National Conference

Scaling Up Sector Reforms: Looking Ahead, Learning from the Past

28-29 April, 2006 | Gandhinagar

Rural Drinking Water Supply and Sanitation

THEMES

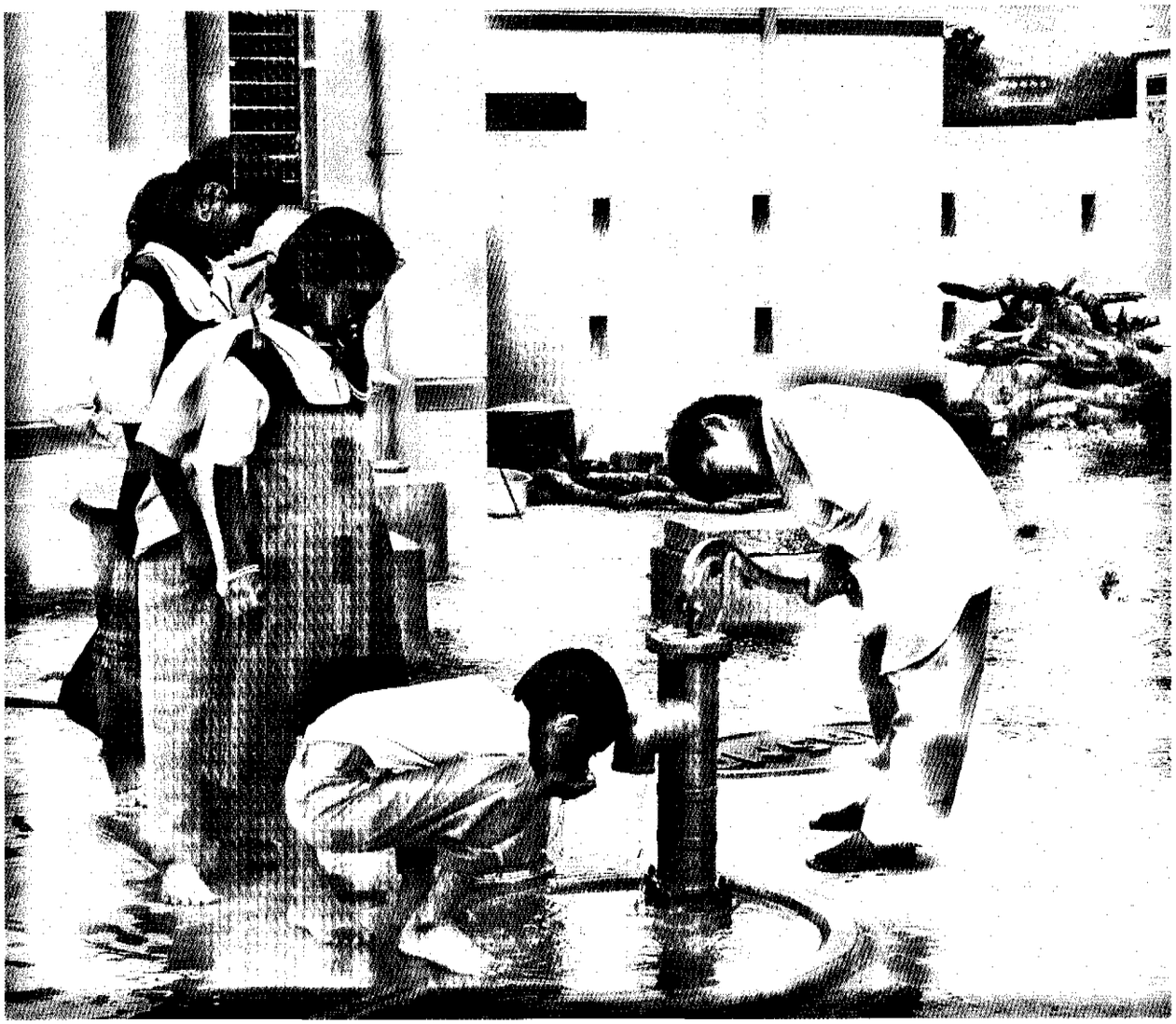
- Institutional mechanisms and partnerships
- Community empowerment
- Assuring safe drinking water
- Technological options and alternatives
- Sanitation challenges
- Scaling up: lessons from the past

WASMO
Government of Gujarat

The Roval Netherlands

Dedicated to the rural communities of Gujarat

Their involvement in the planning, creation and management of drinking water supply systems and sanitation facilities has provided a learning ground and road map for other rural communities



Reform programme in Gujarat at a glance

S. No.	Project Name	Total Pani Samiti formed	Total no. of villages taken up	No. of villages completed	Work under progress
1	Sector Reform Pilot (SRP) project*	833	833	833	0
2	Ghogha project*	82	82	82	0
3	ERR project	1260	899	399	500
4	Swajaldhara programme	1436	947	346	604
5	Sector Reform Scheme (State)	889	561	110	451
	Total	**4500**	**3322**	**1770**	**1552**

***Project Completed**

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The Royal Netherlands Embassy

Guidance and support : Dr. Jaipal Singh
Concept : R K Sama, Bouwe Grijpstra and Indira Khurana
Advisory Committee : Ashoke Chatterjee, Sudarshan Iyengar,
R K Sama, Bouwe Grijpstra,
Indira Khurana and Madhavi Purohit
Content development
and editing : R K Sama, Indira Khurana and Madhavi Purohit
Coordination : Madhavi Purohit
Layout and design : Arif Khan
Cover composition : Kalpesh Purohit and Radhika Shah
Publication support : D and C team

Preface

Four years have now been completed since sector reforms are being implemented by WASMO in Gujarat's drinking water and sanitation sector. These reforms have brought the community-managed approach to the fore, where village communities are equal partners in the creation, operation and maintenance of water supply and sanitation systems. This has changed not only the way drinking water is perceived by communities, but also the delivery mechanisms for bringing about water security.

The time has now come to reflect and take stock of the considerable achievements under the reforms. It is also a time to look at the future and understand that there are great strides that still need to be taken if all 18,539 villages are to be covered. It is for these reasons that WASMO decided to organise a two-day conference in April 2006, 'Scaling up sector reforms: Looking ahead, learning from the past'.

After intense work on the field, there is a wealth of experience available that provides keys for scaling up sector reforms, ensuring sustainable results and strengthening implementation. Simultaneously, in attempting to cover all villages, there are also certain issues and questions that need to be addressed. The conference will provide a platform for WASMO to share its experience and learn from those facing similar challenges.

This compendium of papers has been prepared by WASMO's own professionals and eminent persons intimately connected with the WATSAN sector. The papers dwell on various themes concerning technical, social and management aspects, with communities being the common underlying concern. They draw upon the insights gained through the implementation of five WASMO programmes including Ghogha Project, ERR Programme, Swajaldhara Programme, Sector Reform Scheme (State) and Water Quality Monitoring and Surveillance Programme.

In the preparation of this compendium, special thanks are due to the Advisory Committee, particularly Mr. Sudershan Iyengar and Mr. Ashoke Chatterjee, who extended their valuable support. The earnest efforts put in by Mr. Binoy Acharya and Mr. Sachin Oza by making field visits that formed the basis of their papers also deserves mention. Finally, thanks are also due to the members of Implementation Support Agencies and other partners who willingly made their contribution to the compendium.

The detailed and large amount of valuable material that came in for creating the compilation is a positive indication of the wide interest this sector generates. In conclusion, I hope the beginning made with the cross-learning process will continue beyond this book.

April 2006

Dr. Jaipal Singh
CEO, WASMO

Objectives and the expected outcomes of the conference

National Conference on Scaling up Sector Reforms: Looking Ahead, Learning from the Past 28-29 April, 2006

Community management has become the leading approach for implementing rural water supply projects. Although a wide range of different methods and techniques to implement community managed water supply projects are used, they all aim at strengthening the capacities and willingness of communities to take on the ownership and responsibility of managing their water supply systems after the implementing agency has handed over the project

In Gujarat, WASMO was established with a very specific purpose: A mission mode strategy to facilitate the decentralisation process for a paradigm shift from supply-driven to a demand-driven approach in the water supply and sanitation sector. Three years since it was founded, WASMO would like to share its experiences with others. The National conference on 'Scaling up Sector Reforms: Looking ahead, learning from the past' has therefore been organised with the following objectives:

- To share WASMO's experiences and examine the methodology that it has followed;
- To learn about alternatives from experiences of other movers and actors in the water and sanitation sector in the country;
- To reinforce the concept of dual water supply and development of local sources; and
- To explore the potential of village level institutional framework to promote overall development

In the context of decentralisation, there is an environment for development of policies and frameworks. WASMO would like to deliberate on the following issues during the two days at the conference with other stakeholders in the water and sanitation in the country. The conference is to get people together on a common platform for sharing of emerging experiences and thoughts and provide a mutual learning opportunity

The key issues to be addressed in the conference are given below:

1. Sustainability of systems

   For water supply and sanitation systems to be meaningful, they need to continue to deliver the benefits over a considerable period of time after the projects have been completed and handed over. For the drinking water systems to be able to provide adequate and safe water to the communities, it is imperative that they be well-maintained and are sustainable over a period of time. Particularly, in water stressed Gujarat, source sustainability and O&M of systems play a very crucial role.

Key Issues

In this context the critical issues would be the capacities of the communities, both in terms of technical skills to carry out minor local repairs and maintain finances; and in terms of fixing tariff structure and contributions needed to meet recurring costs of salaries to caretakers, repairs, spare parts, transport, etc. Source sustainability through WRM and conservation ethics will lead the systems to deliver for longer durations.

Outcome expected

1. What is the institutional support that they require?
2. What incentives may be granted for supporting the panchayat/Pani Samitis that have managed their water supply systems and service level satisfactorily?
3. Will incentives bring efficient management and reduce the wastage of funds?
4. Will community be able to take care of equity issues?

2. Dual water supply

A major concern for expanding water-supply and sanitation services is to select technologies and institutional options that users would be willing to pay for, and that would also ensure good public health and sustainable environmental conditions. WASMO's approach uses a dual water source strategy in a majority of the villages. Local water sources are used which are backed up by bulk water transfer from the 'State water grid' that is being formed. In the current WASMO projects, local water sources are given importance and their sustainability is ensured through appropriate water conservation, planning and construction. Regular water supply through centralised network of bulk supply pipe lines may not be secured and increasing demand of water for matching facilities of urban standards, in addition for milch animal cannot be met by the piped water system as it is designed to provide 40 to 50 lpcd.

Key issues

- How to make them interested in dual supply supplementing each other and used for different needs?
- In cases where local sources are available, the communities need to be made aware of the benefits of safe water, which calls for intensive IEC and capacity building. Piped water which may be safe is used for drinking and kitchen needs, while local water is used for other purposes.

Outcome expected

- The question here is: How can it be ensured that these local drinking water sources will not be neglected? At the same time, when water is available in local sources, how to build communities' willingness to pay for safe alternative source?

3. Women Empowerment

Minimum facility for effective water supply and sanitation is motivation for women In most of the villages, the contributions start flowing once women visualise adequate, regular water supply at their door steps, which not only ends their drudgery of fetching and searching for water, but also ensures that piped water to the houses plays an immense role in instituting and sustaining sanitation system and hygiene. This facility needs to become a part of water and sanitation programme. As bath room facilities in every house may not be possible, then perhaps community bathrooms and washing facilities may be possible. We have explored this possibility. Can we universalize it and find out way to succeed?

Experience world over has indicated that hygiene, sanitation and access to adequate domestic water are impossible to achieve unless women are empowered to take key decisions of what and how so as to have say in management and have control.

Key issues

- The challenge is to accelerate the creation of opportunities for women in leadership roles at the village and community level.
- Merely being members of Pani Samiti/ Gram Panchayat cannot ensure building leadership.
- Token leadership has yet to get morphed into meaningful authority.
- The success of sector reform would depend on how we mobilise and empower women so that it creates effective demand, promotes equity and put women in charge.
- It would be of utmost importance to bring down barriers to women's participation.

Outcome expected

- Challenge is to find out ways that women get interested and lead the programme and get empowered to demand regular, adequate, safe water and sanitation facility.

4. Sanitation

Key issues

- To prepare community in mass for adoption of better hygienic practices through effective IEC.
- Water supply is the motivation for sanitation and its inadequacy is a cause of not adopting safe sanitation practices.
- Thus water supply and sanitation has to go together.
- But due to administrative causes in many states it is being addressed by separate organisations and the enormous energy which is required to put these issues to the community, can be saved or usefully utilised, if done through one agency.
- How to do it is the question?

Outcome expected

- Effective IEC strategy
- Recommendation to put together the water supply and sanitation programmes at least at implementing and facilitating level.

5. Extent of community ownership

Key issues

- Working together and being able to influence each other is the foundation for community ownership.
- One of the areas in which panchayats may fail their constituencies is in keeping them in dark about fund received. More village level information sharing systems have to be developed so that crucial information reaches people directly.
- The question is that in those villages, where the community is not able to work together and is not able to influence each other, can community be realistically expected to take meaningful ownership of system/ programmes essentially run by the Panchayat ?
- What are the systematic issues that need to be explored to ensure that it is truly system driven?

Outcome expected

- The questions to be addressed are, how can the Gram Panchayat and Pani Samiti be strengthened? Will PRIs be able to involve the community in management issues directly and how ?

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INSTITUTIONAL MECHANISMS AND PARTNERSHIPS

Water and Sanitation Management Organisation (WASMO): A Special Purpose Vehicle for community managed drinking water and sanitation

An institutional innovation that incorporates the philosophy of the government, NGO and corporate world, WASMO has laudable achievments to its credit. However the organisation should be geared to meet future challenges.

Sudarshan Iyengar

Summary

In this paper the role and functioning of Water and Sanitation Management Organisation (WASMO) is described. The paper starts with a brief historical account that led to the formation of WASMO and goes on to spell the vision and mission of WASMO. It outlines the role, strategies and programmes. It then discusses the working of WASMO since it s inception and analyses the challenges that lie ahead.

What is WASMO?

Water and Sanitation Management Organisation (WASMO) is an independent and autonomous organisation set up in May 2002 by the Government of Gujarat. It is registered as a society under the Societies Registration Act 1860 and also as a Public Charitable Trust under the Bombay Public Trust Act, 1950. Thus, WASMO is a non-government organisation (NGO). WASMO has a Governing Body and an Executive Committee. The Board is chaired by the Secretary, (Water Supply), Government of Gujarat. Join Secretary (Projects), Water Supply and Chief Executive Officer, WASMO is the Member Secretary. The Governing Body has five non-official members also. The structure of the Governing Body and the Executive Committee is given in Annex 1.

WASMO: A Special Purpose Vehicle (SPV)

It is known that Gujarat is one of the most water stressed states in India. It is not surprising therefore, that the state government has always accorded high priority to provide safe, assured and adequate drinking water to the people. In persuance to its committment to provide drinking water to the residents in the state, the Gujarat government has already initiated certain innovative experiments in creating rural infrastructure. All non-covered (NC) and partially covered (PC) habitations have been covered under various schemes. In a Survey conducted in 2004 by the Government of Gujarat, out of 34,845 total habitations, 9,628 have turned 'no source'. Out of more than 18,000 villages 8,252 villages have quality problem of some kind. In the preface to the Annual Report 2003-2004 of WASMO, its Chairman and Secretary, Water Supply to the Government of Gujarat wrote, "Over the past few years the state government has taken several significant steps to find a permanent solution. Bulk transfer through the ongoing Narmada canal-based drinking water supply project and Sujalam Sufalam Yojna with the regional water supply schemes will provide safe drinking water to around 14,000 villages and 174 towns. While the pipeline network will supply water up to the village sump, in-water supply systems will be responsibility of the user community....."

Making the user community responsible in the villages was a significant shift in the management approach of the drinking water systems. Hitherto, the government department was responsible to create,

Experience from around the world indicates that users must have a stake in water managment

operate and maintain the water supply systems. The department charged a small fee for it through the gram panchayats and that too was not regularly paid in most of the habitations. World over the emerging experience suggested that unless substantial stakes are created for users in creating, operating and maintaining drinking water and sanitation facilities in the habitations, there would not be any permanent and sustainable solutions. This global understanding has pressured a paradigm shift in all the governments. The new efforts are required in institutional innovations. In case of the Government of Gujarat too there was a realisation that the existing institutional arrangements would not serve as vehicle to reach the new found destination. An organisation that would focus specifically on the empowerment of the user communities in the villages had to be conceived. Unlike the conventional drinking water supply departments and its field offices, the new institution also had to address and facilitate creating and strengthening possible in-village sources and environmental sanitation. The new institution had to be flexible, innovative and act as facilitating partner and not as a quick fix provider. When any organisation has a special vision and has to achieve a special mission, it requires a special purpose vehicle to reach the pre-determined destination. Thus, WASMO was created as a Special Purpose Vehicle for empowering the rural water user communities in managing drinking water and sanitation facilities.

Genesis of WASMO

The need for a special institutional arrangement for fulfilling the government's commitment to eradicate water scarcity in Gujarat and to provide safe drinking water on a long-term and assured basis was felt for a long time. However, until the year 2000, internalisation of this insight did not take place effectively in the department. The Royal Netherlands Embassy (RNE) supported Ghogha regional water supply project that was designed as a community managed project had not achieved the objectives in any significant way. In fact, an RNE commissioned Institutional Development Mission that the author conducted with a Dutch counterpart Mr. Jaap Boomsma noted in the debriefing report that the Gujarat Water Supply and Sewerage Board and the Water Supply Department had only a lukewarm appreciation and reception for 'software development'. The 'local source first' approach in the Ghogha project area was hardly regarded as feasible. If at all, it was regarded as disturbing the mainstream 'pipeline supply approach' (for details refer Iyengar and Boomsma, 2000). The mission members blew the whistle and tried to remind the people who mattered in the water sector that priority had to be accorded to community managed systems and follow the paradigm shift from the role of a provider to that of a facilitator. The World Water Forum 2000 had supported the 'water wave' that called for software development in water sector where demand driven approach was to replace the supply driven approaches. The Report had recommended a government supported institution that would promote, support and implement community participation and community based management in water projects. A software unit called Coordination, Management and Support Unit (CMSU) had already come into existence and the Mission had recommended its strengthening.

On January 26, 2001, a severe earthquake hit parts of Gujarat and substantially damaged the water and sanitation facilities in hundreds of villages in five districts; more extensively in Kutch. RNE once again came forward with a huge support and UNICEF also showed interest in water quality issues and community managed rehabilitation and reconstruction of the facilities. NGOs in Kutch also showed eagerness and willingness to become partners in community managed earthquake rehabilitation and reconstruction (ERR) work. The need to set up a SPV was felt more acutely.

Pressures to introduce decentralisation in drinking water supply had begun much earlier, which came from the Government of India. The state also has some earlier history in decentralised drinking water systems at the village level where the local sources were developed with people's contribution in the capital cost. A good account is given in WASMO's Annual Report 2004-05. Although the Gujarat Panchayat Act, 1961 entrusted the responsibility of drinking water to the rural population to the gram panchayats, the effective legal strength came only after the 73rd Constitutional Amendment that established constitutional status of the Panchayati Raj Institutions (PRIs). The gram panchayat with this amendment was made responsible to implement economic development and social justice schemes. The gram panchayat is also responsible for the construction of wells and tanks for drinking water and water distribution at the village level. In Gujarat prior to 1970, the panchayat's were responsible to build, operate and maintain drinking water systems with the help of people's contribution towards capital costs. In the 1970s UNICEF helped significantly in creating hand pump based decentralised water supply systems in which villagers were also trained for maintenance. Lack of fund for repairs with the panchayat and frequent breakdown of the hand pumps led to a general failure of the hand pump programme and villages slipped into 'problem villages'.

NGOs involvement in software aspects of drinking water supply began under the RNE project in 1987 when support for regional pipeline water supply scheme for 72 villages in Santalpur taluka of the then Banaskantha and the present Patan district was supported. NGO involvement also continued as noted, in the Ghogha project in 1994.
In 1995, a Government Resolution (GR) was passed on the formation of the Pani Samiti as a sub-committee of the gram panchayat to provide an institutional mechanism for in-village water supply management.

With Pani Samiti at village level and NGOs involved in software activities, the hardware experts in the conventional institutions at the state and district level found it difficult to adapt to the new environment. The Government in the meanwhile also realised that many habitations were slipping back to problem status because sustainable arrangements were not working out effectively. Secondly, along with the bulk water supply distribution based on pipelines a strong need was felt to supplement, and if inadequate, replace the piped supplies with rainwater harvesting and creation of sustainable local sources. The GWSSB was not the organisation to handle the community managed demand driven approaches. A SPV to drive towards the changed objective became necessary and after careful consideration, WASMO was set up as an institutional innovation in the government. It is perhaps a unique institution in the country in the WATSAN sector.

Vision and Mission of WASMO

Vision

- To enable rural communities to have adequate, safe and sustainable drinking water supply and improved habitat by ensuring empowerment and active community management of natural resources, leading to an improvement in their living standard.

Mission

- Empowering communities to plan, own, construct, manage and maintain their water supply and sanitation facilities
- Ensuring participation of communities and women in managing their water supply and sanitation
- Attaining drinking water security through a combination of local and bulk water supply systems along with village level-infrastructure
- Encouraging and empowerment of communities to adopt best practices on

WASMO was set up as an institutional innovation to meet the challenging demands of sustainable rural drinking water supply and sanitation

Under sector reform, communities become the most important stakeholders

local water resource management, including rainwater harvesting
- Bridging the existing information and knowledge gaps among community on water resource management, water conservation, safe drinking water, hygiene and environmental sanitation issues
- Creating a pool of manpower and strong knowledge base in the water and sanitation sector.

Role of WASMO

Hitherto drinking water for communities in rural areas in India in general and in Gujarat in particular was viewed as a public utility that had to be supplied. Bulk water supply projects were planned and executed and pipelines were laid to take water to the villages. The institutional arrangements consisted of water supply department offices at various levels with mechanics and linemen supervised by the engineers. The infrastructure was created by the civil contractors. Government was squarely responsible for providing drinking water and minimum standards such as 40 lpcd were laid down. All in all, the sector was supply-driven and hence the role was chiefly that of a provider.

As we have seen, with the shift in the paradigm, water business has to change into demand-driven and community managed. WASMO, which has been created as a SPV has to assume a different role. In the changed situation the stakeholders have changed and their stakes have also been altered substantially. User communities now have a very important stake. Since the WATSAN schemes are to be people-centric and community owned and managed, people in a habitat become the most important stakeholders. WASMO has to play the role of a facilitator in this new arrangement.

In June 2005, WASMO has completed facilitating the implementation of a community-based village level drinking water and sanitation programme in 82 villages in the water-scarce Ghogha region of Bhavnagar district and is currently facilitating in 1,260 villages of four districts that were severely affected by the January 2001, earthquake. WASMO has assumed the function of the State Water and Sanitation Mission (SWSM) for taking the Swajaldhara scheme of the Government of India to all the villages in Gujarat. Under these arrangements WASMO has broadened the base of stakeholders. Village communities specially women and children, youth, engineers, workers of the PRIs, NGOs as Institutional Support Agencies (ISAs), scientific and social researchers for impact analysis and quality assessment, finance and accounts experts, professional managers etc. have been identified as the stakeholders. As a facilitator WASMO is engaged in building partnerships among all the stakeholders at appropriate levels.

Strategy and Approach

WASMO's approach is to be a facilitator in developing water and sanitation facilities in villages that are owned and managed by the communities. The basic objective is to create sustainable systems in WATSAN. The key strategies adopted by WASMO for achieving its objectives are the following.

1. Empowerment and strengthening of village level institutions;
2. Emphasis on surface water sources, capturing rainwater runoff to recharge groundwater, roof-top rainwater harvesting, and utilising the bulk water supplies from major river projects of water surplus South Gujarat to water deficient North Gujarat, Saurashtra and Kutch;
3. Building demand-driven, community owned and decentralised local water supply and sanitation systems;
4. Sanitation campaigns in villages to promote hygiene and cleanliness, especially among school children; and,

5. Partnership with like-minded organisations.

WASMO Projects

In a short span of less than four years WASMO has emerged as the key player in the planning and implementation of rural drinking water and sanitation projects. As noted, the RNE has been a key supporter in this venture. The first two projects that WASMO took under its fold for implementation have been financially supported by the RNE. Soon by 2005, WASMO became the main implementing agency for a Government of India's participatory project called Swajaldhara that is planned by the Rajiv Gandhi National Drinking Water Mission. The Mission has identified WASMO as the state level partner and thus WASMO is the State Water and Sanitation Mission (SWSM) for Gujarat. In addition the Government of Gujarat has its own project that is known as Sector Reform Scheme (SRS) being implemented in 11 districts on Swajaldhara principles. WASMO is also keen on correcting water quality issues that affect more than 8,000 villages in Gujarat. The list of projects undertaken by WASMO is given below with brief descriptions.

a). Community-managed Ghogha regional water supply and sanitation project.

The Ghogha project, as it is known, was implemented to provide safe drinking water supply and sanitation facilities in 82 villages in three blocks of Bhavnagar district covering a population of about 200,000. It was implemented with the help of three well-known and committed NGOs working in water and environment sector. With their help in software programme implementation, WASMO has put a Coordination, Monitoring and Support Unit (CMSU) at Bhavnagar that provided technical guidance to the Pani Samitis. The project has been completed with in-village distribution systems, sanitation awareness and school sanitation and environment sanitations facilities. The project has come to an end and in most cases communities have accepted ownership for operation and maintenance. Annex 2 shows the work accomplished under the project.

b). Community-managed water and sanitation programme in earthquake-affected villages of Gujarat (known as ERR project)

The ERR project covers 1,260 villages in four districts that were severely affected by the January 2001, earthquake. The project is to provide safe and secure water and sanitation facility in each village. About 40 NGOs have been associated as partner ISAs for orienting and capacitating the village communities. Three CMSUs located in Bhuj (Kutch), Jamnagar and Surendranagar provide technical guidance in preparing village action plans. In more than 600 villages, action plans have been prepared and in around 1000 villages sanitation drives have been completed and school children sanitation work has been accomplished. Annex 3 contains project details.

c). Swajaldhara programme

Swajaldhara is a nationwide programme to implement community owned and managed drinking water programme. WASMO coordinates and facilitates the Swajaldhara programme as the State Water and Sanitation Mission in 13 districts in Gujarat. The district level partner is the District Water and Sanitation Committee. WASMO has formed Core Teams consisting of engineering and social sector professionals to support the DWSC. Pani Samitis are being formed at the village level and village action plans will be prepared and implemented. Annex 4 shows progress until March 2005.

In less than four years, WASMO has emerged as a key player in rural drinking water supply and sanitation

The empowerment of rural communities - specially women - has been one of the key achivements of WASMO

d). Sector Reform Scheme (State)
Before the Swajaldhara scheme the Government of India had supported Sector Reform Scheme. It also works on the same lines as Swajaldhara. Communities are at the centre. After the introduction of Swajaldhara, Sector Reform Scheme (State) has been taken up by with state government support. The Scheme is implemented in 11 districts. With Swajaldhara in 13 districts, all 25 districts in the state are covered under demand-driven community based WATSAN projects. Under this project Pani Samitis have been formed in 525 villages and village action plans have been prepared. Annex 5 contains details of implementation.

e). Water Quality Project
Water quality is a serious issue in the villages of Gujarat. A survey conducted by the government in 2003 identified 8,252 villages out of about 18,000 villages in Gujarat that suffered from fluoride, salinity and nitrates contamination. Fluoride contamination affected water in 4,341 villages, salinity affected water in 2,575 villages and nitrates affected 1,336 villages. The environmental cost on individual and society would be immense if the problem remains unattended. WASMO set a Water Quality Cell in July 2004 with an objective to institutionalise a water quality surveillance system at the grassroots level. A three tier system has been set up and WASMO oversees all the three levels.

It is expected that Pani Samiti and/or the gram panchayat will develop expertise in carrying basic water quality tests at village level. WASMO with the help of ISAs and Core Team members would build capacities in the communities. WASMO also supplies the field test kits. Each village will be equipped with chloroscopes to check residual chlorine and specialised kits are to be supplied for checking nitrate, fluoride, dissolved solids etc.

At district level the DWSC will coordinate water quality activity and will act as the referral centre for higher level tests as and when necessary. Special labs, college labs and labs with NGOs will be set up and thus more partners will be brought together in water quality programme.

WASMO as SWSM will be the central coordinating agency. The Gujarat Jalseva Training Institute (GJTI) that already exists as a state level training institute since long will act as the state level referral.

WASMO's accomplishments as SPV

The Chief Secretary to Government of Gujarat in the foreword to the Annual Report 2004-2005 says, "In the three years of its existence, WASMO has shown an impressive track record. Through the various programmes, the organisation is facilitating community-managed in-village drinking water supply and management in all districts of the state. Decentralised water supply systems currently cover more than 3,300 villages.... The empowerment of rural communities, especially women, has perhaps been one of the most satisfying achievements of these programmes". Similarly, Secretary, Water Supply department and Chairman of WASMO in a preamble to the same report says, "The organisation is now three years old. In these three years, WASMO has become a household name in Gujarat. Working with like-minded people in various institutions, civil society, government agencies and the village community, WASMO has added a new meaning to its belief in building partnerships and working together".

Compared to the situation that obtained prior to the setting up of WASMO with respect to

coverage of villages under the top-down delivery systems, WASMO has begun with a big jump. In a matter of three years only to start programme implementation facilitation in 4,500 villages is indeed a substantial achievement. The monetary implication of the work amounts to over Rs. 4250 million. The work is being facilitated with the help of many partners; communities and ISAs being the main ones.

The first project facilitated by WASMO was an ongoing one. The Ghogha project was taken up in Phase II. It involved creating community based in-village distribution management system and environmental sanitation development in 82 villages. Although the 'local source first' was the objective of the RNE supported project, it settled as a regional pipeline project. Some efforts were made by WASMO by the time the project ended in December 2005, in creating supplementary sources in the form of check dams, tanks and bore wells. Looking closely at annex 2, the three ISAs have done well in the software activities. The CMSU also became relevant largely because of the motivation, orientation and capacity building attempted fairly successfully by the ISAs.

The second major project taken up by WASMO for facilitation was the earthquake rehabilitation and reconstruction project (ERR). Learning from Ghogha was significant. ISAs had played a critical role in mobilising communities, although the nature of the project quintessentially remained a supply-driven one. WASMO recognised the need and relevance of NGOs in partnership and invited more than 40 NGOs to act as ISAs in the ERR project. In 1,260 villages the ISAs have by and large done well. The project is to be completed by 2007. Local resources development has apparently been accorded priority. Water quality surveillance has been set up. The processes and outcomes generated out of the ERR project will be very crucial for the future of WASMO. As on now, the promise is high.

The Swajaldhara and SRS are two extensive programmes. They cover all villages in Gujarat. The programmes are to address all problems pertaining to WATSAN including the quality issue. As SWSM, WASMO has to guide the entire state in the sector. The DWSC is being supported by Core Team and the ISAs. Core teams along with engineers from GWSSB have to act as CMSU. This is going to be a test. Within a short span of three years WASMO has taken up a huge responsibility.

A major achievement of WASMO in a short span of its existence is in influencing the mindset of people. Hitherto people had become used to depending completely on government agencies for supply, operation, maintenance and repairs of water and water delivery structures. People also were never serious about the payment of water charges. WASMO has changed the mindset of people by creating awareness among people. It has done this by partnership with NGOs and village level institutions. NGOs have helped in community mobilisation, capacity building, creating awareness and sensitising people.

WASMO has created an environment at the state level where the legislature, executive and other public agencies have recognised the existence of demand side in WATSAN sector. Despite the fact, that a lot more has to be achieved in this direction, it has an important beginning. This could not have been accomplished if WASMO was not designed as it has been.

How does WASMO function?

According to organisation behaviour experts WASMO follows a matrix structure which facilitates coordination between a multiplicity of complex and interdependent activities. To describe the structure in a simple way, WASMO is governed by a governing body and is head by the Chief Executive Officer who is a government officer. He directly heads and supervises technical cell, project

WASMO has been able to create an awareness amongst the legislature and executive about the importance of demand-driven drinking water supply

WASMO incorporates the best practises of the government, NGO and corporate organisations

management units, documentation unit, finance and accounts and management support unit. Out of these units the technical cell guides water supply cell, water resource management cell, environmental sanitation cell and water quality cell. The management support unit guides administrative cell, HRD and establishment cell and MIS Cell.

WASMO has a multidisciplinary team with professionals from engineering, social work, management and finance, environmental sciences, communication and documentation. The composition is young and drawn from the open market on contract basis. Recruitment is transparent. Systematic review is carried out after every six months to providing financial up gradation and other incentives. A performance appraisal system is in place. A large number of professionals are young and they are guided by relatively very senior professionals most of whom are on deputation from the government departments. WASMO has been funded for institutional support. The support is utilised to attract good professionals from the market and they are offered competitive remunerations. WASMO organises training for capacity building among its staff team and the ISAs. Four workshops and training programmes have been organised during 2004-05.

Strengths of WASMO as an institution

Most stakeholders recognise that WASMO has emerged as a different and effective organisation. Gujarat government in past experimented with corporate model of governance and management to plan and implement projects in agriculture, industry and services sectors. But barring a few very professional ones most such autonomous and quasi corporate entities slipped back into government bureaucracy. In the Annual Report of WASMO for 2004-05 in a section on Institutional Support following is noted, "After GoI introduced sector reforms in rural drinking water supply sector a distinct need was felt for establishing an organisation that could develop and promote the hardware as well as software aspects of the reforms in an equitable, sustainable and transparent manner. Prior to the reforms, the rural drinking water sector was largely perceived as a technical exercise, with a focus on engineering. However, the reforms ushered in a new approach to the sector, with the communities in charge of planning, implementation, operation, maintenance and management of water supply and sanitation system" (p 58).

One may note that the pure administrative department could not deliver and so also the corporate version of the government department. A third form tried out to achieve the newly set objectives in WATSAN sector under sector reforms is that of civil society organisation popularly known as NGO. As noted in the beginning WASMO is a registered Society and a Public Trust. Efforts are on make it a centre of excellence in WATSAN sector. It is visualised that WASMO will have best of government, corporate and NGO culture. Strong network and linkages with national and international institutions including government organisations, community and village-level organisations, research institutions and civil society organisations were to be attempted. A special project namely, 'Institutional Support to WASMO' is being implemented to strengthen the organisation.

Physical environment of the WASMO head office has been matched with that of a corporate body. For quite sometime now the government departments have tried to improve the external physical environment by getting good interiors designed and they are also relatively expensive. If it has helped in improving the productivity and the mindset, it should be a useful social cost.

RNE which sponsors the Institutional Support to WASMO also extended External Advisory

Services (EAS) to help fill the gaps and specific institutional needs. A team of national and international experts assists the organisation in effective policy and strategy development, strengthening of organisation and institutional structure and facilitation of community-managed rural water supply and sanitation. WASMO got the support till the end of 2005.

WASMO also has an interesting feature. Giving up the normal hierarchy, vehicles are made available to functionaries who have to be mobile. Quick and assured access has made functionaries more mobile and work output has improved. Similarly, office automation and internet connectivity, has given scope to build database, library, reference material etc. The environment in general helps in developing professionalism. Under the institutional support programme major activities have been the following.

Human Resource Planning and Selection Process

A multidisciplinary team has been built consisting of young professionals who have had crucial experience in the sector. The team is not dominated by engineers selected through a government process. The positions are advertised in the open labour market and a team of selectors drawn from both the government and outside, but having expertise in the sector interview the candidates and judge the suitability and competence. Personnel are hired on contract by offering handsome pay packets. A comprehensive review process is in place for considering extension of the contracts and financial incentives.

Training and Capacity Building

Orientation and training programmes are organised at regular intervals. The themes have been water, sanitation, hygiene promotion strategy; drinking water and sanitation problems of rural areas; rainwater harvesting); and general orientation. The orientation and training programmes have not been limited to the WASMO team members only, but the ISAs have also been included. Some objectivity has been brought in selection of NGOs especially in ERR, Swajaldhara and Sector Reform Scheme, although it is difficult to have a full-proof system.

