



WaterAid/ Prashanth Vishwanathan

Scaling up community ownership and management in piped water supply



Lessons from five models



Context

The progress in providing water supply facilities in rural India has been steadily improving with 18.4 percent of the total households having access to piped water supply (PWS) with a household connection in November 2019.¹ Now, with the launch of Jal Jeevan Mission (JJM), the government plans to improve this coverage level to 100 per cent, by ensuring piped water supply to all rural households by 2024.

As per the 73rd Amendment to the Constitution of India, 1992, all the rural water supply schemes are to be operated and maintained by local bodies such as Gram Panchayats (GPs), Village Water and Sanitation Committees (VWSCs), Zila Panchayats (ZPs) and civil society organisations. Community participation in piped water supply has been an inbuilt component of various national and state flagship programmes like *Swajaldhara* (national scheme), *Swajal* in undivided Uttar Pradesh, *WASMO* in Gujarat, *Jalanidhi* in Kerala, *Mission Bhagiratha* in Telangana, *BASUDHA* in Odisha and the latest *Swajal* (launched in 2018 under the National Rural Drinking Water Programme (NRDWP) in 117 aspirational districts of India). The management of drinking water services in rural areas offers an opportunity for the

Gram Panchayats to ensure Operations and Maintenance (O&M), however mere transfer of responsibility to the Gram Panchayats cannot lead to sustainability of the piped water schemes. Currently, community participation or management is non-existent, or where present, the role of the community in operation and maintenance is confined to cost sharing of the capital, operational, and maintenance expenses and performing simple repairs and renovations. Examples of communities leading the planning, implementation, and operation and maintenance, are very few and isolated.

To ensure sustainable service delivery and effective community participation and ownership, the capacity of Gram Panchayats and Gram Sabhas needs to be built, and community representatives trained in management of these services and in various aspects of operation and maintenance. Community management has been re-emphasised in the 2018 *Swajal* guidelines and in the most recent Jal Jeevan Mission, 2019, which will focus on specific aspects of financial sustainability, O&M, and institutional reforms for strengthening Panchayati Raj Institutions and Village Water and Sanitation Committees (VWSC).²

¹ https://ejalshakti.gov.in/IMISReports/Reports/Physical/rpt_CoverageIndividualHousePipConnection.aspx?Rep=0&RP=Y

² <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1579924>

JAL JEEVAN MISSION

Renewed efforts towards household level access to piped water supply

The announcement of Jal Jeevan Mission (JJM) expands on the 2013 NRDWP guidelines, which had its goal as access to piped water supply with a household connection to at least 80 percent of rural households. According to the Ministry of Jal Shakti, Jal Jeevan Mission (JJM) is different from the earlier National Rural Drinking Water Programme (NRDWP) as it involves the Gram Panchayats in planning and implementation of the project, proposes performance-based funding to states, and ensures mandatory participation of women in VWSCs. However, these arrangements while present in the design under NRDWP, were largely missing in practice.

Study objectives and methods

Given the importance of community managed drinking water supply for the success of Jal Jeevan Mission's ambition, it is important to look back and learn from some of the demand driven, community managed schemes. This summary is based on lessons learned from five successful community managed piped water supply schemes that have been functioning in different geographies of India – Koderma in Jharkhand, Kanker in Chhattisgarh, Ganjam in Odisha, Gaya in Bihar, and Almora in Uttarakhand. The objective of this study was to understand the reasons for the success of these schemes and the challenges encountered in planning, operations and maintenance thereby providing insights for further planning.

These five schemes on community managed piped water supply were shortlisted through a process consisting of expert interviews, scoring, and ranking on various parameters. Key informant interviews of water sector experts were conducted and 14 examples from across India were collected. Each scheme was assessed on select parameters and scored by three different evaluators. Of these, the five PWS schemes which secured the highest average were shortlisted for detailed documentation. Brief highlights of the schemes were obtained through expert interviews. Detailed field visits were conducted which included discussions with community, Panchayati Raj Institutions (PRI), community based institutions, and departmental officials. This summary of learnings is based on the review and report of each individual scheme.

