supposed to include provision for drinking water supplies.

India's Water Supply and Sanitation Sector

1.2 Providing safe drinking water to over 700 million people in more than 1.5 million villages has been and remains one of the biggest development challenges to the Government of India. National intervention in rural water supply started with the Accelerated Rural Water Supply Program in 1972 and became a national priority with the introduction of the National Drinking Water Mission in the mid-1980s. Later renamed the Rajiv Gandhi National Drinking Water Mission, this was institutionalized with the creation of the Department of Drinking Water Supply and Sanitation within the central Ministry of Rural Development in 1999. In recent years, rural water supply sector expenditures have risen to about US\$2.5 billion per year. Annual central government grants of about US\$1.0 billion are supplemented by contributions of about US\$1.5 billion from state governments, local governments, and communities.

1.3 Access to adequate and safe drinking water supplies grew from 30 percent to 70 percent between 1981 and 1990 during the International Drinking Water and Sanitation Decade, and increased again from 70 percent to 90 percent between 1991 and 2000—a considerable achievement. Access to water in India is defined as having at least 10 liters per capita per day. However, over the last decade, water source sustainability, water quality problems, and inadequate scheme operation and maintenance have been formidable constraints to achieving and maintaining a higher level of service for the rural population. According to the Department of Drinking Water Supply and Sanitation, 30 percent of systems each year revert to the status of being “partially covered” or “not covered.”¹ Other challenges include the management of multi-village schemes, strengthening links between different levels of government, improving monitoring and evaluation systems to better inform policy makers, and scaling-up the reform approach to extract its full benefit.

1.4 Urban water supply schemes typically installed piped water supplies feeding individual household connections, public standpipes, and commercial/industrial users. These systems were generally fed from overhead pressure tanks that stored treated water derived from reservoirs or well fields or a combination of both types of water resources. In contrast, the early rural water supply projects relied on public standpipes and individual hand pumps drawing on groundwater or connected to small piped systems drawing on reservoirs or tanks fed by springs or perennial rivers. Water supply projects were centralized, government-led and fully paid for by government. They focused primarily on delivering engineered solutions

¹ Per capita daily water consumption is designated as ‘covered’ if the supply is more than 40 liters, ‘partially covered’ in the range 10-40 liters and ‘not covered’ if less than 10 liters.

with negligible attention to beneficiary participation or hygiene promotion. Similarly, sanitation's sole task was seen as the installation of pit latrines.

Decentralized, Community-Led Rural Water Supply Reforms

1.5 By 1999 the financing and maintenance problems of the traditional centralized, top-down approach started to receive attention among senior policy-makers (Box 1). Responding to these challenges, in 2000 the central government launched the nationwide Sector Reform Program covering 26 of India's 28 states at a cost of US\$550 million. By 2002 the Program had been piloted in 67 districts of the country. The main reform agenda for the provision of rural water supplies was to introduce demand-responsive approaches, community participation, and decentralization of powers for implementing and operating drinking water supply schemes. In this new approach the government's role was primarily as a facilitator and it was expected that communities would be willing to manage and operate the drinking water supply schemes and contribute to the costs.

Box 1. Policy Statement by the Rajiv Gandhi Drinking Water Mission in 1999

“The entire programme so far 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 totally a 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 to demand a better service.

In the context of both the resource constraints and the competing demands on resources and inter sectoral 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 9th Plan period. Given the circumstances, cost sharing by concerned institutions right from the users, *Panchayat Raj* institutions,² 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 *Panchayat Raj* institutions to own, operate, and manage the drinking water supply systems.”

Source: Government of India/World Bank/ DANIDA, 1999.

1.6 The reform adopted state-of-the-art principles of decentralization and community-driven development in the program design. At the time this reform program was launched, projects using demand-responsive approaches, while locally successful abroad and in parts of India, had not been able to scale-up to a national level. The Sector Reform Program also marked a fundamental change in the attitude of the Government of India towards community management -- first by the unprecedented decision to allow government funds to flow directly to community organizations, and second by explicitly recognising the legitimacy and value of active community involvement.

1.7 It was planned that the pilot projects would be implemented over a period of three years and be funded by the Government of India directly via district level *Panchayat Raj* institutions. Accordingly, under the 73rd Amendment to the Constitution of India, responsibility for providing and managing and rural water supply was devolved to the

² Panchayat Raj institutions are three-tier local government structures with elected representatives in the Zila Parishad (district); Block (or taluka or mandal); Panchayat and Gram Panchayat (village level).

Panchayat Raj institutions. Through a central grant system the federal government provided states with fiscal incentives to reform: 20 percent of the Accelerated Rural Water Supply Programme Fund was earmarked to support sector reform projects.

1.8 In some states the *Panchayat Raj* institutions were not fully empowered. In those states it was expected that implementation would be done through the District Water and Sanitation Mission that has explicit linkages to the *Zilla Parishads* (district councils). Although the district institution was the nodal agency for implementation, actual implementation was to be done through *Gram Panchayats*,³ or through Village Water and Sanitation Committees or local water users' committees. Community contracting, whereby the communities themselves procure goods and services for construction and undertake operation and maintenance, was seen as an essential principle of the program. In addition, the reform allowed nongovernmental organizations (NGOs) to be contracted to assist local institutions in developing their capacity for the implementation and management of the system.

1.9 In December 2002 the federal government launched the centrally-sponsored *Swajaldhara* scheme for nationwide scaling-up of decentralized delivery of rural water supply and sanitation services successfully piloted under the Sector Reform Program. *Swajaldhara* focused mainly on simple community-oriented schemes for poorly-served areas, revival of traditional water sources, and provision of water supply facilities to schools.

1.10 The federal government's Total Sanitation Campaign, announced in 1999, reports building one household pit latrine per ten rural persons from 2001 to 2011 (Spears 2012). The program offered local governments a large ex post monetary incentive to eliminate open defecation, largely through the construction and use of household pit latrines.⁴

1.11 By 2002 the Central Government started reserving 20 percent of its budget allocation for rural water supply to states implementing reforms in the sector. In October of 2003 the Indian government announced the *Nirmal Gram Puraskar* (Clean Village Prize), and a monetary incentive for villages that achieve "open defecation free" status.⁵ Under the federal government's *Bharat Nirman* program renewed attention was given to building rural infrastructure over the period 2005-2009 and covering water supply and sanitation for habitations left out of the earlier projects and programs. The Eleventh Five-Year Plan (2007-

³ A Gram Panchayat (or Village Panchayat) usually corresponds to a revenue village, which is a colonial term referring to a cluster of one or more habitations. Gram Panchayats can vary in size from 50 to 2,500 households. Each Gram Panchayat has members from the cluster of villages or habitations that make up the revenue village. In Maharashtra the Gram Panchayat is generally a single small town or large village; in Kerala Gram Panchayats invariably has several small clusters of habitations, sometimes as many as 50.

⁴ The Campaign emphasized low-cost latrines (approximately 1,500 to 2,000 rupees, or \$30 to \$40, at market exchange rates), and offered only a partial subsidy (60 to 90 percent of average prices), expecting beneficiaries or villages to contribute towards construction costs, especially in better-off households.

⁵ When a village's chairperson decides the village is eligible under the Total Sanitation Campaign, they submit an application to the Ministry of Rural Development, whose monitoring division verifies that every household in the village is disposing of its faeces safely (Alok 2010). If a village is approved, its chairperson receives the prize from a political figure at a prestigious ceremony that provides the chairperson an incentive to motivate the rest of the community. This prize is large for rural India: \$1,000 to \$10,000 per village at market exchange rates, \$3,400 to \$34,000 in purchasing power parity terms.

2012) aimed to provide safe drinking water to all rural habitations. The economic costs of inadequate sanitation in India have been calculated at Rs 2.44 trillion (US\$53.8 billion) a year, or the equivalent of 6.4 percent of India's GDP in 2006 (Water Supply and Sanitation Program 2010).

World Bank Support for Rural Water Supply and Sanitation in India

1.12 World Bank support to India in the water supply and sanitation sector started in the 1970s. Over the first two decades (1970-1989), support focused on urban water supply and sewerage projects for metropolitan cities such as Mumbai, Chennai, and Hyderabad, and for relatively smaller cities in Karnataka, Kerala, Maharashtra, Rajasthan, and Tamil Nadu. Some projects developed rural water supply schemes that drew upon the urban water supply conveyance mains or included peri-urban areas.

1.13 Over the last twenty years the central government and seven states have partnered with the World Bank in implementing nine rural water supply and sanitation projects.⁶ These projects, ongoing or concluded, will have contributed more than US\$ 1.4 billion of financing and benefited about 24 million rural inhabitants in over 15,000 villages that have populations ranging from 150 to 15,000.

1.14 Three Rural Water Supply and Sanitation Projects initiated the idea of community participation. In Maharashtra the sector project (1991-1998) enabled community participation in operation and maintenance of government-designed projects, while the first sector project in Karnataka (1993-2000) significantly increased ownership as communities became involved in the planning of water supply infrastructure. Community ownership was further scaled-up under the first sector project in Uttar Pradesh (1996-2002) that introduced a participatory demand-responsive approach based on community cash contribution and full coverage of operation and maintenance costs by communities. This latter approach was adopted for the two assessed projects in line with the Sector Reform Program and *Swajaldhara*.

1.15 The two projects covered by this assessment—the Kerala Rural Water Supply and Environmental Sanitation Project (also known as *Jalanidhi* - 'treasure water') and the Second Maharashtra Rural Water Supply and Sanitation Project (also known as *Jalswarajya* - 'water self-governance')—benefited from the lessons learned in the 1990s and attempted to mainstream the Sector Reform Program's approach. Thus, in addition to the facilitation of community-led development of water supply and sanitation, these two projects supported local government capacity-building for rural water supply and sanitation in line with the national policy of decentralization.

⁶ The World Bank has approved nine dedicated rural water supply and sanitation (RWSS) projects in India, namely: the First Maharashtra RWSS project (1991-1998), the First Karnataka RWSS project (1993-2000), the First Uttar Pradesh and Uttarakhand RWSS project (1996-2002), the First Kerala RWSS project (2001-2008), the Second Karnataka RWSS project (2002–ongoing with additional financing through 2013), the Second Maharashtra RWSS project (2003-2009), the Second Uttarakhand RWSS project (2006-2014), the Punjab RWSS project (2007-2013), and the Andhra Pradesh RWSS project (2009-2014).

2. Kerala Rural Water Supply and Environmental Sanitation Project

2.1 Kerala, one of India's smallest States, is located on the south-west coast of the peninsula and stretching 580 km in length and 30-130 km in breadth, it has a land area of 38,800 sq. km. Kerala's population (in 2011) of 33.3 million accounts for 2.8 per cent of India's population. Population density is 859 persons per sq. km, one of the highest in the country. It also has the highest literacy rate, which increased from 90.9 percent in 2001 to 93.9 percent in 2011.

2.2 The mountainous eastern third of the State, forming the Western Ghats, falls steeply through a hilly region and then to the narrow coastal belt where most of the population live. While the State receives high annual rainfall — about 3,000 mm — the steep and crowded terrain provides little opportunity for storage, and runoff is quickly lost to the sea. Following the Northeast Monsoon, most of the rivers are dry for 3-5 months a year. Thus, most drinking water is derived from groundwater. In the coastal belt localized over-exploitation of groundwater has caused seawater intrusion that adversely affects water supplies.

2.3 Kerala is unique among Indian States, with a consistently higher level of human development comparable with that of many advanced countries but with a much lower per capita income (Government of Kerala 2005). Kerala ranked first among major States in India in the Human Development Index in 1981, 1991, and 2001, but its per capita income lagged behind the all-India average until recently. In recent years public demand has been focused on ensuring that high priority is given to the development of improved service delivery such as education, health, and water supply. The state government is a strong supporter of decentralization and in 2000 it started transferring about 35 percent of its planned development funds directly to local authorities as developmental grants.

2.4 The project assisted the Government of Kerala in furthering its sector-related goal of increasing the access of the rural population, particularly the poor and socially disadvantaged groups, to drinking water supply and environmental sanitation services. Prior to the project, almost all households had a dug well in the compound that accessed generally shallow groundwater. Water quality was a local problem in several areas as the shallow groundwater systems were mineralized with fluoride and iron. In addition, pollution from poorly constructed deep pit latrines, uncontrolled solid and liquid waste disposal and indiscriminate defecation also affected groundwater and river water quality. The Kerala Water Authority had responsibility for provision of all drinking water throughout the state primarily using large-scale engineering projects. Under its aegis the share of the rural population covered by rural water supplies was 51 percent in 1999, lower than the coverage in other Indian states.

Objectives, Design, and their Relevance

OBJECTIVES

2.5 The project development objective as stated in the Project Appraisal Document was:

“to assist the Government of Kerala in improving the quality of rural water supply and environmental sanitation service delivery to achieve sustainability of investments. Specific project development objectives would be to: (a) demonstrate the viability of cost recovery and institutional reforms by developing, testing and implementing the new decentralized service delivery model on a pilot basis; and (b) building the state's capacity in improved sector management in order to scale-up the new decentralized service delivery model statewide.” (World Bank 2000b, p. 2)

2.6 The project development objective as stated in the Development Credit Agreement (Schedule 2) differs slightly:

“to assist Kerala in improving the quality of rural water supply and environmental sanitation service delivery to achieve sustainability of investments through: (i) demonstrating viability of cost recovery and institutional reforms by developing, testing and implementing the new decentralized service delivery model on a pilot basis; and (ii) building Kerala's capacity in improved sector management in order to scale up the new decentralized service delivery model Statewide.”

2.7 For the purpose of this assessment the objectives described in the Development Credit Agreement are used because they clearly distinguish between the main intended outcomes and the means to achieve them. The first objective, to improve the quality of rural water supply and environmental sanitation service delivery, has to do with engineering design and selection of water sources, and was to be achieved through enhancing decentralized development by communities. The second, sustainability, was to be achieved through the development of communities' institutional and financial ability to maintain these services.

2.8 The project was to benefit communities in the four northern Districts that had a population of 1.5 million or about 5 percent of Kerala state's population. These Districts had 358 *Gram Panchayats*, of which about 80 would be financed by the project.

RELEVANCE OF THE OBJECTIVES

2.9 The objectives were highly relevant at entry. Engineering quality, sustainability, cost recovery, and improving sector management of rural water supplies had long been of concern because the expensive top-down approach via central government and state agencies had paid scant attention to setting aside adequate financing for routine operation and maintenance. As discussed earlier, the project was strongly aligned with the federal government's national decentralization policies for rural water supply and centralization that gathered pace during the late 1990s and continue to the present.

2.10 The objectives were and remain relevant to the Bank's Country Assistance Strategies for India. The Strategy covering the period 1998-2000 was built around the overarching objective of poverty reduction through accelerated growth and social development while recognizing that selectivity was important. Among its five pillars it aimed to concentrate assistance in states and programs that choose to commit strongly to reforms in addition to supporting key areas of policy reforms through early engagement and the building of consensus and ownership with partners. On this basis, operations in the rural water supply and sanitation sector were highly relevant.

2.11 Kerala was not among the four focus states (Andhra Pradesh, Orissa, Rajasthan, and Uttar Pradesh) at the time the Country Assistance Strategy was prepared. However, state selection criteria developed by the federal government on the basis of the joint Government of India -World Bank sector work *India: Water Resources Management Sector Review – Rural Water Supply and Sanitation Report* (January 1998) identified Kerala as the first state for sector assistance.⁷ The subsequent Strategies covering 2001-2004 reaffirmed the relevance of the sector and the selection of Kerala as a special case. The 2005-2008 Country Assistance Strategy further endorsed the sector as contributing to one of its three priority areas -- investing in people and empowering communities -- while the 2009-2012 Strategy included the water sector under its infrastructure development priorities.

2.12 The relevance of the objectives is rated **High**.

DESIGN

2.13 **Components.** The project supported two main components – on local institution building and on community development and infrastructure – and two components for statewide and national sector development, respectively (Box 2).

2.14 **The decentralized, community-led approach.** With the devolution of responsibility for rural water supply to the *Panchayat Raj* institutions, a new organization that could work with local-level stakeholders was required. Thus the creation of a new autonomous agency—the Kerala Rural Water Supply and Sanitation Agency (henceforth “the Agency”)—was proposed to plan, share information on, and facilitate provision of rural water supply and sanitation at the local level. It was designed to facilitate capacity-building of local government and villagers so that they could undertake construction and management of small water supply and sanitation schemes.

2.15 The Agency undertook to short-list NGOs to work as service organizations, but their selection was to be the prerogative of local government and beneficiary groups. Most water supply schemes were to be designed by the NGO engineers with capacity-building support from the Agency in terms of technical guidelines on engineering design, specification and contracting. The Agency was also to develop standard rates for construction materials in each project district.

2.16 The Gram Panchayat was the nodal agency responsible for the selection of the schemes and beneficiary groups and facilitating their development. Gram Panchayats were to be included in the project through a self-selection process based on four selection criteria: a high proportion of poor and vulnerable groups; water scarcity; low latrine coverage; and demonstrated implementation capacity over the last three years. Beneficiary groups were to

⁷ The main factors contributing to Kerala's unusual sectoral merit were: (a) political support and conducive policy environment for changing the role of the government and community empowerment; (b) devolution of substantial administrative and financial powers to local governments; (c) evidence of successful bottom-up community driven development planning and implementation; (d) evidence of targeting development programs to the poor and disadvantaged community groups; (e) good experiences in communities treating water as an economic good; (f) existing high levels of social capital; and (g) implementation capacity in the state, particularly through user groups, nongovernmental organizations, and the private sector.

Box 2: The Objectives and Components of the Kerala Project	
OBJECTIVES	COMPONENTS
(i) To assist the Government of Kerala in improving the quality of rural water supply and environmental sanitation service delivery.	<p>Institution Building. Appraisal cost US\$11.10 million, actual cost US\$10.23 million. This included: (a) setting-up and operating the autonomous Kerala Rural Water Supply and Sanitation Agency to act as a facilitating and support unit to <i>Gram Panchayats</i> and Beneficiary Groups through four Agency's District Project Management Units. Project assistance covered incremental costs, technical assistance, audit, equipment and goods, construction supervision monitoring and monitoring and evaluation; (b) promoting sanitation and hygiene through the development and dissemination of information, education and communication materials (e.g. brochures, radio, and TV); (c) capacity-building, through supply of technical assistance, orientation training of state-level policy-makers, motivation and management training for Agency and its District Management Units, and technical, social and management training of support organizations and <i>Gram Panchayats</i>; and (d) strengthening the <i>Gram Panchayats</i> through support of contract staff for 2 years, their capacity-building, installation of office equipment and computers, and a small and flexible discretionary fund.</p>
(ii) Achieve sustainability of investments.	<p>Community Development and Infrastructure Building. Appraisal cost US\$62.70 million; actual cost US\$73.00 million. This included: (a) community development and support to Beneficiary Groups and their committees in social, technical and management aspects of planning, implementation and operations of water supply and sanitation facilities through community mobilization and well designed training programs. This mainly involved financing of Service Organization's staff and other costs; (b) women's development programs to ensure effective mobilization and participation by women. This included capacity-building programs to upgrade their water supply and sanitation-related technical and management skills and supporting micro-enterprise initiatives; (c) design and engineering support to <i>Gram Panchayats</i> and Beneficiary Groups in preparing engineering designs, procurement, construction and consultancy support; (d) construction of 2,500 micro water supply schemes, 6 large water supply schemes, upgrading existing water supply schemes, 45,000 household latrines, upgrading 8,000 existing unsanitary latrines, small environmental improvement schemes like drainage, compost pits, desilting tanks and implementing groundwater recharge and rainwater harvesting schemes; and (e) developing a Tribal Development Plan and providing support for capacity development, and financing water supply and sanitation facility improvements in nine tribal <i>Gram Panchayats</i>.</p> <p>Statewide Sector Development. Appraisal estimate US\$1.20 million; actual costs US\$0.04 million. This component provided technical assistance for statewide planning, development, and management of the water sector in a comprehensive and integrated manner, including formulation of long-term sector policy and strategic plan to be developed based on comprehensive statewide sector study; development of a comprehensive sector information management system to enhance the strategic planning and monitoring in the state; and other pilot studies.</p> <p>National Sector Development. Appraisal estimate US\$ 2.00 million; actual cost US\$0.05 million. This was designed to provide technical assistance to the Government of India in furthering its sector reform agenda countrywide.</p>

Source: World Bank 2000b

2.17 It was intended that communities seeking project assistance would be facilitated by the NGOs to form an autonomous legally registered beneficiary group. Once registered, the group was expected to undertake a participatory rapid appraisal to prepare a community empowerment plan. This was to form an attachment to a memorandum of understanding signed by the group, the Gram Panchayat, and the Agency that would enable the group to

access project financing. It was expected that the overall time needed to complete a scheme would be 27 months.⁸

2.18 Subsequently the NGO service organization selected by the group was to assist them in finalizing the scheme design. Generally, except for large schemes, it was expected that most of the work would be done through local contracts or by the members of the group. The group was expected to raise 15 percent of the scheme capital cost in advance. The Gram Panchayat was to contribute 5 percent. Payment for project schemes was to be in three instalments from the special project account of Agency's district management units once the Gram Panchayat had certified the work. Collecting 50 percent of the estimated annual operation and management costs by the group was a condition for the release of government's third and final instalment of construction finance.

