



## Water and Sanitation Program

An international partnership to help the poor gain sustained access to improved water supply and sanitation services

# THE BEST LAID PLANS...

## Revisiting Community-Based Rural Water Supply Schemes in Uttar Pradesh

An experimental community piped water supply program was initiated in three districts of Uttar Pradesh (U.P.), India in 1962. The program was implemented by the Planning Research and Action Institute, Lucknow and the Local Self-Government Engineering Department with assistance from WHO, UNICEF, and the State Government. The objectives, strategies and methodologies adopted for the schemes were remarkably similar to those of numerous schemes currently under implementation by the World Bank, the Government of India, and bilateral donors. Like the current schemes, these schemes provided for the bulk of capital contribution by the sponsor, and community responsibility for operations and maintenance.

The piped water schemes were implemented in three districts of U.P. — Meerut in the Western region, Barabanki in Central U.P. and Gorakhpur in the eastern part of the State. At the time, the majority of the rural population met its drinking water needs from contamination-prone open wells or shallow handpumps, leading to high incidence of water-borne diseases. Piped water supply from a centrally controlled source was considered the best means of ensuring provision of safe drinking water to rural communities.



## Project Objectives

The three schemes were designed as demonstration projects to pilot a new community-based approach to rural water supply. The projects had the following stated objectives:

**Construction of project:** Design and construct at minimum cost a piped water supply scheme suitable for rural areas and document practical experience of the design, construction, operation and maintenance of a rural water supply system;

**Health education:** Develop a methodology for educating the villagers about the health benefits of piped water supply and to study the impact of this educational program and the piped water supply on the health of the people;

**Further implementation:** Study the acceptability of piped water supply by people living in rural areas and their participation in the execution and maintenance of such schemes; and

**Community participation:** Show that villagers are capable of organizing themselves and administering piped water schemes independently and evolve a set of rules on sound management practices, which may be applied elsewhere in similar schemes.

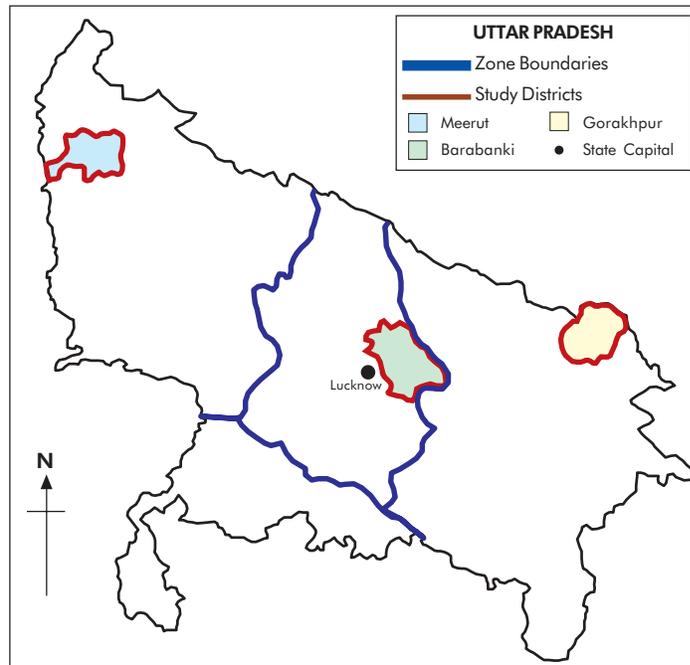
## Roles of Agencies Involved

The overall responsibility for the program, including design and organization of community participation in administering the scheme and implementation of health

education programs was borne by the Planning Research and Action Institute (PRAI) of Lucknow. The schemes were jointly implemented with the Local Self-Government Engineering Department (LSGED), which was responsible for design, construction and an initial short phase of operations and maintenance. WHO and UNICEF provided expert technical guidance and equipment such as pumps, pipes, chlorinating plants and special fittings. The State Government contributed the balance of project costs.

The schemes were initiated when requests were received for the

workers devised various strategies for involving the community in each phase of the project. The Institute collected baseline information on rates of water-borne disease in the project communities, villagers' attitudes to the project, and their willingness and ability to pay for safe drinking water supply. To help develop locally-accountable institutions capable of maintaining a piped water system, the Institute led the creation of a Joint Action Committee (JAC) in each project area. These committees were composed of elected representatives from the panchayats and officials from



**Figure 1:** Location of the Three Project Districts

piped water supply systems from representatives of the three project communities. The communities donated land for the pumphouses and overhead tanks, and contributed some cash and labor towards scheme construction. After construction and a start-up phase, both managed by the LSGED, the schemes were handed over to the beneficiary communities for operation and maintenance.