Networks and Partnerships

WASMO has developed partnerships with GWSSB, Rural Development Department, Forest Department, Health and Family Welfare Department and PRIs. At the national level it has partnership with the Rajiv Gandhi National Drinking Water Mission. It should be mentioned that some partners are given as they are integral part of the programme. In addition, WASMO has sought networking with The Energy and Resource Institute (TERI), WHO, UNICEF, NID, WSP South Asia, IRMA and other NGOs and research organisations in the state and in the country.

Challenges ahead

WASMO has been formed as a SPV to implement people centred participatory WATSAN programmes in Gujarat. It has evolved over time with some innovative projects that were supported from external agencies such as RNE. As stated earlier the SPV has been put in place to help in arriving at the paradigm shift i.e. to shift the government's role from a provider to a facilitator. Formation of WASMO is a step in the right direction since earlier efforts by the government departments in arriving at sustainable solutions for WATSAN have met with very limited success. The implementation vehicle has to be flexible and willing to partner with people and people's organisations. The formation of WASMO has in built flexibility and autonomy. It has functioned with a fair degree of autonomy. The achievements that have been recounted earlier are significant and yet there is a long way to go. First, there has to be an independent assessment of the experiment

Carefully selected staff are provided a conducive environment and training to enhance output

Challenges faced by WASMO in the future include maintaining core competency and consistency with its vision

thus far, although to assess such SPVs before the completion of five years might not be very effective.

WASMO has challenges on two fronts. First is the working of the organisation itself. In organisation behaviour's terminology a good organisation should have the core values and competency. WASMO with clarity in vision and mission has made an attempt to build core values and has hired competent people. They should be retained and allowed to function to their capacities. High turnover of professionals has to be avoided. This would require a regular assessment.

The second area of challenge is the consistency between the vision and the working. Although WASMO has set its mission of developing people centred participatory WATSAN projects with top priority to 'local sources', its major partner namely the state government is pushing the supply driven approach. This contradiction has potential to weaken the partnerships as well as the special purpose of the vehicle itself. There is likelihood of differing perceptions about the feasibility and viability of developing local sources for drinking water, but the if vision and mission is to be believed, it should be receiving priority over the bulk water supplies. According priority would depend on the WASMO's capacity to uphold the core value of partnership. WASMO, as an autonomous organisation has to be very cautious about its role as a partner. It is very likely that in order to push its own agenda of supply driven approach, the state government would pressurise WASMO to follow and make the partners also to follow and make it a condition for the other partners to continue partnership.

Presently, the governing body of WASMO is dominated by government officers and it is headed by the secretary to government. In an international discussion of WATSAN issues, Gujarat civil society had prepared a document 'Jaldisha', which has suggested an autonomous authority to facilitate people centred WATSAN programme in the state. WASMO, as it is formed now, is a distant cousin of the identity that has been created in Jaldisha. Objectively it appears that unless WASMO is governed effectively by the civil society stakeholders, government stakeholders will always find it difficult to carry on substantially the demand driven and participatory WATSAN programmes. Thus, the challenge for WASMO is critical.

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Annex - 1

Governing Body of WASMO

Secretary (Water Supply), Government of Gujarat	Chairman
Secretary, Rural Development, Government of Gujarat	Member
Secretary, Finance, Government of Gujarat	Member
Managing Director, Gujarat Water Infrastructure Limited	Member
Member Secretary, GWSSB	Member
Chief Engineer and Additional Secretary, Water Supply Department Government of Gujarat	Member
Up to 5 non-official members to be nominated by the Government of Gujarat	Members
Joint Secretary and Mission Director RGNDWM, Department of Drinking Water Supply, Government of India	Member
Joint Secretary, Water Supply, and Chief Executive Officer, WASMO	Member Secretary

Executive Committee of WASMO

Secretary (Water Supply), Government of Gujarat	Chairman
Member Secretary, GWSSB	Member
Chief Engineer and Additional Secretary Water Supply Department Government of Gujarat	Member
Non-official members to be nominated by the Governing Body of WASMO	Member
Joint Secretary, Water Supply, and Chief Executive Officer, WASMO	Convener

Source: Annual Report 2003-2004. WASMO, Gandhinagar

Annex - 2

Work accomplished under Ghogha project as on December 31, 2005

Water Supply Scheme

Out of 82 villages, 42 VWSS has been constructed by the agencies/contractors while in 40 villages work has been carried out by respective Pani Samitis.

Under this component, agencies/contractors have completed construction of VWSS in all 42 villages. Pani Samitis have completed work of 40 VWSS. The in-village water supply can be summarised as follows:

Sr. No.	Particulars	Work done by		Total
		Agency	Pani Samiti	
1.	Total villages	42	40	82
2.	Handed over to PS	42	40	82

Major interventions in Water Resource Management

Total WRM interventions(Phase I & II)	Target	Completed
Large / Medium Check Dam	25	25
Medium / Small Check Dam	50	50
Repairing of Pond	24	24
Construction of Pond	21	21
Tidal Control in Major Stream	3	3
Grand Total of Phase-I & Phase- II DPRs	123	123

Minor interventions in Water Resource Management

WRM interventions	Target	Completed
Injection Well	10	10
Well Recharging	124	124
Well Up gradation	83	83
Drainage of Water Points	147	147
Total	364	364

Environmental Sanitation

Works	Target	Completed	No. of villages covered
Demo soak pits	312	312	34
Subsidised soak pits	22441	22441	75
Demonstration Latrines	456	456	81
School Sanitation	149	149	81
Dust Bins	795	795	81
Slogans	1854	1854	82
Centralised waste water disposal system	-	-	6
(in villages, where construction of soak pits was not possible)			

Pastureland development

Pastureland development activities have been completed in 658 ha in 36 villages. After completion, the area covered under Pastureland development has been handed to the Pani Samitis trained by the Forest Department for its further maintenance.

Operation and Maintenance

As a part of creating sense of ownership among the community and for sustainability of scheme, contribution from each household for O&M was made prerequisite for VWSS. In 39 villages, 100 per cent annual O&M contributions have been collected while in 18 villages the collection is between 51 to 100 per cent and in 25 villages the collection is between 1 to 50 per cent.

Financial progress

The total funding for the seven-year project is Rs 5,960.41 lakhs. Total cumulative expenditure incurred is Rs. 5934.68 lakhs (estimated figure as accounts are being settled) against the project provision of Rs. 5960.41 lakhs, i.e. 99.56 per cent utilisation of the project funds.

Annex - 3

Work accomplished under ERR project as on February 28, 2006

Physical progress of the project

S. No	Activities	Planning till March-06	Districts			Achievement as on Feb.06
			Kutch & Patan	Jamnagar	Surendrangar	
1	Introductory meeting	1260	977	146	137	1260
2	Conducting Baseline survey	1260	816	159	139	1114
3	Pani Samiti formed and supported by the Gram Sabha	1260	864	167	151	1182
4	Preparation of VAP	1260	690	149	141	980
5	Finalisation of VAP with help of CMSU	1260	630	146	135	911
6	Acceptance of VAP by the Gram Sabha	1260	593	139	129	861
7	Implementation mechanism and disbursement of funds (Release of 10% advance)	1260	504	139	129	772
8	Work completed or nearing completion	685	302	22	56	380

Financial progress

Funds have been disbursed in 772 villages and Rs. 72.04 crores has been utilised from the funds planned as on February 28, 2006

Annex - 4

Work accomplished under Swajaldhara programme as on February 28, 2006

Presently 13 districts are covered in the state under Swajaldahra programme, which includes Ahmedabad, Anand, Banaskantha, Bharuch, Bhavnagar, Junagadh, Panchmahal, Patan, Rajkot, Sabarkantha, Surat Vadodara and Valsad.

Physical Progress of the programme

Total 833 in-village water supply schemes amounting to Rs. 7412.18 lakh have been accepted and approved by VWSC/Gram Panchayats and 734 schemes amounting to Rs. 6070.81 lakh have been approved by DWSCs. Till date, works of 315 schemes have been completed and commissioned.

Financial progress

Under Swajaldhara programme, Rs. 1222.30 lakh has been received from Government of India towards first installment for the allocation of the year 2005-06. Year-wise financial progress is as under:

(Rs. In lakhs)

Year	Allocation of fund	Funds received from GOI	Funds transferred to DWSCs	% exp. by WASMO	Exp. by DWSC	% exp. by DWSC
2002-03	167.96	162.53	157.53	96.92	156.46	99.32
2003-04	765.56	765.56	765.56	100.00	765.56	100.00
2004-05 (Regular allocation)	826.42	826.42	826.42	100.00	823.42	99.64
2004-05 (Add. allocation)	1,173.67	880.25	981.25	111.47	908.24	92.56
2005-06	1629.73	1222.30	1221.54	99.94	805.11	65.91
Total	4,563.34	3,857.06	3,952. 30	102.47	3458.79	87.51

For the period from 2002 to 2006, Government of India has allocated total fund of Rs. 4563.34 lakhs and so far, fund of Rs. 3857.06 lakhs has been released to Gujarat. WASMO has transferred Rs. 3952.30 lakhs to various DWSCs on the basis of allocation made and these DWSCs have spent an amount of Rs. 3458.79 lakhs (i.e. 87.51%) towards payment to VWSCs.

Annex - 5

Work accomplished under Sector Reform Scheme (State) as on February 28, 2006

The Sector Reform Scheme (State) is a Gujarat government-funded community-based water and management project being implemented in 11 districts of Gujarat. The project was launched in November 2004 to provide in-village water supply and sanitation facilities in the districts of Amreli, Dahod, Dangs, Gandhinagar, Jamnagar, Kheda, Mehsana, Narmada, Navsari, Porbandar and Surendranagar.

Physical progress

Under SRS (State), total 525 in-village water supply schemes amounting to Rs. 4850.37 lakh have been accepted and approved by VWSC/Gram Panchayats and 458 schemes amounting to Rs. 4063.45 lakh have been approved by DWSCs. Till date, total 110 schemes have been completed and commissioned.

Financial progress

Under SRS (State), for the year 2004-05 and 2005-06, allocation of Rs. 1500.00 lakhs each i.e. Rs. 3000.00 lakhs have been made and fund of Rs. 3000.00 lakh have been released to WASMO by Government of Gujarat. WASMO has transferred Rs. 2695.00 lakh to various DWSCs on the basis of allocation made and these DWSCs have spent an amount of Rs. 1953.31 lakh (i.e. 72.48%) towards payment to VWSCs. Detailed status of fund under SRS (State) is as under:

(Rs. In lakhs)

Year	Allocation of fund	Funds *received* from GOG	Funds *transferred* to DWSCs	% exp. by WASMO	Exp. by DWSC	% exp. by DWSC
2004-05	1500.00	1500.00	1500.00	100.00	1438.48	95.90
2005-06	1500.00	1500.00	1195.00	79.67	514.83	43.08
Total	3,000.00	3,000.00	2,695.00	89.83	1953.31	72.48

Village level institutions for decentralised drinking water supply: learnings from WASMO programmes

If nurtured well, Pani Samitis have the capacity to deal with other village development programmes in the true spirit of decentralised self governance

Binoy Acharya and CMSU, Bhuj

Summary

Through its various programmes covering more than 3000 villages, WASMO is involved in the development of decentralised, community-managed water supply and sanitation systems. Community participation through the formation of Pani Samitis with well defined roles and responsibilities is at the centre of all programmes. This paper tries to examine the effectiveness of the Pani Samiti and Gram Panchayats in ensuring decentralised and equitable drinking water supply in rural Gujarat. In the process of examining the structure and role of the decentralised community based instrumentalities, the paper tries to develop insights on wider scope for the programme success particularly for scaling up and wider coverage.

Introduction

"WASMO is an autonomous organisation, established by Government of Gujarat to promote, facilitate and empower rural communities and village panchayats to own, operate and manage their in-village water and sanitation system" (WASMO – Annual Report 2004-05). The programme currently covers more than 3,000 villages and aims to reach all the villages of Gujarat in the coming years. The programme is rooted in strong community participation mobilised through Pani Samitis and panchayats. A Government Reslution (GR) was passed in 1995 and again amended in 2002 on formation of the Pani Samiti as a sub-committee of the Gram Panchayat for creation of infrastructure for water distribution, to ensure effective operations and maintenance (O and M) and collect users fees. The constitutions of the Pani Samiti and its functions are fairly defined. For such a large scale project a certain degree of formalisation of structure and procedure is an essential requirement.

This paper is prepared at the request of WASMO, not as a commissioned paper, but as a third party objective assessment of the programme, particularly the effectiveness of the local institutions. The author had a fair understanding of the programme, not as a stakeholder of the project but as a professional with interest in the development programmes in Gujarat. This paper is developed based on reading of background information on WASMO, discussion with State and District level programme support units officials and field visits to 8 villages in Bhuj and 2 villages in Ahmedabad district.

During the field visits in-depth discussion were held with Pani Samiti members and panchayat representatives. Infrastructure development on water resources and distribution were also visited. General discussions were held with villagers and women to assess the satisfaction level. It needs to be mentioned at the outset that taking 10 villages is not a representative sample to derive any conclusion. The

The continuity of service provision for all is a critical factor in developing user confidence

observations made in the paper may not be treated as research findings. It is only an attempt to draw insights and to articulate issues for further discussion on the topic.

The reports and documents of WASMO mentions a wide range of contributions of the Pani Samitis – community mobilisation, preparation of participatory village action plan, building consensus for contribution and water tariff, monitoring quality of physical activities, developing O and M modalities and developing a sustainable water distribution system. In many places the active Pani Samitis members are women and elected PRI representatives. WASMO through its own staff and ISAs provides support to the local decentralised institutions till the programme is directly managed and run by the villagers. The support period ranges from 12 to 24 months.

The role of Pani Samitis are similar in all the villages as defined in the project documents. However, there is a difference of emphasis in its role. Some of the notable differences are in the following areas.

1. Sustainability of the institutions
2. Participation and empowerment process
3. Demand for project support

Sustainability of the institutions

The programme is unambiguous with regard to sustainability of the local institution - the Pani Samiti as it is rooted with the mandate of the Gram Sabha and functionally linked with the Gram Panchayat which is a constitutional, democratic governing institution. The village specific projects are developed with the action plan and demand of the Gram Sabha and the Pani Samiti facilitates to make the programme community owned and managed. The norms, rules and practices on water resource management and sharing are developed by the villagers. Each Pani Samiti develops its own norms which is collectively understood, respected and observed. The norms are clear with response to roles, contributions, user identification, types of use and tariff structure.

The factors of institutional sustainability as articulated in the development literature are survival of the institution and services over time, cost recovery, continuity of benefits (Honadle and VanSant 1985) and having adaptive rules (Dietz et. al 2002). The institutional accountability is another factor to ensure sustainability. The village institutions developed under the WASMO programme fulfils all the above conditions. However, all the conditions may not be same in all the Pani Samitis.

The continuity of service and service for all is a critical factor to develop users' confidence. It is an important issue which any service based programme must address carefully. It has been observed that villages not having their own water sources face irregularity in the supply either because of lack of availability at the main source, absence of pump operators or break down of machinery. Villagers feel extremely alienated from the programme when water is not supplied on events like marriage and festivals. These are the occasions when they loose faith on the relevance and effectiveness of Pani Samitis. There is a wide range of perceptions on ownership of the programme based on the source and continuity of the water supply. Villagers have a higher sense of ownership where water source is self owned. It needs to be understood that households who are part of the village but live in a scattered way like in Vadi Vistar (in the agricultural land) or in vands (small settlements away from the main village) should also be involved to claim their ownership. WASMO programme has been able to integrate such communities who are spatially excluded. This is a critical factor, which needs to be systematically

addressed and monitored so that every household is included as a member and receives water. A single village programme may not be enough to address the needs of all, hence the programme needs to be developed looking into the diverse needs of different category of the households in the village, which WASMO programme has taken into account.

There are many village based programmes where multiple villages and panchayats depend on a single water source. In group gram panchayat villages the Sarpanch is the Chairperson of the Pani Samitis of all the villages under the panchayat. There are many success stories with regard to effective management of infrastructure and equitable distribution. However, the internal coordination between different Pani Samitis who have common members like Sarpanch, or share a common water resource needs to be examined. The programme has been able to train and develop local leadership on monitoring, promotion of participation, finance management, conflict resolution, health and hygiene promotion, etc. The villages who have been engaged in collective management for the first time may not be able to develop competency on innovative problem solutions with short term trainings.

There are instances where Pani Samitis have taken quick decisions. An example is the decision to close down of bathrooms subsequent to minor damage made to the water taps by village children. Another example is the effective use of water storage tanks made in the schools. Even though such decisions are minor in nature, when the users are put to inconvenience without prior information or decisions are taken without the participation, skepticism develops on the effectiveness of the system. The Pani Samitis need to develop capacity for arriving at adaptive rules and decisions rather than taking extreme action.

The village institutions can only be sustainable if along with functional management practices like monitoring, collection of contribution, tariff fixation, etc., other factors like building relationship with external suppliers, market and administration is maintained. Along with performing all these functions the Pani Samiti should maintain its accountability to the Gram Sabha. Most of the Pani Samitis in the process of working in the programme have institutionalised external linkages and demonstrate public accountability.

The sustainability of Pani Samitis as an institution will depend on their effective and inclusive functioning

In order to ensure institutional sustainability Pani Samitis need to continuously work on (i) maintenance of physical resources so that continuity of benefit is ensured; (ii) keep its accountability to Gram Sabha; (iii) develop adaptive rules rather than creating obstacles for members access to services; (iv) coordinate with other villages and institutions to arrive at solutions on common issues; and, (v) maintain the composition of group members so that it is inclusive and representative.

In this programme the functioning and growth of the Pani Samitis are monitored. However, a self monitoring mechanism needs to be institutionalised so that Pani Samitis monitor themselves after the withdrawal of WASMO. Some of the factors that need to be monitored are (i) representation of members in the Samiti; (ii) tracking down the changing roles of the Pani Samiti over time; (iii) new norms and rules formed or need to be formed; (iv) users' perception of services; and, (v) identification of potential areas of conflict. Villages where people are new to such kind of ownership driven common services need to be provided long term support so that institutions developed so carefully do not decay because of lack of follow up support.

Participation and empowerment

People's participation is a central concern

The positive outcomes of the programme have been greater participation by women and knowledge empowerment

of the current development practice. People's participation to improve the distribution of benefits of development services to reach to the lowest socio-economic strata is one of the functional aspects (Oakley 1994). The WASMO programme has a central strategy to mainstream participation. The programme also takes into account the decentralised democratic process initiated in the country through 73rd Constitutional Amendment. The programme is planned by the Gram Sabha and implemented with the active involvement of Pani Samiti which is a sub committee of the Gram Panchayat for which a special GR has been passed. The participatory development strategies that emphasise popular participation rooted in democratic decentralisation, as in the case of WASMO, has the potential not only to eliminate imbalances in people's access to services, but also empower people to address issues of social justice, promote involvement of people and strengthen democratic practices. One school of thought is of the opinion that participation strategies have not only functional contributions, but also inherently lead to the empowerment process (Chambers 1997).

The WASMO programme has many examples of positive outcome of adopting participatory strategy. Some of the examples are:

- Villagers freely articulate their needs and collectively develop an action plan which is relevant to their local context.
- Women decisively participate in the planning and take pro active roles to halt faulty construction.
- Pani Samiti members maintain records and practice public accountability through social audit.
- People including women learn and practice to examine water quality and promote personal hygiene.
- People have gained confidence to remove leaders with vested interest and establish new leadership who practice honesty and accountability.

Oakley (1994) states that a school of thought views participation as a process whereby people (including the socially excluded) "seek to have some influence and to gain access to the resources which would help them to maintain and improve their living standards." The institutional mechanism like Pani Samiti has a potential not only to attain the project goal but also can lead to overall social change. Pani Samiti along with Gram Sabha provide a strong organisational basis to mainstream and institutionalise participation. While the Pani Samiti is a project initiated institution, the Gram Sabha is a democratic governing entity. The experience of participation in the Gram Sabha on the issue of community water supply has a potential to create a culture of participation in a host of other issues affecting the lives of the poor.

If people's participation is facilitated the Pani Samitis can develop potential to work on many other social issues like land rights for the poor, removal of encroachment, ensuring access of poor to public social service like PDS, mid day meal, anganwadi, schools and hospitals and campaign on issues of dowry, child marriage and promote social inclusion practices.

It needs to be also understood that there a series of factors that obstruct the process of participation. In a large scale programme, standard procedures and project design may not be fully understood to the people and can create dependency. Fully understanding this issue, the WASMO programme has created district level Coordination Management and Support Units (CMSUs) and involved intermediary agencies (ISA) to facilitate people's understanding without creating dependency. The other reasons for obstruction to participation are structural and cultural factors. Though no visible obstructions are observed that impedes participation, each village specific project need to systematically identify the obstructing factors and processes. The best

way to overcome the obstruction to participation is to involve the most marginalised and women to identify the difficulties and help them to identify the solutions.

The programme needs to recognise and understand the wider scope of participation it has initiated. People's participation through Pani Samiti and Gram Sabha can to be sustained through a variety of educational outreach programmes even beyond the conventional project cycle. The aim should not only aim to achieve a sustainable community based water supply programme but can also develop a long term goal to create a participatory and democratic movement at the grassroot level.

Demand for project support

It is observed that panchayats already having their own resources and capital intensive water infrastructure seek for larger project finance support to upgrade their water sources and delivery mechanisms. These panchayats have a well developed mechanism for service delivery and collection of tariff. However, there are many panchayats who do not have any community based infrastructure and services. For the first time the villages and panchayats have initiated community based water infrastructure and distribution mechanisms. While the resource rich panchayats arrange their own contribution from their existing fund the resource poor panchayats undergo a great deal of effort in mobilising the people for collection of contribution and developing their own village action plan. It has been noticed that the resource rich panchayats plan for large investments as compared to resource poor panchayats.

It is difficult to arrive at any conclusion with regard to equity of water distribution and genuine participation of the poor and weaker section in the resource rich panchayats. However, in the resource poor villages it is observed that the household members have economically to plan for large investments as they cannot afford the own contribution at one time and fear that they may not able to manage infrastructure with large investments. Some villagers suggested that since for the first time they are working on community based water management, they may be supported in a phased manner. Uniform norms for two differential set of villages in term of resources, past experience of managing water infrastructure cannot lead to similar output in terms of effectiveness of village institutions, investment plans and operations maintenance mechanisms. Empowerment of community based institutions can emerge over a process of engagement. In order to strengthen the village institutions that are relatively weak, long term support is needed in a phased manner. Without this the project finance will be shared more by the established and developed villages.

It was clearly evident that the resource rich villages have developed efficient systems and procedures over a long period of time. In such villages the voices of the poor and marginalised may not get noticed as there is such a wide faith and trust on the systems. It may also happen that a section of people choose to remain silent as they do not want to question the system which has been running for the years in a caste society where there is not only inequality but also prejudices. In such a scenario, how far the voices and aspirations of the weaker section are recognised and respected needs to be examined.

Conclusions

To conclude, the WASMO supported programme has developed sound village based institutions by integrating project promoted institutions like Pani Samiti and developing organic linkages with democratic decentralised governing institutions of the Gram Sabha and Gram Panchayat. Such a

Linkages of the Pani Samiti with the Gram Sabha and Gram Panchayat have made it a true democratic institution

Institutions developed under the WASMO programme can address development issues that go beyond the project

village level institutional framework has led to sustainability of the programme and created a larger potential to promote people's engagement for the overall development process. The programme can move from functional participation to empowerment based participation in an overall social change process if, this institutional mechanism is nurtured beyond the project framework. For scaling up of the programme the best institutional practices as developed by the Pani Samiti themselves in response to the local needs should be documented and used for capacity building on operational management, formulation of adaptive rules and addressing broader social development concerns.

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Role of Pani Samitis for sustainable drinking water supply in earthquake-affected villages of Gujarat

A clear understanding of roles and responsibilities and their execution has helped rural communities reap the benefits of a decentralised and community-managed approach in water supply and sanitation

Sachin Oza , Dalsukh Vaghasiya

Summary

In the community-managed water supply and sanitation programme in earthquake-affected villages of Gujarat project, Pani Samitis are implementing schemes. Their roles and responsibilities in every stage of implementation are well defined. The NGOs and WASMO provide only technical and facilitation support for mobilising the community, planning the scheme and its implementation and building the capacities of the community to carry out all its functions.

This paper documents the lessons learnt on the functioning of the Pani Samitis and their effectiveness in bringing about drinking water security. It is based on field visits to six villages and detailed discussions with Pani Samiti members, individual beneficiaries and WASMO and NGO representatives involved in the project.

It takes a look at the benefit accrued from drinking water systems as perceived by the rural community itself and also looks at issues related to the sustainability of institutions created during the project in terms of their robustness and financial viability.

Background

WASMO was set up in 2002 to facilitate the implementation of in-village water supply and sanitation scheme on the principles of Swajaldhara and 73rd Constitutional Amendment. A platform that brings all stakeholders together, it is a Special Purpose Vehicle set up solely for this objective. The organisation is presently facilitating the implementation of drinking water schemes in more than 3,300 villages of Gujarat.

One of the projects is the Community-managed water supply and sanitation programme in earthquake affected villages of Gujarat or the ERR Project spread over 1260 villages out of which all the 860 villages of Kutch district are covered. The project is likely to culminate in 2007.

WASMO has done commendable work in ensuring drinking water security in remote water scarce villages. Together, with the involvement of NGOs it has carried out planning and implementation of drinking water systems with active participation of village communities, especially women. It has also tried to see that there is 100 per cent coverage of the households. Since the project has already been implemented in some of the villages and is nearing completion in others, it was important to study the experiences so far. It was also necessary to become aware of the issues that are likely to be faced at the village level once WASMO withdraws. Thus, WASMO invited Development Support Centre to visit the villages in Kutch district and document the lessons learnt on the functioning of the Pani Samitis and their effectiveness in ensuring drinking water security.

Following norms for Pani Samiti formation in the true spirit can go a long way in ensuring participation

Objectives of the study

1. To study the impact of the work carried out by WASMO in Kutch district;
2. To examine the role of the Pani Samiti in ensuring drinking water security in the villages;
3. To study the relationship between the Pani Samiti and Gram Panchayat, NGO and WASMO for providing sustainable drinking water facilities in the villages; and,
4. To look at issues related to sustainability of the assets and institutions created during the project.

Methodology

The following methodology was adopted to study the role of Pani Samitis:

- Preparation of assessment indicators for the functioning of Pani Samitis based on the role and responsibilities defined in the ERR Project.
- Visit to three villages each in Abadasa and Nakhatrana blocks of Kutch district between 10-12 December 2005. These villages were Sudadhro Moti, Dadamapar and Varandi Moti in Abdasa block where Vivekanand Research and Training Institute, Mandvi, Kutch was the ISA and Mosuna, Rampar Roha and Sanganara in Nakhatrana block where Ashapura Foundation, Bhuj is the ISA.
- Meeting with beneficiaries and members of the Pani Samiti and the Gram Panchayat.
- Individual interactions with beneficiaries of the programme.
- Discussion with concerned staff in CMSU-Bhuj and NGO representatives.
- Focussed group discussions on cost of non-development and benefits of drinking water facilities.
- Transact/visit to drinking water facilities/source sites.

Role of Pani Samiti

Through interactions with villagers and members of Gram Panchayat and the Pani Samiti during field visits, we found that:

a) Pani Samitis had been constituted in each of these village where schemes were initiated by WASMO.
b) The Samitis were constituted under, or in consultation with the Gram Panchayat and Gram Sabha.
c) Poorer sections, SC/ ST and women are members in the Samiti.
d) The process of the Samiti formation was democratic, participatory and non-political process in all the six villages.
e) In four villages, 3-4 women were active members of the Samiti.
f) In four of the six villages, the sarpanch was the Chairman of the Pani Samiti, while in the remaining two, community leaders occupied this post.
g) Dadamapar is a small village which is one of nine villages of Group Gram Panchayat Zakhau. None of the villagers is a panchayat member. The Pani Samiti is constituted by all non Gram Panchayat members including the chairman. It however has the support of Group Panchayat.

Awareness and capacity building

In all the six villages, the communities were well aware about the drinking water programme and its guidelines. In the inception period a series of village meetings and exposure visits had been organised by respective NGOs and CMSU-Bhuj. Villagers were aware about the roles and responsibilities of the Pani Samiti for sustainable drinking water facilities in the village. Decision on contribution, water tariff was made in village general meetings. The Pani Samitis had also promoted sanitation measures such as soak pits and dustbins.

Ensuring participation

Participation of the village communities in drinking water supply system was quite high. Even in extremely heterogeneous villages, there was participation from all communities. We found that:

a) In each of the six villages, all households

have been covered for drinking water supply in the project planning.

b) Each caste participated in formation of the Pani Samiti and the Village Action Plan (VAP).

c) The villagers had planned for their drinking water supply system based on their convenience. Technical support for site selection, preparation of plans and estimates and quality control measures was provided by the Engineering Support Cell of CMSU-Bhuj.

d) The Gram Panchayat/ villagers have made significant contributions for managing their system. In Dadamapar village (population of about 225) for example, the drinking water supply system needed a diesel engine set for lifting water from the community well. A diesel engine is a movable asset and is hence not covered in the ERR Project. An additional voluntary contribution to purchase one was made by the villagers. For the last three months, the operational cost of deisel is being collected from each household as well (see Table 1: Pani Samiti composition).

Table 1: Pani Samiti composition

Sr.	Village	Pani Samitis			
		SC/ST/OBC	Women	Gram Panchayat member	Chairman-ship of Sarpanch
1	Sudadhro Moti	✓	✓	✓	-
2	Dadamapar	✓	✓	-	-
3	Varandi Moti	✓	✓	✓	✓
4	Mosuna	✓	✓	✓	✓
5	Rampar Roha	✓	✓	✓	✓
6	Sanganara	✓	✓	✓	✓

Women's participation in the Pani Samiti

In four villages, women selected in the Pani Samitis have been active participants. They took the responsibility of collecting contribution as well as water tariff collection. In Sudhadro Moti, a woman member is also one of joint signatories for operating the pani Samiti bank account. In Mosuna village, the Samiti has delegated the responsibility of financial management to their women members. The women have also collected recurring costs when repairing was required. However, in Rampar Roha village, where a scheme is running efficiently by a committee for more than two decades now, women have had no role to play.

Collection of contribution

a) Every household/ beneficiary contributed (both cash and labour) based on their economic status. Rich families contributed more and poor families contributed less. Some villages obtained donations from private donors who have settled elsewhere. All the villages first deposited about 10 per cent of the total estimated cost in the bank after which WASMO released the balance in instalments. Because of this pre-condition there is genuine contribution by the villagers. The contribution per village ranges from Rs 32,000 to Rs 1,45,000. Besides, each household has also contributed towards construction costs of laying down the pipeline to their own house from the nearest point of the main line.

b) Each village has evolved different norms for collecting user fees. While some villages charge per household others charge per adult individual, in one of the villages it was found that they collected contribution as and when the need arose.

Brief details of the village-wise activities, its cost and contribution collected from beneficiaries are given in Table 2.

Impact of drinking water supply

In the villages visited, various activities for providing drinking water security were carried out by Pani Samiti. An exercise was undertaken to analyse the impact of the activities under the project.

Table 2: Village-wise details

Sr.	Village	Activities	WASMO's cost	Communities' contribution	Total cost
1	Sudadhro Moti	1. 50,000 lits capacity, 12 Mts height ESR 2. Water Distribution Pipe line 3. Cattle troughs 4. Washing Ghat 5. Pumping machinery	8,13,700	89,800	9,03,500
2	Dadamapar	1. 20,000 lits capacity water tank 2. Water Distribution Pipe line 3. Stand posts 4. Soak pits	2,91,700	32,400	3,24,100
3	Varandi Moti	1. 40,000 lits capacity water tank 2. Water Distribution Pipe line 3. Stand posts 4. Pump house 5. Cattle troughs 6. Washing Ghat 7. Under Ground water tank 8. Check Dam	13,18,000	1,45,900	14,63,900
4	Mosuna	1. 20,000 lits capacity water tank 2. Water Distribution Pipe line 3. Stand posts 4. Cattle troughs 5. Drinking water well repairing	3,56,310	39,590	3,95,900
5	Rampar Roha	1. 60,000 lits capacity H.G.L.R 2. Water Distribution Pipe line 3. Stand posts 4. Cattle troughs 5. Electric connection 6. Pumping house, machinery	7,45,920	82,880	8,28,800
6	Sanganara	1. 1,00,000 lits capacity H.G.L.R 2. Water Distribution Pipe line, raising and gravity main 3. Stand posts 4. Cattle troughs 5. Rain water harvesting tank in school 6. Pumping house, machinery	10,18,300	1,11,900	11,30,200
	TOTAL		45,43,930	5,02,470	50,46,400

From the group discussion and PRA with the villagers of Sudadhro Moti, we studied the drinking water systems developed for ensuring 40 litres /day/family drinking water to every household. The project costs under the ERR Project are given below:

a)	Cost of infrastructure	: Rs. 9,03,500
b)	O&M cost (appro.) (yearly excluding unforeseen costs)	: Rs. 72,000
	Total costs	: Rs. 9,75,500

During the PRA discussion, villagers, especially women, brought out the costs for fetching the drinking water by the households based on PRA the benifit cost ratio would 1:9.1. The number of families that need to fetch water is 200. There is no drinking water source within the village and villagers fetch water for drinking purposes from a community well near a small river 1.5 km away. In a normal year, details of month-wise time required, wage rate and male and female members engaged in fetching water were calculated as indicated in Table 3.

The cost of drinking water is derived by assuming the number of hours spent by 200 families for fetching drinking water. Had the time being spared they could have got that much wages. The cost for fetching drinking water is almost nil now, as they have developed home connections through a water supply system in the village. Therefore this has been perceived as a benefit.

g) Benefits accrued per year
   i) Ensured drinking water : Rs. 15,48,000
   ii) Health and other :(not considered)
   Total benefits : Rs. 15,48,000

Benefits Cost Analysis

In Sudadharo Moti the capital cost of the scheme is Rs. 9.75 lakhs with a yearly recurring cost of Rs. 0.72 lakhs. If the life of the scheme is considered to be 10 years, then the total cost of the project for ten years will be RS. 16.95 lakhs. If the benefit to the community by saving time is considered at the rate of Rs. 15.48 lakhs per year, the total benefits accrued for ten years will be Rs. 154.80 lakhs. The cost benefit ratio would therefore be 1:9.1

Villagers calculated the cost benefit ratio of household water supply at 1:9.1

Role of WASMO and NGOs during project implementation

The NGOs and WASMO played a pivotal role for qualitative implementation of the

Table 3: Cost of fetching drinking water to Sudadharo Moti village

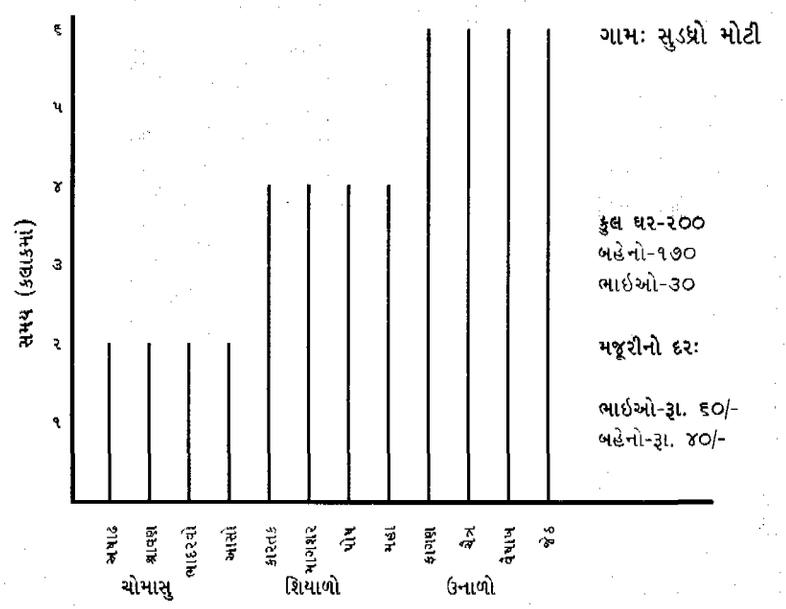
a)	Source of Drinking water	: Community well, about 1.5 km away
b)	Time spent for fetching drinking water	
	i) Monsoon (Ashadh, Shravan,Bhado and Ashu)	: 2 Hours/day/family
	ii) Winter (Kartik, Magsar, Posh & Maha)	: 4 hours/day/family
	iii) Summer (Fagan, Chaitra, Vaishakh & Jeth)	: 6 hours/day/family
c)	Duration of drinking water crisis	: 12 Months
d)	Total time spent per family/year	: 1440 hours (180 person days @ 8 hr per day)
e)	Fetching drinking water by	
	i) Male member	: 30 H/H (wage rate Rs. 60 per day)
	ii) Female member	: 170 H/H (wage rate Rs. 40 per day)
f)	Cost of drinking water fetching of the village	: Rs. 15,48,000 per year

The participatory process adopted by the organisation is clearly reflected in the sense of community ownership

drinking water and sanitation measures in the remote and drought prone villages. Villagers and members of the Pani Samitis have perceived the roles of the NGOs and WASMO/CMSU as indicated in Table 4.