Lessons from five community managed piped water supply schemes

The challenges to achieving assured access to drinking water is mostly associated with sustaining water supply services. This could be dealt to a large extent if the scheme is operated and maintained properly through components like capacity building of the mandated institutions and the community, developing information, education and communication (IEC) strategy for sustainability

of systems, building techno-economic feasibility and financial viability in terms of its capital cost and recovery cost or tariff.

The five community managed piped water supply schemes that were studied bring in learnings and challenges that are crucial for strengthening both the current as well as the proposed piped water schemes.



WaterAid/ Amita Bhaduri

Inar piped water supply scheme, Almora, Uttarakhand



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Zindapur mini-piped water supply system, Gaya, Bihar



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**Jholakarma
piped water
supply, Koderma,
Jharkhand**



WaterAid/ Amita Bhaduri

**Piped water
supply at
Sivani, Kanker,
Chhattisgarh**



WaterAid/ Gram Vikas

**Mini Piped water
Supply at village
Samiapalli,
Ganjam, Odisha**



WaterAid/ Gram Vikas

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Inar piped water supply scheme, Almora, Uttarakhand

The scheme was taken up under Phase 3 of Swajal 1 in 1999 when a group of villagers from Naugaon, district Almora, led by Bhupal Singh, then Gram Pradhan and Dhaan Singh, current chairman of VWSC approached the District Project Monitoring Unit (DPMU), Nainital, along with a local NGO CHIRAG, and another support organisation under the Swajal project.

The scheme was taken up as a village water supply reorganisation project in 1999 to rehabilitate the earlier gravity-based *gadhera* (stream) PWS scheme, which became defunct in 1993. This was an innovation in itself as the old structures and pipelines were to be reused to the extent possible. The scheme provides access to 84 households through 53 household level connections and 31 households through 7 stand-posts at 70 litres per capita per day (lpcd) for household connection and 40 lpcd for stand-posts. The village habitation has 100 per cent access to water supply through a combination of household level connections or stand-posts. Water is also supplied to the primary school and an inter-college located in the community. Water quality is not monitored regularly though it is known to be fluoride free and chlorination takes place at regular intervals.

KEY FEATURES

- 1. Demand driven:** The scheme was based on a clearly articulated demand as the old piped water system structure had become defunct in 1993 and the villagers had to travel miles to collect water from the local stream downhill.
- 2. Community consensus in planning and implementing the scheme:** The community was given a lead role in decision making for planning, implementation, and choosing the appropriate technology option. The identification and selection of habitation was based on willingness to share ten percent of the capital cost and full operation and maintenance cost of the project. Post-handover of the scheme to the VWSC in 2000, community has been involved in maintenance and conducts periodical cleaning of the boulder filled gallery and replacement of boulders in order to provide sustainable water supply.
- 3. Indigenous technology:** The technology of boulder-filled galleries for source-tapping schemes, such as the gravity *gadhera* scheme at Inar, has been indigenously developed by the Drinking Water Supply Department of Uttarakhand. An advantage of the gravity *gadhera* scheme is that it provides gravitational flow up to the community without any pumping and that considerably reduces the recurring costs.
- 4. Long standing VWSC:** The 11 member VWSC named as Inar Committee is registered as a sub-committee of the Gram Panchayat under Swajal 1. The duties of the president, treasurers and other members constituting the committee are well defined. Of the 11 members, six are women. The Committee is functional for the last 20

years with the same members barring two instances where members who died were replaced by new ones. The management role rests with the VWSC members until their demise or on becoming incapacitated, the idea being that those who were involved with the scheme since inception understand its technology, management and financial aspects quite well.

5. Trained members for O&M: As per the DPMU, Swajal 1 projects were sustainable as sufficient awareness and capacity building of the PRIs and VWSCs was undertaken to take over the responsibilities of water supply service delivery. The members of the VWSC were trained in operation and maintenance of the system and overall management of the scheme. They are well equipped with necessary tools and spare parts for repairs especially during monsoon.