Beneficiary participation was considered central to the lasting success of the project. PRAI field

workers were responsible for coordinating operation and maintenance of the schemes. PRAI field workers and the JAC led health education programs in the villages to generate acceptance of piped water supply.

## The Banki Block Scheme

The Banki scheme covered seven villages that formed part of the



**Table 1****Key Dates and Details of the Three Schemes**

Features/Scheme	Banki	Pharenda	Mohkampur
Estimate Prepared	1962	1962	1962
Scheme Commissioned	1965	1964	1966
Transfer of O&M to Village Committee	1965	1966	1968
System Abandoned	1994	Ongoing	1976
# Villages Involved	7	10	1
# Panchayats Involved	2	–	1
1962 Population	4,320	8,757	687
1962 Number of Families	800	1,500	125
30-yr Design Population	5,425	11,000	1,000
Design Water Consumption (gpcd)	10	10	15
Size of Overhead Tank (gallons)	5,000	20,000	5,000
Disinfection Method	Chlorination	Chlorination	Chlorination
Design Capital Cost (1962 Rs.)	159,300	463,500	70,000
Design Annual Maintenance Cost (Rs.)	4,400	8,000	2,470
Design Per Capita Capital Cost (Rs.)	32	42	70
Design Per Capita Ann. Maint. Cost (Rs.)	1	1	3.5
# Families Willing to Pay at First Survey	270	280	12
Community Capital Contribution (Rs.)	500	427	–
Community Labor Contribution (Rs. Value)	2,700	–	–

Source: Joshi (1968), Field Visits

two Panchayats of Sahabpur and Sursanda, approximately 40 kms east of Lucknow. The scheme constructed under the project abstracted water from a tubewell with an electric pump to a 5000 gallon overhead tank. The scheme was initiated when one of the Panchayats donated land for the project site.

The scheme was commissioned in March 1965, and operated by the LSGED for six months, after which the JAC took over management. This Committee was recognized by the State government and consisted of a chairperson, secretary, treasurer and four members. The JAC drafted bye-laws for the collection of water tariffs from private connections and public standposts. The scheme employed three people, who received collections, kept records, operated the pump, and monitored the system

for maintenance purposes. The number of house connections grew from 260 in 1967 to 383 in 1971 and number of standposts from 34 to 42 over the same period. From 1965 to 1973, net revenue from the house connection tariff exceeded expenditures. During the first decade of its operation, the Banki scheme became a highly recognized demonstration model in South Asia and attracted the attention of the global development community.

The Banki scheme encountered problems around 1974, when the electricity supply dropped to about three hours per day. Given the limited capacity of the overhead tank, providing consistent and reliable service became impossible with the decline in electricity supply. Around the same time, conflict between the two Panchayats led to non-payment of water tariffs by

the leaders and residents of one group of villages, which further undermined scheme viability. The scheme went off-line from 1986-1990, allegedly for non-payment of electric charges. It was revived in 1991 and persisted till 1994 and has been defunct since.

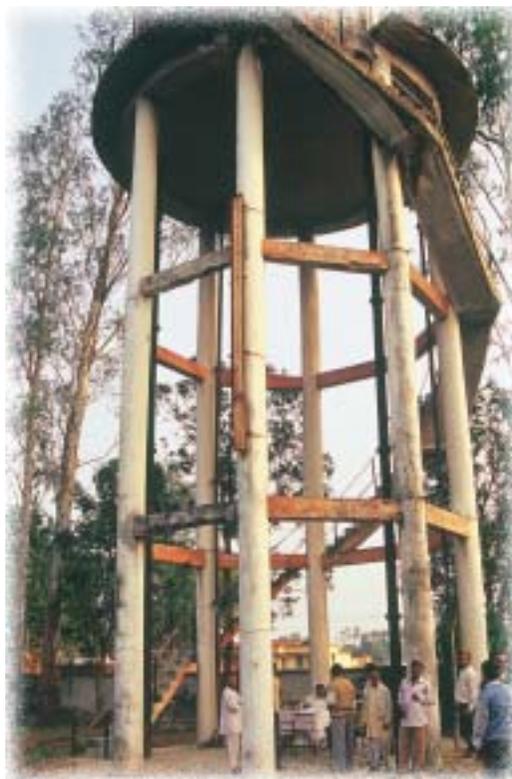
## Pharenda Development Block Scheme

The Pharenda scheme covered eleven villages in the Pharenda Development Block in Gorakhpur District, 42 kms north of Gorakhpur. The scheme was initiated at the request of the Pharenda Block Development Office, which also donated the land for the pump house. The Scheme was commissioned in



1964 and was operated by the LSGED for over one year. Management of the scheme was then handed over to a local Committee, which was assisted by the Development Block and chaired by the Block Pramukh. The scheme enjoyed robust subscription in its early years with demand overshooting expectations. The number of private house connections and public standposts increased from 279 and 123 in 1967 to 547 and 125 respectively in 1971.