Lessons learnt and emerging issues

WASMO together with the respective NGOs, Pani Samitis and the Panchayats has succeeded in ensuring drinking water security in the drought prone, remote villages of Kutch district. The participatory process adopted by the organisation is clearly reflected in the sense of ownership that the community exhibited during the discussions with them. They were proud of the assets created and duly acknowledged the support provided by the various agencies including the Panchayats. It was heartening to see the enthusiasm of the community especially the active participation of women in some of the villages. The genuine contribution by the community towards the assets created and their readiness to pay the user charges clearly reflects the utility of the utility of these structures. However, there is a need to ensure that they are maintained properly. If not, their fate will not be far different than most public structures such as schools, Panchayat buildings or water harvesting structures that get dilapidated within a few years of their construction. Unfortunately that is the sad reality; a great deal of attention is paid by donors, facilitating agencies and the communities themselves during the planning and construction phase on the quality of the assets created. In fact it is stipulated that the structures be maintained properly by the village Panchayats/user groups. However mere stipulation is not enough unless there are mechanisms to ensure that they are actually maintained. One of the important findings of the study on "Maintenance of physical assets in watershed" conducted by DSC is that the maintenance of the assets is largely dependent on the functioning of the village institution / Panchayat responsible for their maintenance. If not nurtured properly this institution too can wither away as quickly as the asset itself!



Graph developed by the community in PRA exercise

Thus the maintenance and sustainability of the physical assets is largely dependent on three factors:

a) The quality of construction and sustainability of its source;
b) The robustness of the institutions responsible for its management; and,
c) The financial viability of the institutions.

It is in this context that the following issues emerge from the visits to the six villages:

i) The quality of the construction carried out was quite commendable be it the huge 1,00,000 litres overhead tanks or the small cattle troughs or stand posts. The physical system covered almost 100 per cent of the households by having individual tap connections. WASMO has played a critical role to ensure that there is no compromise on the technical aspects and the quality of material purchased. However, one does need to

Table 4: Role of NGOs and WASMO as perceived by Pani Samiti's and villagers

Phase	NGO	WASMO
Pre-action plan	1. Build rapport with villagers 2. Develop understanding of decentralise community-manged scheme among villagers 3. Build awareness of villagers on drinking water issues 4. Facilitate to Gram Sabha for formation of Pani Samiti 5. Built capacity of the functionaries of Pani Samiti. 6. Organised exposure visits	1. Select NGOs as an Implementation Support Agency for facilitating villagers and Pani Samitis for successful implementation of the project 2. Facilitate NGO and Gram Sabha in formation of Pani Samitis 3. Provided inputs to NGOs for organising trainings and exposure visits
Village action plan	1. Carry out Participatory Planning exercise on drinking water and sanitation issues 2. Prepare proposal of Village Action Plan 3. Mobilise communities for their contribution in project cost sharing 4. Provide inputs to Pani Samiti for finance management	1. Check technical feasibility of the identified activities 2. Prepare the technical plan and estimates of the project activities 3. Facilitate collection of people's contribution 4. Approval of the Village Action Plan 5. Release fund to Pani Samiti
Implementation of the project	1. Monitor progress and quality of the physical works 2. Facilitate Pani Samitis in execution and management of the project implementation 3. Build awareness of the villages for judicious use of water and sanitation measures 4. Mobilise community for maintaining their drinking water system and water charge collection	1. Provide technical inputs to NGOs and Pani Samitis for implementation of the project 2. Monitor the progress on physical and institutional development 3. Regular fund release to Pani Samitis 4. Facilitate Pani Samitis for water charge collection

look at the sustainability of the source. All the six villages visited had ground water as its major source for drinking water, only one of them had a check dam to recharge the village well. To prevent further depletion of ground water, one needs to look at how these can be augmented by construction of recharge structures or water harvesting structures. This can be done through the convergence of schemes such the Hariyali watershed programme or the 80:20 check dam scheme.

ii) The second issue related to the sustainability of the source is the user behaviour. Since ground water is a common source for irrigation and drinking water, there needs to be some mechanism to ensure that the drinking water is given a priority and its source does not go dry. Looking at the scarcity of water and the profitability of agriculture, there will be a temptation to give it a priority. The gender dimensions in a particular village will also influence the choice of irrigation vis a vis drinking water and therefore could be a major cause of conflicts. It was observed in one village that just near the tube well for drinking water there were several other tube wells for irrigation. Therefore WASMO and the facilitating agency would need to create some awareness and control mechanisms to ensure that drinking water is given a priority even after the

Re-election of Pani Samiti members, unforeseen O&M costs, varying capacities of communities and conflicts between users are some emerging sustainability issues

programme is over.

iii) It was encouraging to see that the villagers had thought of various ways for constituting the Pani Samiti. Based on the socio-political situation of the village some had the Pani Samiti headed by the Sarpanch while others had a leader acceptable to the communities as the head of the Pani Samiti, some had high participation of women while some did not. The selection of the members for the Pani Samiti was based on sound criteria – people who could devote time, were honest and respected by a large section of the community, who could seemingly deliver and manage an efficient and equitable drinking water system within the village. The Samiti had representation from all the castes and hamlets in the village to ensure that everybody had a say in decision making. In the six villages visit it seemed for the present that the right kind of people were selected for the Pani Samiti. However, it was also observed that the facilitating agency had an indirect role in ensuring the above. As per the rules there were to be elections every two years. The socio-political structure of any village is quite dynamic. There will therefore be a need to ensure that the right kind of people are once again elected in the Pani Samiti who can efficiently and equitably deliver drinking water to the whole village.

iv) Even otherwise, drinking water being the prime necessity of any village, it will be necessary to ensure that the Pani Samiti continues to deliver the system in an efficient and equitable manner. This cannot happen if it is left to the community/Panchayat alone. There has to be some agency that ensures that the various functions that the Pani Samiti is supposed to carry out are actually carried out. What if the water charges to be collected every month are not collected, or if collected siphoned off by some powerful person? Thus the regular presence of an agency could put some pressure on such deviant behaviour and also help the community in taking some remedial steps.

v) As brought out in the discussions in all the six villages, even after the completion of the project, the villagers did want the support of the facilitating agency and WASMO albeit in a much reduced manner. They did feel that in case of any difficulty they would ask the NGO to intervene. If the structure suffers from some technical problems or there is a breakage they would approach WASMO. Thus, there will be need for some presence of the facilitating agency and WASMO to see that such demands from the villagers are met. If not it could affect the delivery of the drinking water system.

vi) The villages have evolved different ways and norms for collecting the stipulated 10 per cent contribution for capital cost and also for user charges. The 10 per cent contribution is a pre-condition for any investment by WASMO and therefore has ensured that there is real contribution by the communities either by themselves or in some cases with the help of someone who has migrated and is willing to contribute for the village. This contribution being a cost sharing measure, the user charges that are collected every month from each adult individual/household should cover the regular maintenance cost that the Pani Samiti incurs and also have some balance for unforeseen costs that may arise such as the burning of the motor, breakages etc. Since there is not much clarity regarding how the cost of such exigencies will be met, the user charges in some cases may not be enough to cover both these costs. Thus there will be a need to help the Pani Samitis do a budgeting exercise to see that the quantum of user charges collected are enough to meet both these costs. Considering the life of the machinery as

10 years and civil works as 20 years appropriate percentage should be added to the user charges to create a 'Depreciation Fund's This will ensure that the drinking water system does not stop even for a single day for want of funds. Alternatively the federation of such Pani Samitis could be given a revolving fund to meet such accidental costs.

vii) During the visit it was found that different Pani Samitis had different capacities. While some were strong on the gender involvement others were more efficient in contribution collection. Some were ready for managing their drinking waters systems with reducing role of the facilitating agency while others were still quite dependent on them for the management. Therefore even the post project withdrawal strategy should be carried out in a phased manner after assessing the capacities of the respective Pani Samitis. Based on this assessment, WASMO and the respective NGO can plan the capacity building inputs that need to be given to the Pani for effective maintenance of the assets created and the management of the Samiti itself.

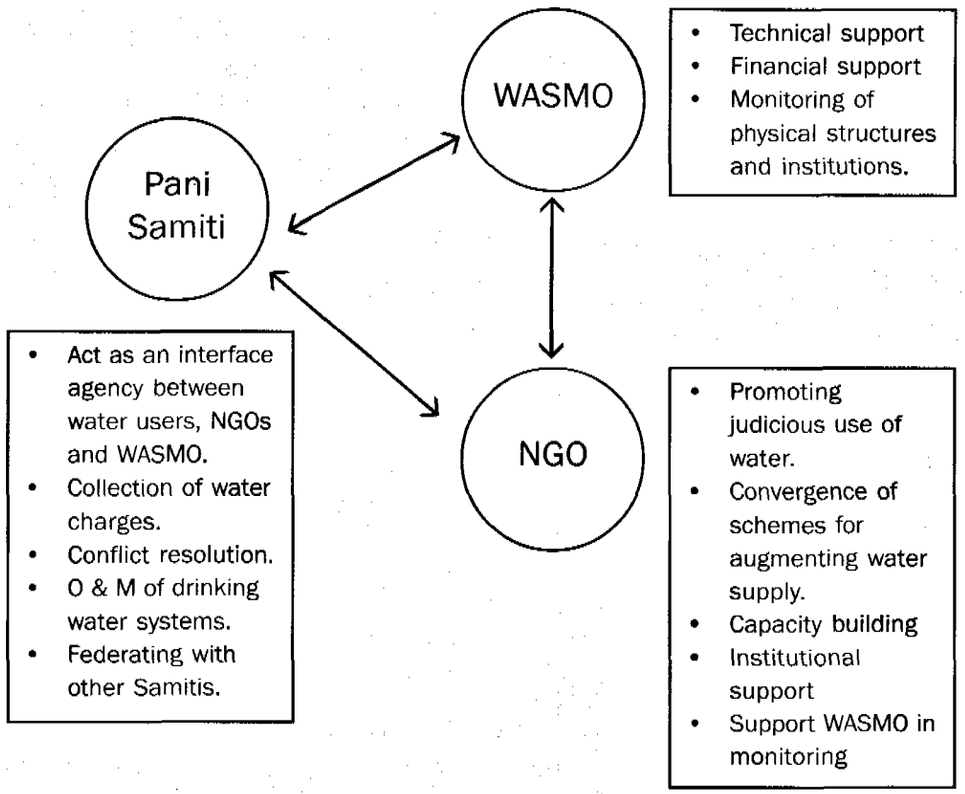
viii) As in watershed programmes, group drinking water schemes and for villages situated in a cluster, it would be a good idea to have a drinking water federation. This federation could provide a number of services to individual Pani Samitis by hiring the services of a local technician for repair and maintenance, drinking water quality testing etc. This federation could later on take over some of the functions of the facilitating agencies.

ix) Having ensured drinking water security in the villages, through high capital and human investment, the stress on efficient management of the system is very important lest it fails prematurely. Besides it would be important to continuously monitor the functioning of the physical and institutional structures created during the project phase. A monitoring system needs to be built up for the post-project period. It may need a small provision for establishing a cell. Thus, at a small cost, WASMO will be able to make sure that the good work it has done goes on!

x) The following diagram brings out the role and functions of the three main actors- Pani Samiti, NGO and WASMO for ensuring quality post project management of drinking water systems in villages.

Efficient management of systems may require institutional support beyond the project

Institutional framework for post project management of drinking water systems in villages



Partnerships in WATSAN: What makes them work?

Unique partnerships in the WATSAN sector in Gujarat offer insight into what makes partnerships effective and meaningful in developmental programmes

Sudarshan Iyengar

Summary

In recent past there have been some innovative experiments in Gujarat in water and sanitation (WATSAN) sector in which civil society organisation and people at the grassroots level have partnered. More than one programme have been planned and implemented with financial support from the Netherlands government has also materialised. The programme has been implemented also for rehabilitating the WATSAN structures and systems in the earthquake affected villages in five districts in Gujarat. The experiments are in a way a response to a paradigm shift in WATSAN sector all over the world, especially in poor and developing countries where people have lost control over natural resources. From top-down techno-administrative centric approach to water and sanitation projects, emphasis is shifting to bottom-up people centred and people owned and managed water and sanitation projects. The paper describes and documents the attempts made by the Government of Gujarat in planning and implementing water and sanitation projects with people and NGOs as partners. It is noted that Government of Gujarat has been innovative in setting up a new organisation that is not only autonomous, but also has experimented fairly successfully with partnership projects. There is good scope to consolidate the experiment and scale it up provided the essence in the partnership is not lost.

Introduction

Three things have changed in the area of development in India since the 1990s. First and most important change has been a paradigm shift in the concept of planning implementing development projects for people in a democratic society. Second, a rigid and sectoral approach to development planning has given way to a more integrated approach towards management of resources which includes land, water and forests. Third, there is an increased awareness in the government quarters regarding the need for broadening the performance parameters and indicators incorporating appreciation of the processes. That is, there is a readiness on the part of the government to view development as a process rather than only an outcome (Parthasarathy and Iyengar, 1998).

The paradigm shift has been possible because the concept of democratic decentralisation for decision making was recognised and introduced from Third Five Year Plan onwards. The rationale for decentralised planning in India seems to have been derived from the observed drawbacks of the macro-sectoral plans carried out at the national and the regional levels (Aziz 1992). The concept gained currency during 1970s when demand from the people's representatives gained control over the command with which the exercise had begun. The Asoka Mehta Committee on Panchayati Raj was a signal to the new era where the planning and allocation of resources for development would be decided more at local levels i.e., district, block and village.

All along the discussion in the literature it has been assumed that the planning at the

Development is not only about outcomes but also about processes

local level is to be carried out to achieve the overall national and/ or state plan objectives (for details refer Dholakia and Iyengar 1988). Planning at the local level was therefore project based. The projects are tested for their feasibility and viability using the macro perspectives. Even when participation of local people is sought in decentralised planning, the consistency assumption under the multilevel planning expects people to 'behave'. Involvement of people in planning their own development projects has been accepted as a paradigm only in the Ninth Five year Plan, although decentralised planning has been discussed since the Third Five Year Plan document in 1966. A good example is Joint Forest Management (JFM) programme initiated by the Forest Department and hailed as potentially one of the best participatory conservation-cum-development programme. The blue print approach to decentralised planning implies that the local component of the macro plan is identified, isolated, executed and monitored for pre conceived outcome (for a detailed theoretical discussion see Mosse et.al 1998) . It is deterministic in most cases. With all provisions and fulfilment of conditions for decentralised planning under the blue print model it is likely to suffer from problems.

Development as a process: Genesis of involvement of people and partnerships

Development as a process is by design flexible. Disadvantaged people are generally located in difficult regions as well. They have their own survival strategies and coping mechanisms that evolves over centuries in some cases. Thus, there is a fair amount of relevant indigenous knowledge base that gets totally ignored in the blue print approach to planning largely because the flow of resources is top-down. In fact, if a good analysis of the existing field situation is carried out[1], the knowledge would come to light and it can be put to use for relevant planning. In this context, the planning has to be for particular section and/or area and not at a spatial unit. In the specific context of Gujarat it may be said that with all the appreciable effort towards decentralised planning in the state, pockets of severe backwardness in dry, drought prone and desert region, tribal regions and sections of very poor populations such as Maldharis, salt pan workers, fishermen are left out. In case of drinking water and sanitation issue most of the villages are suffering from lack of sustainable sources.

The disadvantaged sections also interact more closely with the nature and live on the natural resources. The mainstream plan strategies and programmes have over exploited the natural resource base and invited environmental disasters. Ground water exploitation, deforestation and discharge of industrial waste have polluted land and water resources. The changed concept of development is to view development as a process. According to David Mosse (1998), "there are at least three distinct ways in which the process metaphor signals an alternative to conventional model of the development project." (p 4). In the context of planning, the process approach means flexibility, which help learning while planning and implementation. This is known as "learning process". The second "process" refers to the influences even on a blue print project of the larger social and institutional environment. The third aspect refers to dynamics of the system and uncontrollable events that may take place in project planning and implementation. This understanding has led to the evolution of bottom-up planning for development in water

[1] Analysis of existing situation is now termed as Participatory Rural Appraisal (PRA). The method was formalised by Robert Chambers and it involves seeking participation of the rural people for the area in which the appraisal is carried out.

sector; especially the drinking water sector makes the first claim on the bottom-up approaches to planning and management. Once people are directly involved partnership emerges.

Evolution of partnerships in WATSAN

Working of the water and sanitation (WATSAN) sector is one of the examples of the failure of the centralised planning system. Immense efforts to create new sources for bulk water supply to villages that lack year round reliable sources of water and extending sanitation facility have been most difficult tasks for any state government in India. This is also because water is indeed a merit good and one cannot charge market price for it. Despite international funding agencies providing impressive amounts of capital grants and loans and despite many central government schemes in which pipelines measuring hundreds of kilometres were laid for drinking water supply, regular flow of water in the pipes has been a pipe dream for most of the population especially for the poor in the dry regions. To take an example in Gujarat state, in 1960, the year in which Gujarat state was formed, there were 3,000 villages out of 18,000 plus, that were 'no source villages'. By no source it is meant a settlement that does not have a regular potable water source all through the year. In less than three decades more than 13,000 villages become 'no source' during a drought year and in the normal rainfall year too the number of 'no source' villages has increased to more than 7,000. Rise in population and increased demand for water for agriculture are obvious reasons for such a crisis in drinking water, but it is also true that the sources created have not been able to deliver consistently. Water scarcity has hit Gujarat hardest in the country paralleled only with Rajasthan and one or two other states, although all the states in the country are facing shortage of safe and adequate drinking water.

It appears that the international scene is also not very different. WHO, UNDP and other international organisations have been advocating people centred WATSAN arrangements in creating and maintaining drinking water sources and sanitation in the poor and developing countries all over the globe. Gourisankar Ghosh, Executive Director, Water Supply and Sanitation Collaborative Council, Geneva and an ex Gujarat Government officer said in the Rainwater International, 2001, Mannheim, Germany on 11 September, 2001, that the problem at the core was water management through engineering approach. The development of modern water management science had put all the traditional approaches hidden and in the backyard. Policy-makers were heavily influenced by the large structure proponents. They had slowly neglected basic principles of water management that have been developed by mankind over the centuries. Moving away from the structures which are seen, built and maintained by people themselves, policy-makers and planners heavily depended on systems far away from people, and converted the management of natural resources into a simple supply and demand model. Unless there was a shift in that approach to increasingly involve people in the centre of water management, water would remain a centre of conflict and a natural resource which will again, like land, be cornered by a few and not contribute to sustainable development at all.

Government of India has responded to the international call well and has adopted in principle to put people at the centre stage once again in water and sanitation sector. Since 1999, the Rajiv Gandhi National Drinking Water Mission began to recognise the importance of sustainability in rural water supply and sanitation through decentralisation, user's involvement and cost sharing. It started with experiments such as Sector Reform pilot projects and has been enhanced under the Swajaldhara programme for all the villages. Gujarat has been in the

There is gradual realisation the world over that WATSAN should be people-centric

With the paradigm shift in drinking water management the crucial partnerships are between the Pani Samiti, NGOs and WASMO

forefront in this paradigm shift. With the conventional government set-up of the Gujarat Water Supply and Sewerage Board (GWSSB), the government had invited the non-government organisations (NGOs) to participate in the individual and community schemes of rainwater harvesting. The state government also launched an ambitious participatory WATSAN project at Ghogha in Bhavnagar with the financial and technical support from the Royal Netherlands Embassy (RNE). The cumulative experience with the state government is now for over seven years. There has also been a basic change in the organisational structure. The Ghogha project experiment initiated by the Government of Gujarat and supported by the RNE in 1997, and the sector reform experiment initiated by the Government of India has led to the formation of Water and Sanitation Management Organisation (WASMO) in 2002. Formation of WASMO as an autonomous body taking forward the people-centred development of WATSAN is itself a result of the policy recommendation of institutional change by the RNE under its support programme. A separate article documenting the process of the formation of WASMO has been given in the volume elsewhere. Important to note here in the context of partnership is that in these new efforts people emerge as the kingpin of the programmes.

Involvement of people as partners in the programmes at various stages in planning and implementation called for building capacities for partnership among the communities. There were at least three reasons for this.

- One, compared to the conventional arrangements of drinking water storage and supply in the villages, new sources and techniques had come into practice. Regional water supply schemes have the sources away from the villages and water is transported through pipelines. Thus, neither the villagers themselves create the source nor they have direct control of the source. They have to participate in the process of distribution and maintenance.
- Second, techniques of maintenance and management including account keeping etc. have also changed in managing new water sources. People do not have expertise in it. Thus, in building community capacities government has realised the need for intermediary agencies. NGOs are to assume this role.
- Third and most important reason for building capacities of the communities at the village level was that over last four decades or so people have almost forgotten that their elders used to manage the drinking and domestic water resources with practically no government involvement in it. The conventions and traditional management skills were not passed on to the new generations. If people have to once again assume maintenance and management responsibilities, their capacities will have to be rebuilt. Similarly, the development of source within village areas also calls for new skill as the traditional well-pond-tank combinations are no longer viable. New technologies and techniques are to be used in rain water harvesting and creating other sources including lined ponds and reverse osmosis.

The stakeholders/ partners in WATSAN

Under the people centred WATSAN projects in Gujarat a large number of stakeholders can be identified, although there are three major groups that have to partner. First are the village level organisations, including Pani Samitis and Gram Panchayats. The Second group is that of NGOs who have to act as intermediary between the state level organisations and the village level organisations. The third group consists of the state and national level organisations. The clarity of roles and responsibilities are still to

be worked out finally, but partnership functioning has begun. Stakeholders belonging to these three groups are listed below.

a) Village Level
   i.) Pani Samiti and Village Water and Sanitation Committee (VWSC)
   ii.) Gram Panchayat

b) Intermediary Agencies
   i.) NGOs
   ii.) District Water and Sanitation Committee (DWSC)

c) State / National Level Agencies
   i.) WASMO
   ii.) GWSSB
   iii.) Water Supply Department, Government of Gujarat
   iv.) Gujarat Jalseva Training Institute
   v.) Research and Evaluation Agencies
   vi.) State Water and Sanitation Mission (SWSM)
   vii.) National Swajaldhara Monitoring committee (NSMC)

It should be noted that the stake holders have been identified from the WATSAN projects planned and implemented by WASMO since 2002 and these projects include the following.

1. Community-Managed Ghogha Regional Water Supply and Sanitation Project.
2. Community-Managed Water and Sanitation Programme in Earthquake-Affected villages of Gujarat
3. Swajaldhara Programme
4. Sector Reform Scheme

The relationship between different stakeholders is mostly hierarchical. The NSMC monitors the programme implementation and the state level and the SWSM reviews the progress in the state and responds to NSMC. Similarly, the DWSC reviews the progress at the district level and responds to the SWSM through WASMO. Scope for partnership is between the VWSC or Pani Samiti, NGOs and the Coordination, Monitoring and Support Unit (CMSUs) and the DWSCs and WASMO.

In order to analyse the working of the partnerships let us first review the roles assigned to each of the stakeholder that have scope for partnerships.

Pani Samiti / VWSC

Under the democratic decentralisation Gram Panchayat is a village level organisation that is constituted by the village level representatives. The 73rd Constitutional Amendment has further empowered the Gram Panchayats in planning and implementing the village development programmes. For managing the drinking water and sanitation programmes in the village Pani Samiti has to be constituted. It is a sub-committee under the gram panchayat. Under Swajaldhara programme it is known as the Village Water and Sanitation Committee (VWSC). It is chaired by the village head - Sarpanch. There has been some debate around the autonomy of the Pani Samiti because the Gram Panchayat and the Sarpanch are not always promoters and protectors of the larger village interests. However, the Government of India has put to rest the debate by declaring that VWSC has to be sub-committee of the Gram Panchayat and the Sarpanch or one of the Gram Panchayat members has to head it. VWSCs or Pani Samitis can further constitute sub-committees for procurement, administration and supervision of the works that the Samiti might undertake from time to time. The role and responsibilities of the Pani Samitis are the following (Source: WASMO Annual Report 2004-05 p 64):

i) Ensuring Gram Panchayats take up Swajaldhara implementation issues in Gram Sabha meetings;
ii) Ensuring community participation and decision making in all phases of scheme planning and implementation;
iii) Organising community contributions towards capital costs, both in cash and kind (land, labour or materials);

The 73rd Constitutional Amendment calls for empowerment of the Gram Panchayat for implementing village development programmes

The responsibilities of the VWSC, DWSC and ISAs are clearly delineated to optimise benefits

iv) Opening and managing bank accounts for depositing community cash contributions, O and M funds and project fund management;
v) Signing various agreements with DWSC;
vi) Planning, designing, and implementing all drinking water and sanitation schemes;
vii) Procuring construction materials/goods, selection of contractors where necessary and supervision of construction activities;
viii) Commissioning and takeover of completed water supply and sanitation schemes through a joint inspection with the DWSC;
ix) Collection of funds through tariff, charges, and deposit system for O and M of the serves provided;
x) Empowering women for daily operation and maintenance of the scheme;
xi) Creating and promoting integration of drinking water, sanitation and hygiene in the Panchayat; and,
xii) Participation in communication and development activities in other villages.

The expectations from the Pani Samitis of the Gram Panchayats have to be compared with the earlier system of department based water supply through pipelines with the help of linemen, field staff and engineers. Village people did not have any role other than the direct water users. Under the new scheme village people are the doers and rest are partners in facilitating. Village people cannot assume such knowledge and expertise suddenly. Both ISAs and government agencies have to build capacities.

District Water and Sanitation Committee

The District Water and Sanitation Committee (DWSC) is the district level agency and a major partner that approves the VWSCs action plans. The roles and responsibilities of it include the following.

i) Formulation, management and monitoring of Swajaldhara;
ii) Scrutiny and approval of the schemes submitted by the Gram Panchayat;
iii) Selection of agencies including NGOs for social mobilisation; capacity development, communication, project management and supervision and entering into agreements;
iv) Sensitising public representatives, officials and general public about reform principles; and,
v) Engaging institutions for imparting training to all stakeholders.

In the Swajaldhara programme the DWSC is supported by a Core Team. Consisting of professionals in the field of water engineering, community mobilisation and documentation and communication the core team helps the DWSCs. The focus area of the team is to sensitise the community about the principles of the programme and to facilitate them in the implementation of the scheme. The core team is also assigned the task of training the Pani Samiti members.

NGOs as Implementing Support Agencies

In the people centred WATSAN projects institutional capacity with the government departments is limited in handling the community mobilisation issues. This was well understood right in the first phase of the implementation of the Ghogha regional water supply scheme. Government had involved the NGOs as Implementation Support Agencies (ISAs). Under most other programmes too the need for ISAs continues and hence NGOs also emerge as strong partners in community owned and managed WATSAN schemes. The roles and responsibilities of the ISAs as envisaged in the projects are the following.

i) Community mobilisation by awareness generation and soliciting their participation;
ii) Institution-building by forming effective Pani Samitis in accordance with the guidelines; Sanitation and hygiene promotion through awareness

campaigns that especially involve women and children and facilitate the construction of sanitation facilities;

iii) Ensuring women's involvement through their participation as Pani Samiti members and addressing their water and sanitation needs;

iv) Ensure equity in and across the villages and interest of weaker section the society is fully protected;

v) Water resource management by facilitating plan preparation in consultation with the community;

vi) Facilitating operation and maintenance of the systems created by imparting training; and,

vii) Ensuring transparent and appropriate account keeping by the Pani Samiti by imparting training and being part of the audit process.

It may be noted that the tasks expected from the ISAs and the Core Team overlap to some extent.

Now that the tasks have been listed for those stakeholders whose partnership is designed to be close, it would be appropriate first to identify close partners and then review how partnerships have worked under different schemes. The close partners are the following.

1. WASMO with DWSC, CMSU / Core Team and ISAs, and,
2. Pani Samiti / VWSC with CMSU / Core Team and ISAs.

Let us now review how the partners have worked under different programmes.

How partners work?

As mentioned earlier, substantial partnerships have emerged in four major projects/programmes for which WASMO is responsible. Therefore, in this section partnership is reviewed under each project.

Community-managed Ghogha regional water supply and sanitation project

WASMO took over the Ghogha project for facilitation in 2002. By this time the first phase of the project was over. The project has been implemented in 82 villages of Ghogha taluka of the Bhavnagar district which is prone to droughts. The project is to provide 200,000 people with safe ad secure drinking water and sanitation facilities. This was to be done through the construction of village-level drinking water supply and sanitation systems and water harvesting structures. CMSU located in Bhavnagar and three ISAs worked with the village people since 1999.

The Ghogha Project provided a fertile learning ground for new partnerships and approaches

Three ISAs namely Medhavi, Centre for Environment Education (CEE) and Utthan initially partnered with the village communities and oriented and trained them in the concept of people-centred solutions for development and management of drinking water and sanitation facilities. This effort was supplemented by the CMSU, Bhavnagar in preparing village level plans. It should be noted here that the source for drinking water to 82 villages is Mahi River based pipeline known as Mahi Pariej scheme. With two head works one at Budhel serving 34 villages and second at Tansa serving 48 villages, it is a regional water supply scheme. Very little scope has been there for in-village source development. Nevertheless, the ISAs and village people worked closely and partnered with the CMSU and the GWSSB first and WASMO later in the second phase in formation of effective Pani Samitis. About 125 check dams for recharge, and more than 350 works relating to well-recharging, well deepening, injection well and drainage of water points have been planned and constructed by the Pani Samitis.

ISAs partnership in environmental sanitation has been impressive. They facilitated and motivated the communities in the construction of demonstration latrines and

Partnerships with ISAs have lent credibility to a people-centric programme

soak pits. 418 demonstration latrines have been constructed in 73 villages and this has led to construction of private latrines. More than 21000 soak pits have been constructed and School sanitation corners have been created in 54 schools and by the end of the project 94 more schools would complete the structures. The ISAs in collaboration with Pani Samiti and CMSU have completed slogan writing and dustbin installations. It should be noted that the progress in software programme was more intensive in the second phase when WASMO took over. In the first phase not only hardware component dominated, but it also was largely supply driven.

Both the institutions especially the partnership with ISAs has lent great credibility to the programme. It should be noted that the RNE also in its review reports states that the Ghoga project has been an innovative project and the innovation that it refers to is about the institutional innovation. Orienting and mobilising people with the help of ISAs (role played by NGOs) has been the innovation along side CMSU that also drew workers from private sector in addition to the departmental engineers. The in-village supply systems and operation and maintenance have been handed over to village residents and Pani Samitis have taken charge in a function called 'atmarpan'.

A critical review of Ghogha project brings out an important learning that initially when the project began in 1999, it was mostly hardware and 'supply driven' although the RNE had supported a participatory and community driven project. GWSSB was not an appropriate vehicle to make the project community driven. Involvement of NGOs as ISAs helped convert the project into community driven. When WASMO took over in second phase it was relatively easy to strengthen community participation. The lessons learnt were also built into the next generation project namely the earthquake rehabilitation project.

Community-managed water and sanitation programme in earthquake-affected villages of Gujarat

Gujarat experienced a major earthquake in January 2001. The rural water supply systems were extensively damaged in more than 122 villages. The RNE came to support the restoration and since 2002, WASMO assumed the responsibility to implement the programme of restoration and development of water supply and sanitation facilities in about 1260 earthquake-affected villages in Jamnagar, Kutch, Patan and Surendranagar districts. The approach accepted for the restoration was the one suggested under the Sector Reform Scheme.

Community participation is pivotal in the programme. Work identification, planning, execution and management of the in-village water and sanitation systems have to be attempted by the community. Suitable institutions were set up at various levels. At the WASMO head office level, an ERR team was set up for coordination, planning, implementation, monitoring, evaluation and reporting. At the district level CMSUs were set up to support ISAs and Pani Samitis. Thus the partners at work were the four listed above. Close and ground level working partnership was between CMSUs, ISAs and Pani Samitis.

A large number of ISAs were invited to partner in this ERR venture. 20 ISAs in Kutch, 5 in Patan, 6 in Surendranagar and 7 ISAs in Jamnagar district were respectively invited to partner in working with the Pani Samitis and the CMSUs. The work began with ISAs working with the village communities in understanding the programme, formation and capacity building of the Pani Samitis and community organisations. CMSUs supported the ISAs in the process. For project preparation and technical assistance CMSUs were further supported by the Engineering Service Cells (ESCs). With their independent existence they became the fourth partner.

Implementation was introduced first time under community participation. Hence, Pani Samitis were initially very reluctant to take responsibility of executing the projects. One more small institutional innovation was introduced. At the village level an Empowered Committee was constituted.

Three members from the Pani Samiti, one member of the ISA and one member from CMSU formed the team. The Committee helped the Pani Samiti in procurement of material and fixing labour contracts. The Committee thus became crucial in helping the Pani Samitis in decision-making and execution of the structures and other software programme. In this programme too, presence and working of ISA has been critical in the partnership venture.

Substantial progress has been achieved under the ERR project of the WASMO. Introductory meeting have been done in all 1260 villages. In 896 villages Pani Samitis have been formed. In 602 villages village action plans have been prepared and approved by the Gram Sabhas. In 604 villages work has commenced and out of that work has been completed in 305 villages.

Swajaldhara and Sector Reform Scheme

In two projects Swajaldhara and Sector Reform Scheme the partnership is expected between the DWSC and the VWSC. A Core Team has been identified to support the DWSC. As mentioned earlier Core Team has professionals that are required according to the need of the area. 734 villages under Swajaldhara and 458 villages under Sector Reform Scheme (SRS) have been approved. Work is completed in 315 under Swajaldhara and 110 under SRS. Under the programmes activities such as Information, Education and Communication (IEC) related, capacity building, partnerships with other stakeholders such Panchayati Raj Institutions, district health office etc. water quality surveillance have been organised.

Swajaldhara and sector reform scheme involve NGOs but the expectations have been altered. 30 NGOS have been invited to act as ISAs. The role of the ISAs includes mobilising village communities, creating awareness, help form Pani Samitis, help formulate Village action plans, build capacity through training, help manage procurement of material and help initiating commissioning of system and ensuring its sustainability.

Unlike in Ghogha and ERR projects, ISAs are not involved in setting up demonstration units in sanitation structures. There is a qualitative change in the role of ISAs and they been assigned the role of support agency and this is not strictly partnership. It has certain implications that need to be discussed although it should be admitted that the role subscribed under a support agency is substantial.