6. Duties defined for O&M: While the VWSC manages the water supply scheme, the day to day upkeep and maintenance of the system is looked after by Village Maintenance Worker (VMW), who is also the pump operator, whose duty comprises of distribution of supply, monthly tariff collection, monitoring leakage in the distribution line, and conducting minor repairs for a monthly fee of INR 500. A local mechanic known as 'fitter' or plumber looks into the major repairs.

7. Cost sharing model: The total cost of the piped water supply project was INR 18.25 lakhs of which the community contributed 10 per cent partly by labour and partly by way of cash. For taking household level connection, the users paid a one-time connection charge of INR 1,000 as

contribution to VWSC's O&M account (gram kosh). The scheduled tribe and poor families who could not pay for the individual connection were provided stand post connection and some of them were able to shift to household piped water supply over time. Besides, the collection of a monthly tariff of INR 50 per household helps to meet the cost of minor repairs. Though the rules entail the disconnection of household water connection on non-payment of tariff, no such case has been reported so far and people eventually pay even if on a delayed basis. The Gram Panchayat funds major repairs and has even provided MGNREGA funds of the order of INR 1.5 lakhs for the system's repair.

OVERCOMING CHALLENGES

Inar is remarkable, as it has been functioning satisfactorily for its design period of 20 years. Like every PWS scheme, it does face challenges, typically every monsoon when a part of the structure is washed away. The disruption lasts for one to six days depending upon the damage caused. However, the president and other office holders of the VWSC organise the community to contribute labour for system repair. Around 30-35 people from the village conduct repairs during breakdown. The monthly tariff collected as water user charge is used for material and cartage costs.



Zindapur mini-piped water supply system, Gaya, Bihar

Village Zindapur is largely inhabited by the *musahar* community comprising of 57 households. Until 2016, the village was largely dependent on two dug-wells, a hand-pump, and two shallow private hand-pumps that would go dry as the heat intensified in summers. In late 2016, WaterAid's partner organization, Pragati Gram Vikas Sansthan approached the community with the idea of a piped water supply scheme. It took a while for the community to understand the approach and accept it.

In March 2017, the village embraced a decentralized community managed piped water supply system which allows the households to have tap connections and enjoy water supply for two hours each in the morning and evening. It provides connection to all 57 households apart from providing water to the primary school.

KEY FEATURES

- 1. Need based scheme:** Village selection for the water supply scheme was based on the community's request as there were other water scarce villages too but the perceived need for safe drinking water was the strongest in village Zindapur. The existing water sources in the village (a dug well and a hand pump) would run dry every summer and a government water tanker became the primary source of water. However, the tanker supply could not meet the demand during the lean period.
- 2. Community as the key decision maker in planning the scheme:** In the planning phase, households came together to identify the site for mini piped water supply scheme with the help of the support organisation. Local labour was involved in civil works and to lay the pipes. The community mutually decided the water user charges of INR 30 per month per household.
- 3. Simple and cost effective technology:** The technology for operating the system is simple and comprises of an electric powered pump (2 horse-power) fitted into the bore-well. The bore well is 120 feet deep with casing for first 70 feet. The discharge of the pump is 80 litres per minute. There are two 5,000 litres water storage tanks. Each overhead tank is filled in about an hour and water is made available to the community members through household tap connections. Each household has two pipe connections - one in the toilet and one in the kitchen.
- 4. Community led institution for overall management of the PWS scheme:** The responsibility for overall management of

water services rests with the *Grameen Peyjal Swachhata Samiti* (GPSS) at the village level. The committee comprises of 8 members out of which five are women. The committee is headed by the president and includes a secretary and a treasurer. The committee members, who are trained in using the fluoride testing kit, test groundwater quality twice a year (pre and post monsoon).

5. A stable water user committee: The *Grameen Peyjal Swachhata Samiti* (GPSS) comprises of the same members since inception of the scheme, performing defined roles and responsibilities. The community has painted GPSS guidelines on the wall of the mini piped water supply system, which clearly demarcates roles, and responsibilities of each member for reference by the community.