Persistent yield problems from the tubewell led to poor service even in the scheme's early years. The JAC faced difficulties collecting tariffs due to poor service and the wide geographical spread



of the system. Collection of water tax from users of public standposts was especially difficult. Deteriorating power availability beginning in the early 1970s exacerbated the problem of service delivery. The system was in debt by the mid-1970s and was handed over to the U.P. Jal Nigam, which has operated the system since. The scheme was still operating in 2001, with 184 house connections and several standposts.

## The Mohkampur Scheme

This scheme covered the single village of Mohkampur, located about 8 kms south of Central Meerut. Most Mohkampur residents had little interest in paying for piped water supply at the inception of the project in 1962. When the water supply system was commissioned in 1966, it was operated by LSGED for about one year and subsequently transferred to the Gram Panchayat. When the scheme was first commissioned, none of the residents took house connections, and the scheme supplied water only to a pair of standposts. The Gram Pradhan made a personal commitment to generate subscription to the scheme and was able to sign up at least 20 households. Between 1968 and 1974, the scheme was maintained by the Gram Panchayat. Community leadership changed in 1974, and the new pradhan did not take an interest in tariff collection or maintenance of the project. The scheme stopped operating in 1976.

Connection Type	Banki		Pharenda		Mohkampur	
	Year	#	Year	#	Year	#
Private Connections	1967	260	1967	279	1967	0
	1971	383	1971	547	1968	20
	1991	150	2001	184		
Public Standposts	1967	34	1967	123	1967	2
	1971	42	1971	125	1968	2
			2001	>3		

Year	Banki	Pharenda
1965-66	589	—
1966-67	3,403	1,354
1967-68	6,469	6,569
1968-69	8,738	5,688
1969-70	5,093	8,029
1970-71	8,086	9,388
1971-73	16,944	—
<b>Total Expenses</b>	<b>49,321</b>	<b>31,028</b>
<b>Total Tariff Income</b>	<b>60,335</b>	<b>33,649</b>

Source: PRAI (1972), Misra (1975).



Table 4			
Key Features of Piped Rural Water Supply Schemes			
Features/Scheme	Banki	Pharenda	Mohkampur
Commitment before Construction	High	Medium	Low
Investment in Physical Infrastructure	Medium	Low	High
Investment in Social Infrastructure	High	Medium	Low
Form of Participation	Committee	Committee	Pradhan Led
Formal Institutional Support	PRAI	Dev. Block	Absent
Monitoring & Evaluation Mechanism	PRAI	Dev. Block	Absent
Immediate Cause of Closure	Electricity	Ongoing	Change in Pradhan