What makes partnerships work?

At the outset it should be mentioned that the discussion and observations in this section are constrained by the non-availability of documents on partnership experiences by various stakeholders. The observations are based on the personal experience of the author in the capacity of a member in the advisory groups both at WASMO and with some ISAs. After learning about partnership experiences from various stakeholders, the discussion would be more substantial.

Some indirect experience sharing has appeared in some papers that are contained in the Conference Volume and I have drawn relevant parts from it to discuss issues in this section. The second point of caution is that substantial experience from Swajaldhara and SRS is yet to emerge on working of the partnerships. Hence, the issue of partnerships and how they work and do not work will have to remain alive from the point of view of learning as the state and the society go along on community participation in WATSAN.

The WASMO projects offer a wide canvas to analyse partnerships and key to their success

The CMSU and the ISA have facilitated people's understanding without creating dependency

WASMO led community participation driven WATSAN projects have resulted into new partnerships between the village level organisations and the district and the state level organisations. The key partners in the long run are the District Water and Sanitation Committee (DWSC) and the Pani Samiti or the Village Water and Sanitation Committee (VWSC). In the present situation of experimentation, it is the WASMO, ISA and the Pani Samiti and the Gram Panchayat who have emerged as partners. It should be noted that although the DWSC exists as it is administrative requirement and that is the agency for future, WASMO through its district level presence in the form of CMSU, ESCs and Core Teams assumes the most important space. The key to the working of partnerships also lies there. Although WASMO is technically an autonomous body and could be called an NGO, it is the government's face at the village level and the face it has put up in this new form; it has gained immense credibility of the government agency that works. Similar has been the experience by the NGOs who are partnering the programme as ISAs. Most of the NGOs who are partners as ISA have been in the WATSAN field for sometime and have been pioneer in forcefully advocating people-centred approaches in WATSAN projects at regional, national and international levels. Some of them have also independently demonstrated on field the potential of the participatory WATSAN projects successfully. In this way, WASMO and the ISAs have gained credibility in the assessment of village communities.

Describing the working of the partnerships in brief, Acharya (2006) notes in his paper that in a large scale programme standard procedures and project designs may not be fully understood by the people who are to partner the efforts and this might create unwarranted dependency. The CMSU and the ISAs created by WASMO has facilitated people's understanding without creating dependency. This is a good insight into the working partnerships. Apoorva Oza and others (2006) also reflect similar understanding of the working of WASMO. In the paper they say, "In a short span of three years, WASMO in partnership with 31 NGOs has now involved 1260 village communities in five earthquake affected districts of Gujarat to develop their own in-village water distribution plans in 789 villages and these plans have been implemented and operationalised in 347 villages. WASMO pro-actively partners NGOs in this effort. It has developed extensive communication means to promote its ideology and brand in Gujarat". Oza et.al. share AKRSP's experience in partnering with WASMO at higher level and with village communities at village level and implicitly demonstrate that twin level partnerships have worked with mutual trust, confidence and support.

Sachin Oza and Dalsukh Vaghasia (2006) discussing role of the Pani Samitis in creating sustainable water supply and sanitation facilities in earthquake affected villages also bring out clearly the working of the partnerships at the ground level. They say, "in all the six villages the communities were well aware about drinking water programme Swajaldhara guidelines. In the inception period series of village meetings and exposure visits were organised by respective NGOs and WASMO-CMSU-Bhuj." The paper has also made an almost comprehensive list of the functions performed by NGOs and WASMO that bring out working of the partnership. Effective partnership is built between ISA, Village Community and CMSU/ core team/WASMO when each carries out functions in which they have relative advantage. For instance, in pre-action plan stage, the ISA has to build rapport with village communities, organise awareness meetings, capacity creation and organise exposure visits. The CMSU-WASMO teams have to facilitate NGOs in this. In the second stage of building village action plans ISA has to be active partner to village communities and CMSU-WASMO has to provide technical guidance. Thus, if all partners work in tandem, partnership is likely to flourish.

Nafisa Barot (2006) in her paper in the Conference Volume has stressed the point of empowering the village communities especially women in the partnership process. According to her strong partnerships are likely to emerge only after the communities are sufficiently empowered. This is a useful point also because she has drawn attention to an important fall out of empowerment that has to be recognised if equality in partnership is to be ensured in the long run. She has shown that in some instances where there has been substantial empowerment there have been conflicts between important stakeholders especially between the Pani Samiti, Gram Panchayat and the CMSU-WASMO teams. The conflict is around the issue of prioritising between creating an in-village water distribution system and creating own source for water. The State which promises to bring about paradigm shift in the WATSAN sector will have to face this conflict squarely and resolve it. Working of healthy partnerships would help the conflict resolution.

Analysing the Karnataka experience of Swajaldhara where ISAs appear to be absent, Veerashekharappa (2000) notes, "the experience shows that the quality of the services offered is directly dependent on the soundness or otherwise of the VWSCs. Villages in which the VWSCs were devoid of local politics and factionalism showed better results. In fact, the inhabitants of a couple of villages sank their differences, participated in the project and formed VWSCs." Obviously not all was well with all the villages and variety of models emerged in partnership between the state and the people. Continuing his assessment Veershekarappa goes on noting that things worked well initially for six months or so but subsequently problems started. He says that it had been noted in pilot villages after the handing over of assets to the VWSCs, there was no agency to support or guide the committee. This was the major mistake for failure. There was a need for an agency which would monitor and guide the VWSCs for four years after the handing over. Shah and Iyengar (1997) and number of other studies have shown that the NGOs in have been critically important in the early stages of experimentation in natural resource management with community participation. Well one can contend about the period for which such an agency is required, but it is important to note that communities empowerment has to continue for sufficiently long time and the government agencies might not be the only one attempting it for the long term partnerships to succeed. This is particularly because in the game of partnership between the government and the village people the de facto rule is government guides and people have to follow. It is top-down all the way. It is old wine in new bottle whereas the ISAs can effectively brew new wine and the process would be participatory and bottom up.

Absence of post-completion support can lead to subsequent failure of initially successful projects

Summing up on partnerships

From a somewhat long drawn descriptions and discussions on recent experiments in partnerships in WATSAN sector in Gujarat, following learning emerge. This learning is obviously not exhaustive but illustrative.

- Unless there is a paradigm shift, it is difficult to get communities to assume responsibility for the development to WATSAN at village level and in Gujarat the paradigm shift is slowly but firmly taking place. Community ownership and bottom-up approach has been accepted as the new paradigm.
- Sector level experiments have brought the limitations in working according to the new paradigm and hence need for institution innovation was felt and the innovation was carried out in the form of setting up of WASMO.
- Resource availability and flexibility in approach at WASMO has been a great facilitator in forging new partnerships between communities and the

Drinking water and sanitation is business of, by and for the people and includes both, rights and responsibilities

government. WASMO has facilitated the NGOs as ISAs and village communities by providing technical guidance and training.

- The role of NGOs as ISAs has been firmly established only in the two large experimental projects namely the Ghogha region scheme and the ERR. In Swajaldhara and sector reform scheme ISAs have been given the role mainly to mobilise, sensitise and train. It is a curious role assignment. It does not have direct stake in anything that gets built. However, all the difficult and sensitive areas where community has to learn, do, respond and sustain, ISAs are supposed to build capacity. If it does not happen, the State and the district and village level organisations do not own up any responsibility. If ISAs start behaving like an external support and not as a partner, they too would wash their hands off. Then where does the community owned demand driven projects go? This issue needs to be discussed thoroughly. The role assignment to various partners is State determined and not evolved through discussion among partners.
- NGOs have emerged as the key link agency between the village communities and the government. Should they be continued as the link agency or dropped is the key issue for discussion.
- One of the limitations in the partnership exercise that has been launched by the Government of India and the Government of Gujarat is that there is a strong element of hierarchy in the partnership. Since the experiment is new and novel and since the government is the provider of the capital and other financial resources, it has tendency to retain the ultimate decision.
- The government is the policy making organisation and also the funding organisation. The approach is, therefore, quintessentially hierarchical whereby the State can snap, terminate and marginalise partnerships. In a community owned system the macro plan has to emerge from micro village plans. The process has to be bottom-up. Financial constraint is acceptable since State has resources, but the plan has to be local and should be honoured. This issue also needs discussion.

Drinking water and sanitation is business of the people, by the people and for the people. This is possible only if two things are facilitated. One, drinking water and sanitation should be treated as a basic human right. People too must realise that they have a responsibility towards conserving water as a resource. If they do not pay for the use of a resource that is scarce it is in violation of other person's right to use that source. Two, communities have to regain their geographical spaces, land and water bodies which could be brought under common property regimes. Rights over the ground water continue to be tricky and the government and people have to apply minds to come to a pragmatic solution that also helps conserve the resource. Partnerships will hold and flourish only when perspectives are fully shared.

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WASMO: A model for implementation of the 73rd Constitutional Amendment

WASMO's approach for facilitating drinking water supply directly through gram panchayats offers a development model for decentralised governance as envisaged in the 73rd Constitutional Amendment

R K Sama and Indira Khurana

Summary

Realising that governance is important for tackling the problems of poverty, backwardness and low human development, for several years now, the Government of India has been pushing a governance-related reform agenda. Emphasis is being laid on the 73rd Constitutional Amendment of 1993, which gives Constitutional status to PRIs to bring about greater decentralisation and involvement of the community in planning and implementing schemes, thereby increasing accountability.

Unfortunately, decentralisation has not happened along the lines envisioned. Along with duties, few states have transferred power and funds to PRIs. On their part, PRIs have not been able to deliver as per expectations, largely due to their lack of capacity to deal effectively with their responsibilities.

In 1999, the Government of India introduced sector reform in drinking water supply wherein the responsibility of providing drinking water within villages rested with PRIs.

In keeping with the above two developments, persistent drinking water supply problems in the state and earlier experiences with civil society and community involvement in drinking water supply, in 2002, WASMO was formed as an autonomous organisation by the Government of Gujarat to facilitate communities to demand, plan, implement, own and operate their in-village drinking water supply.

WASMO works to facilitate drinking water supply through Pani Samitis. By early 2006, WASMO was already working with around 3,500 Pani Samitis across all 25 districts in the state. These Pani Samitis are responsible for implementing, operating and managing drinking water schemes planned and approved by the gram sabha.

This paper describes the initiatives taken by WASMO in empowering Pani Samitis, which are subcommittees of the gram panchayat – the lowest rung of the three-tier PRI system– so that they are able to discharge their responsibilities in a decentralised, democratic, equitable, knowledgeable and transparent manner, in the true spirit of decentralised governance. More importantly, it offers a possible model on how gram panchayats and its subcommittees can confidently take up other issues of local self governance and development for effective implementation of the 73rd Constitutional Amendment.

Introduction

The Tenth Five Year Plan highlighted the importance of governance for tackling the problems of poverty, backwardness and low human development and pointed the need for governance reform. For this, emphasis was laid on the 73rd Constitutional Amendment of 1993, which gave

Financial dependency reduces PRIs to a government agency instead of a self-governance institution

Constitutional status to PRIs, to bring out greater decentralisation and involvement of the community in planning and implementing schemes, thus increasing accountability.

The 73rd Constitutional Amendment stipulates that the state government should bestow gram sabhas with clear powers and functions. Article 243 A of the Constitution makes the gram sabha the repository of all the powers and functions devolved on panchayats by the Constitution and expects it to function almost like a legislature, with the gram sabha deriving authority from it.

Over the years, the political empowerment in all three tiers of PRIs – the district panchayat, the taluka panchayat and the gram panchayat – and representation of SCs, STs and women has been established. However, according to the Mid-Term Appraisal of the Tenth Five Year Plan, this political empowerment has not been accompanied by empowerment in other spheres. The state governments were expected to devolve functional autonomy, administrative support and financial resources to the PRIs, but success in this has largely been sketchy. In fact, the issue of empowering funds to the PRIs by transferring functions, funds and functionaries (3Fs) to them has been the subject of discussion between the Centre and the states for more than a decade. The Centre has been urging the state governments to transfer the 3Fs to the PRIs in respect to all the 29 items as listed in the Eleventh Schedule. In practice, however, while most states have transferred a large number of functions to the PRIs, this has not been accompanied by the transfer of funds and functionaries (*see Table 1*). In states where this has happened, state governments continue to exercise control on financial resources and personnel transferred to the panchayats.

The subjects earmarked for PRIs cover all social and economic dimensions of rural life but the extent of financial devolution is not commensurate with the responsibilities. Though the State Finance Commissions have been appointed have been appointed, their recommendations have generally not been implemented.

Effective devolution requires effective devolution of finances. The lack of financial resources means that the PRIs are heavily dependent on the state for government fund, which effectively reduces them to an agency of the government, rather than an institution of self-governance.

Rural drinking water

In spite of heavy investments made over the years to provide rural communities with assured drinking water supply, results have not been commensurate with investment. Access to drinking water continues to be a serious problem. In case of Gujarat also, accessing safe and assured drinking water remains a challenge.

In 1999, the Government of India introduced sector reform in rural drinking water supply. Under this reform, the government will now serve as a facilitator rather than a provider; water supply is demand rather than supply driven; and, community-owned and managed rather than government managed. While 90 per cent of the capital cost is paid by the government, the user community has to pay a minimum 10 per cent of the cost and bear all O and M costs. PRIs play a major role.

With reform, based on previous experience in India and elsewhere, it was expected that with communities at the centre of all efforts, water supply systems and sources would be sustainable. But to do this, empowerment of the PRIs was imperative.

Decentralised village water supply in Gujarat

Gujarat was one of the pioneer states to introduce democratic decentralisation of powers and functions to local bodies at the village, taluka and district level through gram, taluka and district panchayats respectively.

Democratic decentralisation of powers and functions began even before Gujarat was carved out as a separate state from Maharashtra in 1960. A foundation for democratic decentralisation had been laid after the enactment of the Bombay Village Panchayats Act, 1958. The legal and institutional framework of panchayat raj was strengthened with the enactment of the Gujarat Panchayat Acts 1961. This Act delegated power to various authorities to ensure decentralisation. The main purpose of this Act included genuine transfer of powers, functions and duties; transfer of funds along with activities; representation of weaker sections of society in proportion to the population; and, representation of women at all levels by suitable legislative provisions.

After the 73rd Constitutional Amendment, the panchayat laws in the state were amended and a new legislation known as Gujarat Panchayats Act 1993 was enacted. Fifteen activities were under the purview of PRIs. Necessary funds were accordingly transferred by the state government to make PRIs financially viable and strong. With respect to drinking water the three-tiered panchayat system was responsible for the construction of wells and tanks for drinking water supply and water distribution schemes at the village level. The collection of water cess was permitted.

Under the panchayati raj system, community participation and contribution for in-village water supply was initiated as far back as the 1960s:

Table 1: Status of devolution of departments/ subjects with funds, functions and functionaries to Panchayati Raj Institutions (as on April 1, 2004)

	State/ UT	No of departments/ subjects transferred to Panchayats with		
		Funds	Functions	Functio-naries
1.	Andhra Pradesh	05	17	02
2.	Arunachal Pradesh	-	-	-
3.	Assam	-	29	-
4.	Bihar	8	25	-
5.	Jharkhand	-	-	-
6.	Goa	6	06	-
7.	Gujarat	15	15	15
8.	Haryana	-	16	-
9.	Himachal Pradesh	02	26	11
10.	Karnataka	29	29	29
11.	Kerala	26	26	15
12.	Madhya Pradesh	10	23	09
13.	Chattisgarh	10	29	09
14.	Maharashtra	18	18	18
15.	Manipur	-	22	04
16.	Orissa	09	25	21
17.	Punjab	-	07	-
18.	Rajasthan	18	29	18
19.	Sikkim	24	24	24
20.	Tamil Nadu	-	29	-
21.	Tripura	-	12	-
22.	Uttar Pradesh	04	12	06
23.	Uttranchal	-	11	11
24.	West Bengal	12	29	12
25.	Andaman and Nicobar islands	06	06	06
26.	Chandigarh	-	-	-
27.	Dadra and Nagar Haveli	-	03	03
28.	Daman and Diu	05	09	03
29.	Lakshadweep	-	06	-
30.	NCT of Delhi	-	-	-
31.	Pondicherry	-	-	-

Note : The Provisions of the Constitutional 73rd Amendment Act are not applicable to the states of Jammu and Kashmir, Meghalaya, Mizoram and Nagaland

Source : Tenth Plan Mid-Term Appraisal, Planning Commission

Gujarat has a long history of promoting the involvement of local government institutions

1. The Gujarat Panchayats Act 1961 entrusted the responsibility of providing drinking water to the rural population to these institutions.
2. The concept of the user community sharing capital cost for in-village drinking water supply schemes was in practice prior to 1970, when these were usually based on local available sources, particularly wells. These schemes were not expensive, with costs varying between Rs 40,000 to Rs 70,000. The user community contributed 25 per cent of the capital cost. O and M was the responsibility of the village or gram panchayat.
3. In 1971, hand pump-based water supply schemes were introduced by the state government with UNICEF support. Hand pumps were installed mainly in tribal areas. The taluka panchayat also installed hand pumps under various government supported programmes. The responsibility of O and M of these hand pumps lay mainly with the gram panchayat. To make these hand pump-based water supply systems sustainable, tool kits were provided to the gram panchayat and villagers trained on O and M procedures by the Gujarat Jalsewa Training Institute. However, in absence of funds for repair and maintenance with the gram panchayat, O and M ultimately became the responsibility of GWSSB. In some of the tribal areas of the state, repair and maintenance was also undertaken by NGOs and women groups.
4. In 1987, for the first time NGOs were involved during the implementation of the Santalpur Regional Water Supply Scheme designed to provide drinking water to 72 villages in Santalpur taluka. These civil society organisations were involved in awareness raising and mobilising and motivating the community for management of their in-village water supply systems.
5. A Government Resolution (GR) on the formation of the Pani Samiti/ gram panchayat as a sub-committee of the gram panchayat was passed in 1995 to provide an institutional mechanism for in-village water supply management. The responsibility of overseeing and supervising the formation of Pani Samiti/ gram panchayat lay with the Taluka Development Officer. This Samiti would be responsible for the in-village water supply and would be concerned with water distribution, operation and maintenance of the system and recovery of water cess. However these Samitis were not formed.
6. A system has been put in place by the state government for developing and implementing a scarcity master plan, efforts for which are initiated in September every year. This plan is prepared in a participatory manner, wherein demands for drinking water to tide over the crisis are generated by PRIs and local bodies. Drinking water sources of the affected village are surveyed to decide the allocation of the drinking and irrigation water. Drinking water is given priority. Groundwater surveys to quantify available resources are undertaken. A decision on water needs is jointly taken by the people's representatives, local leaders and government officials at village, taluka, district and state level. Based on this information, a scarcity plan is prepared, approved and implemented.
7. In 1994, the Government of Gujarat approached the Government of the Netherlands for supporting a project in 82 water-deficit villages in Bhavnagar district. For the first time, an integrated approach incorporating hardware and software activities was applied.

A new approach

From 2002, there was a significant change in the approach to provide rural drinking water supply in the state. In keeping with the 73rd Constitutional Amendment and

sector reform, WASMO was set up in 2002 with the sole objective to facilitate rural communities and PRIs for the development of demand-driven decentralised and community owned and managed drinking water supply systems and sanitation facilities.

WASMO works through partnerships, mainly the Pani Samiti/ gram panchayat and NGOs who work as Implementation Support Agencies (ISAs). The composition of the Pani Samiti which is a subcommittee of the gram panchayat is defined by a Government Resolution issued in 2002. ISAs have skills of working with communities and are able to motivate them. Their participation is thus key. Together with financial, technical and managerial support from WASMO and its field offices, the villagers are empowered and their confidence is built so that they are able to demand, plan, implement, operate and manage their drinking water supply systems.

In each village a project implementation cycle is followed. The project is implemented in around 18 months and is divided into two cycles. The first cycle of around six months is for community mobilisation and the second 12 month cycle involves actual execution. These two cycles are a mix of social and civil engineering components. Activities undertaken in the first cycle include:

a) Project introduction to generate demand;
b) Pani Samiti formation;
c) Assessment of requirements by the villagers and Pani Samiti/ gram panchayat;
d) Development of Village Action Plan (VAP) by the villagers with technical support from the ISA and CMSU, WASMO;
e) Approval of VAP by the Pani Samiti/ gram panchayat in the gram sabha;
f) Fixing of community contribution and its deposit in separate bank account;
g) Training on issues related to construction and finance management;
h) Planning for work execution; and,
i) Release of the first installment of funds from CMSU, WASMO.

The second cycle involves actual construction which includes:

a) Supervision and monitoring of construction by Pani Samiti/ gram panchayat with technical support from the ISA and CMSU;
b) Maintaining transparency and accounts;
c) Setting of water tariff through community involvement and getting it approved in the gram sabha; and,
d) Commissioning of water supply scheme and its O and M by the community.

Impact

Till February 2006, WASMO has been involved in facilitating around 3,533 Pani Samiti/ gram panchayats. Under different projects, in-village drinking water supply schemes based on the principles of sector reform are ongoing in all the districts as indicated in Table 2.

In several villages, the change is palpable, not just in the creation of physical infrastructure leading to water availability and improved personal and environment hygiene practises, but in the changed attitude of the people. In fact, there has been a change in the attitude of all stakeholders: the user community, the government and civil society organisations. The villagers have begun to have faith in government institutions and themselves. ISAs believe that it is possible for government organisations to put people at the centre of all efforts and to work with them. Government functionaries realise that providing water is not about water source, pipes, sumps and ESRs, but about people and their aspirations also.

Awareness levels have increased, leading to empowerment and self-confidence. Villagers

A changed approach in drinking water supply has transformed attitudes and enhanced self esteem of the villagers

Table 2: Status of decentralised in-village drinking water supply under various schemes (as of February 2006)

(Rs in crore)

Scheme	Villages covered (No)	Villages with work completed (No)	Villages with work under progress	Work to start	Total project cost (Rs crore)	Amount of community contribution deposited till now	Amount transferred to PS
Sector Reform Pilot (SRP) project	833	833	0	0	120	11.75	98
Ghogha Project	82	82	0	0	59.60	0.33	31.60
ERR Project	1260	351	705	204	172.26	5.35	57.36
Swajaldhara	833	315	419	99	45.63	6	34.58
Sector reform scheme (State)	525	110	348	67	30.00	5.00	19.53
Total	3533	1691	1472	370	427.49	28.43	240.48

Note:

* Amount transferred to PS is approximate
* Community contribution cost is approximate
* Rs. 23 crore spent for Mahi regional water supply scheme was given to the Gujarat Water Supply and Sanitation Board

have confidence in government programmes and an interesting rapport has been built up between government functionaries, ISAs and the community.

Several myths have been broken:

(i) Gram panchayats are incapable of bearing responsibilities

As indicated in Table 2, Pani Samiti/ gram panchayats in 3,533 villagers have voluntarily come forward to demand drinking water schemes for their villages with full knowledge of their responsibilities.

(ii) Villagers are unwilling to contribute

As indicated in Table 2, in less than four years, around Rs 28.43 crore has been deposited by the communities. This indicates their need, an understanding of their responsibilities and their trust in WASMO.

(iii) Gram panchayats are unable to implement construction

The paper *Infrastructure developers* by S V Ahuja reveals how Pani Samiti/ gram panchayats have been able to construct drinking water infrastructure in Zone V regions, following prescribed norms for construction and quality control.

(iv) Gram panchayats are unable to maintain fiscal discipline and transparency

The premise that gram panchayats will not be able to manage funds efficiently or keep good accounts has been effectively proved wrong as indicated in the paper on *Financial management by Pani Samiti* by Mahesh Manek. His paper informs how Pani Samitis have been able to maintain impeccable and transparent records which are audited.

(vi) *Villagers are unwilling to pay for O and M*

Once the villagers realise that they will be getting the level of service that they desire but at a price, they are willing to pay for O and M. As indicated in the paper *Sustaining supplies: O and M and beyond,* by R K Sama and others, O and M is being collected in 344 villages of the ERR Project. In the Ghogha Project, O and M costs are being paid by communities from all 82 villages. O and M is also being contributed in around

150 villages covered under Swajaldhara and Sector Reform Scheme (state).

(v) *Villagers do not understand the issue of poor water quality*
The paper *Assuring safe water through community participation* by V M Shah and Chaitali Pandit informs how water quality surveillance is being conducted by communities themselves, how unlettered pump operators responsibly add chlorine doses and how they attribute their improved health to improved with water quality.

(vi) *Conflicts over water use cannot be resolved*
The paper *Assuring safe drinking water in villages* by Apoorva Oza and P G Majithia provides an example of how women convinced the men to reserve at least some water for drinking in times of scarcity.

(vii) *In the conservative Gujarati rural society women have no role to play*
As documented in *WASMO's Annual Reports* (2002-03, 2003-04 and 2004-05) women, traditionally relegated to the background have found their voice and have often led from the front, be it in convincing their husbands to contribute, halt sub-standard construction or clean up their village. Women confess that their experience under these projects have given them the confidence in dealing with other issues as well. Still behind the *purdah*, some address large audiences fearlessly from a dais, other have turned advisors for neighbouring villagers and even bid for fishing right tenders in a male-dominated environment.

While this impact is encouraging, it is important to understand challenges and analyse some of the factors that have made this change possible so that approaches and systems can be used for other sectors as well.

Some of the challenges faced by WASMO, the ISAs and the community include:

- How can sector reform projects remain process driven programmes in spite of achieving ambitious targets.
- How to gear up to the challenges of scaling up.
- How to overcome local differences. Communities are heterogeneous; castes often prevent complete participation including that of women.
- System of support after project withdrawal.
- How to endure sustainability over extended periods.
- How to meet increasing water demands with increasing socio-economic development.
- How to resolve conflicts between drinking water and irrigation water.

Facilitating decentralised governance

The key to the success achieved by Pani Samitis/ gram panchayats has been their commitment, understanding and willingness to shoulder responsibility. It is also attributed to the efforts by WASMO which were directed towards promoting decentralisation at the lowest rung of the PRI system, namely the gram panchayat.

Through partnerships with Pani Samiti/ gram panchayat, WASMO has strived for facilitating and empowering the community in the true spirit of the 73rd Constitutional Amendment and the principles of sector reform.

Bottom-up approach

A conscious decision was taken to interact and facilitate gram panchayats directly, bypassing the district and taluka panchayats. There were several reasons for this. The thinking was that if the projects were to go through the upper two tiers this would imply dealing with a hierarchal system where the desired delivery may not be

WASMO has facilitated the empowerment at the lowest rung of self governance

Directly empowering gram panchayats enables a completely decentralised approach to demand-driven development

achieved. A true bottom-up approach would be one where each gram sabha and gram panchayat is directly approached. True decentralised empowerment and planning would emerge from this. Even though this would imply additional expenditure in terms of human resources and expenditure, the objective was to directly empower the lowest rung of governance, to build up a strong base, so that not only would villagers be able to manage their drinking water systems, but would also be able to deal with other developmental issues as well.

The Pani Samiti is a subcommittee of the gram panchayat with financial powers, acting on behalf of the village community. Full faith and trust was vested in them. Funds were transferred along with the responsibility of implementing the scheme and decision making powers. Important decisions were approved in the gram sabha. Providing support to them helped them perform their duties efficiently.

The endorsement of this decision is evident in the achievements of the Pani Samiti/ gram panchayats. As the paper *Village level institutions for decentralised drinking water supply* by Binoy Acharya indicates, these Pani Samitis/ gram panchayats have been truly empowered and can function beyond the project objectives and deal with other developmental programmes as well. He writes, 'The programme is unambiguous with regard to sustainability of the local institutions, namely the Pani Samiti/ gram panchayat as it is rooted with the mandate of the gram sabha and functionally linked with the gram panchayat which is a constitutional, democratic governing institution.'

Moving towards local self governance

Once the objectives were clear several steps were taken to achieve these as indicated below:

i) *Political/policy support:* Support from the state government came in the form of several policy decisions. These included the Government Resolutions on: (a) The formation and composition of the Pani Samiti; (b) Adoption of Swajaldhara and its principles of demand-driven community managed and owned water supply systems; and (c) Implementation of all future schemes on the principles of sector reform.

ii) *Involving the community at every step and gaining their confidence:* Concerted efforts were made to share all information in a transparent manner. Communities had faith in WASMO and in themselves so that they could demand, plan, implement, own and manage their schemes. For instance, the PRA exercise in the village where the water supply schemes are planned was a truly participatory and equitable process wherein the villagers outlined their needs.

iii) *Community empowerment and confidence building:* The projects have been implemented as programmes. By bridging information and knowledge gaps and providing the community appropriate training at every stage, the community developed the ability and confidence to deal with their responsibilities. Right from informing the villagers about drinking water and sanitation schemes, how to form a Pani Samiti and their responsibilities, poor water quality implications, possible toilet options, advantages of WRM, financial and technical issues, hand holding was provided to the Pani Samiti/ gram panchayat and village community. This hand holding is in the form of formal and informal meetings, printed material (pamphlets, brochures, posters and manuals), street plays and information campaigns.

iv) *Putting full faith in the communities and Pani Samiti/ gram panchayats:* Once the

Pani Samiti/ gram panchayat was formed in a village and an agreement was signed, WASMO put full faith in them. Funds were transferred directly to the bank account that was created for this. The supply systems planned in the village were what they themselves wanted. Construction was implemented and supervised by them. Once complete, the water supply was/will be operated and managed by them.

v) *Sending out messages that WASMO means business:* WASMO staff is a diverse group of professionals who are committed. By and large, they understand community processes and go beyond 'armchair monitoring.' By visiting the villages they understand and make allowances for the dynamics and problems that exist in the village and make efforts to solve these. In the spirit of decentralisation, field offices have been opened in the districts for closer contact with the communities.

WASMO has tried to function as a true facilitator, providing support as needed. Messages were sent out that the organisation genuinely means business and in keeping the community the focus of all efforts. By being professional, setting self targets, putting management systems in place and not serving as bottlenecks, the organisation has managed to work with a large number of stakeholders. The mechanism for release of fund installments for example is simple and rapid. The first installment is given before launching construction after the community contribution is deposited in the bank. This helped in speeding up the implementation process.

The capacity of WASMO and ISAs was also built up through in-house training and orientation programmes and training workshops for ISAs to meet challenges and deal effectively with issues on the ground.

vi) *Being flexible:* Every village plan was sanctioned based on need as against a 'one size fits all' strategy. Several techno-economically feasible options were provided to the community. For instance in areas where local water sources were unable to meet drinking water demands, household rooftop rainwater harvesting systems were installed. In Ludva village in Kutch district, a water treatment plant for iron removal from the local water source was constructed. In villages where the households are scattered cluster storage systems were developed.

vii) *Building partnerships and working together:* Building effective and transparent partnerships based on trust, with roles and responsibilities clearly defined helped provide the user community with the state-of-art knowledge and practices. The MOU between WASMO and ISAs and WASMO and the Pani Samiti/ gram panchayat clearly defines the roles, responsibilities and powers of each partner.

viii) *Putting systems in place that ensure transparency:* The village community is often skeptical of development projects on account of corruption. Several steps were thus taken to minimise corruption. These included discussing details of the project, approval of the village action plan with financial details, accounts, water tariffs and other important decisions in the gram sabha; display of scheme details on notice boards at panchayat ghars and painting of the WASMO logo on check dams. Separate account books were maintained by the Pani Samiti/ gram panchayat which was audited by the ISA as well as WASMO. Regular meetings with the villagers provided information on the project.

WASMO strived to support empowerment in a comprehensive manner that reduced or eliminated road blocks

The WASMO experience offers a model for implementation of the 73rd Constitutional Amendment

ix) *Addressing agents of change:* Several steps were taken to involve women, who are responsible for domestic water needs as well as household hygiene. Women were addressed as a separate group and encouraged to talk about their problems and possible solutions amongst themselves and in gram sabhas and other meetings. They were informed about health, hygiene and water quality issues. Through concerted drives that included workshops, training programmes and exposure visits they were informed about the programme and other issues.

According to the Pani Samiti Government Resolution, one-third of the members should be women. Women Pani Samiti members were encouraged to participate in project activities such as construction monitoring, collecting community contribution, water tariffs and keeping drinking water, their homes and surrounding clean.

Children are effective agents of change since they can put pressure on their elders. Moreover, they will grow up to be future water leaders and opinion makers. By engaging them change can be brought about for the present as well as the future. They were thus targeted as a separate constituency through special efforts.

A model for local governance

WASMO took a conscious approach to facilitate and empower the lowest rung of governance, the gram panchayat. This has meant spreading considerable resources directly over a large constituency. However, the experience gained indicates that when faith is vested in the gram panchayat, with appropriate empowerment support, they are able to rise to the occasion. Rather than pushing them into adopting the programme, the strategy has been to pull or 'attract' them into the programme as partners who demand development projects and are willing to contribute and own it. With systems such as approvals in the form of gram sabha resolutions and compulsory transparency norms in place to make the process truly democratic, working with gram panchayats enables empowerment from the lowest level upwards.

This approach adopted by WASMO offers a a model for completely decentralised governance. This model can be explored for addressing developmental issues in other sectors as well, in the true spirit of the 73rd Constitutional Amendment, for sustained socioeconomic development.

COMMUNITY EMPOWERMENT

An array of communication media is being used for reaching out to the communities

Communication channels

A combination of media is being used to cater to different groups and to reinforce messages. Since indigenous media like folk plays and interpersonal communication are more effective for imparting certain information and messages among rural communities, these are used extensively in addition to mass media. The major communication channels that are used are outlined below.

Print

A bi-monthly thematic newsletter, 'Lok Samvad' is being published regularly by WASMO. (see Box: Published issues of Loksamvad). Since its launch in June 2004, a standardized layout and colour scheme has been developed for uniformity and immediate recognition of the publication. The newsletter is targeted for the grassroots audience as well as policy-level opinion leaders. There is a cascading effect created when literate members in the villages read newsletters and pass on the information to the rest of the community. The content is informative as well as pictorial, with sections dedicated to key themes, village initiatives and inputs by children. There are 20,000 copies published for every issue for easy access by communities, ISAs and other stakeholders. A detailed schedule for dissemination of this newsletter as well as other print material is prepared periodically and region-specific quantities that are to be distributed is indicated. The distribution of the material is done in close coordination with the ISAs.

Published issues of Loksamvad

1. Decentralized approach and people's participation in drinking water and sanitation sector
2. Water Resource Management
3. Sanitation
4. Water Quality and Chlorination
5. Community Participation and Model Villages
6. Community Voices

Various brochures, booklets, manuals, leaflets, posters, banners and stickers have also been developed and distributed among the village community, Pani Samitis, panchayat members, school children, project partners and other stakeholders. While most material has been produced in Gujarati, few have also been developed in English. The introduction of each IEC material, whether it is a poster, a manual or a booklet, is usually done through events and demonstrations so that greater awareness and interest is generated within the communities.

Radio

Two programmes, Gam No Choro, and Lokvani, have been broadcast through All India Radio. Both these programmes were region-specific, and explored the themes of community participation, water and sanitation, health, hygiene, environmental cleanliness, water conservation and rainwater harvesting. In the Gam No Choro programme, local opinion makers such as Pani Samiti members, sarpanches and women were invited to motivate and share their experiences on these themes. In addition to the two programmes, nature-based episodes were developed with the support of Gujarat Ecological Education and Research (GEER) Foundation. Daily radio spots were also aired regularly for over three months on themes like Pani Samiti formation; water quality surveillance; Swajaldhara programme; and environmental and personal hygiene.

Street Plays

These have proved to be an effective means of mobilizing, informing and entertaining the rural communities (see Box: Street plays: An effective means for bringing out solutions). Many of the plays use the traditional folk format, bhavai, and are in the regional dialect, performed by professional media groups. They are usually held on actual prevailing concerns or issues in the village, and are effective in generating participation

and discussions among the people. Typically, street plays are staged around three themes during the different phases of the project, and sanitation aspects are included throughout the project tenure. The three themes are:

1. Introduction of the project in the village
2. Encouraging community participation at the time of project implementation, soon after the Village Action Plan has been prepared
3. Importance of O&M after completion of construction activities

Interpersonal Communication

Face-to-face communication including focus group discussions have been found useful when communicating with women and children. It has been seen that these two groups can be better reached and motivated when approached directly. Communication to them is done through organized networks such as schools and health centres, as well as through community leaders, Pani Samiti members and field workers.