6. Role of the pump operator in O&M: While the GPSS overall manages the water supply scheme, the day to day upkeep and maintenance of the system lies with the pump operator who was initially unpaid but is now being paid INR 500 per month for his services. The person, along with other community members, has been trained in operation and maintenance of the system and attends to minor repairs like pipe bursts. He operates the pump for lifting water and its subsequent distribution, cleans the tank once in four months and applies bleaching powder post cleaning. The operator also collects user charges from households, which is used to meet common repair and renovation.

7. Transparency in functioning: The operator maintains a log book for water supply timings and regulates the water supply based on the decisions made by the Committee.

8. Community sharing the capital and

O&M cost: The scheme cost was INR 6.31 lakhs and the villagers contributed about 10 percent of the cost in terms of labour and cash (INR 53,000), while WaterAid India and its partner NGO, *Pragati Grameen Vikas Samiti* (PGVS) provided the rest. The gram panchayat donated 20 feet X 20 feet land for construction of the system while the community contributed 12 days labour per household and INR 1,000 per household as connection charge. Water user charges at INR 30 per month per household contributes to the O&M pool. However, this amount has been waived off for two women headed households.

OVERCOMING CHALLENGES

The major challenge in Zindapur piped water supply scheme has been to keep the community motivated towards paying the monthly user charges to maintain greater sustainability of supply and efficiency of service delivery.

However, it is important to note that formal procedural measures such as imposition of user charges, forming Village Water Committees and handing over responsibility to communities need to be complimented with measures like community mobilisation, participation (especially by women) and capacity building, in order to build community ownership and responsibility for water service delivery.³

³ https://www.un.org/esa/ffd/wp-content/uploads/2007/12/20071217_vibhu_nayar_paper.pdf



Jholakarma piped water supply, Koderma, Jharkhand

Jholakarma, a small village located in Koderma district of Jharkhand with around 52 households is a fine example of a piped water supply system managed and operated by women led self-help group (SHG).

The community driven approach in water and sanitation services was piloted in Jholakarma by PRADAN in 2012, when it supported the setting up of the VWSC as per the mandate of the gram panchayats. A resolution was passed in a meeting presided over by the Mukhiya to set up a piped water supply system. On receiving technical and administrative approval on the detailed project report (DPR) from the concerned departments, the VWSC implemented the scheme with the involvement of the community and technical support and supervision from UNICEF and PRADAN. The monitoring of the implementation was done by four SHGs in the village. Water supply is provided from a 25 feet deep low lying sanitary well. With 62 individual household connections and 3 institutions (panchayat building, anganwadi centre and government primary school), the coverage of households under the piped water supply scheme is 100 percent.

KEY FEATURES

- 1. Demand based scheme:** The demand for the scheme came from the local women's self help group who had to bear the brunt of quantity and quality impacted water they collected from the lone hand pump in the village and occasionally from the small *chuas* (sand pits) on the stream bed. The contaminated drinking water made everyone suffer from various water borne diseases and led to a huge medical expense.
- 2. Community involvement right from the start:** The community was involved right from inception in planning, detailed project report preparation, execution and in the post-implementation phase. It assessed the overall water requirement of the village by various sectors such as drinking, domestic etc., keeping in mind the current and projected population.
- 3. Managing of PWS scheme by two institutions:** The various components of the pipe water supply scheme are together looked after by the Village Water and Sanitation Committee (comprising of 12 members, seven of which are women) and *Gram Swachhta Samiti* (membership from each household). During the implementation phase, the VWSC managed fund flow from drinking water and sanitation department (DWSD). Post the implementation, the scheme has been handed over to the Gram Swachhta Samiti, which is now responsible for the system's O&M and scheme related accounts, book keeping and financial audit.
- 4. Role of the pump operator in O&M:** The pump operator is responsible for opening the valves twice a day to distribute water from the overhead tank. The operator also

oversees the day-to-day functioning of the system, especially water wastage apart from cleaning the tank regularly. Water quality is tested monthly during monsoons and once in two months during rest of the year. The operator is paid INR 1,000 per month for the services.

5. Cost sharing towards capital and O&M

cost: The community contributed three kinds of costs - capital cost, O&M corpus and monthly tariff. The community contribution towards the capital cost was kept at 10 per cent, household contribution towards building a corpus for O&M was INR 1,000, and the monthly tariff for O&M is currently INR 60 per household. The community had made a provision for waiver of the fee towards the O&M corpus for the absolute poorest (women headed and elderly households).