2.19 Tribal groups were to follow the same selection procedures but with more liberal conditions. Specifically, the scheme cycle was extended to 30 months to enable them to have more time for capacity-building and group registration. They also were only expected to contribute 10 percent of capital costs.

2.20 **Implementation arrangements.** The Water Agency had overall responsibility for implementation of the project. Headed by a state government officer of at least Additional Secretary rank, its multidisciplinary team of about 25 civil service staff was supplemented by 90 additional contract staff drawn from the private sector and NGO community. The majority of contract staff was social scientists.

2.21 The Agency was to establish four district project management units to work with the Gram Panchayats. Initially all field activities were to be managed from the center but after the completion of the first batch and lessons learned, it was planned that the Agency would delegate full operational responsibility to its district management units. Thereafter the Agency's primary focus was to focus on monitoring and evaluation, distilling lessons learned and acting on them, and developing plans to scale-up the project principles state-wide.

2.22 The project adopted a phased approach to implementation. This recognized that the focus on strengthening local capacity to build rural water supply and sanitation facilities and manage financing would be a learning experience that was likely to require adjustment as lessons were incorporated. Thus implementation was planned in five overlapping batches, starting with 5 Gram Panchayats in the first year and increasing to 25 in the fourth year of the six-year project. And within each scheme the sequence of activities was: three months preplanning and mobilization; a 12-month planning period to build local capacity and select the engineering design and contracting arrangements; eight months to build the scheme; and a four month post-implementation period in which service organizations were to provide advisory support to ensure effective operation and maintenance

2.23 **Design of Monitoring and Evaluation.** A comprehensive monitoring and evaluation (M&E) system was designed to measure project progress, project institutional process and project inputs, outputs and outcomes. While most of the key output and outcome indicators

⁸ This allowed 3 months pre-planning to form the group; 12 months to do the detailed planning; 8 months for construction; and 4 months for follow-up support.

were specified at appraisal, finalization of the indicators to measure institutional processes were delayed to enable incorporation of learning and adjustments derived from the first batches of scheme implementation. Institutional and management arrangements and M&E responsibilities were clearly defined with the Agency taking the lead. Baselines were established for each beneficiary group as they entered the project. Three surveys (called ‘impact evaluations’ at appraisal) were planned: the first would establish the project baseline; the second would focus on the effectiveness of the institutional model to inform mid-term review; the third would evaluate the sustainability of the institutional model and its impact on reaching the rural poor as well as degree of participation by them in decision-making bodies.

2.24 In contrast to the comprehensive monitoring and evaluating of the institutional aspects of the project, M&E design paid scant attention to monitoring the level of service delivery in terms of volumes and quality of water supplied to households and household time savings. Similarly, there were no measures to systematically monitor the environmental impact of expanding latrine coverage and community garbage bins.

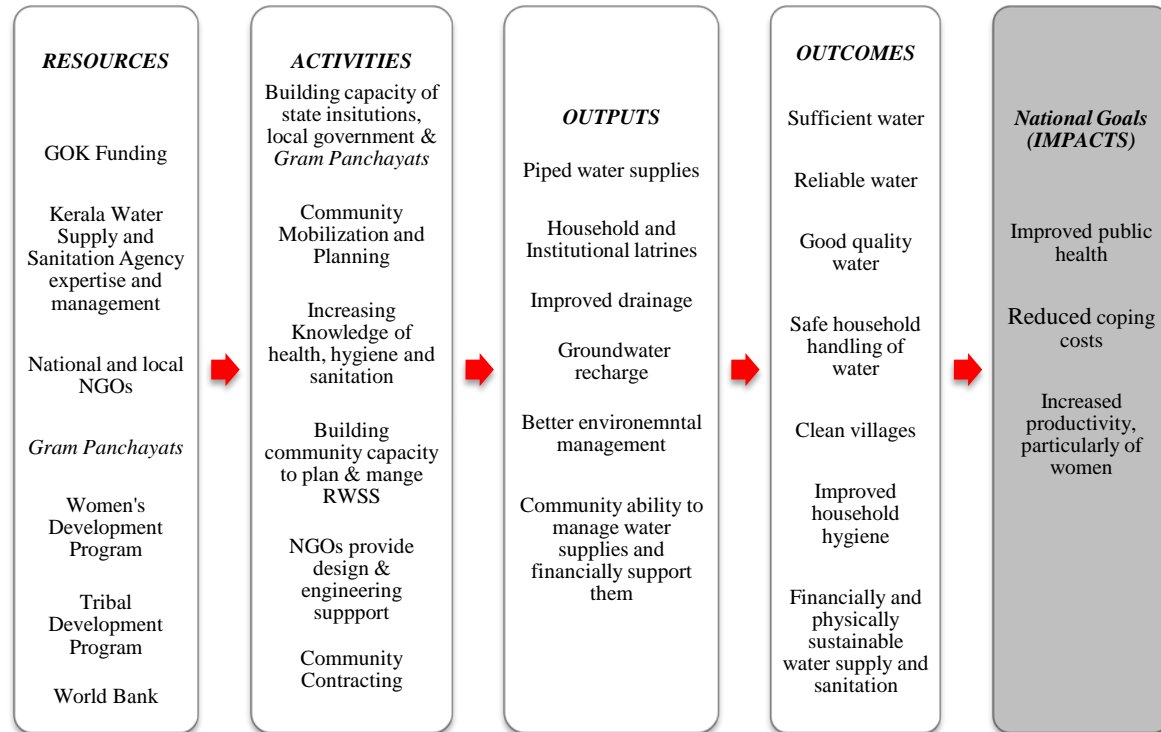
RELEVANCE OF DESIGN

2.25 The implicit goal of the project was to assist improvements in human health through the removal of disease vectors associated with poor quality water and inadequate sanitation. The generalized results chain linking inputs to outputs and outcomes was logical and realistic (Figure 1). Institutional support to increase local capacity was a cross-cutting input. Project design incorporated all of these inputs to produce the desired outputs — new or rehabilitated quality infrastructure, functioning water user groups, local financing for recurrent costs, and an independent higher-level state oversight agency that monitored, evaluated and used feedback to fine-tune policy, governance, support processes and scaling-up. Together these were expected to lead to the desired outcomes of improving the quality and producing sustainable rural water supply and environmental sanitation services.

2.26 Design was highly relevant to achieving the development objectives. It was expected that the local-level approach would lead to better quality small-scale engineering design -- first, because communities had a financial stake in the outcome, and second, because tailoring by beneficiaries to the local geography utilizing indigenous knowledge would produce more reliable water supplies. Community capacity-building using NGOs was expected to build high levels of local ownership and the ability to collect and effectively utilize water users’ fees for operation and maintenance.

2.27 Project design included all the elements needed to successfully mobilize community groups and enabled them to secure sufficient financing to build small-scale water delivery systems. The emphasis in the design process on building communities’ capacity to manage schemes, as well as securing financing for adequately operating schemes at the local level was highly relevant. Similarly, the use of revolving funds and beneficiary contribution to finance latrine construction was a relevant way to reduce environmental pollution from indiscriminate open defecation. Additionally, increased water supply was essential for the hygienic operation of the pour-flush latrines that were generally installed.

2.28 Relevance of design is rated **High**.

Figure 1. Inputs, Outputs, and Outcomes Related to National Goals

Source: Author's construction

Implementation

2.29 The Kerala Water Supply and Sanitation Project was approved in November 2000, supported by an IDA Credit of US\$65.50 million equivalent, and became effective in January 2001. Project savings, of the order of US\$ 20 million, the result of less expensive infrastructure than anticipated and appreciation of Special Drawing Rights against the US dollar, led to a request from the state government to cancel the equivalent of US\$10 million at the mid-term review (October 2003) and an expansion from 89 to 112 Panchayats.

2.30 In December 2004, following the Tsunami, US\$10 million of savings was allocated to finance rehabilitation and expansion of two multiple Panchayat water projects in the coastal belt. However, given the complexity of this exercise, only one scheme was initiated and even that subsequently required a year's extension of the project's closing date.

2.31 The original closing date of December 2006 was thus extended twice for a total of 21 months to allow completion of the project in the Tsunami-affected area and to finalize beneficiary capacity-building. The project closed in September 2008 at which time 93 percent of the total planned project cost had been expended and US\$61.45 million of the credit had been disbursed. An amount of US\$12.27 million was cancelled because the Credit had increased in value to US\$73.43 million equivalent due to appreciation of the Special Drawing Right vis-à-vis the US dollar.

IMPLEMENTATION EXPERIENCE

2.32 The project's intervention coincided with the state government's decision to relieve the Kerala Water Authority of its responsibilities for rural water supply and place its entire subdistrict staff under the administrative purview of the *Gram Panchayats*. In parallel it was expected that the government (independently of the project) would reform the Water Authority to focus on planning, regulation, bulk water supply and technical advisory services. This reform was believed to pose some risks to the project because permanent lower level staff would not only lose their traditional monopoly over awarding contracts, they would be also compelled to work under the authority of locally-elected governments.

2.33 Water Agency staffing, however, was a problem. In seven years the project had seven project directors and eight directors of finance and administration; a few district manager positions were vacant for extended periods of time. As the project progressed it became difficult to retain and replace contract staff. The primary reasons were that the Agency was still seen as a project (not a permanent program), and the initially higher salaries of contract staff (set to attract the best) were eroded by the steady increase in civil service salaries bolstered by extra allowances. In the last year of the project the staff vacancy rate was 68 percent.^{9, 10} In addition, as the project expanded it became more difficult also to secure the services of experienced NGOs as service organizations. Alternative procedures to support institutional strengthening of beneficiary groups had to be put in place, a task made more difficult by the expansion of the Agency's project management units to five new districts. Despite these difficulties, implementation generally went according to plan.

2.34 Addressing seasonal variability of water supply was the most important design challenge: during the summer dry season (February-May) the water table declined and in many cases the volume of water in wells required rationing, but in the worst cases the shallower wells became dry and water had to be supplied by tankers.

2.35 While the project took about seven months longer than anticipated to get up to speed, it accelerated and met physical targets by the original closing date. In many schemes innovations were introduced to foster progress; for example, the planning and implementation phases were merged so that some non-dependent activities ran in parallel rather than sequentially. To speed the NGOs facilitation of community group formation, payment was made based on outputs achieved, rather than on inputs. And the final payment to groups was split into two to minimize the need to recover unspent balances from groups.

⁹ Agency staff at the time of IEG's assessment included 8 senior officers and 12 other officers/consultants plus 30 support staff. At the end of the project the authorized Agency staffing was 28 government staff supplemented by 95 consultants recruited from the private sector. Actual staffing was 14 government plus 26 consultants –or 32 percent of the requirement.

¹⁰ In the early 2000s government officers received salaries of about Rs. 9,500 a month plus benefits and housing. Consultants working for the Agency at that time received about Rs. 12,000 a month. At the time of the mission, government salaries for positions with four or more years' experience have been enhanced by 'dearness allowances' and are typically about Rs. 28,000 a month plus benefits and housing. In contrast, consultants' salaries are about Rs. 26,000 a month with no benefits or tenure beyond the fixed-term contract. The 2012 recruiting drive aimed to secure 400 staff for the Jalanidhi-II follow-on project. In response to advertisements in the first quarter of 2012 only 120 engineers and 687 accountants have applied – the primary need is for social scientists and engineers.

2.36 The federal government component, designed to enable nationwide advocacy for the sector reform policy during the first three years of the project, was cancelled in November 2005 as it was not relevant to their needs.¹¹

IMPLEMENTATION OF M&E

2.37 The monitoring and evaluation system findings were used to adjust project design. Independent monitoring of design and construction improved the quality of scheme engineering, and attention was paid to assessing how well the institutional processes were functioning and this led to improvements in processes. Five sustainability evaluation exercises were undertaken to check that water supplies were reliable and that groups could manage the schemes. Where problems were found, the affected group was advised on potential solutions. Importantly, given that most of the project expenditures were at the group level, considerable attention was given to ensure full fiduciary compliance on audits to avoid delays in disbursement. In 2007, for example, monitoring found that district management staff and support organizations needed more training to ensure supporting documents were officially verified.

2.38 Surprisingly, routine monitoring by the Agency did not verify or record the actual per capita consumption of water or time savings. What IEG found in every village was that the scheme treasurer's records generally indicated pumping hours from which average consumption was calculated - most water committees knew household consumption rates and how they varied across their system. As noted below, many groups went to full metering and increasing block water tariffs to ensure equity within schemes. Time was saved but there was no baseline or systematic monitoring to measure it established by the project.

SAFEGUARDS

2.39 The project was placed in category 'B' under Operational Policy 4.01, Environmental Assessment. Environmental concerns were about water quality and the adverse impacts of inadequate sanitation. While no involuntary resettlement was envisaged, land acquisition by beneficiary groups was required to house water supply infrastructure. An Environmental Management Plan was prepared. Special environmental performance indicators were designed as part of the overall project indicators and these were to be monitored and evaluated by the Gram Panchayats, beneficiary groups, and the Agency.

2.40 The project has secured lands adopting the agreements made during project preparation. No lands were acquired involuntarily. The 3,700 water supply schemes required 30 hectares of land, either for a water source and/ or storage tank. Of these, 9 hectares were public lands, and 20 were purchased at the market price.

2.41 An Indigenous Peoples Development Plan was developed and implemented as required by OP 4.10.¹² The project water supply and sanitation provision included three

¹¹ A small amount (SDR 36,400) was spent prior to cancellation on participation of state government officials in regional policy workshops and the World Bank's Water Week in Washington, D.C.

¹² At the time of appraisal this was Operational Directive 4.20. The new Operational Policy 4.10 became effective in July 2005.

Districts and nine Panchayats housing 35,231 people classified as scheduled tribes. One hundred and sixty-two beneficiary groups were formed of which tribal people were 16.5 percent of their membership in 6,755 households. Contribution criteria were reduced for tribal people from 15 to 10 percent. This was paid about half in cash and half in labor and raised the equivalent of Rs 8,360,000 (US\$183,700) – the first time Kerala tribal people had invested in their own infrastructure. Although a total of 10,721 people participated in sanitation and hygiene programs, 8,710 were trained in project management, and 498 attended skills training, it is not known how these inputs reached tribal people. IEG found that poverty has caused many tribal peoples to remain on the margin of beneficiary groups despite significant project inputs to build their capacity and skills.

Achievement of the Objectives

IMPROVE THE QUALITY OF RURAL WATER SUPPLY SERVICES: *Substantial*

2.42 The service quality objective was to be met by providing adequate volumes of good quality water (at least 40 liters per person per day) from improved sources, rainwater harvesting, increasing groundwater recharge, and adopting measures to increase water quality and assure reliable water supplies. Improving water quality included reducing mineral content through better source selection and mechanical means, reducing direct pollution from pit latrines and reducing health hazards from fecal pollution through chlorination.

2.43 While a few schemes had not been finally commissioned by project closure, as of IEG's mission the project's outputs exceeded the targets (Table 1). A total of 4,095 beneficiary groups now manage 3,712 water supply schemes that supply 190,800 households and 1.13 million people. Water supply coverage increased from 55 percent to 81 percent by 2010.

Table 1. Physical Accomplishments in Water Supply

Output	Appraisal Target	Achieved			Actual as a % of appraisal	Number of People
		By Project Closing (Sept 2008)	Between Closing and Oct 2011	Total		
<i>Total community schemes</i>	2,700	3,698	14	3,712	137	1,130,000
<i>New water supply schemes^a</i>	2,500	3,356	7	3,663	146	867,318
<i>Kerala Water Authority and Gram Panchayat Transferred schemes^b</i>	200	342	6	348	174	59,500
<i>Tsunami schemes</i>	-	-	1	1	-	103,182
<i>Institutional Schemes provided to schools</i>	-	175	-	175	-	-

Source: KRWSA March 2012

Note: a. Two small schemes, while complete, were not yet fully commissioned as of March 2012. b. This includes 253 Gram Panchayat schemes and 98 Kerala Water Authority schemes. The latter schemes were large and were designed on the basis of hydrological units. The 98 Water Authority scheme beneficiaries later reformed into 148 schemes that were more closely aligned to community boundaries.

2.44 Eighty percent of schemes were small-scale, typically serving 30 to 200 households (Figure 2). In addition, there were 15 medium-sized schemes serving 201 to 1,000 households and two very large schemes each covering 20,000 and 25,000 households; most of the transferred schemes were medium or large sized and covered several Gram Panchayats.

2.45 It had been expected at appraisal that financial constraints would cause 30 percent of households to opt for a standpost serving several families instead of individual house connections. In practice, almost 100 percent chose individual household connections that eliminated queuing at a standpost and the need to carry water more than a few meters (Figure 3).¹³ Water metering to assist better management of supplies was provided to beneficiary groups having more than 50 households.

2.46 Groundwater was the primary source of supply (83 percent) followed by rainwater harvesting (12 percent) and springs and rivers (3 percent). Among the groundwater schemes, dug wells were the main source of supply (80 percent). In most cases the most reliable well in the village was singled out and, if necessary, it was deepened and enlarged to guarantee the daily design in the dry summer months. In cases where this was not possible, a new well might be dug or a borewell drilled after geological investigation indicated viability. In some areas there was neither groundwater development potential nor springs, and rainwater harvesting became the primary dry season supply for 436 beneficiary groups and as a supplemental supply for an additional 34 groups.¹⁴

Figure 2. A Typical Small-Scale Kerala Water Scheme Showing Households Connected to the Supply Network



Source: IEG March 2012.

¹³ A 'house' connection included only the supply of water to a faucet (tap) in the yard adjacent to the house. It was left to individual households to install a header tank and any internal pipework and plumbing at their own expense. The hoses attached to the tap in Figure 3 feed a water tank on the roof of the house.

¹⁴ 13,304 rainwater harvesting collectors and storage tanks were installed for the 470 groups. Storage tanks were designed to provide enough water to supply a single household for 100 days during the dry season.

Figure 3. A Typical Household Metered Water Connection in Kerala



Source: IEG March 2012.

2.47 To increase water availability, rainwater harvesting from roofs was also utilized to directly recharge groundwater through wells. This follows the government's initiative in 1999 to mandate roof water harvesting on all new buildings.¹⁵ The initial project target was set at 550 recharge wells because of the novel nature of this resource and technical concerns about water quality and feasibility. Once these concerns were addressed in the first two rounds of construction, 7,500 recharge wells were eventually installed. The large number was the result of concerns about sustainability of water sources in areas supplying 1,013 (26 percent) beneficiary groups. The demand increased for rain water harvesting as more hydrogeological knowledge was generated by the project.

2.48 The number of water schemes not completed by project closing – affecting 12 percent of project beneficiaries – was the result of too few service organizations qualified to do work once the program expanded to 112 *Gram Panchayats*, and an underestimation of the additional time needed to plan and implement more complex projects. This affected 132,000 people. One large scheme in Thrissur District was only partially completed in June 2010.¹⁶ The large and complex water supply project at Chevaram and Panmana (rehabilitated under the Tsunami emergency) was completed only in June 2010. Even then, it currently serves 87 percent of the targeted beneficiary population of 118,600.