Campaigns, Rallies and Fairs

Fairs and campaigns are also useful platforms for reaching out to the communities as women and children participate in a big way. Fairs during religious and cultural events are well attended by the rural populace and focused campaigns on cleanliness drives and greening of villages have a great impact (see Box: Mass campaigns of WASMO).

Capacity Building

Along with IEC activities, capacity building is another major tool to engage the communities in the project activities. It not only enhances the skill base of the people, but also adds quality dimension to the work. The main methods used for training are lectures, group discussions, peer group interaction, demonstrations and case studies. Hands-on training is done for certain topics such as record-keeping to ensure that

IEC Material Disseminated by WASMO

Sr. No.	Material	Quantity
1.	Individual Sanitation poster	9,800
2.	Household Sanitation poster	9,500
3.	Village Sanitation poster	9,500
4.	Toilet Options poster	1,700
5.	Ideal Village poster	2,000
6.	Ideal Village Swajaldhara poster	3,500
7.	Nandanvan poster	800
8.	Nandanvan Swajaldhara poster	4,306
9.	Water quality – human body poster	9,000
10.	Water quality – human body poster (English)	250
11.	Safe water poster (English)	1,500
12.	Chlorination chart	15,200
13.	WRM - Ghogha brochure	5,000
14.	WRM – ERR brochure	19,642
15.	Swajaldhara brochure	40,000
16.	WASMO brochure	27,000
17.	Toilet option pamphlet	60,400
18.	Swachchhta pamphlet	55,448
19.	Water quality pamphlet	68,280
20.	Chlorination pamphlet	68,000
21.	Pani samiti booklet	2,593
22.	Swajaldhara Pani Samiti booklet	5,000
23.	Ghogha booklet	3,162
24.	ERR booklet	22,000
25.	Stickers (English)	50,000
26.	Stickers (Gujarati)	3,00,000
27.	Loksamvaad 1-6 issues	20,000 each

Street plays: An effective means for bringing out solutions

Patadi is a large village in Surendranagar district. Community contributions were not regular in coming and a solution had to be found. A street play on community contributions was organized just prior to the gram sabha that was scheduled that day. This play led to an animated discussion at the gram sabha. What emerged was that the people were well aware of the need to contribute, but they did not know where they should make the payments. The large distances within the village necessitated a centralized system of collection. Matters finally came to a rest and the problem of irregular contributions was solved when it was decided that collections would be done hamlet-wise.

Mass campaigns of WASMO

An Intensive Campaign in Kutch

In January 2005, a special campaign on the dual issues of revival of traditional water sources and village sanitation was held in Kutch. The campaign was conducted as part of the Republic Day celebrations and lasted for three days. The people were only too familiar with the problem of water scarcity in their region. However, they did not believe that anything could be done about it. During the campaign, the people were brought together to understand issues related to sustaining surface water sources and exploring ways to augment them. Rallies, video shows, and focused group discussions with women were organized. Demonstrations and exposure visits were also held for understanding the rooftop rain water harvesting system. The awareness generation activities culminated in the communities identifying at least one action point for their village.

With regard to sanitation, a large number of villages had a history of filth dotting the streets. The campaign spurred the communities into action and pushed everyone into cleaning up their areas. In several villages, the people later built soak pits and planted trees as part of their cleanliness efforts. Many even organized tractors for the collection and disposal of garbage. At the schools, the children received a sanitation kit for keeping the school surroundings clean, as well as a personal hygiene kit.

WASMO at the Tarnetar Fair

Tarnetar, located in Chotila block of Surendranagar district hosts the popular religious and historical Tarnetar fair every year. It attracts large crowds, with as many as an estimated nine lakh people visiting the grounds over three days this year. Since the fair is essentially attended by the rural communities, it is an effective forum for generating awareness and disseminating information on key issues that concern them. WASMO had a stall at the fair, and focused on sensitizing the communities about water and sanitation. A range of display material including posters and models were put up at the stall on latrine models; roof rain water harvesting; health and hygiene; and village sanitation. Further, demonstration and awareness creation was also done on chlorination and water testing for facilitating the intake of safe drinking water. Audio visual programmes as well as the staging of street plays were among the other methods used to generate interest among the village communities on water and sanitation. During the course of three days, approximately 30,000 people visited the WASMO stall and IEC material and guidelines for sanitation units were disseminated to about 5000 visitors.

concepts and guidelines are understood. For instance, the Pani Samiti members are encouraged to do actual exercises in record keeping during the training sessions. Some of the major areas where capacity building is done are:

- Encouraging collective action and understanding group dynamics
- Participatory approaches to community-based action
- Technical know-how about the programme
- Construction monitoring
- Financial processes and monitoring, including bank procedures
- Record keeping
- Water quality surveillance
- Personal and community sanitation and hygiene
- Operation and maintenance

Manuals developed by WASMO

- Pani Samiti guidelines
- ERR Project
- Ghogha Project
- Swajaldhara Guidelines
- Operation & Maintenance Manual
- Finance & Technical Manual
- Chlorination

Interventions for target groups

Pani Samitis

At the village level, the presence of a strong and functional village institution is important for the success of the projects. As a result, sub-committees of the village panchayat, known as Pani Samitis have been formed in all project villages. These committees are involved with the projects at every stage and have numerous roles to play. Among their important tasks are the preparation of the Village Action Plan; construction of in-village water supply and sanitation structures; community contribution collection; operation and maintenance; and ensuring water quality.

To enable the Pani Samitis to carry out their tasks and responsibilities, IEC interventions are necessary during the entire project cycle. Initially, before the formation of the Pani Samiti, IEC activities aim at community mobilization to spread awareness about the project. Once the committee has been formed, the Pani Samiti is taken on an exposure visit to a neighboring village to familiarize it with the nature of project

interventions and the tasks it will have to carry out. These visits are very useful for problem-solving and peer learning as new Pani Samiti members can share their concerns and issues with the more experienced members.

Brochures about project information and contact details are given to the Pani Samiti to assist it in its activities. For the construction of water and sanitation structures, construction guidelines are also provided to ensure appropriateness and quality of construction. Further, contact information is provided about all the service and material providers so that the Pani Samiti can procure materials with ease. To assist the committees with their finance, record-keeping and O&M tasks, manuals with illustrations and graphics are provided. For example, the manual for record-keeping illustrates how vouchers are to be filled to avoid ambiguity about the process.

Women

WASMO's activities are particularly directed at gender issues since water and sanitation is typically the domain of women. If their views and concerns are not factored into the programme interventions, there are greater chances that project activities will not meet their requirements and expectations. For example, aspects such as location of structures, standard of services and timings for water supply need to be determined in consultation with women.

Moreover, while implementing IEC activities, it has been found necessary to design and communicate different messages for men and women. When the female folk have been included through all the project phases, impacts and benefits have by and large been more enduring. Improved hygiene behaviour has been incorporated into daily lives and has also been passed onto children. Language and literacy are often barriers, disallowing women to access many of the print media channels. As a result, communication has been most effective when done through the interpersonal means, radio, fairs and campaigns.

Water supply systems

Since women are the primary collectors of water, it has been easier to have their participation when messages for drinking water systems have emphasized reduced drudgery and of more quality time. Experience has also revealed that the willingness to pay for services and O&M has been more prevalent when women have been closely involved with the projects. This has been true even for poor socio-economic groups, where women have come forward to pay even small sums such as Rs. 1 per family per month for accessing drinking water services.

Use of toilets

For sanitation and the use of toilets, motivating factors apart from benefits to health and environment needed to be found. Since most villages have strong patriarchal systems where men make the decisions, the choice of whether or not to have toilets is often made by males and is based on economics. In several communities such as the Darbars and Muslims, there is a strong tradition of protecting women and excluding them from social activities. Messages have been found to carry greater persuasive power when the sensitivities of men are addressed and they are explained the benefits of toilets such as increased self-respect, privacy and safety for women and girls.

Safe water handling

The chance to contract disease is large when water storage and handling for drinking and cooking is not done safely. Project activities aim to generate awareness among women through information dissemination and demonstration of safe water handling since they are the primary agents for handling water (see Box: Conviction of demonstration).

Manuals and guidelines with illustrations and graphics have been provided to assist Pani Samitis in carrying out construction work and following appropriate financial procedures

Conviction through demonstration

'Water travels about 450 km from Narmada to the village periphery. It travels 450 m in the pipeline before it reaches the village water point. The trip from the tap to the home is approximately 4.5 m and another 4.5 inches are added before the glass of water touches the lips. During the course of this journey, there are innumerable possibilities for the water to get contaminated.' This is a simple and easy-to-understand demonstration of the importance of protecting water sources and safe water handling. It has been found to have a lot of convincing power among the communities for adopting safe hygiene practices and protecting the water sources, especially when handling water within homes.

Hand washing and personal hygiene

Once women become practitioners of improved hygiene, they are able to enforce them even on their children and family. Soiled hands and the practice of not bathing and cutting nails constitute risks to health. IEC activities have identified and targeted these aspects and have sought to bring about improvement in traditional hygiene practices. The main means of communication have been mass media such as the radio, folk media, street plays and interpersonal communication since these have a greater impact on women.

Children

Children are a promising resource for promoting improved sanitation practices. Involving children not only translates into better outreach and effectiveness, but it also creates prospects for greater programme sustainability. Children are the future, and once they adopt safe hygiene behaviour, they will continue with the improved practices and will also ensure that future generations and the rest of the communities also adopt good sanitation practices.

This apart, it has also been found that older children are a considerable influence upon the younger ones and peer pressure is effective among them. They not only look after and help the younger children, but they are also able to influence the habits and behaviour of these younger children. In several project villages, the older children have been taught to ensure that their younger counterparts cut their nails and have a bath before they go to school. It is they, rather than the teachers, who enforce and inspect the hygiene practices within schools. Often, where the communities are more closed and the involvement of women in the villages is limited, targeting children for improved sanitation and hygiene is the only recourse for introducing the community to the concept of sanitation.

Involvement of parents and teachers

IEC interventions for involving children target not only them but also include parents and teachers. Since improved hygiene and sanitation calls for ongoing interventions and is not a one-off activity, efforts are made at two levels. First, awareness generation is created with the concept of sanitation and good practices being introduced to the children within schools. Once there is sufficient awareness, efforts are made to ensure that the children then become practitioners of better hygiene. (see Box: Schools as platforms for encouraging good hygiene behaviour). Incentives and rewards are given out regularly through cleanliness and hygiene competitions organized in schools. Follow-up visits are also done at the household level where mothers are personally approached to encourage them to ensure that the children remain clean and use sanitation units.

Innovations

Several means have been used to target children. Posters and paintings have been specially designed for display at schools, and have been well-received by children. An innovative medium which proved to be very effective was the use of notebook labels for disseminating simple messages on hygiene. Different labels were distributed among children, and generated a lot of curiosity and enthusiasm among them. Each student was keen to know what label the other student received, and as a result, many messages could be communicated.

Among other innovations that have been successful are the organizing of painting competitions, debates, essay-writing and quiz competitions and village rallies. (see Box: Teaching children the value of clean hands). In many villages, cleanliness drives have been organized on a large scale and have been very well attended by children.

Recent Initiatives

WASMO programmes include many levels of stakeholders, from government departments and functionaries, to partnering agencies such as NGOs, down to the communities. While this is an advantage to the organization as it helps it in meeting its milestones and targets, it also means greater challenges in terms of ensuring adequate stakeholder involvement while scaling up activities. Some of the new initiatives that have been undertaken are highlighted below.

User feedback

To ensure ongoing relevance of the IEC material to stakeholder-needs, efforts have been made to collect systematic feedback. A beginning was made in Ahmedabad, during a post card campaign, where feedback was sought from village communities, school teachers, anganwadi workers and PHCs. A post card was sent with the IEC material such as newsletters, pamphlets and brochures and readers were encouraged to fill it in. The respondents were then contacted during field visits by the district officials. Now, the regular newsletter, Lok Samvad, also includes a section for encouraging reader-feedback. Five questions are asked on content and opinions, and prizes are given as incentives to the winning respondents.

Responding to emergency needs – head B

As the organization is gaining experience and insights, it is increasingly equipped to respond efficiently and quickly to disaster and emergency needs. (see Box: Gujarat floods and emergency efforts). Natural disasters and calamities call for focused and intensive IEC interventions to mitigate the adverse effects, and WASMO has begun to shoulder the responsibility of the new demands as the need arises.

Convergence of efforts

The issues of drinking water and sanitation need to be tackled holistically from various fronts for maximum impact. A large number of WASMO's partner agencies, during the course of their work at the field level generate their own IEC material. Since a lot of IEC material is already available, WASMO can focus on identifying and filling the gaps where new communication material may be necessary.

Liaising with government departments

WASMO has forged alliances with Information and Forest Departments for greater outreach. It has developed radio and video spots for the half-hour programme, 'Hariyalo Sopan', which is broadcast through these departments.

Schools as platforms for encouraging good hygiene behaviour

The primary school in Sadai has 52 children. The teacher, Bhavnaben Chowdhry, says, "Instilling the habit of toilets has been an uphill task. The boys shy away from the toilet as girls also use the facility. To avoid this problem and to prevent the children from going in the open, I have created a separate time for boys and girls for using the toilet. In this way, it is compulsory for the children to visit the toilet at least once in the day."

It is because of such regimentation that changes in behaviour are being brought about. In fact, cutting nails, washing hands, and bathing are becoming increasingly common in project villages, and when visited, children from many villages are quick to boast that they are clean.

At school programmes, the children are encouraged to handle water to check if their hands are clean. The ones who believe that they have clean hands are asked to rinse their hands in a bowl and the water from this bowl is poured into a transparent glass. If the hands are dirty, the results will immediately be reflected through the water in the glass. In this manner, the communities are beginning to learn the importance of washing their hands before handling water.

Gujarat Floods and emergency efforts

The heavy rains in 2005 had affected Gandhinagar, Vadodara and Panchmahal districts, and played havoc in many areas, leading to floods, damaged infrastructure, water logging and accumulation of garbage. A comprehensive water quality surveillance programme was carried out in September 2005, as a preventive measure to guard against potential epidemics. In about half of the 100 villages that were visited, incidences of epidemic were suspected because of the lack of sanitation and cleanliness in streets and around water supply sources.

The communities in the affected villages were educated and urged to keep the villages clean and follow safe hygiene practices to avoid outbreak of any epidemic. Comprehensive and need-based IEC interventions were implemented in the villages, along with radio and video spots, cleanliness drives and distribution of IEC material. Efforts at all levels were made to educate people and motivate them to keep the village and sources of drinking water clean. WASMO collaborated with PHCs to survey the diseases and implement damage control, and also simultaneously educated women and children about the importance of drinking water quality and safe hygiene practices.

A 45-second video spot was developed for the Doordarshan network to spread messages about chlorination, sanitation and use of safe drinking water to prevent epidemics. The spot focused on various safety measures to avoid water-borne diseases.

Website

A bilingual, user-friendly website in English and Gujarati has been developed to make information and resources available to a large cross-section of stakeholders. The website serves to reinforce the efforts through other media channels by providing a wide array of data and material. Due to this versatile platform, the website has the potential not only to support community-level activities, but also the organization's advocacy role to influence policy decisions.

Conclusion

The IEC interventions will need to draw upon the lessons learned while gearing up for future activities and responding to new challenges. The three crucial aspects for ensuring that IEC interventions are effective are production, dissemination and demonstration. With regard to production, WASMO today has its own in-house team that can develop relevant and useful IEC material for its projects and special events. It is not only able to produce standard IEC material such as newsletters, posters and manuals on a large scale, but it is also able to respond to specialized needs of the organization when it participates in fairs, campaigns and workshops.

The current challenges are concerned with the latter two aspects – those connected with dissemination and demonstration. As the projects scale up and it becomes necessary to expand the outreach to more villages, there are greater logistical issues for ensuring timely delivery of IEC material to intended audiences. Similarly, with demonstration too, it has been found that it is easier to organize demonstrations of IEC material with smaller groups, but more difficult on a larger scale. Demonstrations are an important element in IEC interventions as they enable the communities to get exposed to the material and internalize the messages. While the aim of the organization is to organize demonstrations at the villages when introducing any new IEC material, this has not been possible at all times. The solution to strengthening IEC interventions perhaps lies in developing greater synergies between project partners and personnel.

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Infrastructure developers:
Construction of village water supply and sanitation systems by Pani Samitis

Supported by engineering teams, confident Pani Samiti members are successfully constructing drinking water and sanitation infrastructure in their village, adopting defined quality norms and following transparent procedures

S V Ahuja and Amita Shah

Summary

In drinking water and sanitation projects facilitated by WASMO, the user community plans, implements and monitors construction activities. Technical support and guidance is provided to them by the Engineering Support Cell of WASMO for meeting quality and financial norms.

The villagers have successfully constructed pump houses, elevated storage reservoirs, sumps, stand posts, cattle troughs, toilets and water conservation structures like check dams, meeting all Zone V (highest magnitude of earthquakes) structural requirements.

This paper attempts to capture the entire construction process, right from sensitising and training Pani Samitis for planning, implementing, monitoring and managing construction in villages of Kutch and Patan districts covered under the Community-managed water and sanitation programme in earthquake villages of Gujarat *project.*

Introduction

The construction industry in India accounts for 40 to 45 per cent of the total investment on development and can be divided into five main sectors: communication, transport, power, housing and water and sanitation infrastructure.

Compared to the other sectors, development of water and sanitation infrastructure has been neglected. However, the commitment of meeting the Millennium Development Goal of halving the number of people who do not have access to safe drinking water by 2015 has increased funding in this sector. In addition, Bharat Nirman, a five year time-bound rural infrastructure plan was launched in 2005 by the Government of India in partnership with state governments and panchayati raj institutions. Between 2005-2009, this plan hopes to provide every habitation with a safe source of drinking water. With the Water Decade also being celebrated from 2005-2015, the next ten years will certainly witness a major thrust on development of water and sanitation infrastructure.

In Gujarat, as a facilitator for in-village drinking water supply and sanitation, WASMO supports Pani Samitis which are committees of the Gram Sabha, to plan, execute and manage in-village drinking water and sanitation construction. This paper will document the process and results obtained from the *Community-managed water and sanitation programme in earthquake villages of Gujarat* or the ERR Project.

Assuring drinking water

On January 26, 2001, Gujarat was hit by a devastating earthquake with its epicentre near Bhuj. This earthquake caused death and massive damage to infrastructure, including drinking water supply systems. This region was already suffering from drought and drinking water shortages. Estimates

Construction by Pani Samitis is a process-driven approach where their capacity to handle construction-related issues is enhanced before actual implementation

indicated that this shortage would only increase in the future.

After the initial relief and rescue operations were over, a decision was taken to implement programmes that would ensure long-term drinking water supply as a part of the reconstruction process. The Asian Development Bank supported the bulk transfer of Narmada water to Kutch as a back-up support for local water sources. This Narmada-canal based drinking water project provides water up to the village head. The Netherlands Government came forward to support the state government for the creation of community-managed drinking water and sanitation systems within villages. The ERR Project was subsequently launched in April 2003. This project covers all 1,260 earthquake-affected villages in Kutch, Patan, Jamnagar and Surendranagar districts and will come to an end in December 2007. From April 1, 2005 the project is being supported by the Government of India.

Implementation of the project is based on sector reform principles wherein the user communities are responsible for planning, implementing and managing the drinking water supply and sanitation facilities. The programme is implemented by Pani Samitis with support from WASMO field offices, namely the Coordination, Management and Support Units (CMSUs) and their Engineering Support Cells (ESCs), and NGOs as Implementation Support Agencies (ISAs). As on November 30, 2005, construction of water supply and sanitation systems was in progress by Pani Samitis in 538 villages in Patan and Kutch and completed in 287 villages.

Believing in communities

The beauty of the whole programme lies in the unbound faith in the Panchayat. Under this programme, planning, construction, quality control and maintenance of the facilities is the responsibility of the Gram Panchayat committee, namely the Pani Samiti. The Pani Samiti is a legal sub-committee of the Panchayat, and consists of minimum eleven members wherein at least three women members and representatives from all castes are included. This committee is responsible to the Gram Panchayat and this approach is a step towards decentralised implementation and management of projects through villagers.

It is the Pani Samiti that is responsible for constructing infrastructure such as stands posts, elevated storage reservoirs, sumps, pump houses, stand posts, cattle troughs, bathing ghats, school rooftop rainwater harvesting systems, toilets and rainwater conservation structures.

Processes involved

The total time frame of completion of the in-village drinking water and sanitation scheme is 18 months. The first phase of software activities planning is of seven months, while the second phase of implementation is of 11 months. Experience indicates that the first phase takes about 5-8 months while the second phase takes 6-12 months.

The first phase consists of software activities in the village to elicit involvement of the community. This includes arranging discussions and workshops for groups of villages wherein Pani Samiti members are sensitised towards construction methodology, the procedure to be adopted, financial rules and procedures to be followed. Construction training is given to masons so that they can implement small construction. At least two workshops are arranged before the actual construction activity starts.

Experience of working with village communities indicates that Pani Samitis initially need considerable technical support as well as support for purchase of materials, accounting and post-project management. The roles of each partner – the Pani Samiti, ISA and WASMO needs to be clear and understood by all partners.

Accordingly, field manuals and materials highlighting and explaining all details of the project in as simplified terms as possible were prepared. Three field based manuals were developed, namely the *Pani Samiti Guidelines*, *Implementation Procedures Manual* and the *Operation and Maintenance Manual*.

Village action plan compilation

Planning of works requires time and patience and is a compulsory exercise for Pani Samitis. Without going into the planning process in depth, it is impossible to involve each and every member of the village in water supply and sanitation. People who take interest right from the planning of the project are naturally interested in the implementation phase.

The village action plan or VAP is the first step towards implementation. Preparation of the VAP is an important process for involving the community at large, women as a focal group and the Pani Samiti in particular. The VAP attempts to recollect and document the history of development and the efforts in drinking water supply and sanitation over the last two decades. In other words, it is a recollection of all important events that have occurred in the village. Participatory Rural Appraisal (PRA) is an important tool for VAP preparation. It ensures that the entire community, particularly women are involved. This helps in articulating the drinking water and sanitation needs of the village. It also helps in mapping existing infrastructure. Many consultations are held at different levels ensure that the VAP emerges as an important village document, one that the residents are proud of. When the VAP is prepared in a participatory manner, the capital contribution becomes easier to collect and equitable. The knowledge of the community in the village and its topography helps in planning and locating structures as well. The Pani Samiti thus becomes the most suited to decide the number and location of various water supply components that best suit the needs of the village. The Pani Samitis here usually take care of every community in their village, irrespective of caste, creed and economical status.

During this phase, the role of the ISA is to ensure community participation - especially women - and support them in planning, and to ensure that the scheme will result in equitable drinking water availability.

With the role of WASMO being that of a facilitator, it becomes the moral responsibility of WASMO engineers to present various technical options regarding water supply systems before villagers so that they can select the best option.

VAP component planning

Once the VAP is prepared, the Pani Samiti gets it approved into the Gram Sabha. The VAP is divided in three main components, all dealt with separately:

- *In-village water supply system*: Includes water transmission lines up to storage reservoir, pumping machinery, storage structures, distribution networks and other infrastructure like stand posts and cattle troughs. This portion of the VAP invites keen interest and involvement from the villagers, since this is directly connected to their needs, lifestyle and livelihood.
- *In-village sanitation system*: Includes the collection and safe disposal of domestic wastewater including toilet effluent and solid waste; school sanitation facilities, community toilets and washing ghats.
- Strengthening of traditional water sources: Includes any work that strengthens the existing drinking water supply sources or creates local reliable sources for drinking water supply.

Structural planning

Several factors are taken into account before finalising the components of the water supply and sanitations systems.

a) *Water supply system*: All techno-

Preparation of the Village Action Plan is an essential participatory process that defines the water supply needs and systems needed within the village

Plans are made for water supply and sanitation systems as well as for the revival of traditional water sources

economic options are explored while planning for each component of the water supply system. For instance, the choice of pipes for transporting water from the source to the village storage reservoir and subsequent distribution networks from the reservoir are important decisions. The decision on the type and size of pipe to be used is finalised after considering engineering and public acceptance perspectives. Public acceptance in turn depends on factors such as the capability of the people to contribute.

Decisions on the type of the storage to be constructed depend upon the paying capacity of the people. Though household connections are usually preferred, multiple pumping to lift and store the water in an elevated tank should be avoided, as this will add to their recurring costs. Many villagers choose to opt for the stand post network for water distribution.

The project is flexible enough to deal with village-specific problems that emerge during implementation. For instance, the groundwater in several villages in Kutch contains excessive iron. Excessive iron intake can affect the digestive system if consumed over time. To address the problem, settling tanks in Filon, Ludva and Kurbai villages and filter plants in Angia, Kodki, Meghpar, Godpar Sarli, Naranpar Ravri villages have been incorporated into the VAP.

b) *Sanitation systems*: Through the efforts of the ISAs and WASMO, villagers are beginning to understand that waste disposal is equally – if not more – important than the provision of safe water. They are now aware that 80 per cent diseases are waterborne and due to unsafe drinking water, lack of safe disposal of wastewater and absence of hygienic practices. They realise that (a) the wastewater from stand posts, cattle troughs, washing ghats and other public places needs either to be discharged into soak pits or collected and disposed off by other means like underground/ surface gutters; (b) biological waste can be used as fertiliser; and, (c) other solid waste should be collected separately and used for earth filling. The type of disposal system they decide depends upon their paying capacity.

c) *Revival of traditional water sources*: Villagers are encouraged to conserve rainwater and recharge underground aquifers so that local traditional water sources are revived and strengthened. The reliability of the local 'home' sources is explained to them. That distant sources should be considered as alternative sources and thus be accorded second priority is emphasised. The involvement of the village elders helps in planning for these water conservation structures. Their knowledge about the local topography, underground strata and the weather, coupled with new technologies available helps in planning.

The final outcome at the end of this planning for all the above components is incorporated in the VAP, indicating the structures to be constructed, their total and initial capital cost, recurring cost and reliability of the system.

Construction implementation

The implementation phase starts after the VAP is approved in the Gram Sabha by the Pani Samiti. Under the decentralised process, the Pani Samiti is responsible for implementation. The role of WASMO is to support Pani Samitis so that they can take decisions on their own. Since problems vary in the villages, the schedule of construction of water supply components also varies, depending on requirements and constraints.

The implementation process includes the following steps:

- Procurement of materials by inviting quotations and/or tenders;

- Selection of the best vendor;
- Preparing the schedule for construction of different water supply and sanitation components; and,
- Supervision of construction work.

Before launching construction, quotations are invited for materials and labour contracts. Tenders are invited for construction components such as elevated storage reservoirs which require technical expertise. The Pani Samiti is free to select the best material and contractor even though it may not be the lowest one. WASMO has always laid emphasis on quality work and this has been internalised by the Pani Samitis.

Implementation options

For actual construction, the Pani Samiti can avail of several options:

a) Labour can be directly engaged on a daily wage basis and materials can be purchased from the open market by direct competition. Here the Pani Samiti is directly responsible for construction. However, the purchase of standard quality material from open market and that too from approved vendors and to get the quality work from the labor is a tedious and time consuming job. Though Pani Samitis have succeeded in getting construction that meets their requirements, most of them avoid this process.

b) The work can be entrusted to a labor contractor where the material can be supplied to the contractor free of cost. The materials are separately purchased from open market through direct competition by Pani Samitis. Here the Pani Samitis have to rely on the labor contractor but can achieve the required workmanship with a little vigil and devotion to work. This has proved to be the best alternative for small projects. Good results have been obtained, especially for the construction of stand posts, cattle toughs, pump houses, small capacity storage tanks, washing ghats, toilets, laying of pipelines and rainwater harvesting structures.

c) The entire work can be entrusted to a contractor, wherein the responsibility of purchasing of materials lies with her/ him. Here the contractor is responsible to provide the finished construction to the Pani Samiti. The responsibility of the Pani Samiti is limited to monitoring the quality of work. This is the most accepted way of implementing the construction of for all medium-sized projects. This approach is not being promoted by WASMO as in this process the role of Pani Samiti members is limited and the aim of WASMO to build up and strengthen the capacity of Pani Samitis is not achieved to the desired extent. However, works requiring engineering skills such as overhead tanks, medium capacity check dams, medium to large capacity ground level and underground water storage tanks are executed in this way.

While implementing construction the Pani Samitis have several options to choose from

Experience indicates that in most cases, the approach has been a mixture of the above processes. Small works are being executed through piece workers and labor contractors and medium to large works are being executed through qualified contractors. By and large the finished results were satisfactory whatever process was followed, since quality of work does not depend on the type of process involved but on the mindset of the Pani Samiti members. Examples of different procedures adopted by Pani Samitis are given in Table 1.

Quality Control

Pani Samitis are encouraged and guided not to compromise on safety aspects in the construction phase. They are explained on the need of being extra vigilant. The direct benefit of safety precaution is quality output. A good structural design with good workmanship always pays, whereas a structure having a perfect and safe design may suffer due to poor workmanship.

Table 1: Implementing options
Examples of implementing procedures adopted by Pani Samitis

Names of villages	Structure	Implementation process
Jakhau, Vada, Panandhro, Dhrub, Vadasar and other villages	Overhead tank and underground sump	Turn key, including design, materials, construction and commissioning
Ravapar, Bhuvad, Antarjal, Ajapar, Khari Rohar, Ajarakhpar	Overhead tank and underground sump	As above but materials such as cement and steel to be provided by Pani Samiti on actual cost basis
Adesar	Overhead tank and underground sump	The Pani Samiti provides cement and steel while all other materials and labor is provided by contractor
Amardi, Sardarnagar, Naranpar (Ravri), Kera, Kotda Athamana, Kotda Ugamana, Nana Tharawada	Overhead tank and underground sump	All the materials to be provide by Pani Samiti, only labor contractor is engaged

Several efforts are taken by WASMO to ensure quality construction to empower the Pani Samiti with knowledge. This includes holding sensitisation workshops, providing documented material in the form of manuals and lists of approved vendors. WASMO adopts the technical norms and specifications set by the Gujarat Water Supply and Sewerage Board (GWSSB). The list of vendors for materials finalised by GWSSB is provided by WASMO to the Pani Samiti. However, a technical committee in WASMO can delete the name of a vendor on grounds of quality if the materials do not meet standards.

Experienced contractors with engineering knowledge are selected as vendors for a particular type of work. Precautions are taken to see that the structural design of the important structures is safe and sturdy.

Other quality control measures include:

a) Purchase of all material from approved vendors. The specification for materials is drafted wherein it is made compulsory for the materials to be as per prevailing BIS norms.
b) Compulsory third party inspection for most of the materials by a Government Undertaking/external agency. The materials are tested in accordance with procedures outlined by the Bureau of Indian Standards. Third party supervision has recently been made compulsory for all construction activities as well.
c) Engineers engaged by WASMO and by ISAs frequently visit and check the quality of work.

Monitoring

The awareness and training provided by WASMO and ISAs, coupled with the strong sense of ownership by the community has ensured that the construction is satisfactory. Strict and constant construction monitoring at vertical levels by different agencies such as Pani Samitis, ISAs and by the ESC, WASMO has helped in rectifying defects and in correcting errors and omissions. As a result, Pani Samitis have been able to construct water retaining and other structures that followed the norms of Zone V (highest magnitude of earthquakes) structural requirements.

Fund disbursal

In addition to being community-managed, the ERR Project requires a community contribution of a minimum of 10 per cent of the total capital cost on water supply components. The remaining 90 per cent is provided by WASMO.

One of the major initiatives taken by WASMO in facilitating the programme relates to the system of disbursing funds to the Pani Samitis following straightforward procedures. Once the VAP is made and approved in the Gram Sabha, Pani Samitis are provided up to 30 per cent of the estimated cost in advance provided the corresponding contribution is collected by them. After utilising 80 per cent of the first installment, the second advance installment of 30 per cent is released. The

third installment of 30 per cent is also released on the same lines. The last installment of 10 per cent is released after verifying the work done, auditing and checking.

Transparency

All possible steps are taken to curtail the likelihood of corruption through transparent financial systems so that any one can raise objections if anything goes wrong. Transparency is fostered through:

a) Passing the VAP in the Gram Sabha.
b) Displaying technical and financial details of the in-village schemes in prominent buildings such as *panchayat ghars*. Notice Boards are placed at work sites where all the details pertaining to work are written so that every one can see that the periodical audit of the expenditures is being done by WASMO authorities.
c) Inviting quotations for materials and labour and tenders for the works by issuing advertisements in newspapers. The work may be awarded to the lowest bidder or to another agency at rates which are not the lowest, but only after approval in the Gram Sabha, wherein the Pani Samiti clears its stand for awarding the work to a particular agency and the rate at which the work is awarded.
d) Following all norms decided by the state government for Panchayati Raj, since the Pani Samiti is a legal committee of the Gram Panchayat. When choosing a contractor, all the norms are decided by the state government for Panchayati Raj. The contractors are registered with the Panchayati Raj department and also enlisted in the vendor list approved by GWSSB for a particular type of work.

Physical progress

The physical progress in construction as on November 30, 2005 is indicated in Table 2.

In addition, 210 rainwater harvesting structures have been planned for Kutch, of which 111 detailed project reports have been approved. Construction has started on 90 of these and completed in 79.

School activities

There are about 1,467 primary schools in Kutch district. It was decided to provide water supply and sanitation facilities in all the primary schools by March 2007 and connect all schools with the village water supply system. This work could be done through:

a) The Village Civil Works Committee (VCWC), which has been formed for schools under the presidentship of the village sarpanch, with the school principal as member secretary. The system followed by the VCWC is similar to that followed by the Pani Samitis.
b) Pani Samitis, following procedures adopted for other works; or,
c) NGOs, where Pani Samitis are not formed and where the VCWC does not come forward.

Construction activities undertaken in schools as on November 30, 2005 is given in Table 3.

Role of ISAs

The ISAs play an important role in mobilising the community and building up its capacity and confidence to engage in construction. The ISA help in planning, implementing and construction supervision and account keeping.

Several steps are taken by the Pani Samiti to maintain transparency in the entire construction process

Table 2: Status of in-village water supply and sanitation construction

District	Villages to be covered	Villages where Pani Samiti is formed	Villages where VAP has been prepared and approved by Gram Sabha	Villages where construction is launched	Villages where construction is completed
Kutch	850	725	507	475	266
Patan	73	72	69	63	21

Role of WASMO

WASMO's role is that of a facilitator. The success of construction activities by the Pani Samiti is a measure of WASMO's successful role as a facilitator. The organisation provides technical support and training. It has set up norms for quality control and fixed vendors for materials like cement, steel, pipes, pumping machinery and other needs. The quality of products is monitored periodically. Materials are tested from Government undertaking organisations such as the Central Institute for Plastic Engineering Technology. Construction is inspected and supervised not only by the engineers of ISAs and WASMO but also by third party inspection agencies such as the Water and Power Consultancy Services (WAPCOS), a Government of India undertaking. The services of experts in different fields are also hired and the best alternative acceptable to the people is finalised. Satellite imagery and the latest technology in the field of geohydrology are frequently used for getting reliable data on sources of water and the underground strata. WASMO also plays an important role in arranging workshops and exposure visits for Pani Samiti members in order to familiarise them with day-to-day construction requirements.