6. Technical capacity building: The technical capacities of staff at all levels and the committee were enhanced so that the fixing of minor repairs could be easily done at the local level. The project had an elaborate capacity building plan which comprised of concept seeding of the project among the villagers, exposure of VWSC and SHG members to successful piped water supply schemes, orientation of VWSC around DPR, transect walk of the village for planning of water distribution system and subsequent mapping of the system. This also included training of VWSC members around membership, role and responsibilities, technical know how, training of *Jal Sahiya* around accounts, book keeping and audit. Along with training of *Jal Sahiya* and other VWSC members around water testing and water quality.

7. Two tap connection: Each household has been provided two connections – in the kitchen and bathroom as per the DWSD guidelines.

8. Transparency and monitoring: Payment log books and user receipts are provided to all households. There is transparency around the collection and disbursement of user fees. The VWSC also keeps oversight on overall management of the system, optimum water use including checking wastage and monitoring water quality. Key components of the system being monitored include water level in the sanitary well, water quality, and accessibility to water services by all households.

9. Innovation: The system is innovative as it taps sub-surface water flow and uses a solar powered pumping device for lifting water. A two horse power submersible pump set, which offers an off-grid water pumping system and has a low operating cost was chosen for the system.

OVERCOMING CHALLENGES

Protecting the solar panel from theft has emerged as a key challenge in the smooth functioning of the PWS scheme. Being located in an isolated area away from the main habitation, four out of six panels have been stolen and the system now runs on grid-based electricity. Subsequently, the Committee is seeking resources from Member of Legislative Assembly Local Area Development Scheme (MLALAD) and panchayats for the purchase of new panels.

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Piped water supply at Sivani, Kanker, Chhattisgarh

Till 2015, the water supply schemes in the Sivani gram panchayat were based on groundwater sources such as hand-pumps and open wells. At Sivani, the gram panchayat decided that the dispersed settlement pattern was a challenge for piped water supply coverage and the only option for PWS was of motorised pumps linked to an over-head tank with connections to households.

Considering this, it was decided to implement habitation level piped water supply schemes with support from WaterAid India and its local partner Samarthan. Currently, there are five PWS schemes operational in Sivani Gram Panchayat - two schemes in village Sivani started in November 2017 and March 2019 respectively covering total 48 households; three schemes in village Goyenda started in February 2018 and November 2018, and March 2019 respectively covering 37 households.

KEY FEATURES

- 1. Involving community representatives in the planning phase:** The *Peyjal Prabandhan Samiti* was involved in selecting the borewell and its digging, selection of the location of the overhead storage tank and ensuring its proper construction, and supervising the laying of pipeline from overhead storage tank to the households.
- 2. Creating informal village level water management committee:** In Sivani gram panchayat, the VWSC looks into

sanitation more than water supply and hence scheme level *Peyjal Prabandhan Samitis* were constituted at the habitation level. The *Samitis* are an all-women group comprising of 8-10 members mainly drawn from SHGs. The *Samitis* were provided with continuous support in terms of creating awareness, training and handholding on various aspects of drinking water supply and sanitation such as planning, implementation, operation, maintenance and management. The *Samitis* have been trained in post construction support involving water quality testing, assessing functionality and technical support.

- 3. Cost sharing towards O&M:** Funds to the tune of INR 8.31 lakhs were leveraged from the Sivani gram panchayat for full financing of the capital costs of the piped water supply systems. All households in the village being Below Poverty Line (BPL) did not contribute to the capital cost at all. While minor repairs are undertaken by the committee from the monthly user charges, the major costs of repairs are borne by the gram panchayat.
- 4. Transparency in maintaining accounts:** An accounts book is maintained by the *Samiti* and the income and expenditure for water supply is systematically tracked.
- 5. Voluntary operator:** The scheme does not hire an operator and this entails less cost. The woman of the household who resides next to the system takes the responsibility of its operation. In her absence, the responsibility is passed on to others.
- 6. Monitoring water quality and quantity:** The *Peyjal Prabandhan Samiti* does regular monitoring and assessment of scheme functioning. Water quality is monitored



Overhead water storage tank in Sivani Panchayat, Kanker, Chhattisgarh

WaterAid/ Amita Bhaduri

twice a year by the *Samiti*. Water table and yield are not monitored as of now. *Samiti* monitors leakage and wastages in water use and the user is advised to amend ways; no system of fines has been instituted yet.