¹⁵ Kerala Municipality Rules 1999 were amended to incorporate the roof water harvesting rules for the new buildings in the municipal areas. The government order of Local Self-Government Department - GO No.677 dated 03/17/2004 – states that all new buildings should have either rainwater harvesting tanks or rainwater percolation pits as per the specifications given in the order.

¹⁶ The project's Pananchery scheme covered 3 zones and a total of 2,349 connections (13,400 people). Works on 2 zones and 1,284 connections were completed in June 2010. The Agency is currently seeking funding to complete the works.

2.49 While the number of water supply schemes was 37 percent greater than planned, the number of beneficiaries at 1.13 million was less than the 1.40 million expected at appraisal. These differing statistics illustrate the difficulty of estimating demand for inputs in community-led projects. Generally it was found that beneficiary groups were smaller and civil works less expensive than anticipated. As a result more water schemes than expected were built within the available budget.

2.50 **Reliability of Water Supplies.** Intermediate outcomes on the reliability of water supplies were tracked using surveys as each batch of the project was completed (Table 2). No information was provided from the Agency on the per capita volume of water supplied within the communities. Generally project water supplies have a high degree of reliability – but not quite to the extent targeted. Variations over time are indicative of the increased knowledge and the differing geographic coverage of households. The three main problems in order of importance are: pump failure due to severe grid voltage fluctuations that cause motors to burn out; partial (generally seasonal) failure to supply sufficient water;¹⁷ and hardware failure (such as pipe burst due to corrosion). Since project completion in June 2008 there have been no follow-up surveys to determine current reliability of the water systems. Accordingly, IEG

Table 2. Reliability of Project Water Supplies

<i>Indicator</i>	<i>Target</i>	<i>April 2003</i>	<i>Nov 2003</i>	<i>May 2005</i>	<i>Oct 2006</i>
Cumulative Number of households ^a	-	7,884	9,202	37,452	37,408
Households Surveyed (%)	-	9	9	22	11
Schemes working at time of survey (%)	90	96	95	97	94
Schemes with no source failure (%)	95	81	96	78	92
Schemes with partial source failure (%)	5	11	4	19	2
Schemes with total source failure (%)	0	7	0	3	5
Downtime > 12 days/year due to hardware failure (%)	5	1	5	8	9
Downtime >24 days due to power failure (%)	5	0	6	4	7
Water supply out of commission due to system breakdown (%)	5	1	<0.1	1	0

Source: Kerala Rural Water Supply and Sanitation Agency, March 2012

a.. The number of households reported is the cumulative number of successive batches. In consequence, after the first batch the sampled households include those who had working schemes from 2003 and those whose schemes have just been commissioned in late 2005. No data were made available to IEG to enable the tracking of the longitudinal experience of any particular household in a single batch.

¹⁷ Partial or full source failure is the result of extremely difficult groundwater conditions where water supply relies on fissures and the degree of weathering of upper levels of rock.

visited 7 *Gram Panchayats* and met with representatives of 322 beneficiary groups – an 8 percent sample (Annex B).¹⁸

2.51 A large majority of beneficiary groups – more than 80 percent of those interviewed by IEG – stated they were happy with their water supplies. For example in Valikunnu Panchayat according to the scheme’s Treasurer, the project served over 1,800 households. Prior to the project, people had to fetch water from up to half a km and supplement this with tanker water in the summer. Since completion in 2002, people receive an average of 58 liters per person per day.

2.52 But there are water supply problems for some. Five groups (of 322) reported source failure to IEG, but in three of these cases alternative supplies were found. Gravity schemes in 2 of the 42 groups in hilly Thiruvampady Panchayat of Calicut District lost their pipe systems in a landslide and cannot afford to replace them; one scheduled tribal group cannot replace the burnt-out motor (Box 3). A similar problem was found in Karyampuraspura beneficiary group where the motor had burned out four times and the scheme has not been working for a year – the 40 households affected now fetch water 1-2 hours a day and supplement this with tanker water in the dry season.

Box 3. Unreliable Power Disrupts Water Supply

The Jaladhara group is served by a former Kerala Water Authority collector well on a river. It supplies 100 tribal households located on an adjacent hill 300 m above the river. The motor/pump has broken down 3 times, the last time 3 weeks before the IEG visit, and is too expensive for the group to repair. Women now have to come down 1 km to the river for water, a trip that takes 1.5 hours twice a day. As a result village children have insufficient water to wash in the early morning and are being stigmatized in school. The village has complained to the Agency but there has been no follow-up.

Source: Kerala Rural Water Supply and Sanitation Agency, March 2012

2.53 Throughout the project area, most dissatisfaction was from those groups in transferred Kerala Water Authority systems that represent 3.9 percent of all systems. Many of these systems are aged, the quality of original construction was poor, and several need extensive replacement investment beyond the means of beneficiaries to provide. In addition, most had accrued arrears with the lower supply utility, and clearing these arrears significantly delayed transfer of power connections to the beneficiary groups.

2.54 The independent household survey commissioned by the World Bank (2008) of all of Kerala’s community mini-water systems found that breakdowns were experienced in 7 percent of households. This increased to 17 percent for single-village systems, such as those provided by Gram Panchayats, and to 20 percent for multiple-village systems, such as those

¹⁸ Within the 7 Gram Panchayats sampled there were 332 BGs ranging in size from 40-120 households to the two largest that included 20,000 to 25,000 households. The sampled Gram Panchayats were spread about 300 km N-S in the northern two-thirds of the State and 70 km inland. At each Gram Panchayat IEG met with the President and the chairs of attending beneficiary groups (not all groups were represented). In addition most beneficiary groups sent committee members. After the meeting IEG typically visited 2-5 individual beneficiary groups in their villages to inspect facilities, meet beneficiaries and discuss service levels. Findings are indicative of outcomes but are not statistically valid because of the small and opportunistic sample.

supplied by the Kerala Water Authority. The same survey found that 44 percent of community schemes reported periodic water shortages. Even so, 95 percent of community mini-water systems received water daily except in the dry summer season when it fell to 82 percent. Indeed, IEG found that some project schemes resorted to three-day rotational water supplies in the summer to serve all consumers.¹⁹

2.55 Despite these problems affecting a small number of groups, almost all households get sufficient quantities of water, even though most schemes are operated only a few hours per day. This ranged from 40 to over 100 liters per person per day. The independent survey by the World Bank (2008) found that the average daily per capita design supply was 60 liters. However, actual supply was 45 liters over most of the year, and this fell to only 29 liters in the summer. For these reasons, a majority of interviewees stated in 2012 that they supplemented project water supplies with alternative traditional sources. As discussed below, they used alternative water sources for non-drinking water activities.

2.56 Many groups in the hill and foothill areas that experienced disparities with water supply because of pressure variations solved the problem with metering, increasing block tariffs, and rotational supplies. Before metering, households in the low-lying areas tended to use water extravagantly whilst those in the higher areas ran short. For example, in 2012 beneficiary group Kiliyaas Chira pays a monthly rate of Rs.50 for the first 12,000 liters/household.²⁰ Monthly consumption above this to 15,000 liters per household is charged an additional Rs.10 per 1,000 liters; and above this consumption users pay Rs.50 per 1,000 liters. Not only has this ensured that all consumers have received an average of 70 liters a day since May 2010, it has also led to water savings such that the same pipe system was able to add an additional 26 households at a connection fee of Rs. 500.

2.57 **Water quality.** Before the project most wells showed signs of fecal coliforms and some were also affected by excess fluoride and iron. While the fluoride and iron problems were solved through installation of small treatment plants, few Gram Panchayats were able to present water quality data.²¹ Reasons given were inadequate testing laboratories and that little attention was given to quality monitoring by beneficiaries. While the state does have a water quality surveillance program and 2,296 samples were tested to June 2008, data collected tend to inform state and national statistics rather than water users. In some Panchayats the President of the federation of beneficiary groups has organized water quality surveys.²² According to the Agency, most wells still show presence of fecal coliforms. While chlorination practices were part of the project package, few beneficiaries have applied them in practice (Table 3).

¹⁹ For example, in Puddaputhi 12 groups of 44 (27 percent) suffer from periodic water shortages and one group with 110 households uses a three-day rotational supply. In these cases adequate storage becomes a key supply factor.

²⁰ This group serves 91 of the 3,070 households in Thiruvilvamlam Panchayat of Thrissur District, a scheme completed in 2001 originally for only 65 households.

²¹ Excess fluorides are present only in Palakkad District and 1,017 domestic defluorination plants were installed. According to the Agency only 150 sources indicate excess iron content, but beneficiary feedback indicates a more widespread problem given the frequency of complaints about discolored laundry. Some of this may, however, be the result of pipe corrosion - a common problem found in many schemes.

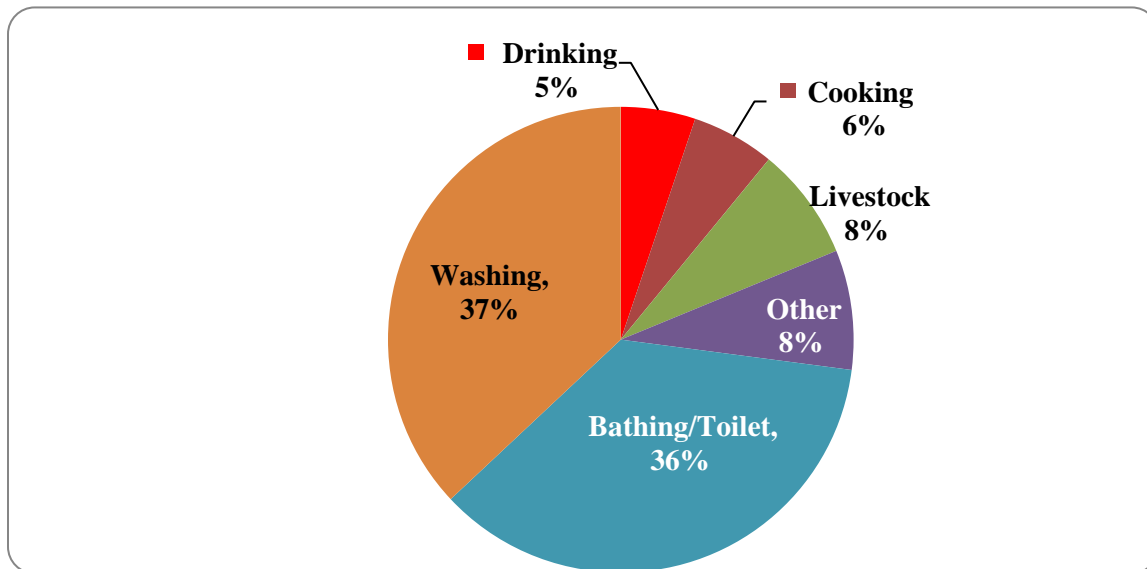
²² For example in Puthupadi Panchayat in Calicut District.

Table 3. Boiling is the Preferred Method for Treating Drinking Water

<i>Indicator</i>	<i>Target</i>	<i>April 2003</i>	<i>Nov 2003</i>	<i>May 2005</i>	<i>Oct 2006</i>
Daily Chlorination (%)	60	32	18	14	10
Drinking water boiled by households (%)	80	na	51	75	69

Source: KRWSA March 2012. na = not available.

2.58 Despite the relatively low priority given to hygiene outreach, about 69 percent in 2006 boiled their drinking water instead.²³ It could not be determined if boiled water was also used for food preparation and washing utensils. These survey data are still representative of the current situation in 2012. A majority of beneficiaries interviewed by IEG stated that they did not like the taste of chlorinated water and did not like drinking it. Most preferred to boil drinking water as it is typically only 5 percent of the total household water use (Figure 4). This is a rational choice given that stored chlorine powder loses its potency if stored too long or incorrectly, and firewood was plentiful.

Figure 4. Drinking Water is Only 5% of Daily Indian Consumption of 68 Liters/Person

Source: World Bank 2008.

IMPROVE THE QUALITY OF ENVIRONMENTAL SANITATION SERVICES: *Substantial*

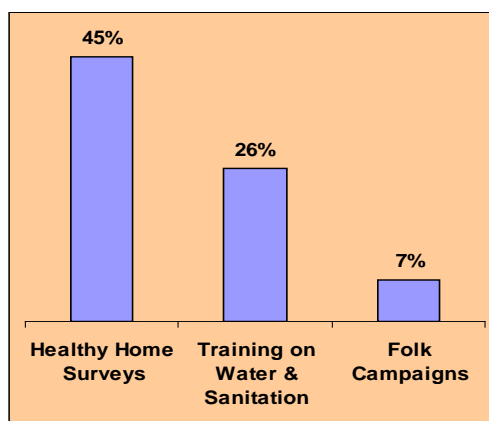
2.59 Environmental sanitation services were to be improved through two actions: first, by eliminating open defecation through the provision of household and institutional latrines, and second, through building community solid waste collection bins and ensuring good drainage.

²³ Boiled water is generally stored carefully and in many cases colored with cinnamon or other herbs to indicate it is safe to drink. The World Bank (2008) independent survey indicated that 75% of households in Kerala boil water to make it safe and about 90 percent store drinking water within the house

2.60 **Reducing open defecation.** Coverage of latrine sanitation in the project area increased from 76 percent in 1999 to 86 percent in 2008. Not all of this can be attributed to the project because other sanitation programs were also active at the time. Improved environmental sanitation reached 507,000 people that were provided with either new or improved pit latrines. The total population of the villages listed by the government as practicing good environmental management is 246,000.²⁴ The net number of people who benefited by both interventions is not known.

2.61 The project's sanitation and health promotion efforts were bolstered by the United Nations Children's Fund (UNICEF), which collaborated with the Agency in designing and developing the outreach materials. These materials were disseminated to over 331,000 trainees in 110 *Gram Panchayats*. Initial low demand for environmental improvement inputs was found to be the result of: (a) less than planned attention to sanitation and health Promotion after the initial batch of implementation, and (b) too complex and too many messages in the promotion effort. While the targeted level of effort was never achieved (Figure 5), the focus was reduced to six key areas: regular chlorination, water quality monitoring, conversion of deep pit latrines, regular maintenance of latrines, hand washing, and solid and liquid waste management.

Figure 5. Sanitation and Health Promotion Efforts were Much Less than Planned



Source: KRWSA March 2012

2.62 As a result of better focus, uptake of physical facilities increased (Table 4). However, the uptake of school latrines was low for a number of reasons: government schools accessed federal government grant programs that were more attractive; some private schools were ineligible for project grants; non-affordability; and low interest by some service organizations in promoting these efforts. Most private schools without sanitation were in rented properties that disqualified them; other schools could not raise the matching funds.

²⁴ KRWSA. March 2012.

Table 4. Improved environmental sanitation

<i>Output</i>	<i>Appraisal Target</i>	<i>Project 09/2008</i>	<i>Achieved Scaling-up to 112 GPs</i>	<i>Total to 10/2011</i>	<i>Achievement to 2011/Appraisal Target (Percent)</i>
New Household Latrines	40,000	57,012	11,011	68,023	170
Latrine Conversion	8,000	22,872	1,322	24,194	302
Latrines: Government Schools	208	126		126	60
Latrines: Private Schools	636	80	-	80	13
Environmental Management Units	26,667	79,541	9,778	89,319	335
Improved Drainage (km)	178	68	-	68	38

Source: KRWSA March 2012

2.63 In shallow water table areas, single deep pit latrines were reduced in depth and replaced by two shallow latrines of improved design, thus reducing leakage of septage to groundwater. The number of new household latrines was nearly twice (170 percent) the number planned partly because of effective project sanitation and hygiene outreach campaigns and partly because of the additional incentives offered by the Total Sanitation Campaign. Of the 112 Gram Panchayats in the project, 25 received the Total Sanitation Campaign's Clean Village Prize indicating elimination of all open defecation at these locations at the time the project closed. Subsequently this increased to 85 Gram Panchayats, or 76 percent of all villages by March 2012.

2.64 All household latrines inspected by IEG were being used and were kept clean due to the availability of fresh water provided by the project. Women's health committees in particular were reportedly vigilant in promoting utilization of latrines as this was a condition of the process to gain the Clean Village Prize. While utilization of latrines and the quality of the environment around and within communities improve, and the project objective was substantially achieved, there was negligible information on the efficacy of the project's efforts to promote hand washing or evidence of any health benefits.

2.65 **Solid Waste Collection.** Environmental management was intended to reduce indiscriminate dumping of garbage in communities through provision of compost pits, soak pits and vermicomposting.²⁵ However, apart from the records of the number of small-scale facilities built, there are no systematic data to indicate their effectiveness at reducing environmental pollution.

²⁵ Vermicast, known as worm castings, worm humus or worm manure, is the end-product of the breakdown of organic matter by earthworms. In vermicomposting, food, organic, and vegetable wastes are thoroughly mixed by worms. Apart from cleaning the village environment, composting produces very heterogeneous compost that is an excellent soil nutrient.

ACHIEVE SUSTAINABILITY OF INVESTMENTS: *Substantial*

2.66 Sustainability implies that the system works throughout its life, and is able to generate adequate cash flow for future expansion and replacement investment. It has four dimensions: ownership and inclusiveness, institutional legitimacy and support, financial sustainability, and technical sustainability.²⁶

2.67 **Ownership and Inclusiveness.** Piloting of the decentralized delivery model took place in five Gram Panchayats as the first batch of the project over the period 2000-2002 and it benefitted 61,900 people. These people organized themselves into 135 beneficiary groups that included 11,501 households of which 42 percent were below the poverty line – considerably more than the target of 30 percent. It also included 1,354 households of scheduled castes and scheduled tribes, representing 12 percent of beneficiaries.

2.68 The pilot proved that relatively poor beneficiaries could form viable scheme management units that could run their water supplies with no state subsidy and provide adequate O&M. Beneficiary groups demonstrated ownership by raising 15 percent of the capital costs (or its equivalent in cash and labor) before they could be officially registered and receive project financing. The decentralized delivery model owned by beneficiaries enabled the project to exceed planned water scheme outputs by 46 percent.

2.69 The project's decentralized service model built high levels of ownership. All groups participated in their scheme design and implemented community contracting. Groups reported to IEG that this approach not only led to improvements in the engineering design, it also kept costs down and put pressure on the group to complete the work as quickly as possible. Initially, because service organizations were paid a fixed fee, they tended to take their time in advising groups. By the time of the third batch it was found that an output-based payment was more effective in speeding up construction and commissioning. It also improved timely reporting to the Agency's field offices.

2.70 The project model demonstrated that those below the poverty line and tribal groups would participate and pay for improved service coverage. At appraisal it was thought that only 30 percent of those below the poverty line would contribute to their own water supplies – in practice this class represented 52 percent of all project participants. Overall, beneficiary contribution to the total capital cost of the project was US\$11.80 million, 10 percent more than anticipated. At appraisal it was also thought that inclusion of six tribal beneficiary groups was ambitious – by project closure 10 tribal groups were part of the project and they contributed Rs.8,360,000 (US\$182,000) to capital costs in cash and labor.

2.71 **Institutional Legitimacy and Support.** Following the success of the pilot in generating ownership and inclusiveness, lessons learned were rolled into subsequent batches. The managerial, financial and technical capacity of self-organized beneficiary groups was built by service organizations to incentivize them to contribute to initial capital cost and enable them to subsequently undertake community contracting, and manage O&M. In most schemes a strong partnership was developed between the Agency, beneficiary groups,

²⁶ World Bank 2000b, page 26.

federations of groups and the Gram Panchayat.

2.72 Beneficiaries formed legally recognized groups.²⁷ The General Body of the beneficiary groups had two members per household (a male and a female). The constitution of the General Body was adopted and this enabled election of a Beneficiary Committee for each scheme comprising 11 members, in which one of the key office bearers (Treasurer or Secretary) was a woman and one-third of the Committee was reserved for women. At the end of the first batch, 62 percent of groups had women in executive posts; by the end of the project this had increased to 100 percent of groups in all batches.²⁸ Groups reported to IEG that the increased role of women in official positions had a catalytic effect of group mobilization, transparency, and legitimacy, particularly for managing scheme accounts and contractors.

2.73 **Financial and Technical Sustainability.** Over 90 percent of the water schemes have proved to be sustainable over three to eight years in terms of producing adequate volumes of water and distributing it to users through piped networks. Latrines are by their nature technically sustainable as they are passive structures. Most household latrines seen by IEG were well maintained.