Table 3: School activities in Kutch

Activities	Total structures planned	Sanctioned	Completed	In progress
Rooftop rainwater harvesting systems				
a) Kutch	1,467	879	410	297
b) Patan	50	56	42	3
Toilet blocks				
a) Kutch	840	356	107	208
b) Patan	9	9	0	9
Water connectivity and parab construction				
a) Kutch	633	308	116	135
b) Patan	0	0	0	0

Experiences and learnings

The ERR Project has been an eye opener and a satisfying experience. It has offered several observations and raised issues. These will help in implementing similar projects in the future.

Community involvement

Involving women increases chances of success since they are the ones who benefit most from water availability. There are several examples where they have directly taken the lead in collecting contribution and monitoring construction (*see Box: Motivating moments*).

Technical issues

a) Usually villagers prefer household connections for drinking water supply, except in small villages in the banni region, like Abdasa and Lakhpat talukas, where the villagers have opted for a stand post distribution system. In banni, the villagers prefer to have underground tanks in clusters of settlements, from where people can fetch water through hand pumps.

A survey indicated that 68 per cent of the villages opted for household connections, 25 per cent opted for distribution through stand posts, six per cent opted for a cluster storage tank system approach and one per cent for open well system with no distribution.

b) It is challenging to get quality work from inexperienced village people and so, extreme caution should be exercised while selecting vendors.

c) In order to get quality work, the quantum of physical works should be restricted to the capacity of technical staff available with NGOs and WASMO

d) The main requirement of this programme is to build the capacity of the local people and to inform them about present engineering know-how. As a result, engineers are sometimes apprehensive that the approach wherein

Motivating moments

The response from villagers across the ERR Project has endorsed WASMO's confidence in its approach of empowerment, support and trust

Village Nana Tharawada, taluka Bhuj

Water in this village was supplied through a regional water supply system. The residents comprise of the Patel community who are economically sound, Harijans and Muslims. While the Patels regularly pay the GWSSB for the water supplied, the other communities did not do so. The Patels also had their own private tubewells.

When this village opted for WASMO's programme, the Patels came forward and contributed for developing a distribution network based on their private tubewells as well, so that in case of a failure of water supply from the scheme, the villagers would not suffer from water shortage.

Bharasar village, Bhuj taluka

The villagers here have their own private water supply system complete with tubewells, pump houses, pumping machinery trained operators and an equitable, well planned distribution network. Moreover, they recharge their tubewells with water from adjacent ponds. Streets are clean and dry. Water is accessible 24 hours a day and little is wasted, though there is a fine of Rs 100 on water wastage. All this without any government or non- government support and aid. This village did not need WASMO or an ISA to understand that the best method of meeting demands is through self help. This example has reinstated WASMO's faith in village communities.

Village Kotda Ugamana

The Pani Samiti invited quotations for the PVC pipeline. Three parties forwarded their quotations. The Pani Samiti stood firm and purchased PVC pipes from one particular company after paying the difference in price from their own contribution, since it felt that this quality was the best.

Chakarmora Vandh village, Anjar taluka

This is a poor village with a population of 350 which faced an acute drinking water crisis. Some water was supplied through tankers by the GWSSB, but it was not enough and the villagers had to walk to a source 2.5 km away to fulfill their needs. With the help of the ERR Project they decided to lay a pipeline from this source to their village so that they could at least stop the dependency on water tankers. Being a poor village it was difficult for them to generate the required amount but they managed to do so. The real challenge for WASMO lay in getting the village's Pani Samiti to plan and supervise the laying of the pipeline as they did not have confidence in themselves to carry it out. It was after much hand holding that they developed confidence and finally rose up to the task.

Ajrakhpar Pani Samiti

The Pani Samiti pramukh from this village visited the WASMO office one day and asked for details of supervision of construction work. Every small detail like maintaining cement concrete proportion, curing, overlap length, cover and spacing of reinforcement was explained to him. During a subsequent site visit it was found that everything explained to him was written point wise in Gujarati on a piece of paper. This paper was handed over to the person responsible for the supervision for that day so that he could follow the written instructions. A date-wise construction supervision duty roster was allotted to each Pani Samiti member and also mentioned in the paper.

Kotda Athamana village (Harijan Vas)

In this village, the womenfolk are the real leaders. When WASMO explained to the Pani Samiti that supervision of construction work was their duty, the male members shirked from taking on the responsibility, citing shortage of time as an excuse. On hearing this, the women immediately came forward and offered to supervise if everything could be explained to them.

As the work of the ESR was in progress, the reinforcement of concrete was explained to them by practically showing them the bars of different diameters. Simple drawings were made for step-by-step explanation. They were taught how to count number of bars, their spacing and other measurements. As the work progressed the women often climbed up to a height of 8 m to check the spacing and number of bars and count the number of buckets of cement, *kapachi* and sand.

Dhaneti Village

In Dhaneti village 80 per cent population are Ahirs, who work outside the village and are off to work early in the morning. The Pani Samiti solved the problem of how to supervise construction by appointing a person to do the job and collected Rs 10 from each house for his salary. Initially, he was not confident to read the measurement tape for checking the spacing for reinforcement. He soon came up with an innovative idea to solve his problem. He cut a bar of the length of the spacing mentioned in the drawing. Placing this small bar at various places he confidently started measuring the spacing.

Engineers have a critical role to play in the technical empowerment of Pani Samitis so that quality construction is possible

the Pani Samiti is entirely responsible for construction may lead to engineering being relegated to second priority. Also, progress of work suffers since in every village the same process of community empowerment and acceptance is adopted.

e) Differences of opinion with the Pani Samiti may affect the quality of works. The quality and workmanship is not totally under the control of engineers. However, given that even in cases where the engineers are entirely responsible, quality has been found wanting, this should be viewed in the proper perspective.

Sanitation

The experience of community toilets has not been promising. The difficulty with the community toilet is the daily cleaning, which is not being attended to appropriately. WASMO is therefore now emphasising on the construction of individual toilets and the degree of success can be indicated from the following figures:

- In 45 villages, all the households have individual toilets
- In 110 villages, 75 per cent of the households have individual toilets
- In 80 villages, all the households have constructed soak pits
- In 134 villages, 75 per cent of the households have constructed soak pits

Process issues

a) Software activities take time. The Pani Samitis should be mentally prepared for coming forward as the participation of community is vital. Any short cut in awareness and software activity may be detrimental.

b) ISAs should be carefully selected. Responsible and devoted NGOs are the prime requirement for success of such programmes.

c) Considerable time is required for resolving differences between the Pani Samiti members as cooperation within the Pani Samiti is an important requirement for the project. ISAs can play a crucial role in this.

d) Influence by local politicians can sometimes hinder progress.

Conclusions

According to the 73rd Constitutional Amendment, the prime responsibility of providing water supply and sanitation facilities rests with the concerned local body. If the responsibility of providing and maintaining water and sanitation services is to lie with the Gram Panchayat, then the system for implementing the infrastructures needs to be changed from a centralised to a decentralised one. WASMO is supporting communities to move in that direction by sensitising them, building their capacity and helping them stand on their feet.

The response to the approach adopted is encouraging as indicated by:

- The villagers are satisfied as they are the planners and implementers getting an opportunity to air their views which are given due weightage.
- People now feel that the assets created are their own, not only because of their contribution in cash but also because of their participation in each and every stage. They know that they are the owners and direct beneficiaries of the infrastructure they create and are thus more concerned and vigilant about the works. They are becoming quality conscious as the process involved by WASMO gives weightage to quality. The materials purchased by Pani Samitis reflect their commitment towards quality.
- The capacity and confidence amongst the Pani Samiti and the community at large to procure materials of approved quality and get work done through labor contractors has improved significantly.
- Workmanship may not be 100 per cent satisfactory from the engineer's point of

view but the villagers are definitely moving towards the best possible workmanship.

- Trusting the people should be the main objective in such programmes. The one reason why the ERR Project is successful is the 100 per cent trust invested in Pani Samitis.

The approach lays complete faith and trust in the Pani Samitis, their ability to rise up to construction challenges right from planning to purchasing of materials, maintaining records of expenses, rates, measurements, awarding contracts, monitoring construction and managing after the construction is over. This has led to the development of a viable and practical approach where 'unlettered villagers' could complete construction of facilities, keeping in mind all safety requirements, given that Bhuj is in Zone V category, with technical support from engineers. Water supply system bifurcated into different zones by them keeping in mind regions with different elevations can match the plans of a qualified engineer.

Construction management by 'laypersons' cannot be taught in classrooms. It requires a vision to change the mindset of village people and to satisfy them through practical examples where emotions are to be created. If they are touched and impressed then they cooperate willingly. Pani Samitis should therefore, be brought to the level so that they are able to take the work from:

- Head (vision): To visualise and decide what is good for them. This will be the first step to decide the type of structure they want and it will finalise the 'blue print' of the construction infrastructure they would like to have, to:
- Heart (emotion): To think from their heart while solving problems occurring during implementation. The outcome may not be economical, but it will always be in the better interest of community, to:
- Hands (action): To take action as planned and decided through head and heart. The result of action will be a 'dream come true' and the quality of the work will be beyond imagination.

The process involved in ERR Project can be followed in Sector Reform (State) and Swajaldhara programmes. Priority should be given to software activities and awareness towards potable water, disposal of wastewater, disposal of solid waste and development of hygienic practices. Other things will follow.

The entire in-village infrastructure development activities should be entrusted to village people. Not only will build the capacity of people, but will also save time of the government machinery. However, for them to succeed, sustained efforts are needed to provide them with support so that they develop the capacity and confidence to deliver.

The experience with Pani Samitis indicates that with appropriate support, rural communities are capable of developing their infrastructure requirements

Transparent transactions:
Financial management by Pani Samitis

Empowering Pani Samitis with financial management knowledge has helped them utilise funds efficiently and transparently

Mahesh Manek

Summary

As is the case with any project, financial management of decentralised village water supply schemes (VWSS) is crucial. Financial management includes not only elements of record and account keeping but accountability and transparency as well.

One of the programmes that WASMO is facilitating is the Community-managed drinking water supply and sanitation programme in earthquake affected villages of Gujarat project or the ERR Project. In this project, since the Pani Samiti is responsible for implementing the schemes, funds for the same are handed over directly to them. In fact, the Pani Samiti is accountable for all the actions that they take, including those with financial implications.

Successful financial management has been possible through weaving in transparency and accountability measures at every stage of the project, and accordingly developing simple financial management systems. Through training exercises Pani Samitis have learnt how to manage finance. As a result, they have been managing funds effectively by keeping records of every transaction, operating bank accounts, monitoring expenditure, following all transparency measures.

Introduction

Financial management of a village water supply scheme (VWSS) is as vital an aspect in its successful and sustainable implementation as is a sustainable source of water or technically appropriate infrastructure. There are many instances were schemes have failed because of poor financial management regarding cost estimates, transparency in accounting, contracts going into wrong hands, fake community contribution and other such financial issues.

Under the WASMO approach, which is based on the 73rd Constitutional Amendment and sector reform principles, funds for implementation are transferred and managed by Village Water and Sanitation Committees or Pani Samitis which are subcommittees of the Gram Panchayat. WASMO is thus not directly involved in the implementation of the VWSS but is a facilitator, providing finances and technical support.

Regarding financial issues, Pani Samitis are responsible for:

- Generating a minimum of 10 per cent of the capital cost as community contribution and ensuring that each household in the village contributes;
- Opening a bank account exclusively for the scheme;
- Accessing 90 per cent of the funds from WASMO through installments for which systems have been set up;
- Managing the funds transparently and flawlessly; and,
- Generating and maintaining operation and maintenance (O and M) charges.

WASMO defines financial rules for Pani Samitis and trains them so that these rules can be followed

Thus financial management is a critical component of the projects and is given due emphasis. Experts and professionals have been engaged specifically to the strengthen financial management systems, not only at WASMO but also for the partner Implementation Support Agencies (ISAs) and Pani Samitis.

Paving the way

Pani Samiti members have turned out to be good financial managers. This result was not achieved overnight, but through a well designed process. Efforts were made to empower the Pani Samiti with knowledge on every aspect of financial management. A numbers of workshops were held at state, district and community levels. More importantly, success was achieved by setting examples and demonstrating success stories.

Making rules

After WASMO was formed, one of the first crucial steps that WASMO took was establishing financial rules and procedures for Pani Samitis in the form of a *Pani Samiti Handbook*. This handbook has answers to almost all the questions that may arise in the minds of the community, including technical and financial issues. The financial rules ensure:

a) Transparency in financial dealings of Pani Samiti members;
b) Utilisation of funds for the purpose for which these are allocated;
c) Community contributions actually come in; and,
d) There is fair play and work is carried out in true spirit.

The financial rules are non-negotiatable and include:

a) Maintenance of a separate bank account;
b) Most of the transactions to take place by cheque only;
c) A register for community contributions to be maintained;
d) Receipts to be issued for all cash incomes;
e) Every payment to be supported by valid evidence; and,
f) A separate cash book to be maintained to record all income and expenses.

Understanding and following rules

Rules are relatively easy to make, but to convince Pani Samitis that it is possible to follow these rules and maintain accounts, it was important to assess and build up their capacity. Preferably, suitable persons who could carry out the task of maintaining accounts were identified from within the village community. In those cases where such people were not available, the Pani Samiti appointed an outsider by paying a nominal fee. WASMO's experience has been that nearly always, someone volunteers to maintain the books of accounts, whether it is the school teacher or retired post master. In Nani Khakhar village in Bhuj Taluka of Kutch for example, accounts are maintained by a retired businessman from Bombay now returned to his native village. He took up the responsibility of maintaining books of accounts as a voluntary contribution and is doing the job well.

Training programmes for financial management and accounting were designed and conducted in batches comprising of two representatives from about 10-15 villages. Refresher courses were conducted as well.

The villages were selected for training depending on the progress of the scheme implementation. Training took place before any financial assistance was provided so that the Pani Samitis were prepared for fund management. During the training programme accounts kits - a bag containing a cash book, community contribution register, calculator, stapler, punching machine, scale, measuring tape, bill file,

correspondence file and tender file were distributed to participants. This kit proved to be a success with the villagers because it helped them to keep all important documents and records of bills at one place. This bag was handy during verification of accounts by WASMO staff as well. In those villages where the Samitis were unable to record accounting entries, the safeguarding of these bills in this kit allowed the auditor to verify fund utilisation.

In three years, around 20 training programmes were conducted for 200 villages.

Release of funds

WASMO has developed an efficient and foolproof system to release fund installments. The first installment is released only after a bank account has been opened in the name of the Pani Samiti in which at least 50 per cent of the total committed community contribution is deposited. Finance staff from WASMO along with programme staff then visit the village, verify bank account details, community contribution register, receipt books and makes a few cross verifications. Once satisfied that the rules have been observed, the first installment comprising between 30 to 50 per cent of WASMO's contribution is released. Thereafter, subsequent installments are released subject to the condition that 80 per cent of the funds made available to the community are spent. Pani Samiti members come to the Coordination, Monitoring and Support Unit office with their accounts kit, sit with the finance staff, and verify books and bank reconciliation. The subsequent installment is released after a satisfactory report has been filed by the technical and financial programme staff. All this is well managed and completed within a day. "We never felt like we are visiting a government organisation. The staff has always been friendly and helpful," are the words from the sarpanch of Narayanpar Ravri.

Verification of accounts

The books of accounts of Pani Samitis are verified in a careful and sensitive manner so that the Pani Samiti members do not feel they are under scrutiny and distrusted. It is always made clear to them that they should maintain accounts accurately and that WASMO would like to provide assistance in case they find it difficult. Checking of accounts relates to verifying the source of income and application of funds through supporting bills and records, particularly bills for purchase of material and labor payments. Cash and bank balances are reconciled with the book. On the spot guidance is provided if books are not maintained as required. This procedure has greatly helped in building confidence between WASMO and the Pani Samitis.

Transparency and accountability

Transparency can be defined as providing all information that is demanded and being open to inspection. This practice prevents distrust and helps curb malpractices and corruption. To address the issues of transparency and accountability and to gain community confidence and to strengthen participation, a mechanism has been established (*See Box: Decentralisation with transparency and accountability*).

A few simple steps are taken to provide information to all and get their views. Firstly, once the village action plan is finalised, the details are displayed on a board outside the panchayat office so that all the villagers are aware about the interventions that will take place in the village, the cost, the amount of money that the community needs to contribute towards implementation and operation and maintenance. These details are also announced in the Gram Sabha.

During the implementation phase, the Pani Samitis invite quotations from at least three dealers for the materials needed. Tender

Sensitive verification of fund utilisation has instilled confidence rather than suspicion

Decentralisation with transparency and accountability

In keeping with the principles of decentralisation, Pani Samitis are responsible for managing funds for the construction and maintenance of their village water supply and sanitation schemes. The approach followed by the Coordination, Monitoring and Support Unit (CMSU) of WASMO in Surendranagar district shows that genuine decentralisation occurs, but along with responsibility and accountability and in a congenial environment.

1. Signing of agreement

Once a village decides to be a partner in the project, active Pani Samiti members visit the CMSU office to sign the agreement with WASMO. The agreement, its importance, conditions and sanctity is explained and the agreement is signed in good spirit from both sides. This process gives food for thought to the villagers who have rarely passed through such processes before.

Efforts are made to make the Pani Samiti as professional as possible, so that they can take conscious decisions and informed risks and stand by them. In village Mayurnagar for example, the Pani Samiti was keen to construct an underground check dam. Construction is possible in the sandy strata here only in the months of May and June, when groundwater levels are low. In spite of the Engineering Support Cell team explaining that it would not be possible to complete the structure within the stipulated period, the Samiti was keen to go ahead and requested a budget of Rs 14.77 lakh. It was then explained to them in case the work would not be completed, they would have to return the funds. The Pani Samiti agreed, an agreement was signed and accordingly an installment of Rs 7.5 lakh was released. The Samiti spent Rs one lakh and realised that it would not be able to complete the work. It honoured the agreement and decided to stop work, cut their losses and returned the full amount to WASMO.

2. Capacity building for financial management

a) Technical and financial guidelines are provided to the Pani Samiti members at the time of signing the agreement.
b) All active Pani Samitis members are provided classroom training by finance and accounts experts from CMSU and the ISA.
c) If needed, the Pani Samitis are supported by a field worker (one for five villages of the ISA) and volunteer graduates (as and when required and who are paid Rs 100 per day), who work with the secretary/chairman of the Pani Samiti to compile vouchers, fill in the cash book, update the stock register, issue payment receipts and maintain bank accounts and simultaneously teach them.
d) Pani Samitis have the option to appoint an accountant. The fee must be limited to one per cent of the VAP costs. In practice, lesser costs are incurred as usually teachers or leaders offer their support.

3. Community contribution

A community contribution register is maintained along with a receipt book. The contribution is village-specific and usually based on the economic conditions of the inhabitants. The contribution rates are decided in the Gram Sabha and sometimes Pani Samiti meetings held in presence of the ISAs and project staff.

Contd...

notices are published in daily newspapers for inviting quotations for works costing more than Rs one lakh. Details of the award of contracts and their rates, work progress and expenditure incurred and collection of community contribution are discussed every month or every quarter in the Gram Sabhas. The community is free to voice its opinion. The Pani Samiti needs to take the people along and justify its decisions to arrive at a consensus.

Post-construction financial management

As an institution, the Pani Samitis are charged with the responsibility of implementing the water supply schemes in the villages. They are also responsible for getting the active involvement of the community at every stage of the project, right from planning and decision-making to implementation and post-project O and M. The capacity of the Pani Samitis is built up during the implementation phase by making the villagers accountable for drinking water supply through the development of a structure for O and M charges. These are arrived at through consensus, subsequently endorsed in the Gram Sabha and made a rule. In many cases these are collected by the Pani Samitis during the commencement of implementation itself. The charges are decided either on a household or per head basis. Successful collection reflects their sense of commitment, discipline and ownership amongst the community.

Conclusions

The response from the Pani Samiti to adhere to financial management regulation has been heartening. The workshops helped them understand financial issues. Periodic checking of accounts by WASMO staff revealed that indeed accounts are being appropriately maintained.

It would not have been possible to achieve this level of effectiveness without having a

4. Release of funds

Normally each village gets funds from WASMO in 4-5 installments. Each subsequent installment is released after a technical and financial audit duly signed by responsible Pani Samiti members and certified by ISA and CMSU staff.

5. Issuing of tender notice

Advertisements inviting tenders and letters are issued by the Pani Samiti with guidance from the Engineering Support Cell at Surendranagar. For structures such as elevated storage reservoirs and RCC sump groups of Pani Samitis are formed by joint resolutions to attract competitive rates from registered contractors.

6. Sanction of rates

All the decisions regarding sanctions are taken by Pani Samiti members by adopting respective resolutions. Each voucher must possess the resolution number along with the meeting date. If this condition is not fulfilled, an audit para follows. Satisfactory compliance with the audit para is pre-requisite for release of the next installment.

7. Transparency measures

a) All the plans, sanctions and final expenditures are put before the Gram Sabha for review, discussion and correction, if any.

b) An 8 feet X 7 feet board mentioning details of the scheme, an item-wise budget and duties is displayed by the Pani Samiti in a prominent place in the middle of the village. Daily announcements, duties, expenses of the work completed, consumption of materials and final expenses are mentioned on this board as well. This transparency measure helps the villagers to understand the development activity going on in their village and reduces chances of fund mismanagement.

c) New assets such as civil structures must carry the WASMO logo. This prevents claims about other structures as being constructed under this project. Structures costing more than Rs 25,000 carry details of the sanctioned cost, actual cost, completion date and name of implementing agency embedded in tiles or painted on surface.

8. Audit

Auditors regularly verify the Pani Samiti's bank accounts, stock register, cash reconciliation, bills of item-wise expenditures against sanctioned resolutions, sales tax payment, obeying income tax rules and other financial issues. They educate the members on how to remove anomalies and issue an audit para for compliance. In case of over-expenditure, the auditors seek the help of engineers for rate rationalisation in accordance with the WASMO approved Schedule of Rates and market rate analysis. When expenditures are beyond permissible limits, the excess amount is either recovered or deducted from further installments, as was done in case of Nadala and Nani Madhad villages.

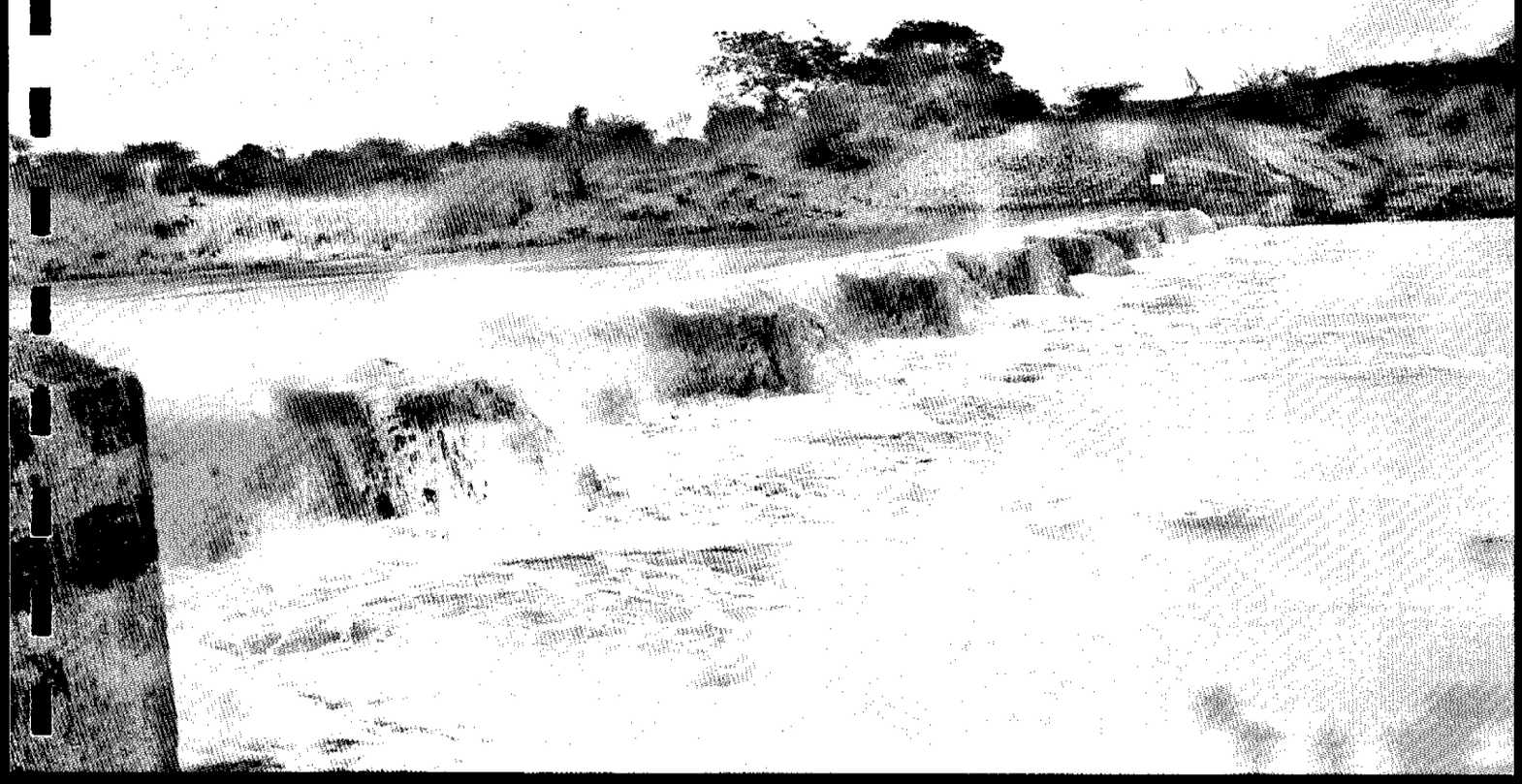
Source: P G Majithia and I K Chhabra

good team at WASMO, with positive attitudes and clarity of thought. Pani Samiti members were free to approach WASMO for clearing doubts, advice and assistance. The finance staff spends considerable time with Pani Samiti members, guiding them in maintaining books of accounts, sometimes, themselves updating the books of accounts if needed.

These capacity building exercises were whole heartedly supported by ISAs. Around 38 ISAs in ERR project were instrumental in organising and imparting training programmes.

The Swajaldhara and Sector Reform State (SRS) projects are huge in terms of the number of villages and funds. Here WASMO is not directly involved in releasing funds to Pani Samitis as this function is performed by the district level engineering units. Books of accounts are verified and reported by audit firms appointed from a panel of auditors selected by a district level committee. As the State Water and Sanitation Mission for these projects, the main role of WASMO is to monitor physical and financial progress from each district and report the same to the Government of India. WASMO could make its monitoring more effective through further capacity building of Pani Samitis and providing a support system for timely audits by persons who are sensitively tuned to provide genuine support to Pani Samitis. Creating transparency, right from the level of the Pani Samiti, promoting genuine community participation in decision-making and information sharing are crucial to achieve sustainable in-village water supply.

ASSURING SAFE DRINKING WATER



Sustaining water supplies: Beyond Operation and Maintenance

To secure their drinking water, villagers in Kutch and Patan districts have taken up their responsibility to manage water supply systems and pay for the operation and maintenance of these

R K Sama, I K Chhabra, Indira Khurana and Manisha Sarkar

Summary

In April 2003 a community-managed drinking water and sanitation project was initiated for all the 1,260 earthquake-affected villages in Kutch, Jamnagar, Surendranagar and Patan districts. The project is aimed at creating safe drinking water systems and improving the level of sanitation in village habitats through a demand-driven approach, with the village communities taking a leading role and demonstrating ownership.

The sustainability of infrastructure requires maintenance and funds. The sector reform guidelines stipulate that the users of a drinking water supply system pay the costs of its operation and maintenance (O and M) through the collection of water charges.

Why would communities be willing to pay and how much should they pay? This paper describes the modalities and the processes used by the project's Coordination, Monitoring and Support Unit (CMSU) to motivate the villagers to pay for O and M. It draws attention to the initiatives taken by the communities in devising tariffs and collection procedures, instituting penalty systems and records how these are put into practice. The paper also states that sustainability requires a sense of responsibility that goes beyond O and M and mentions future challenges in this regard.

Introduction

In spite of considerable investments made over the years by the Government of India and state governments in setting up drinking water infrastructure in rural areas, sustainability has been a problem. Sources have either dried up or the infrastructure created has become unusable due to lack of maintenance. This has often led to systems lying defunct for want of minor repairs. The water using communities have no ownership over the assets created by the government through a centralised approach. This leads to situations where water is irregularly available or is not available in the tail of the system villages and in many cases the water is not safe. When left unattended, the water supply systems deteriorated and in many cases, broke down eventually. The lessons were clear: the people did not have ownership, the system did not deliver what it was designed for and as a result water was not available. At the same time, several examples indicated that when communities are involved from the inception of the project to its implementation and subsequent management, it is likely to adopt a system design which takes care of the need of each of them on equity basis. In addition easy maintenance is also considered. They develop a sense of ownership and responsibility and see to it that the drinking water supply systems are in good order and fulfill their needs.

The sector reform introduced in 1999 by the Government of India changed the role of the government from a provider to facilitator, and its approach from supply-driven and government-managed to one that is decentralised, demand-driven and community-managed. Communities now

Mere creation of water supply and sanitation systems is not enough. These require maintenance by the users, for which they should be willing and capable

would have to plan, construct, operate and maintain their in-village drinking water supply. They must contribute a minimum of 10 per cent of the total capital cost and 100 per cent of the O and M costs. The 10 per cent contribution at the beginning of the project is important because it indicates that the community needs the facility, is definitely interested to acquire it and is willing to pay for O and M.

The ERR Project

The Netherlands assisted Community-managed drinking water supply and sanitation programme in earthquake-affected villages in Gujarat (commonly referred to as the ERR project) started in April 2003 with a mass meeting in Bhuj. Its objective is to create sustainable drinking water supply and sanitation systems in all earthquake-affected villages in Kutch, Jamnagar, Patan and Surendranagar districts. The earthquake of January 26, 2001 had not only caused heavy loss of life but had also destroyed essential infrastructure including drinking water sources and supply systems.

The main thrust of the ERR Project is to empower the village communities with knowledge so that they understand their responsibilities and are equipped to engage themselves effectively in the project, right from collecting the stipulated 10 per cent community contribution towards the construction and operation of the systems.

The village schemes are based on local water sources. But in many villages the pipeline that carries water from the Narmada canal serves as a back up. To sustain the local water resources, water conservation structures are built. The project's hardware includes water conservation structures, storage reservoirs, water distribution networks, cattle troughs, stand posts, bathing ghats and toilets. Rooftop rainwater harvesting systems and sanitation facilities are provided to schools.

Sustaining systems

Once a scheme is constructed and commissioned, the Pani Samiti, a sub-committee of the Gram Panchayat, is responsible for its O and M that will ensure a reliable supply throughout the year.

Planning and constructing in-village drinking water and sanitation infrastructure is no mean feat for the villagers. But the real challenge lies in operating and maintaining these facilities so that the efforts are fruitful and the water supply is sustainable. Collecting the initial contribution from the prospective water users and getting the payment for water services provided is not easy, given that initially only a few realised the need to pay. Moreover, the people are just recovering from the devastating earthquake of January 26, 2001.

Yet, in 344 villages in the Kutch and Patan districts, O and M charges are being paid, though in only 193 villages the schemes are already functioning (see Table 1). Ways of collection, periodicity of collection and penalty structures have been innovatively devised by the villagers themselves. In a few villages, also a tariff for water consumption by cattle has been introduced.

Building sustainability

Water-supply and sanitation systems developed cannot be viewed as an end in themselves. Their benefits need to continue long after the projects are commissioned and project facilitation or institutional support is withdrawn. Sustainability therefore depends not only on the technology adopted and O and M systems developed by the community, but also on their mindsets, their understanding of responsibilities and involvement and support. The Pani Samiti members should be responsible for particular tasks and areas in the village and dedicated to their tasks. The subject of commitment has been addressed in the ERR project in the following ways:

a) Sharing responsibilities through partnerships

The partnerships that were forged were based on dignity, trust and faith. The agreement between WASMO, the ISA and the Pani Samiti clearly outlined the roles and responsibilities of each partner. Grey areas were clarified with time. For instance a technical approval is given by WASMO while the Pani Samiti gives an administrative approval. Another example concerns the construction records in the measurement book. The Pani Samiti fills in the temporary measurement book in presence of the ISA, while the final measurement book is filled in by WASMO staff. This procedure indicates the involvement and responsibility of all three partners. Once roles and responsibilities are clear, empowerment is likely to take place.

Table1: Villages in Kutch and Patan districts where O and M charges are being collected

Taluka	Total Programme Villages	Villages where work is complete	Villages where work is in progress	Villages collecting water tariff
Abdasa	152	21	71	51
Anjar	75	16	29	19
Rapar	112	18	59	14
Bhachau	74	1	24	6
Lakhapat	89	1	15	53
Nakhatrana	125	8	10	93
Mandvi	89	27	46	26
Bhuj	185	73	106	52
Mundra	59	16	36	26
Santalpur*	73	12	63	4
Total	1,033	193	459	344

* Other than Santalpur, which is in Patan district, all talukas are in Kutch district

b) Empowering villagers for accountability and transparency

Achieving and sustaining in-village drinking water supply is based on the empowerment of the villagers as well as the Pani Samiti. Considerable efforts are made by WASMO to enhance their capacities. The approach is aimed at accountability, transparency and sustainability, in particular:

i.) WASMO is in contact with the villagers through the Gram Panchayat/Pani samiti whose members are in direct contact with the other villagers almost daily, which increases accountability.

ii.) The community is encouraged to ask questions, leading to increased accountability, transparency and efficiency of the Pani Samiti. To stimulate questions multiple media awareness campaigns are held, so that clear messages are delivered. Different target groups – such as women groups and schoolchildren – are addressed. For instance, a booklet in Gujarati entitled Pani Samiti Margdarshika was prepared and distributed within the village. It outlined the formation, roles, rules, regulations, and procedures of a Pani Samiti. The Pani Samiti members and the other villagers could learn about their roles and the support they could obtain from the ISAs and WASMO. The intensive IEC campaigns went a long way in ensuring transparency.

iii.) Exposure visits to villages where work was either initiated or complete helps to minimise doubts and to build up confidence in new villages. The interactions between the two give the latter a chance to see that the ERR project is a serious programme and that intent will be followed by action.

c) Assuring quality control

Repeatedly it has been expressed that poor quality construction is not acceptable. Under WASMO's demand-driven programme, the entire

O and M is more than paying charges. It is about providing services that the community needs and is ready to invest in

responsibility of construction planning, implementing and its management lies in the hands of the Pani Samiti. To ensure that the Pani Samitis are able to bear this huge responsibility, they were strengthened by information, training and technical support. The Pani Samitis on their own purchase materials, issue cheques, award contracts and monitor construction. But it is the responsibility of the ISAs and WASMO to ensure that they are capable to do these and adhere to the standards set by WASMO.

WASMO engineers have been directed to demolish poor quality construction, but this has hardly happened. It indicates the high levels of technical competence, commitment and accountability levels that have been reached.

d) Making Pani Samitis responsible and financial sustainability
The Government Resolution on Pani Samitis states that the Pani Samiti will maintain a separate bank account. Thus, funds collected for the purpose of drinking water supply and sanitation are not to be pooled with the common Gram Panchayat fund. The Pani Samiti bears every responsibility for its account, as governed by the Panchayati Act and financial rules.

e) Cost of water
The cost of water is an important input for the calculation of O and M charges. WASMO recommends to use local water sources when possible and to depend on Narmada water only as a backup in times of scarcity or for quality water for drinking purposes. Efforts are made to convince the communities to pay the O and M of their in-village water supply systems as well as for the Narmada water. It is interesting to note how villagers devise their own 'dual water supply' systems. In some villages Narmada water is supplied at stand posts to be used only for drinking and cooking. For other water needs, household connections provide water from a local source. In other villages the quality Narmada water is provided in the evening, to be collected and stored for drinking and cooking. Water from local sources for cleaning purposes is provided in the morning.