7. Two tap connection: Each household has been provided with two tap connections – in the kitchen and toilet.

8. Innovation towards reliable water services: An innovation in the system particular to village Goyenda is that all the three schemes in the village have been interconnected with each other through valves and should any of them fail, the other two in the village are used for providing water to the households. If the solar pump does not function due to cloudy weather, electricity is used and vice-versa.

OVERCOMING CHALLENGES

There is a need to formalise financial arrangements preferably by opening a bank account. Further, a corpus created by one-time contributions will help support repairs that may be required in the future. The piped water supply running through engagement of SHG women seems encouraging but more work needs to be done on institutional aspects like opening of bank accounts and encouraging people to create corpus through one-time payment for major repairs that might happen in the near future.



Mini piped water supply at village Samiapalli, Ganjam, Odisha

Samiapalli is a village comprising 76 households in district Ganjam, Odisha. 95 per cent of the population belongs to the scheduled castes. Gram Vikas first initiated sanitation infrastructure and supply of piped drinking water to all households under the Rural Health and Environment Programme (RHEP) in 1992. This programme became the entry point of collaboration between the community and the support organisation. Water supply connection along with sanitation and bathroom facilities has helped women have more spare time for spending in productive income generation activities. The village now has an extended PWS coverage starting from 66 in 1992 to a total of 92 households in 2019. Around 10 households did not join the programme citing financial constraints and unwillingness to shift to the new habitation where the remaining 66 households were located.

KEY FEATURES

1. Demand based scheme: The water supply system in the village was completely inadequate with falling groundwater tables, bacteriologically contaminated groundwater, defunct hand pump and frequent power outages. In 1992, the community approached Gram Vikas when they came across a newspaper advertisement regarding the initiation of a pilot project on Rural Health and Environment Programme (RHEP).

2. Strong water management committee:

A village organisation was set up and registered as a society named as *Byaghradevi Gram Unnayan Samiti* (BGUS). The eleven member executive committee of BGUS comprises of three women. The expertise developed by the committee in managing the piped water supply system gained the trust of the gram panchayat and the committee was later recognised as the VWSC as mandated under the Panchayati Raj Act. The society has bye-laws and runs as per those.

3. Role of the committee and community in O&M:

A clear-cut system for operation and maintenance has been put in place. The committee oversees the collection and use of funds, monitoring the construction and maintenance of the piped water supply system and sanitation structure. Besides the committee, the community has also been trained on maintenance and management of the piped water supply system, accounting, and hygiene and therefore takes full responsibility for the management, operation and maintenance of water supply and sanitation systems in the village. A trained operator looks after plumbing, electricity, and pump maintenance. He is paid a monthly remuneration of INR 2,300.

4. Allied activities for income generation by the panchayat:

The community was encouraged to develop the commons and undertake community income generation activities such as social forestry, cashew plantation and pisciculture. Through the co-management of commons, the community is able to put in at least 25% of the income from this into the village fund, which is used to meet the O&M costs of the water supply.



WaterAid/ Gram Vikas

Panchayat building in Samiapalli Village, Ganjam, Odisha

5. Three tap connection: In the 1990s, every household in the village constructed a toilet and bathroom for itself, with 24-hour piped water supply a day. Households are provided with three taps, one each in the bathroom, toilet and kitchen.

6. Water Quality monitoring: The water quality is being monitored from 2019 onwards to check for bacteriological contamination (e-coli), turbidity and nitrates etc. Currently, the capacity of the community is being built to develop a protocol for quarterly water quality monitoring.