2.74 Several rounds of financial sustainability assessment considering a year's performance were conducted during the project for each group (Table 5). More recent data from the Agency were not available. IEG's discussion with beneficiary groups and scheme indicates that the findings in 2006 are probably currently valid. Importantly, water tariffs are set by the beneficiary group's annual meeting and they vary with type of system and level of pumping required.²⁹

2.75 Water tariffs are sufficient to cover routine O&M costs and IEG found that most groups interviewed have savings against the need created by unforeseen events. Groups also appeared to have the financial capacity to absorb new households subject to the flow constraints imposed by pipework – generally this is enabled by a connection fee that ranges from Rs. 500 to over Rs. 5,000. The main problem areas are for small groups that worry they will not be able to afford major repairs, such as replacing burnt-out electrical motors and corroded pipework. In some areas these concerns have been mitigated when groups form into federations. Thus in Mundathicode Panchayat of Thrissur District, the 32 beneficiary groups

²⁷ Under the Societies Act of 1860 beneficiary groups became autonomous legal entities with the own byelaws and Memorandum of Association detailing function and governance. The labor contribution to capital costs was calculated based on the engineer's calculation of scheme cost and the share members of the community agree to undertake.

²⁸ Field survey indicated that 82.7 percent of the beneficiary groups Palakkad District and 72.4% of the BGs in Trichur have membership of women in decision-making process, and participation of women in key posts Kerala State Planning Board. 2009. An evaluation Study on Jalanidhi Projects in Kerala. of Treasurer was 87 percent in Palakkad and 83.7 percent in Trichur.

²⁹ For example, in Thiruvampady Panchayat gravity water supply, the President reported that users are charged Rs.10/month. In pumped schemes the tariff is Rs.50 per household up to 12,000 liters/month and use above this is charged Rs.10 per additional kiloliter for the 10 of 36 schemes that are metered. The Panthalankumma group in Malappuram District, operational since 2002, initially established a tariff of Rs.50/household, but as costs increased this was increased to Rs.60 and is currently Rs.80/household. The Srothus group in Kozikode District serves 42 households. The initial monthly tariff was Rs.30 per household; this is now on an increasing block tariff and users now pay between Rs.50 and Rs.170 a month.

have federated and, working closely with the Panchayat, they cross-subsidize the poorer groups for essential repairs.

Table 5. Financial Sustainability Indicators for Kerala Small-scale Water Schemes

<i>Indicator</i>	<i>Target</i>	<i>April 2003</i>	<i>Nov 2003</i>	<i>May 2005</i>	<i>Oct 2006</i>
Cumulative Number of households	-	7,884	9,202	37,452	37,408
Households Surveyed (%)	-	9	9	22	11
Scheme water tariff system in place (%)	90	100	98	100	100
Scheme bill collection operational (%)	90	100	98	97	100
Households pay tariffs regularly (%)	90	na	63	80	75
Collect more than 100% O&M needs (%)	90	66	55	70	71
System for fund management (%)	90	na	98	100	100

Source: KRWSA March 2012. na = not available.

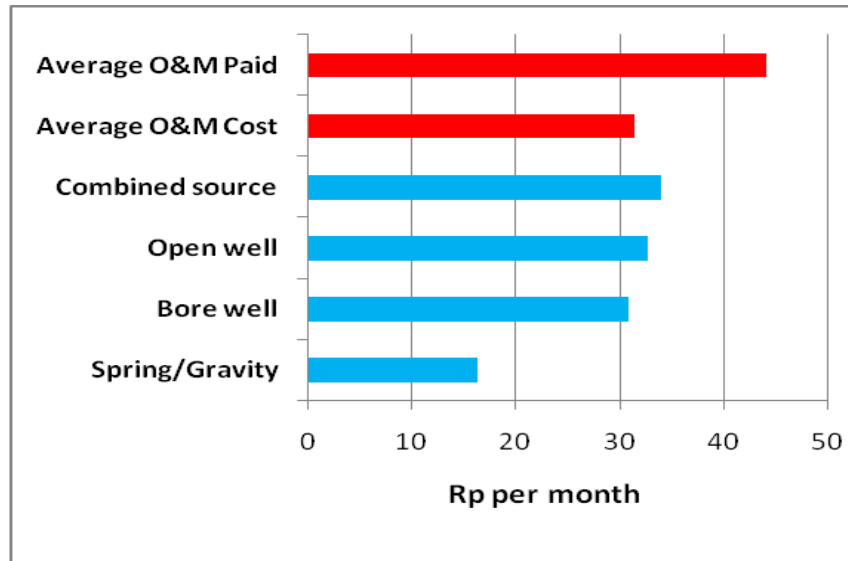
2.76 The systems for billing are rigorous and are managed by the scheme treasurers who are frequently women trained by the project. While there is some flexibility for paying bills, almost all schemes disconnect non-paying members after three months with allowances for special circumstances (such as death of a family member, illness, or unemployment). Failure to pay water bills carries a social stigma, particularly in the smaller schemes. Reconnection also costs Rs.500 or more.

2.77 The range of water tariffs is affordable for most families. A study by the World Bank (2008) of 10 states in India found that willingness to pay in Kerala was Rs.51 a month for a private connection from all sources (private or government). This was the starting point for setting the water tariffs in project schemes. In terms of affordability, the lowest income groups in Kerala spent about 4.3 percent of income for community management of their water supplies costs; middle income about 2.1 percent and upper income about 0.3 percent.³⁰

2.78 An O&M costs analysis conducted in 2008 based on data from 2,135 small schemes found that the average water tariff paid by households was 40 percent larger than the costs (Figure 6). The largest component of costs was the pump operator (51 percent), followed by electricity (31 percent) and general maintenance (14 percent). Chemicals accounted for only 4 percent of costs. Overall, 90 percent of the communities fully recover recurring O&M cost, without any subsidies from the local or state government. Financial sustainability is thus high.

³⁰ World Bank (2008). Low income <Rp3,000/month; middle Rp3,000-Rp5,000; upper income > Rp5,000. These expenditure data are the average for all government, Gram Panchayat, and community-managed schemes. In developing countries more generally, the willingness to pay averages about 2 percent of income (Jiwanji 2000).

**Figure 6. Users pay more than the basic operation and maintenance costs:
Project Averages from 2,135 Schemes**



Source: KWRA. March 2012.

Efficiency

2.79 At appraisal the economic rate of return was estimated to be 25 percent when capital investment, institutional strengthening, and software costs were included. Including only capital costs increased the rate to 33 percent. Benefits were derived from the time saved in water collection that could be used in remunerative activities and from the value of incremental water consumption.³¹

2.80 At project completion no new data were available for the incremental volumes of water used or time savings. In consequence, the Implementation Completion and Results Report (ICR) used the appraisal assumptions but reduced the opportunity cost of time saved by 15 percent and the value of incremental water consumption by two-thirds, and increased monthly O&M costs by 48 percent to match the average amount paid by beneficiaries, despite the fact the actual O&M spent was the same at the appraisal estimate. No account was taken of the health benefits derived from more water use and improved sanitation, although no evidence of these benefits was collected by the project. On this basis the average economic rate of return was estimated to be about 19 percent. This estimate is fairly robust over the likely range of water consumption improvements and its economic value, and population growth. Field evidence indicates only small, if any, improvements in the average per person daily water consumption. The rate is, however, highly dependent on the assumptions on the opportunity cost of time and total time saved. If an hour is saved and valued at Rs. 5, the economic rate of return is about 19 percent, but at Rs. 2 per hour it falls

³¹ In the project appraisal document (page 102) it was estimated that the average time spent on water collection before the project was 1.33 hours per household. With the project it was assumed the time needed would be reduced by 90% with a household connection and 75% for neighborhood standpipes shared by several houses. Incremental daily water consumption was expected to increase from 64 liters/capita to 70 liters/capita.

to about 6 percent. For the same opportunity costs, but reducing time saved to 40 minutes, the rates are 12 percent and 1.7 percent, respectively.

2.81 IEG discussed time saving with beneficiaries. This is highly household-specific, but generally people living in the hills had longer to walk and thus larger time saving than those near the coastal belt. Estimates ranged from 1 to 2 hours and one respondent reported 4 hours. Additionally, time savings were seasonal. Prior to the project some water sources would go dry and women had to walk further. With the project the time spent in moving water around the household was typically only a few minutes except for the small minority with supply problems discussed earlier. An independent study commissioned by the World Bank (2008) estimated the time spent on water collection in Kerala (Table 6). It appears that community piped schemes save a minimum of 2 hours per day compared with alternatives.

2.82 The opportunity cost of time savings is probably higher than the ICR estimate. Daily wages of agricultural workers are about Rs.60 to Rs. 100 caused by the demand for labor from the Gulf States and Oman. Remittances further increase demand for labor as much of this money is invested in house construction and improvements. Given the egalitarian politics and social norms of Kerala, women are paid wages similar to men's wages – this is certainly true of women employed by the project's beneficiary groups. Thus an hourly wage rate of Rs. 5 -10 would not be unreasonable for those women in employment.

Table 6. Time Spent in Water Collection in Kerala by Type of Water Project

	<i>Type of water project</i>		
	Community	Government	Gram Panchayat
Time spent (hours/month)	27	92	120
Community Saving (hours/month)	0	65	93
Community Saving (hours/day)	0	2.1	3.1

Source: World Bank 2008. Figure 5.6

2.83 The surprising IEG finding was that among interviewees, only a minority of women used their freed time for work, business, or micro-enterprise activities. Most said that the time saved enabled them to spend more time looking after the family, on self-improvement, and on voluntary activities outside the home. Quite a few, using committee and management skills gained via the project, are involved in local politics and NGOs. No value can be imputed for these activities. Considering time savings overall, employment factors, and unquantifiable economic and social benefits, it seems probable that the ICR's overall ex-post economic rate of return of 19 percent may be an underestimate.

2.84 There is also strong evidence that the decentralized, community-led model for provision of water supply was more cost-effective than the alternative centralized, government-led approach (Table7). Overall cost is 70 percent of the traditional government supply. As a result, the project was able to increase the number of communities served within the original budget, an efficient use of project resources.

Table 7: Kerala - Components of total costs of water by approach (Rs. per 1,000 liters)

Approach	Capital Cost	O&M Cost	Coping Cost	Institutional Cost		Indirect Power Subsidy	Total Cost
				Government	NGO/SO		
(A) Decentralized, Community-led	20.3	6	2.8	5.9	5.9	2.2	43.1
(B) Centralized, Government-led	20.6	6.3	10.6	22.2	-	1.5	61.2
Ratio A/B (%)	99	95	26	27	-	147	70

Source: World Bank (2008). Figure 4.9.

2.85 While normalized capital costs and O&M costs of the two approaches are almost identical, household management costs - representing the opportunity cost of household time spent on water supply - are about a quarter of the government-led schemes. Similarly the government's institutional cost - in this case the Agency's - is about a quarter that of the Kerala Water Authority or *Gram Panchayat* Schemes. Even when the cost of the NGO and support organization needed to organize community schemes is taken into account, total institutional costs are half that of the traditional alternative. Finally, the electricity subsidy is higher for community water schemes because the state government reduced their electricity tariff.

2.86 Administrative efficiency during the project was high. Apart from the initial slow disbursement as capacity was built, the Agency continually sought to streamline and/or eliminate bureaucratic hurdles and successfully facilitated institutional strengthening within budget. The project delivered more infrastructure than was expected. This was because the efficiency of the design process was high and led to considerable savings that allowed a greater number of water supply schemes to be constructed. The only downside was that it took much longer than planned to complete the very large water supply schemes inherited from the state water agency, but this was more a reflection of their complexity than inefficient implementation.

2.87 Based on these findings, project efficiency is rated **Substantial**.

Ratings

OUTCOME

2.88 Relevance of objectives and design was high throughout the project and remained so at the time of this assessment. All three of the objectives were substantially achieved, albeit with shortcomings regarding water quality. Well-engineered water supply and environmental sanitation services tailored to local needs were provided and are generally reliable. While the water quality objective was not secured by chlorination as expected, alternative purification (boiling) is now widespread. Investments are financially sustainable with very high levels of community contribution, ownership, and viable cost recovery mechanisms, the one shortcoming being that provision for major repairs in the longer-term needs to be secured. State capacity to effectively implement decentralized service delivery was built and successfully facilitated community-led development of water supply and sanitation and

enabled it to be scaled-up beyond the project area. Even so, capacity constraints of the Agency emerged towards the end of the project brought about by dwindling government funding. Efficiency was substantial. The outcome of the project is rated **Satisfactory**.

RISK TO DEVELOPMENT OUTCOME

2.89 Political and administrative risks are negligible as both the federal and the state governments continue to place a very high priority on providing and sustaining rural water supplies and sanitation. Decentralization of planning and financial disbursement authority in the sector to local governments is now well-established. Local Self-Government Departments effectively provided administrative and policy support to the demand-responsive institutional processes piloted by the project. This support will be enhanced by the six-year (2012-2017) World Bank-supported Kerala Local Government and Service Delivery Project that focuses on capacity-building in all 1,038 rural and urban local governments in the state. However, there is strong pressure from some local politicians to give more financial resources to the *Gram Panchayats* so that they can sponsor schemes in the areas that the project could not serve because of potential group's inability to raise the required co-financing.

2.90 Inputs required for sustainability carry low-to-moderate risks. Schemes continue to deliver adequate and reliable quantities of water and beneficiaries have proved willing to pay O&M costs. Current risks of physical failure are low – less than 6 percent. Many schemes have also successfully adopted increasingly sophisticated metering and increasing block tariff systems to regulate use and conserve water. The growing number of federations of water-user groups has proved also to be a viable way of self-provided cross-support to tackle emerging problems. Countering this, this assessment met several beneficiary groups under newly-elected leadership that had negligible knowledge of the founding principles of *Jalanidhi-I* and the self-help principles involved.³² Given that this cohort of new leadership will grow significantly as third and fourth generation elections take place, mechanisms to ensure their orientation and training on beneficiary-managed water supplies will be required.

2.91 Mechanisms to provide technical support to beneficiary groups to solve their larger-scale physical maintenance problems that are beyond local beneficiary group resources are in a state of flux. This poses a substantial risk. Almost all beneficiary groups met by IEG complained that support mechanisms were inadequate.

2.92 While it is envisaged that the follow-on project will make the new-entry *Gram Panchayats* formally responsible for ensuring adequate O&M of schemes managed by beneficiary groups, and needed financing will be provided to them from the state, this will only apply to new schemes. Using this approach it is hoped that the problem of larger-scale maintenance would be solved. In return, O&M funding raised by groups will be turned over to the *Gram Panchayats*. It is anticipated that this could be a way around the dilemma revealed at appraisal: that while *Gram Panchayats* are good at development, they have a poor

³² In Thiruvilvamala Gram Panchayat, Thrissur District, while a federation had been formed of the 62 beneficiary groups it was not active because beneficiary groups do not support it financially (as they do elsewhere). It was reported to IEG that groups were not holding regular meetings and new office-holders were unaware of the principles of *Jalanidhi* to the extent that some were not even renewing compulsory annual registration.

record on regulation and bill collection. Indeed, that was one of the reasons some *Gram Panchayat* schemes were handed over to beneficiary groups during the project under review.

2.93 Schemes developed under this project have no such formal arrangements and not all beneficiary groups are convinced that ceding authority to *Gram Panchayats* is in their interests, particularly where they have strong federations of beneficiary groups willing to offer cross-support within the federation. They are most concerned that O&M money from self-supporting schemes may be used by politically ambitious *Gram Panchayat* Presidents to subsidize water schemes for those unable or unwilling to follow the model, and that this would lead to inadequate maintenance for the schemes. Part of the pressure to put *Gram Panchayats* in charge, apart from being accountable for state funding, is that some *Gram Panchayat* Presidents are concerned that the head of the water-user federations would compete with them politically. One solution – that *Gram Panchayat* Presidents should become head of the federations – is a complex and difficult issue. As a result, the range of proposed institutional arrangements for the longer-term administrative and financial relationship between *Gram Panchayats* and beneficiary groups remain under discussion.

2.94 Risk to Development Outcome is rated **Significant**.

BANK PERFORMANCE

2.95 **Quality-at-Entry.** The project was comprehensively and thoroughly appraised. Risks were correctly identified and mitigating actions put in place. The establishment of the new autonomous Agency was well planned and project activities were appropriately phased and scoped to enable the Agency to learn and grow simultaneously. The Bank worked closely with both the federal government and the government of Kerala to ensure ownership. Institutional and financial aspects were very thoroughly appraised by the Bank and this enabled the project to get off to a quick start. Even though it was an institutional reform demonstration project, more attention could have been given to designing outcome indicators on cost recovery, institutional reform, incremental per capita water consumption and environmental quality improvements. In addition, the Bank over-estimated the federal government's willingness to utilize technical assistance to further its national reform agenda. Quality-at-entry is rated **Satisfactory**.

2.96 **Supervision.** Continuity of key staff throughout implementation created an effective team that worked extremely well with the Borrower, helped by an emphasis on field inspection that visited 500 schemes. The Bank quickly and effectively responded to the Tsunami and the emergency reallocation of US\$10 million was done expeditiously. Inattention to ensuring that the O&M system captured water quality and water consumption data was a moderate shortcoming. Similarly there was no monitoring of the efficacy of the environmental sanitation components. Quality of supervision is rated **Moderately Satisfactory**.

2.97 Overall Bank performance is rated **Moderately Satisfactory**.

BORROWER PERFORMANCE

2.98 **Government.** There was high borrower ownership at the state level as government was in the forefront of India's reforming states. Enabling policy and regulatory instruments were established to allow decentralization and the government setup and supported the new implementing agency. It reaffirmed its policy support with the issuance of a new State Water Policy in 2008.

2.99 There was strong support for the new Agency, its autonomy and the lean management team supported by private-sector contract professionals. Recognizing its potentially pivotal role in the sector, government endorsed a sound staff incentive package to ensure the best- and- brightest were attracted to the Agency. However, over the life of the project the incentive package was allowed to decay, and the Agency's image as a project rather than a program created problems in retaining essential staff as the closing date approached. Counterpart funding was timely but generally inadequate: the state government provided only 52 percent of its agreed contribution.

2.100 In contrast, the federal government showed almost no interest in using this project to provide technical assistance to assist furthering its sector reform agenda in the states countrywide (component 4). Similarly the government of Kerala did not utilize technical assistance to develop a comprehensive state-wide water plan (component 3). Even so it did develop a comprehensive water policy. Five elections disrupted implementation. Government performance is rated **Moderately Satisfactory**.

2.101 **Implementing Agency.** The Agency developed a cadre of qualified staff that were highly committed to community-driven development. The employment of individuals from the private sector under contract mitigated the risk that there would be rear-guard action against the new rural development model. It also ensured that the Agency's outlook would be multi-sectoral and not dominated by engineers. Staffing incentives and retention problems sapped its demonstrated potential towards the end of the project. In consequence, there was a high turnover of senior staff. The Agency indicated that district management tended to remain aloof from the local government project staff, many of whom were earlier transferred to the Gram Panchayats when the Kerala Water Authority shed its responsibility for rural water supply. This is being addressed in the follow-on *Jalnidhi-II* project.

2.102 The Agency successfully networked itself with a large pool of NGOs in accomplishing the challenging job of mobilizing communities and enabled take ownership of, and management responsibility for, small-scale water supply and sanitation facilities. The process is transparent and publicly accountable. The project management unit had problems coping with the expansion of the project and this was exacerbated by the additional work to address damage in the Tsunami-affected area. Even so, the Agency significantly exceeded output targets set at appraisal. Insufficient attention to monitoring and evaluation was a moderate shortcoming, as was the Agency's inability to organize post-exit support for beneficiary groups.

2.103 There are about 150 cases for technical help pending with the Agency, some for two or more years. The primary reason is that the Agency has had minimal staff since closure of

the project and has been unable to satisfy the demand from beneficiaries for a more comprehensive O&M advisory service for completed schemes. A major issue is that the incentive structure that attracted good candidates to the Agency has been changed – current salaries are less attractive than those recruited to regular government positions. Implementing Agency performance is rated **Moderately Satisfactory**.