Understanding O and M issues

Several issues need to be addressed before people will pay O and M charges. In the ERR project the following conditions are met.

a) The user community should need the facilities
WASMO follows a demand-driven approach, conforming to the sector reform methodology. In-village drinking water schemes are supported only when the communities ask for these and are willing to contribute. Their ten per cent contribution towards the capital costs indicates their need and willingness to own the scheme and bear the responsibility for its O and M.

b) The user community should recognise the need for O and M
Often the villagers are unaware of the necessity to contribute towards O and M. In the ERR Project, this awareness is created the moment the programme is introduced to the village community.

From the very beginning of the programme issues concerned with sustainability of the systems are discussed in meetings with villagers. The responsibility of the Pani Samiti to successfully and satisfactorily operate the systems once the project is over is explained. The necessity to pay O and M charges, as well as water charges to the Gujarat Water Supply and Sewerage

Board (GWSSB) for the Narmada water supplied, the basis on which to calculate O and M charges and the need to establish operating rules and methodologies are discussed extensively.

The sensitisation process towards meeting O and M costs includes:

- Discussing O and M issues during introduction of the programme;
- Construction and account keeping workshops;
- Exposure visits;
- Inter-village workshops; and,
- Inviting representatives from villages where the programme has just been started to O and M workshops in villages where construction is complete.

c) The user community should get what it wants

Participatory practices are used to design equitable drinking water supply systems.

First the Pani Samiti prepares a Village Action Plan (VAP). It describes the systems and structures that will be created, with estimated costs. The VAP is based on a Participatory Rural Appraisal made by representatives from every group and hamlet in the village. The VAP includes the list of materials required and a map indicating existing locations and the proposed water and sanitation infrastructure, along with the structural design approved by WASMO.

While planning the systems several factors are taken into account and options are offered where possible:

i) The capacity of the water storage and distribution network is based on 70 litres per capita per day for human beings and for the cattle population in the next 30 years.

ii) A hydraulic statement is prepared for the complete water supply distribution system. The sizes of the pipelines should promote an equitable water supply.

iii) The population density and topography of the village are important factors in the scheme design. Villages with a widespread area are divided into zones. Different technical options are presented where and when possible. It is left to the villagers to select what suits them best. Frequently the choice is between cluster storage reservoirs fitted with handpumps and stand posts. The first possibility is suitable for large villages and in cases where the topography is uneven, because it ensures equal water distribution. Household connections are another option, wherever they have assured source for supply. Stand posts have at least two taps; each can serve up to 100 people. It is one of the most viable options for equitable distribution. No individual house should be more than 150 meters away from the nearest stand post.

iv) Control valves at appropriate locations assure an equitable supply in zonal water distribution systems. Households at higher elevations are ensured water with sufficient pressure by installing U-bends at lower elevations.

Once the VAP is prepared it is approved in the Gram Sabha, to generate consensus in the village.

d) The user community has the technical capacity to carry out O and M

As the construction approaches completion, the capacity of the Pani Samiti for O and M is enhanced through training. The training methodology is interactive and includes a brain storming exercise on O and M requirements and related issues.

Planning for water supply systems is a critical step which should be based on principles of equity and demand

Fixing of O and M charges by the users themselves indicates acceptance and increases chances of recovery

Participants in the training get new ideas through interactions with members of experienced Pani Samitis. Participative decisions are arrived at on topics like time requirements for O and M, inventory listing, financial estimates for materials required, methods to raise funds and bookkeeping. Appreciation for water quality by the community is important. This includes understanding the meaning of quality water, the need for quality water, water quality tests, demonstration of water chlorination and the importance of cleanliness of water heads and structures. The second part of the training is on operation and maintenance of the hardware which is done for operators. The training programmes conducted on O and M are given in Table 2.

Exposure visits to villages where water charges collection has started are a successful learning strategy. The host Pani Samiti showcases its village with a sense of pride and shares its experience with the guests to motivate them to practice the same, perhaps in an improved manner.

e) The user community should be enabled to devise appropriate water tariffs
O and M tariffs must be clear and logical to be understood by all water users. When scheme construction advances, the village community has to decide on the strategies to generate financial revenues for O and M, both fixed and recurring costs. WASMO and the ISAs organise workshops to help them decide on the tariff. The following issues are discussed in these workshops:

- Importance of post-project O and M and the water and sanitation tariff;
- Methodology of tariff calculation;
- Technical aspects of O and M;
- Importance of water quality and its health implications; and,
- Demonstration of the field kit for water quality surveillance.

The Pani Samiti proposes a water and sanitation tariff, taking into account:

- The number of persons needed to operate and guard the water supply and sanitation systems – operator, watchman and valve operator – and their monthly honorarium;
- Operational charges like electricity bills and chlorination powder;
- Depreciation costs of machinery and fittings, which include usual replacement and repairs
- Monthly honorarium for village cleanliness and sanitation workers
- Contingency funds; and,
- Payment to the GWSSB for supplying water in bulk from outside source.

Based on the above, an annual amount is arrived at. Next the Pani Samiti decides whether the tariff should be per household or per person. Also the frequency of collection of the O and M charges by the Pani Samiti, monthly, annually or otherwise, is looked into.

f) Acceptance of the O and M tariff
The tariff and the number of installments as proposed by the Pani Samiti are presented to the Gram Sabha for approval. This practice enhances consensus and the willingness to pay.

g) The user community should get the level of services it requires
The experience in Kutch and Patan districts has been that the villagers are

Table 2: Number of training programmes on O and M (as of November 30, 2005)

Workshop details	By ISAs	By WASMO	Total
Training workshops	30	3	33
Pani Samitis	261	35	296
Participants	1,638	35	1,673

willing to pay for water if it is delivered in a convenient and user-friendly way. (see Box: Paying for service).

h) Maintaining transparency
Transparency is important so that the villagers know where their money is going and how it is spent. To maintain transparency, Pani Samitis are trained in account keeping. Persons who pay their dues are issued a receipt. In several villages the records of O and M funds and the expenses incurred are displayed in the panchayat office.

Community responses

The attention paid to the different aspects of O and M results in the villagers' commitment towards the new village level utility. Step by step the communities demonstrate ownership and feel empowered to manage the facilities so that the water supply is secure and they have easy access to water when needed. Details of the community responses are as follows:

a) When assured that drinking water will be available and that the assets will be theirs, the village communities respond favourably. Even in villages in remote and far-flung areas, where the people are poor and still recovering from the earthquake, the collection of water charges has begun (see Box: Banni communities: Paying for water).

b) Rural water users pay well-defined tariffs and in some villages there are penalties for defaulters. In some cases, the villagers developed such a strong sense of ownership that they have started collection before the commissioning of the water supply system. In villages where the water charges are not yet being collected, collection will start in the near future.

The basis of the water tariff varies from village to village. The villagers devise unique tariff collection systems. The Pani Samiti determines the tariff structure and the fees may be collected annually, half-yearly, quarterly or monthly. In some villages, the fees do not apply only to the water facilities, but also to the sanitation facilities. Also the sum that is collected varies from village to village – while in Gadpadar village Rs 50 per household is collected annually, in Payarka, the same amount is collected half yearly.

The fees are also different for those with household connections and those using stand posts. In Filon, monthly Rs 10 per connection is collected for pucca houses; Rs 5 per connection for kacha house; and Rs 3 per family for families fetching water from stand posts. After the 10th of every month fines are

Paying for service

Experience in Kutch district indicates that village communities are willing to pay water charges if they are convinced of the necessity and the service is good and convenient.

Filon, a small village with a population of 177, where the majority of the inhabitants belong to the migrating Maldhari community, has put in place a perfect system of O and M. Says Pani Samiti pramukh Vankabhai, "We were unaware about our responsibilities such as the need to pay for water or to maintain the systems. After we got associated with the WASMO programme, we developed an understanding. Discussing the issues in Gram Sabhas, exposure visits to other villages, training programmes, all helped us understand our responsibility and the need to pay for our drinking water." Now, by the 10th of every month, Rs 5 per person is collected as O and M charges. Defaulters are fined an extra Rs 2.50, although such instances are few. A new household connection costs Rs 250. Migrants are exempted from payment during their absence. So far, Rs 20,000 has been collected as O and M charges.

In Virani village, Rs 5 is collected per month per individual. Individual household connections cost Rs 1,000. O and M funds and expenses incurred are prominently displayed on a notice board in the Pani Samiti office. Defaulters are paid a visit by Pani Samiti members.

The active Momaymora Pani Samiti had little problems in convincing the villagers to pay Rs 150 per person per annum as O and M charges. Explains Kasturben Sanghani, "In the past, there have been instances when drinking water was not available for as long as 15 days. Now that the problem has eased, the villagers do not mind paying."

Banni communities: Paying for water

Banni grasslands in Kutch are spread over a vast area with scattered villages and sparse population. The area is dry and sandy. The village economy is poor and dependent on cattle grazing and handicrafts. There are 44 villages in the Banni region, inhabited mostly by Muslims and Harijans.

The Bhirandiara Regional Water Supply Scheme was constructed to provide drinking water to all the villages of the region. Though water did flow through the pipeline, due to old and damaged storage systems and internal distribution networks, villages often went without drinking water. While the villagers suffered, the GWSSB had to incur extra expenses and provide water through tankers. In case of a delay in the tanker service, the people depended on unhygienic sources such as viridas.

When the WASMO programme was introduced in these villages, contribution by these people was initially slow and sporadic – ten or twenty rupees – because they were poor and could not afford to have their money wasted. "When a person earns his income the hard way, from fetching and selling ganda baval, every rupee is precious to him. As the repair works began, people were able to see the changes and began to contribute their money and labour more willingly," explains Ismailbhai Sahu, the treasurer of the Pani Samiti in Varli village.

Now that water is available in the village, these same villagers are paying the water tariff to GWSSB to ensure that they have regular water supply. According to Ashok Gosai, Deputy Executive Engineer, Banni region, "During last year the water tariff collected was nil. This year, the total water tariff collected was Rs 4,31,930 up to mid-December 2005. The supply of water through tankers has totally stopped, easing the financial burden on GWSSB."

imposed in case of non-payment. In villages where the number of cattle is large and animal husbandry is a prominent occupation, the water tariff is also based on the number of animals owned by a household.

In a few villages where women are actively involved in Pani Samitis, it has been decided to have concessional rates for women-headed households, infirm and aged-person headed households, economically poor households, and migrant households.

c) The involvement of women in the programme activities, including O and M, has positive effects. Often it is the female Pani Samiti members who convince the villagers to pay and who collect the dues (see Box: Women in O and M).

d) One of the indirect benefits of convincing the villagers to pay for the O and M charges for their in-village drinking water supply has been their increasing acceptance and willingness to pay the GWSSB for the water transport service.

Prior to the ERR Project, the GWSSB has been unsuccessful in collecting water dues from the users. As of June 2005, Rs 2.05 lakh was collected. This included Rs 30,000 from Khavada village in the Banni region; Rs 67,000 from Nakhatrana village; Rs 9,000 from Lakhpat village; and, Rs 39,000 from Bhachau village, all poor villages severely affected by the earthquake.

e) There has been a decline in the number of water tankers that were plied to meet water demands as indicated below:

- 1998-99 - 126 tankers
- 1999-00 - 200 tankers
- 2000-01 - 278 tankers
- 2001-02 - 298 tankers
- 2002-03 - 216 tankers
- 2003-04 - 97 tankers
- 2004-05 - 50 tankers

Conclusions

Of the 1033 villages where construction is in progress or completed, in 344 villages the collection of O and M charges has been initiated. Several conditions had to be met and substantial efforts were needed to reach this level. These include sensitisation, capacity building, maintaining transparency in account keeping, developing a sense of ownership and provision of the desired level of services. It is important to bring up the subject of O and M charges at the time the programme is introduced to the village, so that right from the start the villagers are aware and prepared. Involving women in these first discussions helps significantly.

However, challenges remain. Once the water schemes are successfully completed, the

Pani Samitis may still need some psychological, technical and managerial support, even though considerable efforts towards their empowerment may have been made. Following a well-designed withdrawal strategy and providing requirements such as maps of the infrastructure, manuals and kits, may not be sufficient. Communication systems for problem identification and redressal have to be put in place, including information concerning when and what continued support the government could give. A system similar to the scarcity management plan in case of inadequate rainfall in Gujarat could be considered. Another idea is to introduce an incremental incentive scheme based on O and M performance, so that communities are rewarded for their efforts and are encouraged and helped to continue O and M efficiently.

Over time, with empowerment and socio-economic development the villagers' demands for water, both quantity and quality, will increase. They will demand further improvement of services. A system may have to be put in place to support communities in meeting their requirements. Needed is a policy decision that requires that future upgradation of systems is taken into consideration when schemes are designed.

The Pani Samiti is a body of the Gram Panchayat and its composition and purpose are specified in a state Government Resolution. This GR also defines its tenure to be concurrent with the Gram Panchayat. One-third of the members are replaced every two years. According to the GR, if the Gram Panchayat is dissolved, the Pani Samiti too stands dissolved. Thus, until the next Gram Panchayat is formed, all activities are in limbo. This could have an impact on water and sanitation programmes, such as construction, operation and maintenance. The Pani Samiti should not be bound legally by Panchayat rules. In order to avoid a vacuum, the Pani Samiti should be allowed

Women in O and M

The following are examples of female Pani Samiti members taking the initiative in setting and collecting O and M charges.

Rapar taluka

- In Amarpar village, women Pani Samiti members have been instrumental in setting the monthly tariff at Rs 15 per household per month. They have also convinced the villagers to pay Re 1 per animal per month.
- In Naliya Timba, Chandrikaba successfully explained to the villagers the need to pay Rs 30 per household and Rs 1 per animal per month.
- In Dedarva Versara village, sarpanch Shobanaben ensures that the villagers pay Rs 15 as O and M every quarter.
- In Bandhadi village, Rambhiben Bachubhai Ahir is the lady sarpach. Right from the start Rambhiben was actively involved in the programme. She started collecting community contribution by visiting each household and was successful in collecting Rs 49,000. She did not stop there but went ahead and has taken the initiative to sustain these new facilities by starting the collection of water tariff at the rate of Rs 5 per household for the last three months. As a result, the Bandhadi Pani Samiti collected Rs 800 for O and M. She personally maintains the tariff register and issues a receipt on payment.
- Other villages wherein women Pani Samiti members have taken the responsibility of collecting O and M charges include Naranpar, Gauripar, Mevara and Vanoi.

Abdasa taluka

- In Asapar and Deedadromoti villages, women are actively engaged in deciding on the methodology and rules and regulations for O and M.

Nakhatrana taluka

- In Rampar Roha village, a woman Pani Samiti member has taken the full responsibility for collecting O and M charges from all in her falia. She collects Rs 50 per household annually.

Mundra taluka

- In Gelda village, Pani Samiti member Moghiben played a central role in collecting contribution from the villagers to meet 10 per cent of the capital costs, monitoring construction activity and collecting the water tariff which has been fixed at Rs 5 per person per year.

Anjar taluka

- In Varshamedi village, 90 per cent of the Pani Samiti members are women. These women have distributed the faliyas amongst themselves for collecting Rs 250 for every new household connection and O and M charges.

Bhuj taluka

- In Gado village where 50 per cent of the Pani Samiti members are women who take their responsibility of collecting O and M seriously.
- In Gadhpadar, Pani Samiti member Kunwarben has taken the lead in collecting O and M charges.
- In Kotda Athamana, Harijanvas women are actively involved in O and M collection.

to continue till such time that a new Gram Panchayat and Pani Samiti are formed. For this, initiatives to modify the GR concerning the Pani Samiti may be taken.

Thus, though the challenges of assuring drinking water may change over time, recognising these and planning for them is always a step towards addressing them.

Enhancing sustainability of drinking water supply in villages through water resource management

Strengthening of local water sources through scientifically planned WRM has begun to improve groundwater availability and water quality

Manmohan Sehgal

Summary

Several villages in Saurashtra and Kutch districts suffer from drinking water scarcity. Already a water-scarce region, large-scale extraction of groundwater for irrigation purposes has resulted in a constant decline in the water table over the past three decades, increasing seasonal fluctuations in groundwater levels and ingress of seawater in coastal areas, further reducing drinking water availability considerably. A large number of wells have become dry, permanently or seasonally, because of the decline in water table. The deterioration of water quality has severely impacted the health of the users and encouraged use of unsustainable practices.

WASMO's strategy focusing on the development of local water sources duly supplemented with imported water has been successful. Water resource management (WRM) interventions have recharged local water sources and considerably improved the availability of potable water. The efficacy of these traditional interventions on recharging aquifers and increasing availability of drinking water are in the process of being assessed.

This paper describes the various WRM interventions on sustainability of the created in-village water infrastructure in the Ghogha and ERR Projects.

Introduction

Scarcity of potable water has been a persistent problem in Gujarat. The frequent occurrence of drought and over withdrawal of groundwater for irrigation and industrial purposes has seriously affected the availability of potable water from hand pumps, dugwells and bore wells providing water to village water supply schemes. As a result, the number of 'no-source' villages has increased considerably.

Until recently, most efforts to resolve the scarcity of water were directed towards additional water development by focusing on the supply side, by the transfer of water through regional schemes that supplemented local traditional drinking water sources. However, transfer of water from distant sources is often complex and expensive. Moreover, when a regional scheme fails, people have to fall back on traditional sources of water such as village ponds, tanks, dugwells and bore wells. Where such common resources deteriorated or did not exist, villagers face problems of both access and quality.

One of the components of WASMO's projects is the construction of in-village water supply structures such as underground sumps, elevated surface reservoirs, stand posts and pipelines. These structures are based preferably on local water sources which are supported by bulk transfer of water from the Mahi pipeline for the Ghogha region and the Sardar Sarovar Canal-based drinking water project for the earthquake-affected villages in Kutch, Jamnagar, Patan and Surendranagar districts. To strengthen local water sources, considerable investment is made in augmenting these through

Sustaining the water source is an important component of any water supply system

appropriate water conservation measures that include a revival of traditional water harvesting structures and the construction of new ones. This shift in approach from supply to management is a major factor reshaping the sustainability of created in-village water infrastructure.

While there are many issues equally critical for ensuring safe drinking water, this paper focuses on the impact of WRM interventions on augmentation of local water sources, leading to the sustainability of in-village water infrastructure. The WRM interventions undertaken in Ghogha and ERR Project areas include the construction of check dams, tidal control structures, injection wells, gabion structures, gully plugs, vegetative plugs, the repairing and construction of ponds, well recharging, drainage of water points and well upgrading. Other measures undertaken are forestry and pastureland development and rainwater collection from rooftops and courtyards.

Ghogha Project

Implementation of the community-managed Ghogha Project began in 1997 and was completed in June 2005. This project has enabled 81 villages in the project area with perennial, sustainable and cost effective water supply and sanitation facilities. This has been achieved by integrating water resource management (WRM) with water supply systems (WSS) primarily based on local water sources, and duly supplemented by the import of surface water through the Narmada-based Mahi pipeline network.

Demographic profile

According to the 1991 census the population in the project area was 167,747, projected to grow to 256,741 by 2010 AD. Agriculture and related activities (60 per cent) followed by diamond cutting (17 per cent) and artisan work (16 per cent) are the main occupations of the people here. Many households also keep animals such as buffaloes and sheep.

Physical Setting

The Ghogha Project area covering an area of 61 sq km is situated south of the city of Bhavnagar. It is located between the Gulf of Khambat in the east and the Shetrunji River in the south and a mountain range in the west. The project area includes parts of the Bhavnagar (21,047 ha), Ghogha (27,695 ha) and Talaja (18,381 ha) talukas and covers 81 villages and Ghogha town.

The climate is semi-arid. The monsoon extends from June to October, with an average annual rainfall of approximately 580 mm. The project area is just above sea level with elevations that range between 0 to 300 m. Slopes are gentle in Bhavnagar area and moderate to high in Ghogha and Talaja area. It is hilly in the western central part, gently undulating in the central part and more or less a plain country in the east. In Bhavnagar taluka the predominant soil type is clayey, gently sloping and well drained, while in Ghogha and Talaja talukas the soil is of mixed nature. There is salinity ingress of 5 to 6 km. in the Ghogha taluka and about 2 to 3 km in Talaja taluka. Currently, around 20 per cent of the villages are affected with salinity ingress.

Hydrological Conditions

The main river in the project area is the Shetrunji River, which forms the southern border of the project area. Other important streams are Manari Nadi, Ramdasia Nadi, and Malesari Nadi. There are four minor irrigation tanks located near Kareda, Nagdhaniba, Odarka and Guipure villages respectively. Two ponds located near Ghogha and Bhuimbli villages which are used for domestic purposes. Water releases into the Shetrunji Left Bank Canal, which has a length of about 59 km and a canal command of 220 sq km have been highly irregular in recent years. In 1997-98, canal flows were reported for 18 days only. Estimates indicate an annual runoff available for utilisation to be 29.44 MCM, around 67 per cent of which was going as waste into the sea. A part of it

(20 per cent) could easily be harvested to meet various water demands of villagers (See Table 1).

Hydro-geological Conditions

Geologically, the project can be classified into the basalt area (449 sq km) and the coastal tract (165 sq km). Sixty two of the project villages lie in the basalt area and 19 in the coastal zone.

Due to variation in lithology, water availability is not uniform over the entire project area. There is water scarcity in the upper reaches (north) as well as in the coastal areas (east). In the basalt area, shallow weathered zones extend up to a depth of 20 m below ground level and form the major source of fresh groundwater for dugwells. Fractures below the weathered zones, at greater depths of up to 100 m are exploited by bore wells fitted with either hand pumps or submersible pumps. These zones are suitable for recharge by constructing percolation tanks and check dams. Though the groundwater in weathered rock formation is potable, salinity increases from west to east. Confined aquifers yield moderate to heavy saline water. In the coastal zone, water suitable for drinking water occurs in seasonal fresh water lenses at shallow depths on top of the clay layers or in riverbeds containing sand or gravel. These river bed aquifers are an important source for piped water supply to a number of villages. However, over exploitation has led to the intrusion of sea water into these aquifers.

Estimates of groundwater balance

The water level data monitored by CGWB and GWRDC from 1970 to 2005 indicates a variation in pre-monsoon water levels from 9 to 37 m, while post monsoon water levels ranged from 3 to 15 m. The general regression line of water levels indicates a progressive decline in water levels by 2 m over a period of 35 years at an average of 67 mm/year. At face value, this decline may not appear to be serious. However in areas that are water-stressed – especially in coastal areas – every millimeter counts. During this period, wells have gone dry. Seasonal rise has varied between 1.7 to 11.4 m (average 5.5 m) and 0.6 to 10.4 m (average 5.9 m) in 1996 and 2000 respectively. The rise was higher in the foothills area (5 to 10 m) and varied between 2 to 3 m in the coastal areas (Thalsar and Ghogha wells).

Table 1: Runoff estimates in the Ghogha Project area
(All units in Mcm / year)

Item	Bhavnagar	Ghogha	Talaja	Total
Dependable yield	13.77	18.16	12.07	44.00
Surface runoff (85 % of dependable yield)	11.70	15.44	10.26	37.40
No. Of existing check dams	94	119	65	278
Capacities of existing check dams. (1mcft/CD)	02.66	03.37	01.93	07.96
Available runoff (2-4)	09.04	12.07	08.33	29.44
Run off development (20 % of available runoff)	01.80	02.40	01.60	05.80

Note: Estimates based on IWACO's and GWSSB reports.

Water balance studies carried out by the Estimation Committee (1998), IWACO (1998) and by Shukla (2002) for the Ghogha Project indicated surplus groundwater balance (See Table 2). However, these estimates appear to be on the higher side, since these implied a continuous increase in the groundwater storage, which was neither supported by the prevailing groundwater scarcity conditions, overall decline in the water levels during the past thirty years, nor the salinity ingress along the coastal areas.

Subsequently, WASMO carried out a review of the water balance to understand the behaviour of the groundwater regime. Estimates of water balance were interpolated based on records of long-term water level fluctuations. Assuming that 12 per cent of rainfall infiltrates underground and joins the groundwater body (GEC report, 1984), annual recharge in Ghogha Project works out to be 37.50 MCM/year. Adding to

A survey indicated that groundwater could meet drinking water requirements provided these are recharged

it an overdraft of 1.23 MCM/year (based on yearly decline in water levels), the total groundwater withdrawal from the aquifers is estimated 38.73 MCM/year for an average rainfall year. In years of scanty rainfall with little or no canal water supplies, imbalance in groundwater (draft exceeds groundwater recharge) could lead to further declines in water level. An attempt to maximise the groundwater recharge in good rainfall years was thus necessary as additional inflows into these aquifers would prevent the continuous decline in water table.

Potential for drinking water supply using local sources

A baseline/ census survey undertaken in 1991 by GWSSB classified most of the villages in the project area as 'no source' villages. A rapid survey carried out by IWACO in 1997-98 revealed that the most important existing water supply sources were open dugwells (99 per cent of the villages) and ponds (62 per cent of the villages). Water scarcity was experienced in the upper reaches (north) as well as coastal areas (east). Though around 60 per cent of the villages had access to a river or an irrigation canal, these remained dry for most of the year. Around 2,280 hand pumps were installed in 78 per cent of villages, 60-75 per cent of which were working. Around 45 villages had piped water systems known as Individual Village Water Supply Schemes (IVWS). Another seven villages were covered by the Ghogha Regional Water Supply Scheme. Under the scarcity programme in 2000, drinking water shortage was observed in 55 villages.

According to a WASMO report published in June 2001, 22 of the IVWS were either defunct or partially functional. The regional scheme was poorly functioning as well. As many of the above mentioned water sources were seasonal, invariably 40 per cent of the villages had to be supplied water by tankers during the dry season.

IWACO carried out a detailed hydro-geological investigation to explore the possibilities of developing village groundwater sources that fulfilled the criteria of sustainability, demand and quality. Findings indicated that under the existing scenario, only 28 per cent of the villages could be supplied with sufficient drinking water. In fact, some of these villages had little or no water during the pre-monsoon period. However, the potential for local drinking water supply from groundwater for a number of villages was quite high (84 per cent): It was overexploitation and the resultant effects that was the main cause behind the difference between the 'potential' and 'existing' situation. Drinking water supply in approximately 37 per cent of the villages could be improved by increasing aquifer recharge. Another 19 per cent of the villages could be supplied drinking water from a local groundwater source provided WRM measures were undertaken. In approximately 13 villages there was no possibility of using groundwater as a drinking water source. Alternative solutions for these villages would have to be based on surface water from outside.

Drilling of about 236 bore wells in the beginning of the Ghogha Project indicated poor water availability in deeper aquifers. To recharge the aquifers serving these

Table 2: Estimates of groundwater balance in the Ghogha Project area (All units in MCM/ yr)

Estimates by	Gross ground water recharge	Utilisable ground water recharge	Total ground water draft	Ground water balance	Category
IWACO (1998) Canal irrigation negligible (1994-95)	46.87	37.50	33.08	4.02	Gray
IWACO (1998) Canal irrigation abundant (1997-98)	63.00	50.40	16.97	33.43	White
Shukla (2002)	60.86	48.69	31.72	16.97	White
WASMO (2003)	46.87	37.50	38.73	-1.23	Dark

Source: EAS to WASMO Report, 2003

borewells, it was necessary to undertake suitable measures to enhance groundwater recharge. Since infiltration of rainfall is the most common way of recharging groundwater, it was necessary that water resources development and management plans put emphasis on the harvesting of rainwater and its storage.

ERR Project

The Community-managed water and sanitation programme in earthquake-affected villages of Gujarat project or the ERR Project envisages the repair, reconstruction and development of water and sanitation facilities in 1,260 earthquake-affected villages in 27 talukas of four districts (Kutch, Jamnagar, Surendranagar and Patan). It aims at providing access to safe, reliable and sustainable drinking water and environmental sanitation facilities. The focus is on in-village improvements based on integrated development of piped supplies and development of traditional water sources through the active support of the Pani Samitis. The projections of demand and supply of water in these areas also indicated a likely shortage of water by the year 2010. Therefore transfer of water to these regions had to be an important component of any water policy to assure steady and uninterrupted supply of water. Salient features of ERR Project districts are given in Table 3.

Physical setting

Kutch district lies in the Saurashtra peninsular region of Gujarat and is bound on the north and east by the greater and little Rann of Kutch and on the south, west and southeast by the Arabian Sea and Gulf of Kutch. In the northwest it forms a part of international boundary with Pakistan and in northeast it has its boundary with Rajasthan. District has a tropical monsoon climate with extreme weather conditions. Average rainfall in Kutch district is 333 mm. Soils are broadly classified as alluvial sandy soils, medium black soils, saline alkaline soils and desert soils.

Table 3: Salient features of ERR Project

District	Project Area (Sq km)	Number of affected talukas	Population	Population density/ Sq km*	Sex Ratio*
Kutch	17023	9	874650	33	964
Jamnagar	2082	10	223446	135	941
Surendranagar	2363	7	256053	144	923
Patan (Santalpur)	1350	1	86396	206	933

Note: * District values

Source: Directorate of Census Operations, Gujarat, Ahmedabad.

Jamnagar district lies in the Saurashtra peninsular region of Gujarat and is bound on the north by the Gulf and Rann of Kutch, on the east by Rajkot district, on the south by Junagadh district and on the west by the Arabian Sea. The average annual rainfall for district is 511 mm and air is humid throughout the year. Soils of district may be broadly classified as coastal alluvial, medium black, shallow black and hilly. The coastal alluvial soils are mostly saline and alkaline in nature.

Surendranagar district is a part of Saurashtra peninsular region of Gujarat and is bound on the north by Little Rann of Kutch, on the east by low lying alluvial tract plains of north Gujarat and on the south and west is encircled by uplands of Central Saurashtra. Most of the rainfall amounting to 643 mm occurs during the monsoon. Alluvial silty rocks are alkaline and saline in nature with moderate fertility and suitable for limited irrigation.

Santalpur taluka is situated in Patan district. The area is mostly plain alluvial, the climate is semi-arid and the temperature varies from 20 to 34 degrees Centigrade. Average rainfall in Patan district is 575 mm.

Hydrological conditions

In general the surface water resources in the ERR area reflects the variations in physical features and the rainfall pattern. The river systems prevailing in the ERR areas can be

grouped as the rivers of Kutch and the rivers of Saurashtra. In Saurashtra the river basins are small and fragmented. Being a rocky arid region, Kutch has ephemeral streams which rise from the central hill range and flow radially in all directions. It has 97 drainage courses originating from central uplands and flowing north to the Rann and south to the sea. Major/medium reservoirs are Rudramata and Kankavati. In Jamnagar district the central stretch of highlands and the hills form a distinct water divide. From the northern and north-western part of the district, rivers flow into the Gulf of Kutch. From the southern and south-western part of the district, river flow to the Arabian Sea. The Ranjit Sagar dam constructed by the erstwhile ruler of Jamnagar is exclusively meant for water supply to the city. The drainage in the northern most and eastern parts of Surendranagar district comprises mostly short streams which disappear into the Little Rann of Kutch. Limdi, Bhagova I and II are two east flowing and Brahamani and Kankavati are the north flowing ephemeral streams. Many small reservoirs and tanks are constructed to meet the irrigation and domestic requirements of the area, but most of them dry up during the summer. In Patan, the major drainage system is of the Banas and Saraswati rivers. The major irrigation scheme is based on the Saraswati. The extent of soil salinity and groundwater salinity is high in Santalpur taluka. Estimates of available runoff for rainfall harvesting are given in Table 4.

Hydro-geological conditions

The general groundwater conditions within various rock types are briefly summarised below:

Deccan traps

These are essentially basaltic lava (Cretaceous to Eocene age) flows with almost horizontal dispositions over a wide area. From the groundwater point of view, the shallow weathered and fractured zones are promising. Dug well yield is generally poor and varies from a few liters to 100 CUM/ day. Some favorable locations have higher yields. These can be further enhanced by lateral and/ or vertical borings. Weathered interflow zones, extending to the entire thickness of basalt flows yield water under confined conditions. The Intertrappean in Kutch area have inherent salinity (calcium and sodium salts) and yield brackish water. At several places dykes act as sub-surface barriers and impound groundwater. These areas support spring and shallow dugwells with good yields.

Sedimentary rocks

Mesozoic formations are Pacham, Chati, Katrol and Bhuj (Umia) series in Kutch and Dharangadhara and Wadhwan sandstones in North-eastern Saurashtra. One of the most important and productive aquifers occurs in the Bhuj series. It consists of dominantly friable and soft, medium to coarse grained sandstones occurring at depths of a few meters to as much as 300 meters. Tube wells having depth of 200 m yield 10 to 370 CUM/ hour at a drawdown of about 10 m. In general groundwater salinity is low in uplands and increases towards the areas of discharge. It also increases with depth and water turns almost saline below 150 m depth.

The Dhrangadhara sandstones about 40 m thick comprise of fine to coarse grained sandstones, inter bedded with carbonaceous shale and basaltic sills. Tube wells having depth up to 200 m yield moderate discharge of 14 to 80 CUM/ hour. Basic sills having thickness of 30 to 50 m intrude lower Dhrangadhra formations and with carbonaceous shale, form the lower limit of fresh water. Deeper zones have inherent salinity. The Wadhwan sandstones yield brackish water. In areas receiving fresh water replenishment, improvement in water quality is noticed. The lametas, Bagh beds and intra trappeans are poor aquifers because of poor primary and secondary porosity.

Gaj beds (Tertiary) occurring all along the Saurashtra coast consist of limestone, clay

and gysiferous grits with minor sands. Quality of water in upper Gaj limestone is good and deeper zones with intercalated clay bands yield meager quantity of saline water.

Dwarka beds exposed in Jamnagar district comprises of gypseous and calcareous clays and sandy lime stones having thickness of 150m.Yield of dugwells is about 27 CUM/ day and tube wells about 22 CUM/ day for a drawdown of 4 m.

In Kutch area, tertiary formations have saline water and form poor aquifers. In general Tertiary rocks are not dependable and potential fresh water aquifers. Quaternary formations include Milolitic limestone, alluvium and mixed Aeolian and fluviatile deposits. The Miliolitic limestone is observed all along the southern and western Saurashtra coast and in a few inland valleys in Saurashtra. These are of limited thickness and occur below 200 m elevation. Highly cavernous Miliolite lime stones aquifers have potable water in the otherwise saline coastal areas. Dugwells yield up to 200 CUM/day but the quality of water deteriorates towards the coast. There is salinity ingress up to 2 to 4 km from the coast due to overexploitation of groundwater.

Quaternary sediments are mainly composed of clay, silt and sand with kankar and show large variations in character and composition. In piedmont areas yields are up to 200 CUM/ hour. Abandoned river channels and valley fills are good source of water in hard rock terrain. Sediment thickness may vary between 20 to 30 m and yield 10 to 20 CUM/hour. Groundwater occurs in alluvium under water table conditions and at shallow depths. In deeper horizons it may occurs under semi confined, confined or artesian conditions. Aquifers have areas of recharge in piedmont terrain and in hills. In general permeability is poor to moderate.

The groundwater quality is unsuitable for drinking purposes due to excess fluoride, salinity and nitrates. Over withdrawal of groundwater has resulted in sea water intrusions in coastal regions. Salinity ingress has affected coastal plains 4 to 6 km away from the sea coast, rendering phreatic aquifers saline. Quality of water deteriorates below the depth of 150 m. A few deep bore holes have yielded groundwater with EC values less than 1000 micro-mhos/cm.