7. Cost sharing and financial sustainability: The community shared 20 per cent of the capital cost by contributing labour and construction material while 80 per cent was contributed by Gram Vikas. Moreover, a corpus fund has been created in each village with a contribution of INR 1,000 from all households. The corpus has been placed in a fixed deposit and the interest earned on it is used for extension of facilities to new families. The monthly O&M charges at INR 30 per household are used for O&M purposes strictly.

8. Longer planning and implementation phase: At the onset of the programme, all executive committee members go through leadership development programme, gender sensitisation, health training, training in dealing with PRI, running meetings, managing construction and record keeping (accounts) training. A typical project lasts between three to five years, after which Gram Vikas hands over the full responsibility of the management, operation and maintenance of the system to the PRI.

OVERCOMING CHALLENGES

A major challenge faced in Samiapalli was building capacities of the under-represented, excluded sections of the village community. Not just that, it also took time to demand accountability from committee members and reduce the control of traditional leaders who continue to influence decision-making. Loosening of traditional patriarchal attitudes has taken place in the village but there is still a long way to go.

Key learnings for Jal Jeevan Mission

Some of the important learnings that have emerged from the study and are essential for access to safe, sustainable, and reliable drinking water services from community managed piped water supply are as follows. These learnings also provide insights for informing the Jal Jeevan Mission on maximising community participation and building complete ownership by the community.

DEMAND GENERATION FOR THE SCHEME

1. The demand for access to piped water supply schemes and a clear articulation came from the community in at least four cases documented while one was a need driven scheme. The reasons for demanding a PWS scheme in the village were various ranging from long walk to water source, dried up water structures and contaminated water sources, water for practicing safe sanitation. The community had put a request to the department or agency or NGO for support to improve its water supply (demand driven approach). Therefore, clearly articulated demand is necessary for subsequent community involvement.
2. Community participation was witnessed right from early stages of the scheme i.e from the pre-planning and planning phase wherein the community participated in decisions pertaining to site selection, technology, user fee, etc. rather than just giving their consensus to the detailed project report prepared by the water

supply department. Therefore, any scheme that requires operation and maintenance to be carried out by the community should also allow a key role in planning and implementation as well.

PLANNING AND DESIGNING THE SCHEME

1. The planning and implementation phases were found to be -2 to 5 years in some of the oldest PWS scheme like Inar (CHIRAG supported) and Samiapalli (Gram Vikas led). This reflects that robust-planning and creating community involvement might be time-taking but it keeps the scheme functional for a longer time period. Therefore, significant amount of time needs to be invested in for planning, design, implementation and transfer. A minimum six months to a year's time is required for planning and design.
2. User friendly technology (convenient for the community to operate and maintain) were found to be more sustainable. Moreover, while planning the design of the PWS scheme, a formal agreement or a common consensus on technology selection was found to be reached between the community and the supporting department or NGO. Therefore, the choice of technology selection by community later simplifies operations and maintenance of the scheme.

FINANCIAL MANAGEMENT FOR O&M

1. Each of these schemes had a unique cost sharing arrangement wherein the community was encouraged to bear the partial capital cost of approximately 10 per cent by way of contributing labour, construction material, or even cash. When community contributes towards capital cost, it becomes the first step towards ownership of asset.

2. In all instances, there was a monthly contribution for piped water connections at an average of INR 30 per household per month. Minimum amount was found to be INR 20 per month and maximum of INR 60 per month. Therefore, a monthly user fee that is mutually decided, helps to meet the recurring expenses towards operating the scheme.
3. A one-time contribution of INR 1,000 towards creating a corpus fund, which was later invested in the bank, was reported in at least four of the schemes. Contribution towards the corpus fund plays a key role to meet the cost of major repairs.
4. A system of punitive measures like penalties and monetary fines was also reported in some instances. Yet, flexibility existed in payment of O&M contributions – monthly, six-monthly, and acceptance of delayed payments. For instance, in village Naugaon, non-payment of tariff leads to disconnection of household water connection. However, no such case has been reported so far and people even pay on a delayed basis. Therefore, while the provision of fine ensures adherence to the processes, the committee should be rational in applying them based on what the situation demands.
5. Apart from being able to cover its operating costs with the current tariff structure, four of the models were able to generate net benefits too. A profit-generating model helps to meet the recurring cost and allows the services to be sustainable.