2.104 Overall borrower performance is rated **Moderately Satisfactory**.

MONITORING AND EVALUATION

2.105 The design of the monitoring and evaluation systems was very thorough. Indicators were appropriate and captured inputs, outputs, and outcomes. Implementation was excellent and the attention paid to monitoring outcomes and lesson-learning enabled project design to be improved. Even so, some important aspects of the project, water consumption improvements, water quality and the impact of environmental improvements were not captured by the M&E system. While these data often exist within communities and locally, they were not summarized by the Agency's information systems. The quality of monitoring and evaluation is rated **Substantial**.

3. Maharashtra Water Supply and Sanitation Project

3.1 Maharashtra is the third largest Indian State, with 112 million people living in 44,000 villages spread over 33 districts as of 2011. About 55 percent of its population lives in rural areas and most of this population is dependent on agriculture, which produced only 12 percent of the state's gross domestic product. While Maharashtra's economic growth rate has risen steadily, from an average of 5.0 percent per year from 1993 to 2001 to 7.8 percent from 2002 to 2007, its social development is not commensurate with its ranking among the richest states of India and its high rate of economic growth. The head count ratio of poverty has remained around the national average of 25 percent. In 2008 its nutrition status was ranked 10th out of the 17 states, a modest improvement over 1994 when it was ranked 13th out of the 15 states for which the Indian Nutrition Index was calculated (Sathi 2009). The state's literacy rate increased from 76.9 percent in 2001 to 82.9 percent in 2011.

3.2 The Deccan Plateau occupies about 82 percent of the state's geographical area. The Western Ghats (the *Sahyadri Range*) run in a north-south direction up to 1,000 m above sea level and are parallel to the western coast some 50 km inland. Because the Ghats run at a right angle to the southwest monsoon, the land to the east lies in its rain shadow. The narrow coastal lowland, mostly below 200 m, is traversed by narrow, steep-sided valleys and interspersed by low lateritic plateaux. The highest annual rainfall (6,000 mm) occurs over the Western Ghats and it drops to about 500 mm within the drought-prone rain shadow which accounts for almost a third of the state's geographical area. There are around 400 rivers in Maharashtra with a total length of around 20,000 km forming five main river basins. The coastal plain has small flood-prone rivers flowing to the Indian Ocean.

3.3 Groundwater provides more than 80 percent of water supplies. On the Deccan Plateau, groundwater availability is limited by both the low rainfall and the low porosity of the hard basaltic rock formations which are also regularly dissected by impermeable dikes

and traps, preventing the movement of groundwater. Where groundwater sources have been developed for agriculture, there has been widespread mining, for which extraction exceeds the natural aquifer recharge. As a result, many wells have gone dry. In contrast, the coastal belt's water supplies are from highly porous rocks that have difficulty retaining water.

3.4 Up to 1985 the main thrust of the Government of Maharashtra's efforts to increase access to water supplies focused on providing dug wells and boreholes fitted either with manual or electrically powered pumps. By 2002 some 220,000 hand pumps, 14,000 power pumps and 90,000 community wells had been constructed. However competition for the same groundwater resources from rapid expansion of irrigation wells – an estimated 2.2 million in 2002– caused many water supply wells to run dry. In addition, a survey by the state government in 2002 found 18 of 26 districts suffering from either declining groundwater levels or water quality deterioration (Das 2006).

3.5 Between 1985 and 2000 the state government's focus shifted to providing water supply schemes in rural areas based on surface water sources and implementation of a US\$1.6 billion state Water Master Plan for regional and single village piped water supply schemes. By December 2002, US\$1 billion had been spent and 1,907 schemes were ongoing. The state government utilized the current grants/budget available under the federal government's Minimum Needs Programme and the Accelerated Rural Water Supply Programme to complete these schemes.

3.6 Several external development partners also assisted the state government. The Bank's first Indian rural water supply and sanitation project (1991-1998) provided US\$110 million to improve access through support for 17 single village schemes and 47 multi-village schemes in 560 villages of 10 districts. Water supplies were designed to serve a population of 450,000. Its environmental sanitation component was implemented in 2,100 villages covering a total population of about 4.6 million. The United Kingdom's Department for International Development over the period 1990-2000 provided US\$ 1.6 million equivalent to build 3 regional schemes in 3 districts.

3.7 In July 2000, the state government took a major policy decision to adopt the community-led approach towards the drinking water and sanitation sector following the federal government's Sector Reform Program. In addition, two large state-wide rural sanitation initiatives have been ongoing from 2000. The first was the *Sant Gadge Baba Clean Village Competition*, which encourages all the villages to undertake sanitary improvements through community participation and local resource mobilization.³³ The second was the federal government's Total Sanitation Program. To assist these reforms, Kreditanstalt für Wiederaufbau (KfW), the German Development Bank, assisted the state in three districts to pilot various models of community participation under the *Santa Gadge* initiative. Additionally new state initiatives promoting groundwater conservation and rainwater harvesting across the state started in 2002.

³³ The villages are then judged for the outcomes (toilet coverage, waste treatment, health status, women development, community awareness etc) and the first three ranked villages at block level, district level and state level are given cash rewards. This competition has reportedly improved the toilet coverage drastically, with very little state funding.

3.8 As a result of these efforts, Maharashtra's rural water supply coverage increased from about 86 percent in 1981 to 95 percent in 2001 and 99 percent in 2004 (GOI 2011). However, this apparently high rate of coverage hides considerable variation in the quality of coverage. In 2004 for example, 28 percent of villages were classified as 'partly covered' and had daily water supplies of less than 40 liters per person. In the period 1998-1999 only 15 percent of the rural population had access to modern sanitation and only 23 percent had a household water connection (NFHS 2000). In the period 1996-1999 about 117,000 latrines were constructed, but by 2002 only 57 percent were used for defecation.

3.9 In the period 1998-1999, there were marked differences in infant mortality depending on where people lived. In rural areas infant mortality was 51 per 1,000 live births and for children under five it was 68 per 1,000. The comparable figures for urban areas were 44 and 58 percent, respectively. Much of this high mortality was due to disease brought about by poor hygiene and inadequate and poor quality water supplies –23 percent of children under three suffer from diarrhoea. The official recorded number of people having diarrhoea, gastroenteritis, infant hepatitis, typhoid, and cholera over the period 1999-2002 was 3.6 million and there were 1,047 deaths.³⁴ In 2002 the state government estimated that water supplies to about 14,000 villages/habitations were not covered, and about 16,000 villages/habitations faced water scarcity during the five summer months.

3.10 To address these problems more systematically and in line with the Sector Reform Program, the Bank agreed to provide an IDA Credit of US\$181 million equivalent for the Rural Water Supply and Sanitation '*Jalawaraja*' Project to assist mainstreaming of the Program in 26 of Maharashtra's districts not covered by other donors.

Objectives, Design, and their Relevance

OBJECTIVES

3.11 The Project's Development Objectives stated in Project Appraisal Document were:

“To (i) increase rural households' access to improved and sustainable drinking water supply and sanitation services; and (ii) institutionalize decentralization of Rural Water Supply and Sanitation service delivery to rural local governments and communities.”

3.12 The objective stated in the Development Credit Agreement was:

"To improve access to potable water supply and environmental sanitation in the rural areas of Maharashtra."

3.13 The articulations are consistent; the Credit Agreement points to access to water supply and sanitation and to water quality ("potable water supply") as the main outcomes. While the Appraisal Document adds institutionalizing decentralized service delivery, this is the means to achieving these outcomes. Accordingly, this assessment uses the project objectives defined in the Development Credit Agreement.

³⁴ Official disease incidence data are the cases reported at the Primary Health Centers. They do not include families that visit local doctors or herbalists. Source: Das (2006) as cited.

RELEVANCE OF THE OBJECTIVES

3.14 At the time of appraisal a large proportion of Maharashtra's rural population was without sustainable sources of good quality drinking water. Large-scale surveys in India, including the Indian National Family Health Surveys of 1992-1993 and 1998-1999, have shown that household water supply and sanitation have a strong positive impact on the mortality rate for children under five years of age, but this is not the case for community stand posts or wells that had been the primary intervention before the project (World Bank 2010a). Similar results were found for diarrhoea prevalence (Jalan and Ravallion 2003).

3.15 The project's objectives were strongly aligned with national decentralization policies for rural water supply that gathered pace during the late 1990s, was adopted by Maharashtra in 2000, and continues to the present. Institutionalization of decentralized rural water supply and sanitation service delivery to rural local governments and communities remains highly relevant. Centralized, government-led service provision has failed to produce sustainable services because it does not take into account beneficiaries' preferences and frequently has low local ownership (Narayan 1995). Low ownership particularly applies when service provision falters because of breakdowns brought about by insufficient funding for O&M from government agencies whose prime focus is meeting new construction targets. The World Development Report 2000 (World Bank 2000b) concluded that decentralization has great promise, but only when it was tailored to reach the poor and was backed by adequate finance and autonomy.

3.16 Community-driven development gives control of decisions and resources to community groups by including them as partners in the development process (IEG 2005). Community-based approaches have also been found to lead to better allocation of resources to communities and reduce corruption and misuse of those resources. Project objectives were relevant to findings of the Local Development Conference of 2004 that empowerment does not take place in a vacuum - it is affected by local government development and sectoral programs of national governments (Helling, Serrano, and Warren 2005; Binswanger, de Regt, and Spector 2009).³⁵

3.17 The objectives were and remain relevant to the Bank's Country Assistance Strategies for India. The 1998-2000 Strategy was built around the overarching objective of poverty reduction through accelerated growth and social development, while recognizing that selectivity was important. Among its five pillars it aimed to concentrate assistance in states and programs that chose to commit strongly to reforms in addition to supporting key areas of policy reforms through early engagement and the building of consensus and ownership with partners. On this basis, operations in rural water supply and sanitation in Maharashtra were substantially relevant even though Maharashtra was not among the four focus states at the time the Strategy was prepared.³⁶ The 2001-2004 Strategy reaffirmed the relevance of the sector. The 2005-2008 Strategy further identified the sector as contributing to one of its three

³⁵ Local and Community-Driven Development brings three alternative approaches to local development come together in this approach: empowerment of the poor and other marginalized groups, responsiveness to beneficiary demand, autonomy of local institutions, greater downward accountability, and enhancement of local capacities.

³⁶ The four focus states were: Andhra Pradesh, Orissa, Rajasthan, and Uttar Pradesh.

priority areas (investing in people and empowering communities), while the 2009-2012 Strategy included the sector under its infrastructure development priorities.

3.18 Relevance of the Objectives is **High**.

DESIGN

3.19 **Components.** Project components and costs are summarized in Box 4. Project resources were to be used to build the institutional capacity of local government and communities and for new or rehabilitated infrastructure. The amount allocated to institutional aspects of the project, some US\$67 million or 23 percent of project funding, indicates its relative importance. This focus on institutional development is the primary difference between this project's design and the parallel Sector Reform and other rural water supply and sanitation programs in the state that were implemented at the same time and provide the counterfactual to this project.

3.20 Given that decentralized, community-led projects were new to Maharashtra, pilots financed by a Population and Human Resources Development (PHRD) grant were to be carried out in three districts to test the project rules and procedures for community-led projects and to ensure learning procedures were understood.³⁷ It was found that state and local level institutions had difficulty in moving away from the top-down mode, despite piloting of the NGO-assisted model of participation, and that they had difficulty also in drawing lessons and reflecting them in project design. Consequently, submission and documentation of these lessons was made one of the appraisal requirements. And because monitoring and learning were so important, a specific project pilot activity was devoted to it.

3.21 The selection of districts was to be on a demand basis using agreed transparent eligibility criteria that were to be given equal weight:

- Poverty: the percentage of households below the poverty line and households belonging to the other vulnerable groups including the scheduled caste and tribal population;
- Water scarcity: the proportion of villages having no access to water supply and shortage of water during critical months; and
- Institutional: the district's performance at managing existing water supply schemes, how successfully they promoted the *Gadge Baba* campaigns and number of villages getting good scores in the campaign. Past experience of using community-based approaches was to be given extra weight.

3.22 Districts wishing to participate in the project were expected to show some threshold level of preparedness by taking active part in an orientation and capacity-building program and undertaking key preparatory activities. Once in the project, they became eligible for the *Incentive Fund for Zilla Parishad*. This was designed to motivating districts to improve governance for inclusiveness, participatory decision-making, effectiveness, responsiveness, transparency, and accountability.

³⁷ The Japanese PHRD Grant of US\$720,000 was used to provide the state government with expertise for this and other preparation activities.

Box 4. The Objectives and Components of the Maharashtra Project	
Objectives	Components
<p>(a) To improve access to potable water supply in the rural areas of Maharashtra."</p> <p>(b) To improve access to environmental sanitation in the rural areas of Maharashtra."</p>	<p>A. Community development and capacity building (appraisal cost \$187.00 million; actual cost \$250.90 million). This component financed three main activities: (a) <i>Community Development</i> activities to facilitate the formation and training of inclusive, responsible and skilled Village Water and Sanitation Committees; utilize a Women's Empowerment Fund to mainstream women's participation in water management, sanitation, and village development activities; and strengthen Village Panchayats capacity for financial management, implementing social audit processes, promoting Gram Shaba-based inclusive decision-making, revenue generation, water conservation and distribution, sanitation and hygiene promotion, and O&M. (b) <i>Community Infrastructure</i> to increase recharge to groundwater, finance construction, rehabilitation and improvement of drinking water facilities, promote total sanitation, and finance sanitary complexes for women, and water supply and sanitation for schools. (c) The <i>Tribal Development Program</i> to build the institutional capacity of tribal people and improve their access to sustainable water and sanitation services. It financed technical assistance to build community capacity to develop and self-manage community infrastructure.</p> <p>B: Institutional strengthening (appraisal cost \$54.60 million; actual cost \$28.74 million). This component involved: (a) capacity building for government staff skills at each administrative level in the areas of community development and infrastructure, water supply and water source strengthening, water conservation, environmental sanitation, information education and communication, water quality monitoring, and project monitoring and learning; (b) developing and implementing a State communication strategy promoting safe water supply and use, sanitation and hygiene, the Women Empowerment Fund, and the Local Government Incentive Fund; (c) training team members in monitoring, learning, and evaluation concepts and methods in the areas of rural water and sanitation; and (d) support for district and state level project management.</p> <p>C: Sector development and strengthening (appraisal cost \$4.50 million; actual cost: \$0.69 million). This component included support for knowledge management an policy support and for water quality monitoring.</p> <p>D: Pilot components (appraisal cost \$12.50 million; actual cost \$5.77 million). This component funded three pilot activities: (a) a <u>Local Government Incentive Fund</u> that aimed to improve decentralization and governance of district and village-level institutions through grants of about \$150,000 equivalent each to nine <i>Zilla Parishads</i> and grants ranging up to \$10,000 equivalent in 225 Village Panchayats; (b) an <u>Operation and Maintenance Pilot Fund</u> that aimed to develop an O&M capacity-building model for ongoing drinking water supply schemes outside the project's community infrastructure component and prepare an action plan for scaling-up the model to eventually cover the entire State; and (c) a <u>Groundwater Aquifer Management Pilot</u> that aimed to develop and test approaches for holistic and sustainable management of water resources with the involvement of key stakeholders in six representative districts.</p>

Source: World Bank 2003

3.23 All *Village Panchayats* were self-selecting for short-listing at the district level provided they satisfied four criteria. These were: quantity and quality and state of existing water facilities; the proportion of tribal and below poverty line inhabitants; record of paying water bills; and agreement to adhere to project rules. To ensure targeting on the neediest, villages would be ineligible if the average daily water supply was greater than 40 liters per

person. Villages also had to take the whole package, not parts of it.³⁸ To establish villages as advertisements of the success of the project model and decentralization principles, and spur replication, an *Incentive Fund for Village Panchayat* was set up to reward villages for accountable, demand-responsive, and inclusive institutions.

3.24 Finally, in recognition that women play a major role in improving family health and acceptance of innovations that improve family welfare, the *Women Empowerment Fund* was established. The goal was to enhance participation of women in the project leading to their economic and social empowerment. In addition to rewarding women for an effective and meaningful role for women in water and sanitation fora, the subcomponent included skills development to improve their livelihoods through schemes such as enterprise training, and link them to networks of women and federations. The awards from the fund were to be tied to the overall performance of villages and women playing an active role in village water committee. The fund would be managed locally by either *Mahilla Mandals*³⁹ or a women's committee selected by the *Gram Sabha*.

3.25 **Coverage.** The project aimed to cover about 7 million of the rural population of 57 million, focusing on the rural poor and women located in 2,800 villages spread over an area of 250,000 square kilometers. It also aimed to improve service provision in 1,700 tribal settlements with a population of about 0.5 million. It was planned that the project would be launched in four successive batches starting with nine districts in October 2003 and in extending to all the remaining 17 districts by June 2004.

3.26 **Implementation arrangements.** The project was implemented by the Water Supply and Sanitation Department headed by a Minister. A State-level Advisory Committee on Water Resources chaired by the Minister advised the state government on water supply and sanitation policy issues. The Department's Principal Secretary to the Government was in overall charge of the project. A Deputy Secretary was designated as Project Director with responsibility for day-to-day running of the project. An Empowering Committee chaired by the Principal Secretary of the Finance Department was set-up to speed decision-making and had the appropriate powers of Cabinet devolved to it; the Project Director was the Member-Secretary of this Committee.

3.27 The Project Director had two teams to carryout implementation and was also in charge of the parallel Sector Reform project and the KfW-assisted project. The Sector Policy Support Team ensured implementation of sector policy and provided strategic support and advice. The Operation and Monitoring Team had cross-sector responsibility for institutional development, infrastructure and monitoring. This team established six regional project management units that oversaw operations in 25 districts. An important task of the team was to secure the services of support organizations and NGOs to facilitate social mobilization and community organization. It was expected that District Facilitation Teams with multi-disciplinary expertise would be established and, with the help of support organizations, they

³⁸ This was to reduce the risk that some villages would apply only for the sanitation component so that they could qualify for the Clean Village Prize

³⁹ The Mahila Mandals are voluntary organizations of rural women, interested in working together for the promotion of nutrition education, family welfare, food storage, immunization of children, small saving accounts of women, provision of bathrooms, smokeless chulhas, women crafts centre, and balwadis etc. The registered Mahila Mandals have representative of all classes of society, and have their own executive committee.

would facilitate capacity-building at district and village level local governments. The team was also to manage cross-support from other government agencies such as the Groundwater Development Agency, and private sector providers of special services such as water metering, water network design and equipment.

3.28 Project implementation at the district level was through the *Zilla Parishad's* Drinking Water and Sanitation Committee each of which oversaw three district teams. These three teams - one to facilitate planning and capacity building, one to manage finances, payments and audits, and one to oversee scheme appraisal, monitoring and evaluation – worked directly with the lowest tier of local government, the *Village Panchayat*. The *Panchayat* and the Committee was the local focal point for project implementation. Its primary responsibility was to make expenditures for project activities and account for them.⁴⁰

3.29 Participatory decision-making on the use of project resources at the village level was by the *Gram Sabha*, a general body of all people registered on the electoral roll. In 2002 the *Gram Sabha* was empowered by law.⁴¹ to call meetings, select beneficiaries for government schemes, approve local development plans, grant approval to their *Panchayat's* expenditure on schemes, and form Water and Sanitation Committees to oversee project procurement, work supervision and financing. It was expected also that the water committees would facilitate involvement of para-professional community service providers (well-drillers, plumbers etc.,) and relevant local NGOs and self-help groups.

3.30 **Design of monitoring and evaluation.** Much of the M&E design was left for the implementation phase. The chosen outcome indicators were not measurable. There was no system of standardization or processes across the several departmental, local government institutions, and villages doing monitoring. Responsibilities for reporting were unclear and there was no system of upward aggregation.