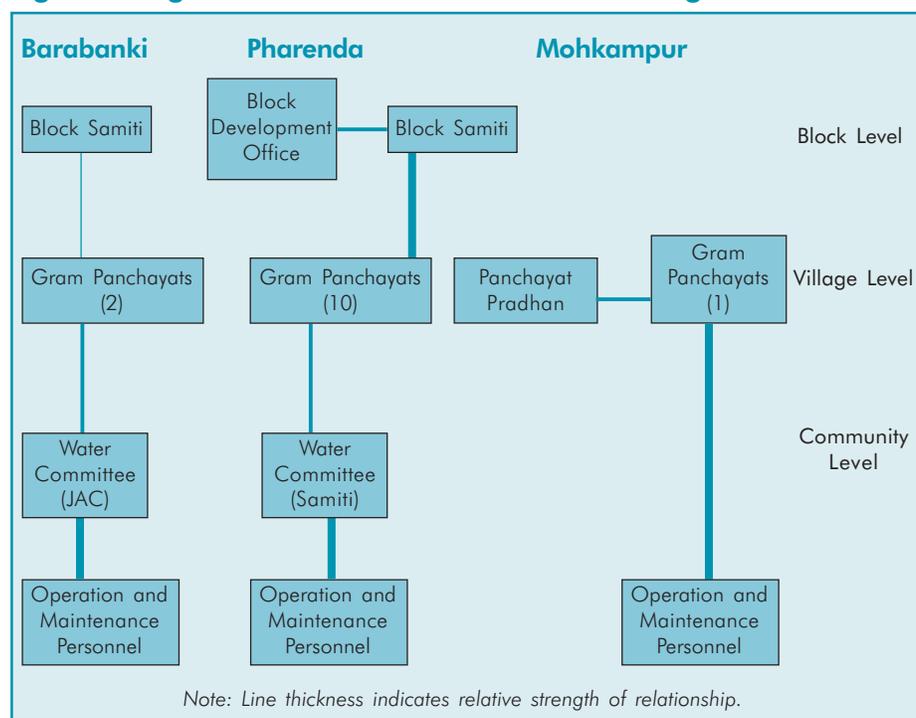
## Conclusions

A comparative assessment of some key institutional features of the three schemes is summarized in Table 4.

The Mohkampur scheme failed early apparently because of a general lack of involvement on part of the beneficiary population. The Banki and Pharenda Block schemes both registered an initial phase of strong growth. The excellent performance in the initial years of the Banki scheme is closely linked to the established presence and activities of PRAI field workers in the area. The Institute's field staff contributed significantly towards capacity building of the community and to the monitoring of the scheme until 1971-72. The Pharenda scheme also had substantial institutional support, in the form of strong ties to block level institutions (see Figure 2). These links with the Block probably facilitated the scheme's eventual bailout by U.P. Jal Nigam.

All three schemes faced crises in the mid-seventies. In Banki and Pharenda the deteriorating electricity

Figure 2: Organizational Structure of Scheme Management



supply conditions and rising electricity costs created a vicious circle in which a decline in service levels led to a drop in tariff collections, which further deteriorated supply conditions. As people substituted and supplemented it with other alternatives, it became expensive and impossible to operate the system as designed. A shift towards the target-oriented approach nationally also contributed to the decline of the schemes.

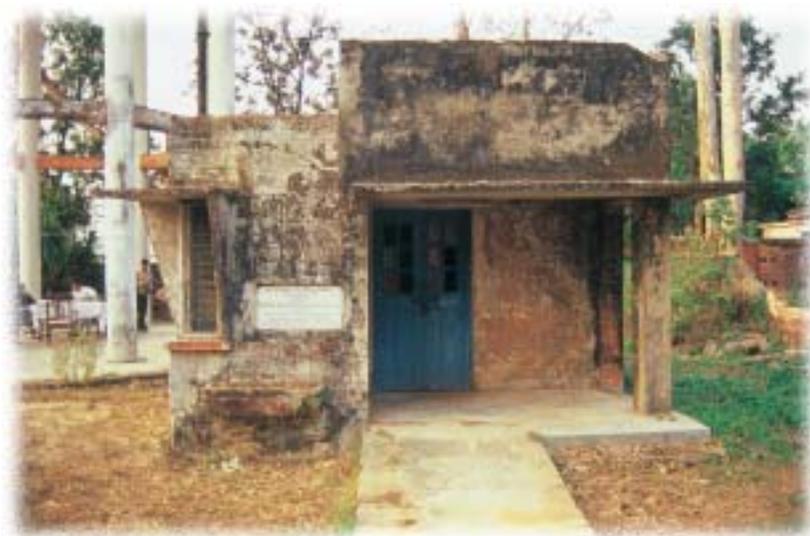
## Lessons Learned

The U.P. project demonstrates that, given exposure to an educational program, rural communities prove capable of understanding and appreciating the health and other benefits of improved drinking water supply. The initial success and growth of the Banki and Pharenda schemes show that rural communities are efficiently able to evaluate alternative



sources of water supply and are willing to pay higher prices for higher level of services. The Mohkampur case demonstrates that prior assessment of demand is crucial for the sustainability of schemes. The project illustrates the importance of investments in basic infrastructure in influencing the outcomes of programs that have high potential health, economic and social benefits. Despite the evidence of community self-sufficiency, some institutional support was a critical ingredient in the two projects that

succeeded. This need for support raises issues of concern for projects currently under implementation. Project design must give careful consideration to the kinds of institutions that are required to provide support to rural water projects, to what extent and for how long this support may be required. WSP believes such support should come from accountable, responsive local governments that now have the constitutional responsibility for water supply and sanitation through the 73<sup>rd</sup> Amendment.



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**WSP Discussion Paper #1** *Sustainability of Rural Water Supply Projects: Lessons from the Past.*

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This Field Note is based on a more substantive discussion paper: "Sustainability of Rural Water Supply Projects: Lessons from the Past" available from [wpsa@worldbank.org](mailto:wpsa@worldbank.org)

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