INSTITUTIONAL STRUCTURES FOR O&M

1. Inclusive approach in terms of decision-making, planning and coverage was found across all models. Women and

representatives of various caste, tribal groups and religious minorities were included in user-committees, including management positions in proportion to their populations. An inclusive approach in representation in committees and decision making leads to a sense of ownership across caste and community and ensures equal access to project benefits.

2. The PWS scheme comprised of dedicated personnel, teams, and members of village level institutions who were trained in planning, designing, operating and maintaining the scheme. Significant investment in capacity building of village level institutions helps in planning and designing the schemes and of operators to maintain the systems.
3. Participation in O&M was of more than one actor or institution, who were involved in different ways in the operation, maintenance and management. While mandated institutions like the PRI or VWSC (Inar and Jholakarma PWS scheme) played a key role in most cases, in others, community-led bodies like *Grameen Peyjal Swachhata Samiti* (GPSS), Gram Swachhata Samiti and Peyjal Prabandhan Samitis (Zindapur, Samiapalli and Sivani PWS scheme), took the lead in implementing the programme.
4. Importantly, the primary day-to-day responsibilities were clearly defined and these were basically the responsibility of the mandated bodies or non-formal institutions or the pump operator. Defining the duties and maintaining log book created transparencies in the system.



A baiga woman collects water from a stand post at Kapoti Village, Dhindori, Madhya Pradesh

TECHNICAL MANAGEMENT OF O&M

1. In at least 4 of the 5 models, drinking water quality was being monitored and the committee members or the pump operator was conducting occasional tests. Testing of water quality was primarily on bacteriological parameters to ensure access to safe drinking water and prevents users from going back to the unsafe water sources.
2. Water was being supplied twice or thrice a day. Two of the schemes (Inar and Samiapalli) even supplied 24x7. The committees had also laid down clear

strategy of regulating drinking water supply during lean summer months distinct from norms during other times of the year. Therefore, while no meters may be in place for regulating water, the supply regulation should be based on sustainability of the source and seasonality.

3. It was also observed that despite being piped water supply schemes, equal importance was given to sanitation during the community mobilisation phase. Therefore, most of these villages were either early open defecation free or had water and sanitation drives going simultaneously.

Challenges to be addressed in the schemes

1. The Village Water and Sanitation Committee – though a mandated standing committee of the Gram Panchayat- often does not exist in reality. It often needs to be created and their capacity invested in.
2. When decentralised schemes are functioning at a habitation level, a local water management committee often has to be created. There needs to be a mechanism for recognition of sub-committees of the GP and VWSC to manage decentralised water supply schemes. This formal recognition will ease opening and operation of bank accounts and can support receipt of funds from the GP.
3. Dependence on ground-water sources, in four of the five schemes, was found to be high. Source sustainability measures were also missing in majority of the schemes.
4. Meters were non-existent in all of the schemes. Water quality testing though being conducted was minimal and at best twice a year.
5. For schemes that are dependent on solar energy, having a dual source of power i.e. solar and electricity is a prudent strategy.
6. Capacity building and community mobilisation requires an external agency. In all of these instances, there has been a voluntary agency that has played this role. This in itself could inhibit scale.

Conclusion

Water, sanitation and hygiene (WASH) programs too frequently fail to bring sustainable benefits to the people they seek to serve, with as much as 30-50% of WASH projects failing after two to five years.⁴

Lessons learned from the five schemes clearly reveal that for safe and reliable drinking water supply, it is imperative for the scheme to be planned, operated and maintained through local citizens and community groups by developing a well-functioning accountability mechanism that clarifies the responsibilities of actors while keeping the government as a 'facilitator, supporter, and co financer'. Additionally, areas like designing a cost-sharing model, which is inclusive of the community's ability to pay, formally institutionalising the non-formal village level institutions, and ensuring source sustainability also needs to be looked into. Lastly, the scheme should not merely be about construction and contracts but develop responsible and responsive relationship of the community with water.

⁴ https://www.unicef.org/wash/files/Accountability_in_WASH_Explaining_the_Concept.pdf



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