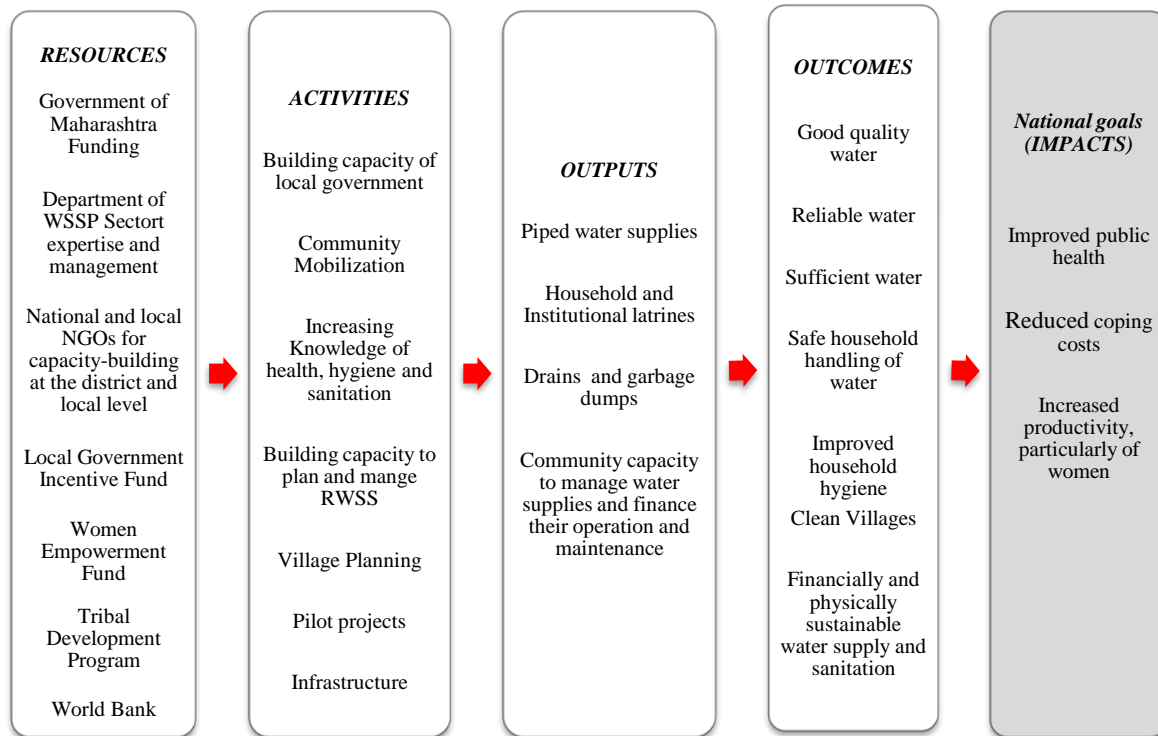
RELEVANCE OF DESIGN

3.31 The results chain linking inputs to expected outputs, outcomes and impacts was logical and comprehensive (Figure 7). The clear results chain had the potential to provide the basis for easily monitored indicators to the outcome level, and for one of the three desired impacts: reduced coping costs. Health benefits and increased productivity of women were affected by many exogenous factors beyond the ability of the project to monitor and evaluate. However, as noted below, insufficient attention was given to transforming the results chain into measurable indicators of progress and arrangement for monitoring the counterfactual.

3.32 Relevance of Design is **Substantial**.

⁴⁰ For larger water schemes that included several Panchayats, this authority was given to the council of several Panchayats (the Panchayat Samiti) included in these schemes and to the Zilla Parishads.

⁴¹ Bombay Village Panchayat (Amendment) Act, 2002.

Figure 7. The Results Chain for the Maharashtra Project

Source: Author's construction

Implementation

3.33 The Maharashtra Rural Water Supply and Sanitation Project was approved in August 2003, funded in part by an IDA Credit (3821-IN) of US\$181.00 million equivalent, and became effective in October 2003. While the government requested a one-year extension to the project to complete ongoing works, the project was closed on schedule in September 2009. At that time, rating of implementation progress was raised from moderately satisfactory to satisfactory. Physical completion of ongoing works was 73 percent and it was agreed that state would complete the remainder with its own funds. The credit, which had increased in value due to the appreciation of the Special Drawing Right in relation to the US dollar, was fully disbursed, although there had to be significant reallocation of unspent project funding from the institutional components to the physical infrastructure components. As a result, actual costs were 134 percent of planned for the first component that financed capacity building and infrastructure, while only about half of the planned institutional strengthening (53 percent) and pilot components (46 percent) were expended. Only 15 percent of the planned financing for sector development and strengthening was used. Total project costs amounted to \$286 million, or 110 percent of the planned amount.

IMPLEMENTATION EXPERIENCE

3.34 The project became effective in October 2003 but it took four years before the full momentum developed. Part of the initial problem was that national elections followed by state elections took six months in 2004. The major problems were too many demands on

central project staff from the parallel sector programs, insufficient Department staff posted to the project and their turnover, particularly in the districts, and slow progress on institution-building at district and village level. There were problems also in developing the community-led approach because of uneven performance by service organizations and NGOs. As a result, enrolling villages into the project was much slower than anticipated and disbursement was only 1.1 percent two years into the six-year project. Only 3 percent of approved schemes had progressed to the final stage of operation and maintenance. In June 2005 implementation performance was downgraded from satisfactory to moderately unsatisfactory.

3.35 The Mid-Term Review at the end of 2006 found that the pace of implementation had picked up and implementation performance was subsequently raised to moderately satisfactory in early 2007. Even so, Departmental staffing in the districts remained about 20 percent below agreed levels throughout the remainder of the project, and this included quite a few senior leadership positions.⁴² Additionally there was a high vacancy rate among health and hygiene specialists. Difficulties with monitoring procurement led to enhanced attention at the state level somewhat late in the project and a procurement specialist was appointed to guide district teams and ensure compliance with agreed procedures. It also proved difficult to retain the services of private sector specialists and NGOs for the capacity-building tasks outside of building community skills, particularly as it was insufficiently nurtured when official attention had to become more focussed on getting physical works back on schedule. To overcome some of the shortage of NGOs the project resorted to hiring retired staff and school teachers, few of whom had social development skills, to bolster numbers at the village-level.

3.36 Preoccupation of Department staff on infrastructure and lack of demand led to either partial completion or cancellation of some pilot activities. The Zilla Parishad Incentive Fund and the Operation and Maintenance Pilot were dropped. The Village Panchayat Incentive Fund was scaled back by 70 percent and was only piloted in 32 villages. Similarly, the Aquifer Management Pilot only completed 28 percent of the planned work.

FIDUCIARY AND PROCUREMENT

3.37 Financial management was problematic throughout the life of the project. This was partly because village water and sanitation committees had difficulty producing and submitting acceptable accounts, and partly because the computerized financial management system to integrate the diverse expenditure centers became operational two years behind schedule in 2007. Accounting for the contributions made by beneficiaries was one of the milestones in the memorandum of understanding between the beneficiary group and the department represented by the *Zilla Parishad*. Unfortunately, conflicting advice between the the Bank team and the state government's auditors led to some accounts (2007-2008) not meeting auditing requirements and deadlines. The Bank then suspended disbursements against statement of expenses in February 2009 until the end of the project.

3.38 Procurement was also problematic, mainly because of the unfamiliarity of the department with community contracting, and significant differences between the Bank and

⁴² 10 of 26 senior team leader positions were vacant; 5 capacity-building posts were deleted. Over all 36 of the project's 156 staff post were vacant.

state government procurement procedures. These problems were compounded by a shortage of experienced procurement staff at the state and district levels and significant delays in simplifying the procurement manual that was only finalized in late 2006.

IMPLEMENTATION OF MONITORING AND EVALUATION

3.39 Too much of the design of the M&E system was left to project implementation and this proved to be a major problem that plagued the project. While routine input and output monitoring followed normal state government practice, the Department was slow in developing outcome indicators and had difficulty in applying them. There was a limited baseline survey at entry. A Bank mission two years into the project (May 2005) found that the system in operation was unable to capture outcomes/impacts and output indicators of all project components including processes, community performance, and institutional relationships. This was despite the recommendation in May 2004 from an external consultancy agency on performance monitoring and intermediate key performance indicators. It was also found that, while the project had promoted internal learning,⁴³ these initiatives were episodic and there was a lack of institutional mechanisms for its systematic dissemination.

3.40 An assessment by the Bank's Quality Assurance Group in July 2005 was highly critical of implementation performance primarily because of the M&E problems had not been resolved. Documentation on participatory M&E was lacking. A particular concern was that the source of achievements at the village level – the project or other state programs – remained unclear. To help the Department address these shortcomings the Bank shared some of the successful monitoring and learning processes gained from the Kerala Water Supply and Sanitation Project.

3.41 Outcome monitoring and evaluation were greatly delayed. It took a typical scheme about two years to complete the capacity-building cycle and construction. Thus, the first completed schemes would have been available from late 2005. The first batch of sustainability evaluations took place in the last year of the project (2008) and it was only applied to a very small sample of non-random projects – 52 of 3,021 villages, two villages per district. As a consequence, opportunities to systematically learn lessons and use them to improve project design in the last four years of the project were lost.⁴⁴

SAFEGUARDS

3.42 The project was classified as safeguard category “B” under environmental assessment (Operational Policy 4.01). In addition, a tribal development program was prepared in accordance with OP 4.10. Key environmental issues were seen as water quantity and water quality, the result of the difficult hydro-geological environment. An environmental

⁴³ This included regular sharing meetings at the Gram Sabha level, sharing workshops within and between districts involving district and some state level staff, thematic workshops. In addition participatory monitoring, community score card and process monitoring were being piloted.

⁴⁴ In September 2009, as the project closed, the Department stated its intent to scale-up the exercise to reach 5 percent of all project villages (152) immediately and then expand it to most other project villages in the following nine months.

management plan was prepared to specify how the project would address these issues and the type of environmental monitoring and mitigation required. Generally, the requirements of the plan were included in the village development plans.

3.43 Within and around villages, environmental concerns were silage water and waste disposal; appropriate solutions were soak pits, compost pits, and drains. In many villages, open drains were covered over. Many of the recommendations of the management plan were implemented, but environmental monitoring was poor and it is difficult to determine how well the environmental management plan was implemented. The few villages visited by IEG had mixed outcomes. Three had piped drainage for wastewater disposal, community bins, and compost pits at strategic points in the village. The rest were partially covered, with some well kept and clean areas and others with scattered rubbish and pools of wastewater. An independent impact evaluation found that between 2005 and 2007, most project villages made no progress on wastewater disposal or garbage disposal.

3.44 The tribal development plan was fully implemented. A tribal population of 1.6 million in 626 Panchayats benefitted from the project. The tribal plan was almost identical to the main project plan for non-tribal villages, but included special provision for the empowerment of tribal women and youth. In addition, 414 hygiene promotion centers were created in Ashram schools run by the state. The tribal villages contributed a total of US\$1.92 million for capital works and over 420 Panchayats (67 percent) had collected advanced O&M tariffs for up to six months in advance by project closure. Sanitation coverage was 71 percent, compared with zero at the baseline. Almost two-thirds of the Panchayats representing 749 villages became “open defecation free.”

Achievement of the Objectives

INCREASE ACCESS TO POTABLE WATER SUPPLY IN RURAL AREAS: *Substantial*

3.45 Commissioned water supply systems reached 6.7 million people by project closure, 76 percent of the target. Work continued by the Department since then increased this to 8.8 million people (the project target) by June 2011 (Table 8). Within villages and communities, NGOs were comfortable working within communities and there was good progress at motivating people to form and join village water user groups, and in developing women’s self-help activities. In 61 percent of villages women were involved in O&M activities.

3.46 Groundwater is the main source of supply and at the time of IEG’s visit 6,747 wells, including 5,235 new wells provided water for 97 percent of the project population. Before the project, 1,114 villages had to be supplied by tanker; this number was reduced to 133 villages by the end of the project. Good groundwater investigation surveys prior to construction ensured that only 3 percent of new wells failed.

3.47 The project included almost 600 more villages than planned by project closure; 207 of these villages had completed water supply facilities by June 2011. In addition, another seven villages are currently in the process of completing all the formal exit procedures from the project that includes successfully undertaking O&M for three months. Not all of these additional villages qualified for water supply schemes, either because they could not fulfill

the entry conditions or because the physical work could not be initiated before the project closed. It was originally expected that water schemes would be operational 18 months after scheme acceptance. Villages interviewed by IEG stated that scheme construction typically took 18 months, and from application to exit could be as long as 2-3 years. Extra time was needed if baseline water quality testing, a condition of scheme acceptance, was delayed.⁴⁵ On other occasions it was reported that adjacent villages could not raise the required deposit of 10 percent. Coming to closure on settling differing opinions on scheme design and cost sometimes also delayed contracting and payment of the state government's contribution. Villages dropped out of the project if these issues were not resolved. The overall attrition rate was about 13 percent. Villages not qualifying reverted to using unreliable water sources or water tankers.

Table 8: New and rehabilitated water supply systems

<i>Indicator</i>	<i>Target Number</i>	<i>Actual Number</i>		<i>Achievement</i>	
		Sept 2009	June 2011	Sept 2009	June 2011
Districts	26	26	26	100%	100%
Village Panchayats	2,800	3,391	3,007	121%	107%
Schemes	2,800	2,298	2,985	82%	107%
Beneficiaries (millions)	8,846	6,700	8,787	76%	99%

Source: WSSD March 2012.

3.48 Access to drinking water. An evaluation of this project and one in Orissa was independently undertaken and some of its intermediate outcomes, such as increased access to water supply and sanitation over the period 2005-2007 were captured (World Bank 2010a). The overall objective of the study was to determine the project's impact on hygiene and health and contributing factors. In Maharashtra, the self-selection of beneficiaries ruled out a randomized control and treatment approach. Instead, propensity score matching was used to select a control group of non-project villages. The total sample size was initially 10,000 households from 240 villages.

3.49 Compared with the alternative non-project government water schemes, the project achieved only modestly higher access to improved water sources over baseline conditions in both wet and dry seasons (Table 9). Over the two-year period (2005-2007), the access of project households increased by 13 percentage points in the dry season (from 61 to 74 percent) and 32 percent in the wet season (from 45 to 77 percent). However, conditions improved as well for households in the matched control villages, which experienced a 4 percentage point increase in the dry season and 37 percentage point increase in the wet

⁴⁵ Water testing had to be done before the wet season. If it was delayed beyond March or April it could incur a delay of more than 9 months. This was confirmed by villagers in Feb-March 2010 (World Bank 2010b, p. 114).

season. The net increase in access in the project villages over the control villages was 9 percentage points in the dry season, but in the wet season access was 5 percentage points lower than in communities served by other government projects. The conclusion, assuming no spillover effects from the project into the control areas, is that the project was not notably more effective than other government projects in providing infrastructure. It was, however, better at targeting areas where water supply was a problem in the dry season.

Table 9: Impact evaluation shows the Jalswarajya project is only modestly more effective than other government projects at increasing access to water

	Dry Season			Wet Season		
	Project	Control	Project Difference	Project	Control	Project Difference
<i>Number of Sample Households</i>	9,348		-	9,360		-
<i>Access 2005</i>	61%	68%	-7%	45%	39%	+6%
<i>Access 2007</i>	74%	72%	+2%	77%	76%	+1%
<i>Improvement</i>	+13%	+4%	-	+32%	+37%	-
<i>Net Project Improvement</i>	+9%			-5%		

Source: World Bank 2010a. Tables F3 and 5.5.

3.50 Availability of drinking water. As in Kerala, almost all villages installed elevated storage tanks to ensure adequate delivery pressure and most beneficiaries chose individual household connections (Figure 8). There are few project output data on the incremental increase in the volume of water supplied. The baseline daily water consumption was 27 liters per person. Much of the reporting assumes that the output is the design volume of 40 liters per person.

Figure 8. A Typical Household Connection in Maharashtra



Source: IEG February 2012

3.51 The independent impact evaluation found that in 2005 average daily water availability per person in the dry season was 31 liters; by 2007 this had increased to 43 liters.

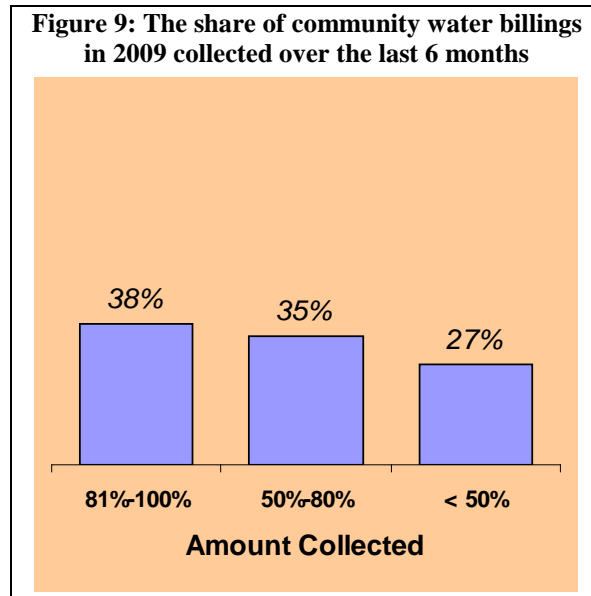
In the non-project control sample, availability increased from 29 to 37 liters. Overall, the evaluation found that the difference-in-difference estimators suggested that the project helped meet water sufficiency to a modest extent. On average, 5 percent more households in project villages compared with non-project control villages were likely to consume more than 40 liters per person per day. There was weak evidence that the project increased individual water consumption by 3-4 liters a day in the dry season and 3 liters in the wet season. In addition, the same analysis suggests that in the dry season the project increased supply of water to project households by 8 to 13 percent over non-project households.

3.52 Water Quality. There is no systematic reporting of water quality or its changes over time. During IEG's site visits most water supply facilities visited practiced some form of chlorination at source, after which the water was generally put into elevated storage tanks for transmission to consumers. The Department organized an inter-village monitoring exercise, one village evaluating another, in 2009 covering 60 villages spread over all 26 districts.⁴⁶ The results of that survey found that 85 percent of villages had records for chlorination.

3.53 The independent evaluation sampled 5,741 households in 2005 and 6,105 households in 2007 for E.Coli as an indicator of faecal contamination. The overall conclusion was that having a piped water connection from any program/project reduces E.Coli contamination by 40 percent. It was also found that organizing village drainage reduces total coliform contamination by 30 percent but has no effect on E.Coli. Both interventions would decrease household exposure to disease-causing pathogens. However, the difference-in-difference indicators showed that project households were 8 percentage points *more likely* to have contaminated water than non-project households. The reasons are unclear. The same indicators also showed that in the dry season 6 percent more project households would treat their water than non-project households, but there was no difference in the wet season.

3.54 Sustainability. The 2009 inter-village survey found that tariffs were being collected and accounts maintained in 93 percent of villages. In 82 percent of villages the water tariff collected was more than current O&M costs. However, when asked about the billing experience over the last six months, the results were not quite so reassuring (Figure 9). A second survey undertaken by the Department for 156 villages in 2009 found that 87 percent of water schemes were functioning and that financial sustainability was stated to be 60 percent – schemes ranged in age for three to more than eight years. Overall institutional sustainability was found to be 70 percent based on 11 parameters that covered source, water supply system, finances, and institutions. About 16 percent were highly likely to be sustained; 74 percent were likely to be sustained, and 10 percent were unlikely to be sustained.

⁴⁶ The sampling method used by the Department has not been disclosed and IEG is unable to verify how representative these results are of the overall project outcomes.



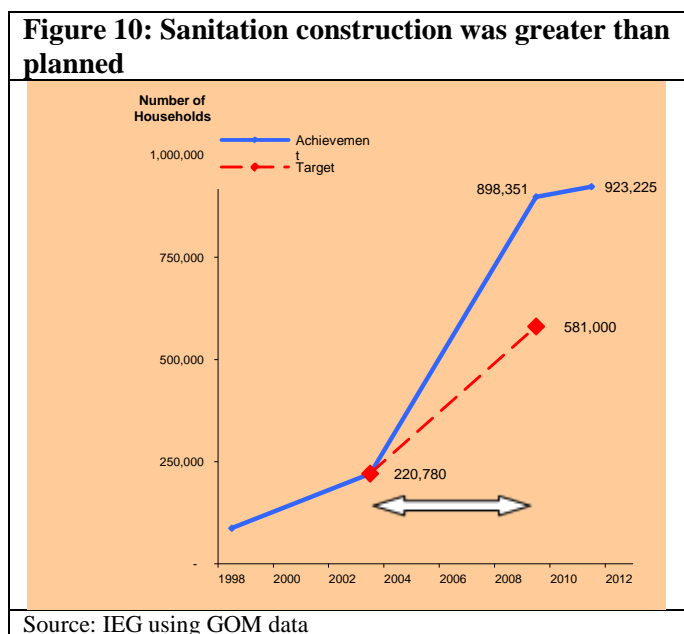
Source: WSSD, March 2012

IMPROVE ACCESS TO ENVIRONMENTAL SANITATION IN RURAL AREAS: *Substantial*

3.55 Installation of household and school latrines increased the population coverage of sanitation from 19 percent in 2003 to 77 percent in 2009. More recent data from the Department indicate coverage is now 79 percent (Figure 10). All schools in the project villages had full sanitation coverage. While actual coverage will be lower because of population growth, this cannot be verified until the 2011 district census data are taken into account. Given that the Total Sanitation Campaign was operating in all districts simultaneously, the actual contribution of the project on sanitation coverage cannot be determined.

3.56 The impact evaluation showed the rate of open defecation fell from 83 percent in 2005 to 62 percent in 2007. A similar reduction was found in non-project villages. The similarity of the incremental improvements is primarily a result of the Total Sanitation Program. Even so, the difference-in-difference estimator found the project increased toilet use by 6-10 percent more than non-project villages. Increased use of latrines helped to reduce illness coping costs. The impact evaluation found that average annual household medical costs due to diarrhoea declined from Rs 258 in 2005 to Rs.194 in 2007. Taking into account all costs of inadequate water supply and sanitation, monthly household coping costs fell from Rs.1,064 in 2005 to Rs.562 in 2007.

3.57 As the project progressed, knowledge of the beneficial effects of sanitation and hygienic behaviors gained momentum. At the end of the project in 2009, 1,848 villages – 61 percent – had been certified open defecation free. By 2011 this had risen to 1,968 villages or 65 percent. The *Nirmal Gram Puraskar* (Clean Village Prize) had been awarded by the Government of India to 43 percent of the project's villages. This achievement, however, can be only partly attributed to the project.



Efficiency

3.58 At appraisal the economic rate of return was calculated for a 20-year period. It was estimated at 20 percent for the whole project and 21 percent if only water source and supply costs are considered. It was based on a sample of 20 proposed schemes and a survey of 670 households in five districts. The project benefits included: time savings collecting water; increased water availability; time savings from using household latrines; value of health benefits and reduction of malaria; savings in capital and O&M costs; and income multiplier of micro-credit made available to women.

3.59 Time saving was a significant benefit. All villagers interviewed by IEG stated that the time and effort saved from not having to fetch water as one of the biggest benefits of the project. While most women stated that they spent 1-4 hours a day fetching water before the project, in many cases this seems to have been exaggerated. The independent impact evaluation found typical time savings are about 16 minutes a trip during the dry season and 7 minutes a trip in the wet season.⁴⁷ Similarly, the same evaluation found that increased use of household latrines saved 7.5 minutes a trip or a total of about 38 minutes a day.

3.60 The economic rate of return was calculated at project completion for the cash flows and benefits over the next 15 years and was estimated at 23 percent. The original benefits, updated to include 2009 results and the findings of the independent impact evaluation were used, plus the benefits of communication and capacity-building. A number of intangible benefits – tanker-free villages, better governance and accountability, participation of women in Gram Sabhas and effects of capacity-building could not be included and were ignored in

⁴⁷ In 2005 women spent 12 minutes walking and 20 minutes waiting, total 37 minutes. In 2007 this was reduced to 8 and 13 minutes respectively, total 21 minutes. The net time saving was 16 minutes.

the analysis. Based on IEG's field visits the quantifiable benefits are correct and accord with feedback received from villagers and Department officials.

3.61 The decentralized, community-led model of provision of water supply was less costly than the alternative government-led approach (Table 10). Total costs were 38 percent and capital costs 29 percent of the centralized, government-led model. Normalized O&M costs and household management costs are about 70 percent of the centrally managed model. Similarly the government's institutional cost in the project is about a quarter that of a typical centralized, government-led project. Even when the cost of the NGO and support organization needed to organize community schemes is taken into account, total institutional costs are half that of the traditional alternative.

Table 10: Maharashtra - Components of total costs of water by scheme type (Rs. per 1,000 liters)

<i>Type of scheme</i>	<i>Capital Cost</i>	<i>O&M Cost</i>	<i>Coping Cost</i>	<i>Institutional Cost</i>		<i>Total Cost</i>
				<i>Government</i>	<i>NGO/SO</i>	
A) Decentralized, Community-led	9.4	1.6	2.8	1.6	1.9	19.2
(B) Centralized, Government-led	32.8	2.5	4.1	6.3	-	45.6
Ratio A/B (%)	29	63	69	25	-	38

Source: World Bank (2008a). Figure 4.9.

3.62 However, there were serious administrative inefficiencies. It took far longer than planned to develop the community-led model and three years into the project only 9 percent of project funding had been disbursed. Subsequently increased managerial attention after the mid-term review led to a rapid escalation of disbursement – but at the cost of reducing some of the critical institutional objectives at the local government level. At project completion, while the funds were fully disbursed, construction of 10 percent of water supply schemes remained incomplete. It needed a further two years of Department supervision (and their support costs) to near total completion. Many of the delays and problems were the result of administrative inefficiencies brought about because the project was only one of the Director's responsibilities and this was exacerbated by the very high turnover or absence of senior staff, particularly in the field. There were major inefficiencies in financial management and procurement that resulted in suspension of disbursements.

3.63 Project efficiency is rated **Modest**.

Ratings

OUTCOME

3.64 The outcome of the project is rated **Moderately Satisfactory**. Relevance of the objectives was high throughout the project and remained so at the time of this assessment; design was substantially relevant to the objectives. The project using the decentralized, community-led model substantially increased access to potable water and environmental sanitation – as did the more traditional, centrally managed schemes in other areas, with some shortcomings in water quality. Efficiency is rated modest due primarily to inefficiencies in implementation.

RISK TO DEVELOPMENT OUTCOME

3.65 Political risks are negligible because the government is fully behind the principles of community-driven development and is prepared to supply needed financial resources, particularly as the project approach increased the efficiency of investment in water supply and sanitation across the state.

3.66 Institutionally, the staffing levels in the department and the willingness of experienced people to work in the districts poses a modest risk to ensuring that local governments have the knowledge and ability to support village water supply schemes, particularly for the larger villages. This risk was increased because of the low priority given to building the capacity of local government during the project.

3.67 Risks at the community level are difficult to assess given the widely varying ability to raise sufficient funding for operation and maintenance to sustain infrastructure achievements. With the completion of the project the NGO and support organizations are no longer so readily available. While some villages interviewed by IEG were determined to stand on their own two feet – and a good proportion of these villages had very active women’s committees and water user groups – there were other villages where they had turned over the operation of the schemes to the Village Panchayat. IEG therefore assesses this risk as significant because the data provided by the department indicate that the level of funding raised for O&M is below requirements.

3.68 The Risk to Development Outcome is rated **Significant**.

BANK PERFORMANCE

3.69 **Quality at Entry.** From finalization of concept review the project was appraised in eight months. The Bank had considerable earlier experience in Maharashtra and the rural water supply and sanitation projects in other parts of India that had initiated many of the reforms and public participation that underpinned the federal sector reform program. Overall the appraisal process was comprehensive. The review of the project by the Quality Assurance Group in 2005 rated strategic relevance and approach as highly satisfactory.

3.70 While significant attention in the design was given to building community capacity to organize for water supply and sanitation, community contracting, and procurement, the appraisal of the Department’s institutional capacity was inadequate, specifically the practicalities of mainstreaming the approach within the department and understanding departmental institutional constraints, particularly in the areas of M&E, accounting, and procurement. Also, the project schedule overlooked the disruptive effect of the summer rains on travel and construction activities. As a result, the scope of the project was overly ambitious. Similarly, while an ambitious monitoring and evaluation system was described during appraisal, much of the detail was left to implementation and this created problems that plagued the project for the first few years, a shortcoming highlighted by the 2005 Quality Assurance Group review. Finally, the scale of the project, spread over 250,000 square kilometres, was too large and the expected pace of implementation too fast given that it was piloting a new development paradigm. Quality-at-entry is rated **Moderately Satisfactory**.

3.71 **Supervision.** In 2004 the Task Team Leader was changed and became field-based in New Delhi. At the same time, implementation problems appeared to multiply as the task team leader was caught between pushing for infrastructure development to accelerate disbursement and resolving the chronic problems associated with accounting and procurement. Possibly for the same reason, attention to environmental safeguards was modest. In addition, project support to enhance local government participation in the project and for some of the pilot studies was allowed to languish. Insufficient attention was given to monitoring and evaluation to inform learning, which was supposed to be one of the major institutional outcomes of the project. In consequence, at the end of the project many of the difficulties of the Department and local government working with community-based organizations and beneficiaries remain unresolved. Supervision is rated **Moderately Unsatisfactory**.

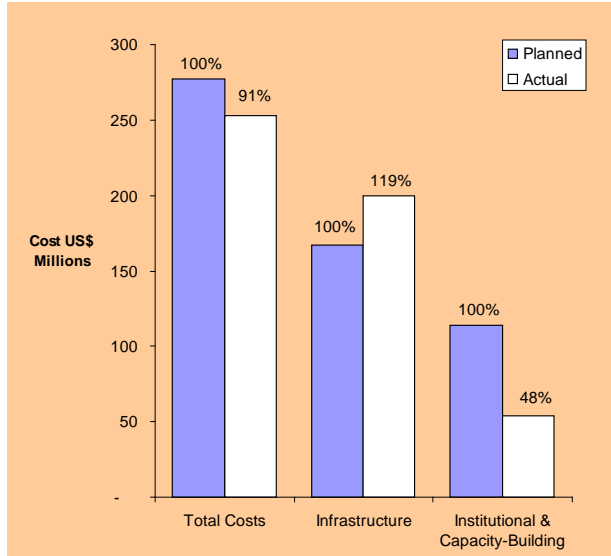
3.72 Overall Bank performance is rated **Moderately Satisfactory**.

BORROWER PERFORMANCE

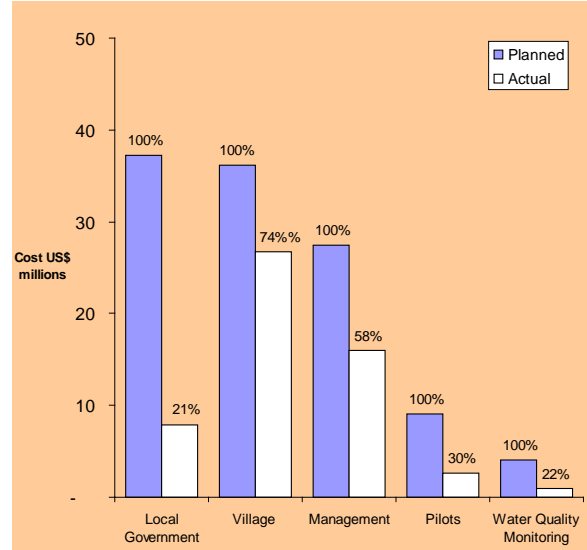
3.73 **Government.** The government had high ownership of the project concept and was one of the leading proponents of community-driven projects and decentralization in India. It was very active in processing essential new laws to enable the project to operate with beneficiary groups and local government, and it maintained this high level of policy commitment to the present. Its approach to the management of the decentralized community-led development was to make small organizational changes within the existing drinking water supply and sanitation department. In retrospect, entrenched attitudes in this organization made it difficult in the initial years of the project to move away from the centrally-managed approach. Government performance is rated **Moderately Satisfactory**.

3.74 **Implementing Agency.** The project director was changed three times during implementation. Staff turnover was high, particularly in the districts, and throughout the project staffing averaged about 80 percent of needs. The most significant problem was that the project director running the reform support and project management unit was also responsible for the ongoing rural water supply and sanitation supply programs of the state. While these were aligned with the federal sector reform program, they did not have such a large institutional development component, or work closely with the NGO sector. In consequence, the department had a very steep learning curve in the first 2-3 years of the project on working with NGOs and cooperatively with local governments. The complexity of screening and managing diverse NGO support organizations was underestimated, particularly when it came to working with local governments.

3.75 The decentralized model of service delivery was slow to get off the ground because of the steep learning curve by the Department and also the inexperience of NGOs in the area of water supply. Experienced NGOs were hard to recruit and, given the difficult and widespread nature of the work, difficult to retain. The ability of the Department to institutionalize the approach was hindered by chronic understaffing in the field. Only half of the planned spending on institutional capacity building was disbursed, and only a fifth of the planned expenditure for local government (Figures 11 and 12). The significant underspending at the local government and district level undercut capacity-building efforts.

Figure 10: Distribution of project costs by type of investment

Source: Government of Maharashtra

Figure 11: Distribution of institutional and capacity-building costs

Source: Government of Maharashtra

3.76 The overall impression from IEG's visit to and interviews with the Department and communities was that the process of approving through multiple steps and overseeing the building of civil works with reduced staff, displaced time that should have been spent facilitating the use of NGOs and service organizations to build local government capacity. In consequence there is little evidence that local governments are equipped to plan and manage decentralized provision of rural water supply in the absence of the NGOs. There was considerably more interest in building sanitation infrastructure given the federal government's incentives; particularly so as the water supply engineers work for the Department.

3.77 There was woefully inadequate attention to monitoring, evaluation, and learning and the department was very slow to internalize the few lessons learned from project implementation. The department had considerable difficulty working with communities in terms of procurement and accounting, a process not helped by the Bank's lack of clarity on some of the accounting issues. Finally, the attention to monitoring and evaluating intermediate and final outcomes was totally inadequate and was only applied on a very small scale at the end of the project. In many respects the department was good at its traditional input/output accounting, but not so good at tracking demand-driven inputs and outputs and determining outcomes. Implementing agency performance is rated **Moderately Unsatisfactory**.

3.78 Overall Borrower performance is rated **moderately satisfactory**.

MONITORING AND EVALUATION

3.79 The design of the monitoring and evaluation systems was poor. Too much was left to be finalized during implementation, yet it was not. Implementation was uneven and too little

attention was paid to monitoring outcomes and lesson-learning. The quality of monitoring and evaluation is rated **negligible**.

4. Conclusion and Lessons

4.1 The two projects increased access to rural water supply and sanitation. While health goals and impacts were not part of the project's objectives, an independent impact evaluation of the Maharashtra project found that communities that achieved water supply improvements and sanitation coverage for the majority of the population reduced water contamination; had better child health indicators; and had lower cost of illness and coping costs. This applied to both project and non-project villages. Having piped water and improved environmental sanitation services improves these outcomes irrespective of whether the services are community-led or centrally planned and managed.

4.2 While the Maharashtra project was only modestly better at increasing service coverage than the state's centrally managed water schemes, both projects clearly show that the decentralized, community-led approach can reduce investment costs. However, both projects show that there is considerable concern about the ability of community-managed water projects to cope with major repair costs likely in the medium- to long-term. Further, the community-led approach to rural water supply schemes that require users to contribute to capital costs may not be feasible in villages with low ability to pay. Under the current approach districts are supplied through government-owned schemes and community schemes and this leaves unserved enclaves where villages are unable or unwilling to contribute to project financing.

4.3 Short-term financing of operation and maintenance by beneficiaries has been partially secured across the projects but some communities are not contributing enough. Concerns remain about longer-term sustainability of the sector generally, particularly when 'slippage' statistics are reported—national coverage reportedly fell from 95 percent coverage in 2001 to 67 percent in 2009 (James 2011).⁴⁸ An explanation is that the availability of *Swajaldhara* funds created a perverse incentive for states to continue reporting 'problem habitations' so that they could get additional funds that were often spent elsewhere. In 2009, the federal government announced a new and far-reaching National Rural Drinking Water Programme, and followed it up with detailed Implementation Guidelines in April 2010, which also reversed the perverse incentive for states to over-report problem villages. In addition, it set up a Working Group in June 2010 to create a Results-based Framework for the period 2010–2022. More recently in 2012, to emphasize the national importance placed on expanding access to rural water supply and sanitation, the Rajiv Gandhi Drinking Water Mission within the Ministry of Rural Development was established as the Ministry of Drinking Water and Sanitation.

⁴⁸ "Slippage" results from sources going dry or lowering of the groundwater table; sources water quality deterioration; sources outliving their lives; systems working below rated capacity due to poor operation and maintenance; increase in population resulting in lower per capita availability; emergence of new habitations; and slippage due to seasonal shortage of water either from low rainfall or increased competition from irrigated agriculture

4.4 Both projects chose state agencies to manage the community-led process. In both states the *Gram Panchayat* and *Village Panchayat* were planned to be the nodal point for local development planning and disbursement in response to communities' demand. Considerable resources were allocated within each project to build capacity at this level. In practice, however, each state adopted a different approach.

4.5 In Maharashtra, rural water supply was a reform unit within the Department that covered both urban and rural water supply. The reform unit managed the process down to the village level. While the senior staff were highly skilled general administrators, line staff were mostly water and sanitation engineers. Line staff continued to substitute due to lack of local government capacity and provided all the required checks and balances for disbursement and value-for-money to the extent that it became a brake on progress. NGOs were involved primarily to facilitate community demand in rural areas and build their capacity to manage or oversee the scheme construction and take responsibility for its subsequent maintenance. NGOs provided the skills that the Department lacked. However, the culture supportive of community-led approaches has not become mainstreamed in the Department and local government culture.

4.6 The Maharashtra project had difficulty in creating a local government substitute for the Department's presence. Typically, communities remain mostly beholden to the Department for engineering guidance. Thus while community-led development thrived, decentralization and planning of water supply development was only partial. Sanitation fared better under central government initiatives that have empowered local governments, villages, and NGOs, and these local institutions have grown to become adequate alternatives to the formerly centralized, state government-led management of sanitation.

4.7 The Kerala management model was different. The newly-created Agency was autonomous and its central management team was small and dedicated solely to the rural water supply and sanitation sector. All other staff were contract employees and the majority of them were social scientists that worked in the districts. State government engineers were few and they were supplemented by engineering and technical staff that were transferred to the Village Panchayats when the Water Authority was unbundled. NGOs were vetted by the Agency but they were contracted by communities to provide social facilitation, capacity-building, and water engineering skills. Importantly, the Agency devolved all decision-making and budgeting authority to the village Panchayats and did not substitute for them.

4.8 The Kerala management model was associated with better outcomes. However, the states' socioeconomic differences probably give Kerala an advantage. Kerala is crowded and villages are closely-spaced, communication is easy, literacy is very high, the political system empowers communities, and rural incomes are the highest in India. In contrast, Maharashtra has about a third the population density, villages are widely separated, making communication difficult, literacy is lower, the political system is more centralized, and rural incomes are less than two-thirds of Kerala's.

Lessons

4.9 There are five specific lessons from this assessment:

- **Improving the quality of rural service delivery to increase access to water supply and sanitation improves environmental health.** It is effective irrespective of the source of funding or implementation approach used, be it decentralized and community-led or centralized and government-led.
- **Given a supportive institutional environment, decentralized, community-led water supply and sanitation projects can be both effective and less costly at providing new rural infrastructure.** Given the right training, support, and autonomy, communities are able to design, manage and operate water supply and sanitation schemes. Importantly, communities were able to manage sufficient cost recovery to cover routine operation and maintenance. However, equipment damage caused by fluctuating rural power supplies and local environmental problems (such as landslides), create repair problems beyond communities' capability, and there is a role for government-sponsored assistance with these problems.
- **Government line agencies that have traditionally delivered services through a centralized, government-led approach face challenges in supporting decentralized, community-led rural water supply and sanitation approaches.** This is particularly so in agencies responsible for both urban and rural water supplies. The projects assessed demonstrate that creating a new and lean autonomous agency with a narrower rural focus can facilitate partnerships between local government and communities, and that this partnership empowers communities to successfully undertake small civil works and maintain them.
- **The limited availability of experienced NGOs capacity to facilitate community capacity-building can constrain adoption of the community-led approach for rural water and sanitation service delivery.** Both projects had problems with finding experienced NGOs when they rapidly scaled-up and moved to more remote areas.
- There is a role for public or private support agencies to provide much-needed expertise and technical support to trouble-shoot community-owned water schemes. Where this is missing, communities have difficulty in planning and managing major maintenance and budgeting for the schemes.

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Annex A. Basic Data Sheet

KERALA RURAL WATER SUPPLY AND ENVIRONMENTAL SANITATION “JALANIDIHI” (CREDIT 3431-IN)

Key Project Data (amounts in US\$ million)

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	89.90	83.32	93
Credit amount	65.50	61.15	93
Cofinancing	0.0	0.0	-
Cancellation ^a	-	12.27	

a. The amount of the cancellation was larger than the difference in the US\$ amounts because the Credit was in Special Drawing Rights (XDR) that appreciated against the US\$. In terms of XDR the original credit was XDR 50.1 million and XDR 41.0 million was disbursed.

Cumulative Estimated and Actual Disbursements

	<i>FY01</i>	<i>FY02</i>	<i>FY03</i>	<i>FY04</i>	<i>FY05</i>	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>
Appraisal estimate (US\$M)	3.5	13.1	27.3	42.3	54.2	63.3	65.5	65.5	65.5
Actual (US\$M)	2.5	3.6	7.1	11.8	28.8	42.5	53.6	57.0	61.15
Actual as % of appraisal	71	27	26	28	53	67	82	87	93
Date of final disbursement:	December 2009								

Project Dates

	<i>Original</i>	<i>Actual</i>
Concept Review	07/29/1999	07/29/1999
Begin Appraisal	05/29/2000	05/29/2000
Negotiations	09/18/2000	09/18/2000
Board approval	11/07/2000	11/07/2000
Signing	01/04/2001	01/04/2001
Effectiveness	02/12/2001	02/12/2001
Closing date	12/31/2006	09/30/2008

Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget only)	
	No. of staff weeks	US\$ 000 (including travel and consultant costs)
Lending		
FY98	*	5.03
FY99	*	44.62
FY00	105.84	246.10
FY01	29.74	90.73
Total	135.58	386.48
Supervision/ICR		
FY01	12.49	20.91
FY02	25.47	37.71
FY03	29.42	52.72
FY04	33.16	74.82
FY05	35.85	92.81
FY06	27.91	75.60
FY07	24.74	70.56
FY08	11.50	71.46
FY09	19.69	109.84
Total	220.23	606.43

*Information not available in SAP

Task Team Members

Names	Title	Unit	Responsibility Specialty
Lending			
G.V. Abhyankar	Senior Sanitary Engineer	SASDU	Task Team Leader
Parameswaran Iyer	Senior Water & Sanitation Specialist.	ETWSA	India Team Leader
Meera Mehta	Sr. Urban Specialist (Consultant)	SASDU	
S. Rajagopal	Consultant	SASDA	
D. Maruthi Mohan	Consultant	SASDU	
Ava Shreshtha	Consultant		
Meena Munshi	Sr. Economist	SASDA	
Suryanarayan Satish	Senior Social Development Specialist	SASDI	
R.R. Mohan	Senior Social Development Specialist	SASDI	
T.C. Jain	Senior Agriculturist	SASDI	

Names	Title	Unit	Responsibility Specialty
Smita Misra	Sr. Economist	SASDU	
D. Ahluwalia	Sr. Economist	SASDA	
S. Vani	Lead Financial Management Specialist	OPCFM	
Santhanam Krishnan	Senior Procurement Specialist	SARPS	Consultant
S. Santhakumar	Operations Analyst	SACIN	
Kirsten Hommann	Economist	SASDU	
Jacqueline Julian	Senior Program Assistant	SASDO	
Supervision ICR			
G.V. Abhyankar	Senior Sanitary Engineer	SASDU	Task Team Leader until 07/31/2007
Mam Chand	Senior Procurement Specialist	SASDU	Consultant
Priti Jain	Procurement Specialist	SARPS	
Atul Bhalchandra Deshpande	Financial Management Specialist	SARFM	
Santhanam Krishnan	Senior Procurement Specialist	SARPS	Consultant
Manvinder Mamak	Senior Financial Management Specialist	SARFM	
D. Maruthi Mohan	Consultant	SASDU	
Ramachandran R. Mohan	Senior Social Development Specialist	SASDI	
Meera Mehta	Consultant	ETWAF	Consultant
Smita Misra	Sr. Economist	SASDU	
Suryanarayan Satish	Senior Social Development Spec	SASDI	
Oscar E. Alvarado	Task Team Leader from 08/01/2007	SASDU	
Shivendra Kumar	Procurement Specialist	SARPS	Procurement
Kirsten Hommann	Economist (ICR)	SASDU	
Christophe Prevost	Sr. Water & Sanitation Specialist	ETWSA	
Mamata Barush	Program Assistant	SASDO	
Michelle Chen	Program Assistant	SASDO	

Other Project Data

Borrower/Executing Agency:

Follow-on Operations

<i>Operation</i>	<i>Loan no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
Second Kerala Rural Water Supply and Sanitation (Jalandhi II)	5027	155.3	12/15/2011

MAHARASHTRA RURAL WATER SUPPLY AND SANITATION “JALSWARAJYA” (CREDIT 3821-IN)

Key Project Data (amounts in US\$ million)

	<i>Appraisal estimate</i>	<i>Actual or current estimate</i>	<i>Actual as % of appraisal estimate</i>
Total project costs	268.60	286.10	110
Credit amount ^a	181.00	194.45	107
Cofinancing	-	-	-
Cancellation	-	0	-

a. The credit was expressed in Special Drawing Rights (XDR) 128.8 million and it was fully disbursed. The equivalent amount in US\$ increased over the life of the project because the US\$ depreciated against the value of XDR.

Cumulative Estimated and Actual Disbursements

	<i>FY04</i>	<i>FY05</i>	<i>FY06</i>	<i>FY07</i>	<i>FY08</i>	<i>FY09</i>	<i>FY10</i>
Appraisal estimate (US\$M)	7.0	22.0	62.0	122.0	172.0	181.0	181.0
Actual (US\$M)	9.0	11.2	46.0	141.8	191.1	194.4	194.4
Actual as % of appraisal	128	51	38	116	111	107	107
Date of final disbursement:	June 2010						

Project Dates

	<i>Original</i>	<i>Actual</i>
Concept Review	11/12/2002	11/12/2002
Begin Appraisal	05/08/2003	05/08/2003
Negotiations	07/03/2003	07/03/2003
Board approval	08/26/2003	08/26/2003
Signing	09/30/2003	09/30/2003
Effectiveness	10/29/2003	10/29/2003
Closing date	09/30/2009	09/30/2009

Staff Inputs (staff weeks)

Stage of project	Staff time and cost (Bank budget only)	
	No. of staff weeks	US\$ 000(including travel and consultant costs)
Lending		
FY01	2	7.94
FY02	45	193.45
FY03	101	425.91
FY04	11	41.18
Total:	159	668.48
Supervision/ICR		
FY04	32	111.63
FY05	33	112.45
FY06	32	81.00
FY07	31	84.90
FY08	26	103.37
FY09	32	292.93
Total:	186	786.28

Task Team Members

Names	Title	Unit	Responsibility/specialty
Lending			
Meena Munshi	Sr. Economist	SASDA	TTL
R.R. Mohan	Sr. Social Development Specialist	SASDI	Co-TTL
Vivek Srivastava	Sr. Public Sector Specialist	AFTPR	Institutions Specialist
Smita Misra	Sr. Economist	SASDU	Economic Analysis
P.C. Mohan	Lead IEC Specialist	AFTRL	IEC
Manvinder Mamak	Sr. Financial Management Specialist	SARFM	FM
M. Balachandran	Financial Management Specialist	SDNCA	FM
Kiran R. Baral	Sr. Procurement Officer	SARPS	Procurement
R.S. Pathak	Sr. Irrigation Engineer	SASDA	Water Resources
Rachel Beth Kaufmann	Health Specialist	SASEI	Health Aspects
Parmesh Shah	Lead Rural Development Specialist	SASDA	CDD
N.V.V. Raghava	Sr. Infrastructure Specialist	SASDU	Engineering
S. Satish	Sr. Social Development Specialist	SASDI	Tribal Aspects
N.R. Tankhiwale	Consultant	SASDU	Groundwater

Names	Title	Unit	Responsibility/specialty
R. Soopramanien	Council	LEGMS	Legal
Priti Kumar	Sr. Environmental Specialist	SASDI	Environment
Barbara Verardo	Sr. Rural Development Specialist	SASDA	Social Anthropologist
Ghazali Raheem	Consultant	SASDA	Implementation
Ramesh Deshpande	Consultant	SASDA	Implementation
Vijaylaskhmi Das	Consultant	SASDA	Gender
Jacqueline Julian	Sr. Program Assistant	SASDA	Costab Specialist
Sujata Pradhan	Program Assistant	SASDU	Project Support
Theodosaias Karmiris	Program Assistant	SASDA	Project Support
Supervision			
Meena Munshi	Sr. Economist	SASDA	TTL (untill 2005)
N.V.V. Raghava	Sr. Infrastructure Specialist	SASDU	TTL (Sept.2005)
R.R. Mohan	Social Development Specialist	SASDI	Co-TTL
Rosana Nitti	Economist	SASDU	CDD
Priya Goel	Sr. Financial Management Specialist	SARFM	FM
J.V.R. Murthy	Water Institutions Development Specialist	ETWSA	Water Institutions
Ranjan Samantaray	Sr. Natural Resources Management Specialist	SASDA	Environment
Priti Kumar	Sr. Environment Specialist	SASDI	Environment
Sanjay Pahuja	Sr. Water Resources Specialist	SASDI	Groundwater
P.C. Mohan	Lead IEC Specialist	AFTRL	IEC
G.V. Abhyankar	Consultant	SASDU	Engineering
Moho Chaturvedi	Environment Consultant	SASDI	Environment
Asit Nema	Sanitation Consultant	SASDU	Sanitation

Other Project Data

Borrower/Executing Agency:

Follow-on Operations

<i>Operation</i>	<i>Credit no.</i>	<i>Amount (US\$ million)</i>	<i>Board date</i>
Third Maharashtra Rural Water Supply and Sanitation Project (Jalswarajya-II)		165.00	11/12/2013

Annex B. List of Persons Met

New Delhi

Mr. Nialya Mitash IAS	Director, Department of Economic Affairs, Ministry of Finance, Government of India
Mr. T.M. Vijay Bhaskar IAS	Joint Secretary Ministry of Drinking Water and Sanitation, Government of India.

Government of Maharashtra

Mr. A.K. Jain IAS	Principal Secretary of Chief Minister's Office
Mrs. Malini Shankar IAS	Principal Secretary, Water Supply and Sanitation Department,
Mr. Sudhir Thakare IAS	Secretary, Rural Development Department
Mrs. A. Shaila IAS	Project Director/ Deputy Secretary , Water Supply and Sanitation Department
Mr. Dheeraj Kumar IAS	Project Manager, Jalswarajya Project
Mr.S.P. Chankar	Under Secretary Water Supply and Sanitation Department
Mr.Ganesh Bhalerao	Executive Engineer
Mr. Mrudul Sambhare	Account Officer
Mr.Sunilkumar Shrivastav	Technical Officer
Mr.Hanif Mujawar	Knowledge Management Specialist
Mr. Vijay Goregaonkar	Sectional Engineer
Mr. Sandip Kamble	MIS Assistant
Shri. Ravindra Shinde	Chief Executive Officer Zilla Parishad,Thane

Maharashtra Field Visits

Gholwad Grampanchayat of Dahanu Tahasil (District Thane)

Smt. Rupali S. Patel	Sarpanch ,Grampanchayat
Shri. Nilesh Mutha	President, Village Water Supply Committee
Shri. Molesingh S. Jadhav	Secretary, Grampanchayat

Kapsi Grampanchayat Dahanu Tahasil (District Thane)

Smt. Dippika Dagale	President, Village Water Supply Committee & Sarpanch GP Kapsi Dahanu Tahasil (District Thane)
Shri Naresh Mohite	Secretary, Village Water Supply Committee

Sajole Grampanchayat of Surgana Tahasil (District Nashik)

Shri. S.M. Suryajoshi	Block Development Officer, Surgana
Shri. K.S. Bagul	Sarpanch
Shri. K.A. Gaikwad	Dy. Sarpanch
Shri. R.M. Gavitt	Chairman Village Water Supply and Sanitation Department
Smt. Hirabai Dalvi	Member BG
Smt. Yamunabai S. Gagure	Member BG
Shri. H.K. Gavitt	
Shri. Hiranman Pawar	Jalsurakshak

Bhagurdi Grampanchayat of Kalvan Tahasil (District Nashik)

Shri. J.M. Abhale	Block Development Officer, Kalvan
Shri. B.W. Chavan	Sarpach

Shri. R.S. Devere	Dy. Sarpanch
Shri. Rajendra Pawar	Chairman Village Water Supply and Sanitation Committee
Shri. S.R. Sathe	Member BG
Smt. V.R. Wagh	Member BG
Smt. Ranjana S. Patil	Member BG
Shri. J.M. Abhale	Block Development Officer, Kalvan
Shri. B.W. Chavan	Sarpach
Shri. R.S. Devere	Dy. Sarpanch
Shri. Rajendra Pawar	Chairman Village Water Supply and Sanitation Committee
Shri. S.R. Sathe	Member BG
Smt. V.R. Wagh	Member BG
Smt. Ranjana S. Patil	Member BG

Sindhakhedraja Buldana District (Aurangabad) Region

Mr. Jagan Sahane	President, Aquifer – Level AWMA
Mr. Vilas Deore	TSP
Mr. Devidas Thakre	President, Village Level –AWMA, Sindkhed Raja
Mr. Badrinath Budwant	President, Aquifer – Level Social Audit Committee, AWMA
Mr. Gajanan Jaybhaye	Member, Aquifer – Level AWMA
Mrs. Sulbha Karbhari Jaybhay	President, Village Level –AWMA, Savkhed Tejan
Mrs. Triveni Baburao Budhwat	Vice-President, Village Level –AWMA, Savkhed Tejan
Mrs. Dwarkabai Laxman Vighne	Secretary, Village Level –AWMA, Savkhed Tejan
Mrs. Prayagbai Ramprasad Baheti	Member, Village Level –AWMA, Savkhed Tejan

Nasadgaon Grampanchayat, District Jalna (Aurangabad Region)

Mr.Suhas S. Gavali	IEC & EC DWSM , Z.P. Jalna
Mr. Jay U. Rathod	FCO, DWSM , Z.P. Jalna
Mr. Shrikant A. Chitral	Water Quality spl., DWSM , Z.P. Jalna
Mr. Dhiraj H. Patole	HRD, DWSM , Z.P. Jalna
Mr Lahurao H. Deshmukh	Chairman, Village Water Supply Committee, Nasadgaon
Mr.Jayaji K. Deshmukh	Sarpanch G.P. Nasadgaon
Mr.Ravi A. Kolhe	Gramsevak, G.P. Nasadgaon

Bhendala Grampanchayat, Nagpur District. (Nagpur Region)

Shr.Chandra Shekhar Choudhari	President, Village Water Supply Committee, GP Bhendala
Shrmati.Indirabai Rode	Secretary, Village Water Supply Committee GP Bhendala
Shri.Vilas Thakare	Sarpanch GP Bhendala
Shri. Ramekar	President, Village Water Supply Committee GP Dehegaon Rangari
Shri. Ashokrao Ramekar	Sarpanch GP Dehegaon Rangari
shri. Munde	GPSecretary GP.Dehegaon Rangari

Padoli Grampanchayat, District Chandrapur (Nagpur Region)

Shri. Bharat Balaki	Sarpach, GP Padoli
Shri. Mohan Avale	Dy. Sarpanch, GP Padoli
Shri. Kishachand Jetwani	President, Village Water Supply Committee, Padoli
Shri. Prakash Reddi	Member, Padoli
Shri. Kishor Avale	Member, Padoli
Smt. Biharinbai	Member, Padoli
Smt. Kodape	Secretary Village Panchayat

Jambharla, Chinchapoli Grampanchayat, District Chandrapur (Nagpur Region)

Shri. Parshuram Kumare	President, Village Water Supply Committee, Jambharla, GP Chinchapoli
Smt. Rekha Kusaram	Dy. Sarpanch, Rural Water Supply and Sanitation GP Chinchapoli

Government of Kerala

Mr. V.J. Kurian IAS	Principal Secretary, Water Resources Department
Mr. James Vergese IAS	Principal Secretary, Local Self-Government Department
Mr. K.J. Mathew IAS	Chairman, Kerala State Electricity Regulatory Commission
Mr. K. Jayakumar IAS	Additional Chief Secretary, Government of Kerala
Mr. S.M. Vijayanand	Director, Institute of Management in Government
Mr. Ashok Kumar Singh IAS	Executive Director, Kerala Rural Water Supply Agency (KRWSA)
Mr. Pranabjyoti Nath IAS	Deputy Executive Director, KRWSA
Mr. S. Rathish	Director Operations, KRWSA
Mr. B. Sreekumar	Director Finance & Administration
Mr. V. Sukumaran Nair	Director Hydrology
Mr. M. Premlal	Director HRD
Mr. P.R. Narendradev	Director Technical
Mr. Clinneese J. Mathews	Manager Procurement
Dr. V. Pradeep Kumar	Manager Operations
Mr. P. Nandan	Consultant M&E
Mrs. D.S. Rema	Consultant Finance and Planning

Malappuram District

Mr. Jameela	GP President
Mr. Karuppan	President BG CWSS Vallikkunnu
Mrs. Krisnankutty	Secretary “
Mr. Sheeba	President GP Nediyruppa
Mr. Govindan	Former President BG Panthalamkunnu
Mr. Md. Shah	President BG Panthalamkunnu
Ms. Seelath Beerankutty	President GP Alliparambu
Mr. Mohanan Master	President BG Kodakkaparambu
Mr MuhammedKutty	Secretary BG Kodakkaparambu

Kozhikode District

Mr. Eliyamma	President GP Thiuvambadi
Mr. Babu	Vice-President “
Mr. Kumran	President BG Cherupuzha

Mr Abu	Secretary BG “
Mr. Balakrishnan	President BG Jeevambrutham
Ms. Thangachhan	Secretary “
Mr. Ramachandran	President BG Kerala Water Authority-Jaladhara
Ms. Thanga	Secretary BG “
Ms. Alina Hassan	President GP Puthupadi
Mr. Biju	Vice-president “
Mr. Marrikkar	BG Federation President
Mr. Ramani	Secretary BG Priyadarshini
Mr. Abdulla	President BG Srothus Saidudkunnu
Ms. Molly Anto	Secretary BG “
<u>Thrissur District</u>	
Mr. N.R. Salhusus	Chairman Mundathikode GP
Mr. K. Ajitkumar	President “
Mr. P. Sarthi	Vice-president “
Mr. Babu	President BG Minalur
Mr. Deeleep Kumar	Secretary BG Kiliyaas Chira
Mr. Siva Rahman	President BG “
Mr. C. C. Joseph	President BG ?
Mr. P. Gangadhan	Secretary BG Federation
Ms. Susheela	BG President
Mr. C. Vally	President GP Thiruvillamel
Mr. P.R. Pradelkhan	Vice-president “
Mr. G. Sasumdram	General Secretary
Mr. Udayan	Member BG and Ward Member Thiruvillamel GP
Mr. P/N. Mohmeles	“
Mr. K.M. Radhika	“
Ms. P. Jayasree	“
Ms. Sreedevi Radhakrishnan	Member BG and Ward Member Thiruvillamel GP
<u>Kasaragod District</u>	
Mr. Somys Venigopal	President GP Kodembellur
Mr. Banaus Krishnon	Vice-President “
Mr. C. Chandvan	Welfare Standing Committee Member “
Mr. P.V. Thackaray	Development Standing Committee Member
Mr. T.M. Mathew	Member BG
Mr. Jose Jossph	Member BG
Mr. M. Narayan	Member BG
Mr. Rajan Putbasservi	Secretary GP Kodembellur
<u>World Bank New Delhi</u>	
Mr. Raghava Neti	TTL Maharashtra Rural Water Supply and Sanitation Project

Mr. Ghanasham V. Abhyankar	TTL Kerala Rural Water Supply and Sanitation Project
Dr. Smita Misa	Senior Economist (SASDU)
Mr. Manu Parkash	Consultant SASDU