Table 4: Estimates of utilisable surface water and available runoff (Unit: MCM /Year)

District	Climate	Rainfall (mm)	Utilisable surface water	Effective storage capacity of reservoirs	Available runoff for harvesting
Kutch	Extremely arid to semi-arid	333	400	252	148
Jamnagar	Arid to semi-arid and moist	511	350	257	93
Surendra nagar	Arid to semi-arid	643	650	494	156
Patan	Arid to semi-arid	575	620	642	-

Source: Narmada and Water Resources Department, Government of Gujarat 1998

Groundwater balance

Based on GWRDC depth to water table data, the minimum, maximum and average depth of the water table was analysed. It is observed that the depth to water table (pre monsoon) has varied from 2.3 m (Jamnagar) to 34.3m (Kutch) and average depth to water levels varied from 10.3 (Surendranagar) to 14.3 m (Patan). Analyses of post monsoon data revealed that average seasonal fluctuations (rise in water table) varied from 2.13 m (Patan) to 5.18m (Jamnagar). Due to overexploitation of groundwater, the water table in many areas has receded sharply. It is observed that in general the level of groundwater development is moderate to high in most of the project areas. In four talukas of Kutch and Santalpur taluka of Patan there is over development of utilisable resources. District wise estimates of groundwater balance for the year 1997 are

The ERR Project area has huge potential for harvesting rain runoff. Several traditional rainwater harvesting systems were already in use here

as per the norms recommended by the Groundwater Estimation Committee (See *Table* 5). Though at present there is surplus groundwater available in a majority of the talukas of ERR areas, overall a decline in available quantities has been observed. To improve water balance of the area measures to store runoff and direct it to aquifers needs to be initiated.

Potential for local drinking water sources

Traditionally, the Kutch region (including parts of Jamnagar) used tanks in alluvial areas, wells in rocky areas as well as traditional systems like virida and vav to meet drinking water demands. Rooftop water collection tanks were also used by communities to store rainwater throughout the year. Jamnagar and Surendranagar districts are hilly with small rivers, which tend to dry up in the summer. The coastal region has low rainfall. Here also people used wells and ponds as well as roof water collection tanks to obtain drinking water and domestic water. Prior to 1960 the drinking water situation was fairly good due to sufficient availability of groundwater. However, over-exploitation of groundwater by farmers, destruction of forests and vegetation has lowered water tables and affected the quality of water. These areas are suffering from a severe water crisis. It is possible to use local rainwater harvesting structures for ensuring adequate water supply to people. Revival of *viridas* and the construction of check dams, percolation tanks, roof water collection tanks are likely to mitigate drinking water problems in these areas.

Before any interventions to harness rainwater are proposed it is necessary to evaluate the runoff effectively. Detailed estimates of the utilisable water resources vis-à-vis the level of groundwater development have been summarised in Tables 4 and 5. It is evident that the potential for runoff harvesting is large and water harvested can be effectively used for recharging groundwater in affected areas. The interventions proposed are storage ponds, check dams, well recharging and rainwater harvesting. Besides this, to prevent further depletion and degradation of water resources in the ERR Project areas, state government also decided to use water from Narmada to ensure dependable water supply to the regions of Kutch and Saurashtra.

Table 5: District-wise groundwater balance in ERR areas (1997)
(Unit: Million Cubic Meters /Year)

District	Total Reserves	Utilisable Reserves	Total Draft	Ground-water Balance	Level of groundwater development
Kutch	627	502	431	70	Grey
Jamnagar	816	653	375	278	White
Surendranagar	628	502	354	148	White
Patan (Santalpur)	-	-	-	-	Saline/ Over exploited

Note: Level of Groundwater development (White >65%; Grey-65 to 85%; Dark-85 to100%; Over exploited >100%.)
Source: Narmada and Water Resources Department, GOG 1998

WRM Interventions

In order to restore and maintain groundwater levels and promote qualitative and quantitative sustainability of the local sources, WRM activities have been undertaken in both the project areas. These interventions impede surface runoff, increase rainfall retention time and allow enhanced infiltration and percolation of water, thus increasing aquifer recharge. This in turn increases groundwater storage and flows into wells and tubewells. During non-monsoon period, this stored water can be diverted to ponds, aquifers or pumped for water supply.

Storage-cum-recharge structures includes check dams, percolation tanks, ponds and shallow borewells or tubewells in village ponds or riverbeds. These measures can substantially increase the availability of surface and groundwater during the post monsoon period and improve quality as well.

Tidal check dams can reduce groundwater salinity and seawater ingress. Percolation tanks collect and impound surface runoff during rainy season to facilitate infiltration and percolation to aquifers. Storage of surface water in open ponds is a traditional practice. Ponds are small water bodies made either by constructing an embankment across a watercourse, or by excavating a pit, or the combination of both. These storage structures collect and impound surface runoff during rains and facilitate its infiltration. These improve the availability of water for livestock and human beings and also moderate the hydrology of small watersheds .The construction of recharge tube wells in or near the percolation tanks enhance groundwater storage and directly recharge the depleted aquifers with surface water.

Soil and water conservation measures include pastureland development, afforestation of forest and waste lands and nalla / gully plugging such as gabion structures, medium and small loose gully plugs, vegetative plugs and small check dams. A series of nalla plugs constructed in the upper and middle reaches will help in arresting surface runoff and impounding it at small intervals in small ponds. This also reduces soil erosion and the silt load carried into check dams.

Rooftop rainwater harvesting systems are low cost (as the existing roof can be used) and durable. Maintenance costs are low as well. However, the water collected may be turbid due to sediments and in absence of adequate precaution, contamination is possible.

WRM interventions in Ghogha Project

Through information campaigns, WASMO was able to generate widespread interest in WRM interventions for augmenting drinking water supply.

WAPCOS was engaged by WASMO in 2003 to prepare detailed project reports (DPRs) for major WRM interventions in each village so that water conservation efforts could start as soon as possible. Based on these DPRs, by the end of the project in June 2005, 123 major WRM structures costing Rs 1.25 lakh were completed (*See Table 6*).

In addition, the ISAs proposed a number of minor WRM interventions such as well-recharging, well-upgrading, injection wells and the drainage of water points. These designs were approved by WAPCOS (*See Table 7*). The construction of all these could not be completed before the end of the project. As these were constructed after the monsoon 2005, their efficacy needs to be monitored.

Pastureland development

Pastureland development was completed in 36 villages and covers 658 ha of village land (*See Table 8*). In many villages these pasturelands have been opened for grazing as the grass growth is substantial. As a result fodder availability at the village level has increased, enabling the villagers to save both time and money. In villages such as Avaniya and Bhadbhadiya the Pani Samiti has earned more than Rs 10,000 from the sale of fodder and grass seeds. It was observed that some trenches made to keep out animal grazing got damaged. At many places the thorny bush Ganda babul (*Prosopis juliflora*) was noticed as well. Thus, regular maintenance is necessary to maintain good growth of grass.

Table 6: Number and types of completed WRM interventions

Taluka	Large check dam	Medium check dam	Tidal control structure	Pond construction	Pond repair	Total
Bhavnagar	10	04	01	14	11	40
Ghogha	05	26	00	03	10	44
Talaja	10	20	02	04	03	39
Total	25	50	03	21	24	123

Source: WASMO Reports, 2006

Table 7: Minor WRM interventions by ISAs in Ghogha Project

WRM structure	CEE	Medhavi	Utthan	Total
Well recharging	23	17	16	56
Injection wells	10	00	00	10
Drainage of water points	19	08	24	51
Well upgradation	21	16	14	51

WRM Interventions in ERR Project

An emphasis is being laid in this project to increase groundwater recharge by traditional rainwater harvesting measures. Major WRM interventions in water-scarce villages are in progress. These are based on WRM proposals prepared by CMSU. Some of the structures are located on sites identified by WAPCOS under a pilot project of the Rajiv Gandhi National Drinking Water Mission (RGDNWM). Most of the completed sites were able to store runoff during the monsoons of 2004 and 2005, some of which even overflowed (See *Table* 9).

To ensure supply of safe drinking water to schools rooftop rainwater harvesting structures are being promoted. The aim is to demonstrate their usefulness to the communities and the schoolchildren. In eight blocks of the Kutch and Patan districts rooftop rainwater harvesting works have been taken up through School Civil Works Committeeswhere the school headmasters play a pivotal role . About 787 rooftop rainwater harvesting strcutures have been completed. In Surendranagar and Jamnagar districts 62 and 42 works have been completed. The status of all these interventions is given in Table 9.

Table 8: Pastureland development by ISAs in Ghogha Project
(Area in ha)

1	CEE	11	322	271	271
2	Medhavi	16	327	254	254
3	Utthan	09	122	133	133
4	Total	36	771	658	658

Source: WASMO Reports 2006

Major observations

The check dams constructed during 2003-05 in the Ghogha Project area have proved their worth by recharging aquifers, ensuring availability of water for longer periods and improving water quality. After the good monsoon of 2005, impediment of runoff resulted in bank to bank flow of water in the streams and a considerable rise in the water table in the vicinity of the check dams, indicating a recharge of the aquifers and an increase in sub surface groundwater flows. In many villages dugwells were full and several rivers and streams were flowing even after after monsoon.

An impact assessment study was commissioned to quantify the impact of all these rainwater conservation efforts (*See Annex I*). Water levels were monitored weekly in 92 dugwells in 18 project villages and 13 dugwells in 3 control villages (where no WRM intervention was made) during the monsoon period of the year 2005. About 68 per cent of the monitored wells indicated the maximum rise (>5 m) in water levels, 20 per cent of wells indicated moderate rise (3 to 5 m), and the remaining12 per cent of dugwells indicated minimum rise (3 m rise). There has been a positive impact on the seasonal water level fluctuations between pre and post-project situations in all the three talukas of Ghogha Project as well. This had increased by 3.91 m to 6.85 m in basaltic area and 0.53 m to 6.46 m in alluvial areas. For a few WRM/ non-WRM villages, the average rise in water table (2005) and its comparison with the rise in the previous years amply illustrate the impact of WRM interventions. The utilisable groundwater recharge has been estimated to have increased from 37.50 MCM to 87.95 MCM. It has changed the category of the Ghogha area from dark to white. WRM interventions have also indicated significant improvements in the quality of groundwater. The range of TDS concentrations has improved from 520-5390 to 470-2764 mg/l in Bhavnagar taluka,

644-3260 to 430-2660 mg/l in Ghogha taluka and 873-3760 to 318-2874 mg/l in Talaja taluka (*see Box: Intervention impact*).

To record the impact of WRM interventions on the water table, groundwater recharge and the quality of water, a systematic monitoring of various hydrological parameters has been initiated by the CMSUs at Bhuj, Jamnagar and Surendranagar.

Conclusion and recommendations

The conclusions and recommendations given below are based on the above information and field observations.

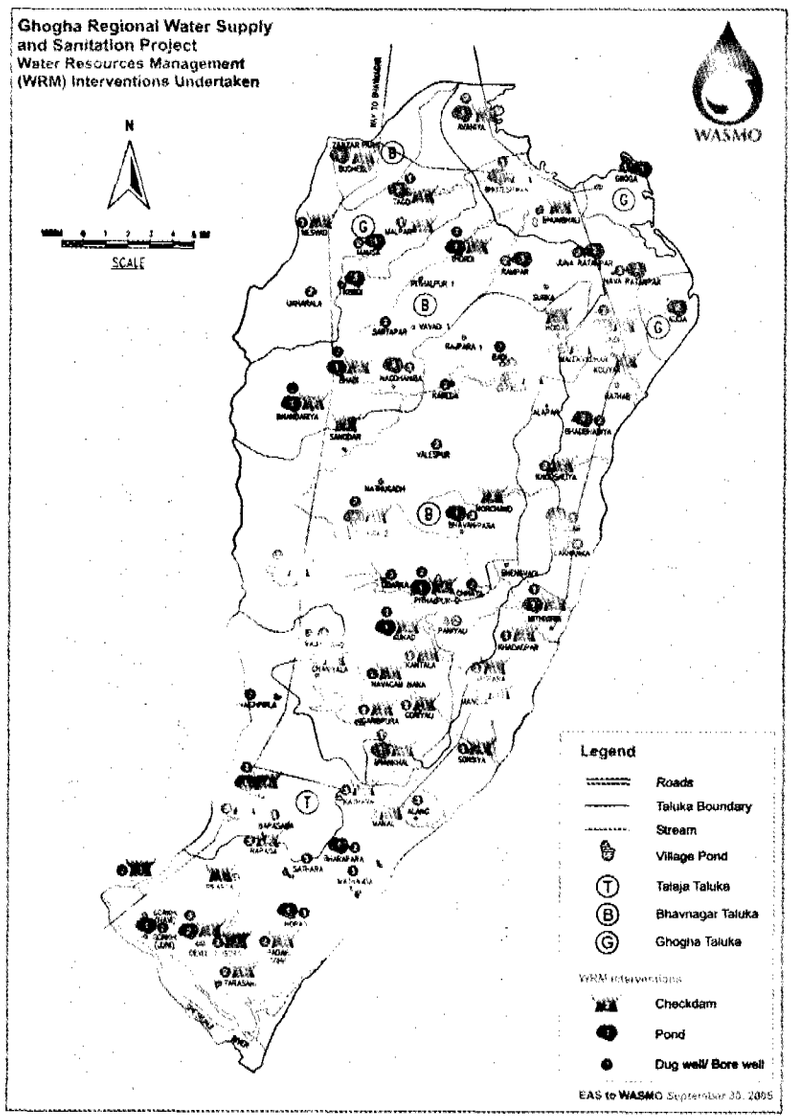
Since sustainability of local water sources is vital, WRM interventions were made to recharge the aquifers. Selection of these structures was based on each village requirements, the availability of runoff and terrain characteristics. Storage of water in check dams/ponds has improved the availability of water for drinking as well as domestic and animal use. Without these check dams, water would have wasted away and rivers would then stay dry till the next monsoon. Recharging of local sources through various WRM interventions has helped to improve the sustainability of community managed in-village water supply systems in both the project areas. Impounding of water has led to an increased availability of potable water. In many villages the quality of water has improved. Groundwater accretions under gravity flow have reappeared in the streams, where through check dams, these are being recycled. The positive impact of soil and water conservation efforts has convinced the villagers to go for more WRM interventions.

A number of WRM interventions have been undertaken by villagers duly facilitated by WASMO. With regard to the different interventions/activities there is a need for:

Table 9: Status of WRM interventions under ERR Project
As on September 30, 2005

	Kutch / Patan	Surendra-nagar	Jamnagar	Total
WRM interventions started	113	56	39	208
WRM interventions completed	64	45	07	116
WRM works in progress	19	11	12	42
WRM works yet to be taken up	30	00	20	50
RRWHS completed	787	62	45	894

Source: WASMO Reports, 2006



Intervention impact

Several villages in the Ghogha Project are reaping the benefits of tapping rainwater.

- Mithi Virdi village was once famous for the sweet water available from *viridas* (a small pit from which water is extracted with bare hands using small vessels). However, over the past few decades, wells in this coastal village had either dried up or turned saline. The village was declared to be a 'no source' village as it had no longer a lasting source of potable water. Agricultural production had declined as well. Under the Ghogha Project, the Pani Samiti with contribution from their village community and technical and financial support from WASMO constructed a check dam. The check dam was full with impeded runoff after the first rains in 2003. Consequently, in many dugwells, water was within reach and its salinity reduced considerably. Even the quality of the river bed water improved. It was drawn for domestic and irrigation use. The water stored in the check dam lasted for about four months after the monsoon. Monitoring of the water table in 24 wells around the check dam indicated a rise between 3 to 21 m. Encouraged by improvements in water availability and quality, the villagers have constructed a tidal regulator-cum-check dam downstream of the first check dam at the mouth of the estuary. This resulted in the formation of a large pool of fresh water and improvement in groundwater quality. Both dams overflowed during the monsoons of 2004 and 2005. Two other tidal regulators-cum-check dams have been constructed in Tarasara and Padri Gohil villages as well.
- To harness overflows and to impede runoff more than two check dams on a stream were constructed in many villages. The cascading effect of multiple storages helps in arresting the maximum amount of rainwater. The construction of two check dams each in Avania, Malpar and Mandava villages helped in making water available from dugwells and stream beds even after March 2004. These were villages where water scarcity was normal.

  Four check dams on Maleshwari river and three on Jaspara Nadi have been constructed as well. Irrigation return flows and excess canal water have been diverted to streams to be stored in check dams. After the monsoon of 2004 and 2005, the cascading impact of stored water is clearly visible in increased river flows and recharged dugwells.
- The improved availability of water has not only boosted the kharif crop, but also helped farmers in growing a rabi crop. In Mandava and Lakhanaka villages, farmers are able to draw water with 5HP pumps, which was impossible prior to the construction of check dams. Near Sosiyan village newly planted orchards are using water stored in the check dam.
- In Mithi Virdi village, rooftop rainwater harvesting helped in storing water for domestic needs. In Tarasara village the rainwater reservoir built in the school premises provided water for a whole year. The concrete slab that covers the rainwater reservoir is used by the school for hosting plays and other cultural programmes. The capacity of reservoir is 50,000 litres constructed for Rs.50,000 or Rs one per litre.
- The fluoride content in Avaniya village was as high as 3 mg/l while the TDS was 3,000 mg/l. After the monsoon of 2005 fluoride content reduced to 1.4 mg/l and TDS to 2,076 mg/l. Avaniya owes this drastic improvement of its groundwater quality to the recharge of groundwater sources through rainwater capture. The villagers have tested the water themselves with the field test kit provided to them under the project. In a mishap that had damaged the Mahi bulk water pipeline providing drinking water to the village, the community unhesitatingly used drinking water from their local sources as they had tested it themselves and were sure of its safety.
- In Thalsar village, the well water was unfit for drinking due to high levels of TDS, sulphates and nitrates. After the construction of acheck dam, the well water has become potable. Groundwater quality has improved in many coastal villages as well.

a) An inventory of existing check dams, percolation tanks and ponds near the local water sources.
b) Regular desilting of all the check dams, percolation tanks and ponds. This will increase subsurface flow to groundwater sources; both dugwells and dug-cum-bore wells.
c) Increased awareness about the optimum withdrawal of groundwater in their area. The reservation of groundwater source for drinking water through appropriate legal and institutional mechanisms is a must.
d) Involving villagers and creating awareness during planning of the in-village water supply infrastructure to help them identify holistic options. At WASMO this has ensured effective participation by communities and increased

willingness to share capital and O and M costs of village water supply scheme and WRM interventions.

e) Monitoring of short- and long-term -term changes in groundwater levels, drinking water quality and use of water for different purposes. This is necessary in order to delineate the impact of check dams and also to evaluate the influence of the future groundwater abstractions on groundwater regime.

e) Proper delineation of the watersheds for preparing long term WRM plans.

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ANNEX

WATER TABLE MONITORING GHOGHA PROJECT
(Monsoon 2005)

Average Depth bgl (m)

Sr. No.	Taluka	Particulars	Name of Village	No. of Obs. Wells	Pre-Monsoon	Post-Monsoon	Av. W L Rise (m)
1	Bhavnagar	Non WRM	Alapar	5	11.62	3.12	8.5
		WRM	Koliyak (Nr. Coast)	6	6.33	3.50	2.80
		WRM	Bhandariya	6	15.23	4.45	10.78
		WRM	Thordi	7	14.08	3.97	10.11
		Previous years Post Monsoon Rise Range:					2 to 6
2	Ghogha	Non WRM	Sarvadar	3	13.10	0.75	12.35
		WRM	Morchand	5	12.10	3.32	8.78
		WRM	Kukad	5	13.70	1.80	11.9
		Previous years Post Monsoon Rise Range:					1 to 4
3	Talaja	Non WRM	Sathara	5	24.5	1.66	22.84
		WRM	Mithivirdi (Nr.Coast)	8	6.09	2.63	3.46
		WRM	Devli	15	13.44	1.36	12.08
		WRM	Bapada	9	13.54	1.26	12.28
		Previous years Post Monsoon Rise Range:					2 to 5

Source: 1. WRM Impact Assessment Study WASMO - ORG (2005)

Previous Years: CGWB well monitoring data (1990- 2004).

Sustainability of created in-village water infrastructure through water resource management

Villages in drought prone Surendranagar district have been able to evolve holistic water supply systems integrating distribution systems with recharge measures to improve source sustainability

Apoorva Oza, P G Majithia and Raman Patel

Summary

This paper looks at the water problems in Gujarat and the issues of sustainability of the rural drinking water systems in semi-arid regions where surface water sources are scarce. It tries to draw lessons from the work done in the drought-prone district of Surendranagar by two agencies, the Aga Khan Rural Support Programme (India) [AKRSPI] and Water and Sanitation Management Organisation (WASMO). AKRSPI is an NGO working in Gujarat for the last two decades while WASMO is an autonomous agency set up by the Government of Gujarat (GoG) in 2002.

This paper is written in two parts; Part 1 deals with the problems of drinking water availability for rural households in Gujarat and the roles played by the Government, autonomous agencies like WASMO and NGO's like AKRSPI.

Part 2 looks at the issue of making rural drinking water infrastructure sustainable and the lessons that emerge from the work done by WASMO and AKRSPI in the drought-prone district of Surendranagar in Gujarat.

Part -1

Water sector in India

Water has always been a key natural resource for India as it has 16% of the worlds population, 5% of the fresh water and almost 65% of the population dependent on agriculture. Groundwater has emerged as a major option for the country and is the source for more than 50% of the irrigated area now (India is the worlds second largest user of groundwater). In India, irrigation uses 83% of all water, while domestic and drinking water accounts for only 4.5% of the use.

Since independence the State has taken up the responsibility of providing safe water to all its citizens. This role of the State has increased substantially from 1970. Prior to this large scale intervention of the government responsibility for drinking water provision was largely with the village community either through managing common water resources or developing private infrastructure. In most cases private wells or village tanks were the principal sources of drinking water. The major intervention of the government was in developing resources and providing infrastructure to distribute the water at the village level. However, with increasing population and pressure from other water users (farmers, urban citizens, industries etc.) rural areas are facing a crisis. Villagers having poor access to drinking water or consuming water with arsenic, fluoride, nitrate etc have only increased over the years. Conflicts between various users have become violent. In an era where the well-off urban people increasingly access expensive bottled water, this water crisis has affected the health and quality of life of millions of villagers, especially village women who bear the principle responsibility of collecting water for domestic needs.

Gujarat is primarily dependent on groundwater which does not get adequately recharged due to poor rainfall and other factors like geo-hydrology and topography

Water issues in Gujarat

Gujarat is one of the most drought-prone states of India, suffering from cyclic droughts. The per capita availability of renewable fresh water (year 2001) is about 1137 cubic metres (cm) per annum, which is less than the level of 1700 cm given by Falkenmark and is therefore water-stressed. Gujarat also has a high regional variation in rainfall and surface water availability, with south Gujarat being water surplus while Saurashtra, North Gujarat and Kutch are water-scarce regions.

With low availability of surface water sources, groundwater provides 79% of the irrigation, 77% of the rural domestic needs and 50% of the urban domestic needs in Gujarat.

Thus, groundwater quality and sustainability affects the quality of life of most "Gujaratis". Drinking water availability is a problem, and with years, the number of no-source villages have only increased from 1043 villages in 1965 to 6840 in 2000-2001 (see annex 1). Thus, almost 37% of the villages do not have assured safe drinking water supply throughout the year. 19% of the villages have water quality problems as the groundwater is affected by fluoride, chloride or nitrate problems. Studies reveal that 85% of the women and 67% girls were engaged in collection of water - with an average distance to the source ranging from 1-2 kms from the village.

The frequent occurrence of drought has a major impact on the water availability. In the 3 years of 1985-1988, GoG spent Rs.821 crores in drought relief, of which Rs. 115 crores was spent for water supply alone. Drought also affects individual and regional water supply schemes. In the drought of 2001, 156 out of 404 rural regional water supply schemes and 978 individual village water supply schemes were affected to some extent and 55% of the hand pumps in Saurashtra became seasonal dry.

The GOG, through the Gujarat Water Supply and Sewerage Board (GWSSB), has invested substantial funds in providing drinking water for rural areas. However, the problems persist as many of the regional and village water schemes are not fully functional.

Problem Analysis

Let us analyse why Gujarat has still not been able to provide safe drinking water for its citizens, especially the rural population. Before that, let us understand the typical rural water supply system in Gujarat.

In most villages, hand pumps are used (there are currently more than a lakh hand pumps installed for the 18000 plus villages) as interventions which tap the shallow ground water while in areas where drinking water is not available at a shallow depth, bore wells were dug. In most cases the source of water is groundwater as technically ground water is of better quality than surface water and more suitable for drinking. In addition to hand pumps, there are individual village water supply schemes (more than 7000). Typically in the village water supply schemes the sources (borewells) are connected to overhead tanks which in turn supply water to stand posts in different parts of the village. The water is pumped to the overhead tank and then flows by gravity to the stand posts.

In many villages where ground water source was not available the government resolved this by extracting water from a location where ground water is abundant and transporting water through pipelines to multiple villages were it is distributed through overhead tanks. These are known as regional water supply schemes (400 RRWSS cater to 5943 villages/habitations). In this technology villagers are completely dependent upon the government for the drinking water sources.

The village Panchayat is responsible for the management of the schemes and water

charges are also levied on a per capita basis annually. Recovery of water charges has been poor so far. The power supplied for pumping is subsidiced fully. Recharging the groundwater source is not a part of the RRWSS programme and much of the water harvesting work in rural areas had been taken up and is the mandate of other programmes of GoG and GoI. The departments like irrigation, rural development, etc. are also doing recharging works in their programmes.

In Gujarat, agriculture is highly dependent on ground water for irrigation and with the increase in both number and depth of borewells (see annex 2) there is pressure on the ground water sources and this affects the availability and quality of drinking water from the hand pumps and even from the borewells. Depletion of groundwater is the major cause of non-sustainable drinking water schemes as the source of water for the villagers is non-sustainable.

To summarise, the key reasons for the lack of assured potable drinking water availability for rural citizens are:

- Recurrent droughts and low surface water availability: Gujarat is subject to frequent droughts which affect surface storage and groundwater availability. Many of these droughts are multi-year which make it difficult for any local, rain-based source to sustain.
- Sectoral Approach: There is an attempt to create a sustainable water supply and distribution system dependent on a source which itself is a common source accessed by all farmers/industries whose livelihood depends on this source. Drinking water is not thought of as a part of the overall water resource plan of the village or region. Hence over-exploitation by other users made the drinking water source fail.
- Inappropriate Technology: The technologies used for water distribution are highly dependent on power. Unfortunately the power supply and distribution in rural areas has been unreliable and erratic. The power crisis worsens in periods when water is most required, i.e. summer months and drought years.
- Institutional gaps: The responsibility, authority and planning of most village infrastructure had been taken over by the government with a result that the community did not take any responsibility for maintaining or managing the water infrastructure. Designing appropriate village institutions, empowering them, ensuring their capacity building, evolving appropriate water charges to make Panchayat viable etc has received less priority by the GOG which has largely believed that more infrastructure was the answer.
- Poor attention to water quality: There is no system to monitor water quality of all the sources regularly nor make villagers aware of the importance of water quality.

Evolving Solutions

The response to this drinking water scenario has emerged since the early 1980's from all the key actors; rural communities, NGO's and the State. Some villages have revived traditional systems (ponds, tanks) and developed roles to manage them while many NGO's have been working with rural communities, especially rural women to evolve context specific solutions. The pioneering work done by Utthan, an NGO working in the extremely difficult regions of Bhal (a water logged coastal region) led to experimentation with many new technologies (lined ponds, roof rain water harvesting etc.) and an approach which placed rural women at the centre of the development process. Gradually partnerships evolved between the State, NGO's and rural communities in a few pilot projects.

Drinking water has not been awarded its due place in the overall water resource planning, in spite of Gujarat being water stressed

Both AKRSPI and WASMO actively collaborate with the communities

AKRSPI's work in drinking water

AKRSPI is an NGO working with rural communities to improve their quality of life through management of natural resources, both private and common. Since 1985 it has been working in three diverse regions of Gujarat; coastal Junagadh, drought-prone Surendranagar and tribal Bharuch and Narmada districts. AKRSPI initially worked to improve the villager's access to irrigation by the promotion of appropriate surface and groundwater based systems. Lift irrigation, checkdams, renovation of percolation tanks etc were all promoted with active collaboration with rural communities.

In the early 1990's, AKRSPI found that drinking water was emerging as a key problem in the coastal regions due to salinity ingress and recurrent droughts and rapid pace of groundwater irrigation had also led to acute water scarcity in the Surendranagar villages. Learning from other NGO's like Utthan and ASAG, AKRSPI added drinking water interventions and planning to the water harvesting work for supporting irrigation.

Over the years, it developed partnerships with the GWSSB and local panchayats and womens groups to develop context specific technologies (shallow wells in saline zones, well sealing, roof rain water harvesting etc).It also piloted the use of the low-cost drinking water testing kit developed by Development Alternatives.

Evolution of a new organisation - WASMO

Water and Sanitation Management Organisation (WASMO) was created amidst this continuing crisis of drinking water availability. WASMO draws its origins from the work done in Ghogha project of Bhavnagar where there was a partnership between the Dutch Government, GWSSB and three local NGO's(Utthan, Centre for Environment Education and Medhavi). This was the first time NGO's had been involved on a long term basis to develop participatory drinking water plans and management by the State. WASMO also draws many lessons from the sector reforms introduced by the GOI in 1999 which gave additional authority to village bodies to implement and manage their own water supply systems.

The GOG ,with initial support from the Dutch Government, decided to use this experience to pilot an institutional change in the rural drinking water sector by promoting a new organisational form, WASMO which would seek to bring the rural community at the centre of all interventions in the rural drinking water sector. WASMO is an autonomous institution, registered in 2002 under the Societies Registration Act and Bombay Trust Act. WASMO operates under the overall guidance of a Governing Body which is headed by the Secretary and has five civil society members.

In a short span of three years, WASMO, in partnership with 31 NGO's has now involved 1260 village communities in four earthquake affected districts of Gujarat to develop their own in-village water distribution plans and these plans have been implemented and operationalised in 380 villages. WASMO pro-actively partners NGO's in this effort. It has developed extensive communication means to promote its ideology and brand in Gujarat. Recently 30 NGOs have been selected to work in 1393 villages of 24 districts under Swajaldhara and Sector Reform Scheme (State).

WASMO also promotes awareness campaigns to emphasise hygiene practices and has funded school sanitation and roof water harvesting in schools.

Much of the causes of the problems mentioned above are sought to be resolved

by WASMO. It has a structured interface with GWSSB at the highest level to ensure that inter-agency issues are resolved.

PART-2

Defining sustainability in the context of village water infrastructure

In this context we have to review sustainability from many viewpoints:

- Source sustainability: The source of water for drinking sustains itself over a period of time and does not get depleted. This would imply that over extraction of ground water due to irrigation does not effect or there are recharge measures which compensate for the ground water extraction so that the source is preserved, both in quantity and quality.

- Institutional sustainability: Since the ground water extractors for irrigation and ground water preservers for drinking water in most cases belong to the same village there is need for institutional arrangements which ensure that the drinking water users get priority in decision making. Also, villages are heterogeneous; with exploitation of the underprivileged (scheduled castes, poor, etc).Hence institutional arrangements which leave water distribution to traditional leaders and do not pro-actively provide for the underprivileged are likely to fail.

- Financial Sustainability: There are financial costs in pumping out water and distributing it and though they may be subsidised currently by the government, over a period of time these costs may need to be borne by community/ budgeted by the state if the intervention is to be sustainable.

- Sustainable technologies: Existing infrastructure has high dependency on power supply. Since this is a factor outside the control of both the village community and the government (the demand and supply gap in power in Gujarat will only increase over time) the infrastructure used will be sustainable if its dependency on power is reduced. Technologies also have to address the heterogeneous and dispersed nature of the village as well as the wide range of hydro-geological conditions in Gujarat.

For holistic sustainability of sources, institutional, financial and technology aspects are prime

While the authors are aware that all the above issues are equally critical for assuring safe drinking water, this paper will only address issues related to Sustainability of Source and Technology.

Learning from field experiences of AKRSPI and WASMO in the drought – prone district of Surendranagar

While one can conceptually agree on the need to have a 'sustainable water source' so as to ensure safe drinking water for all villagers, operationalsing this is the difficult part. This paper, therefore uses case studies from Surendranagar district to illustrate the problems of ensuring sustainability, what has worked so far and the challenges which we need to address. It also gives an overview of the work done on water resource management by these agencies and the potential that exists for the future. These cases are from Surendranagar district, and are drawn from the collaborative work done by village communities, a facilitating NGO, AKRSP (I) and a autonomous support agency like WASMO.

As Annex 4 shows, Surendranagar offers valuable learning lessons because it is challenged both by poor natural resources (uncertain rainfall etc) as well as by socio-

Decentralised storage and low power dependency promote equitable distribution of water

economic conditions (inter-caste conflicts) As far as drinking water supply is concerned, 448(68%) of the 654 villages are no-source villages (4 villages not covered,213 villages(32%) partially covered and 231(35%)villages with quality problems) Hence, we would like to believe that if an approach can work in this district, it is likely to work in similar areas of Gujarat and the country.

Evolving appropriate technologies for sustainability

As mentioned earlier in the paper, the typical in-village distribution technology is of a "centralized storage high power dependency" type even though the power supply in interior villages of Surendranagar is erratic and unreliable and repairing of pumps and motors is time consuming. The typical overhead storage tank of 60-80,000 liters in a village of 150 households (population of 800 people) gets emptied in a day and if there is a longer breakdown then they revert back to more distant sources (virdas, irrigation well etc).

This story is repeated year after year. In drought years, there is less water available and power is more erratic, so the situation worsens. Since the entire village is dependent on one tank, villagers play safe by storing water at household level, more than they need. There is much wastage at the stand post level as taps leak. To address this issue, AKRSP (I) had piloted an in-village distribution system in villages Pipaliya and Mokasar (Surendranagar district),which is based on 'decentralised underground storage and low power dependency'. In this system, the source is connected to underground tanks of 10-15,000 litres capacity, which have hand pumps fitted on them. There is one underground tank for every 20-25 households and all the clusters of the village have their own storage tank. Storage capacity is slightly higher than earlier, and therefore even if there is power shortage or pump/transmission break down, there is water available which can be pumped out by hand pumps. Since the storage is also not in only one place for the whole village but distributed in separate localities, managing the storage (cleaning, repairing hand pumps, preventing over use etc.) is also easier as only 20-30 households have to manage this and chances of inter-caste conflicts affecting the entire village are reduced. (In Saurashtra villages, most affinity groups large families, castes, religious groups etc. stay near each other.

The poorer communities and artisans, who work as labourers and return home only late in the evening, can draw out water at their convenience. Earlier, by the time they would return in the evening, the rest of the village would have filled up water from the stand posts ,the overhead tank would be empty and lack of power meant no refills. Hence, after returning from a hard day of labour, the women would have to again walk to collect water for cooking/drinking. Another advantage of this system is that decentralised management(in small clusters of 20-30 households)is better with the heterogeneity of the population and chances of domination by one caste almost ruled out. Collecting funds for hand pump repairs is also easier with smaller numbers. Repairs of hand pumps is also easier than replacing taps or repairing motors. Even if one handpump breaks down, that cluster can always borrow water for a day from a neighboring cluster. This kind of "decentralized storage ,low power dependency" approach has been promoted on a large scale by the WASMO programme. WASMO also promotes greater village storage by constructing common underground storage tanks(called cluster storage sumps) of 50000-70000 liters in many villages of Surendranagar and Kutch. These are useful to store tanker water in drought times and also help when there is power breakdown.

Another option, relevant for villages where there is no groundwater source (local or external) is that of roof rainwater harvesting systems.(Since there is currently much debate on the match between roof size and family requirements etc. we would prefer to call these decentralised drinking water storage systems wherein it is accepted that the roof may not be the only source of fresh water storage)!. As the case study of village Dhakalva shows, there will always be local situations where a single, standard technology is not feasible and multiple options have to be worked out.

Sustainability of the Source

Let us look at the options which have been tried for making sources sustainable

a) Having a centralised source of water which is not ground water based (the SSNL pipeline in Gujarat is an example) or replenishing village sources/recharge structures through external surface water sources. (note on this option is given as Annex 5)
b) Recharging the source through appropriate water harvesting/water recharge structures.
c) 'Reserving' the drinking water / ground water source through appropriate legal/ institutional mechanisms.
d) Combination of the options above.

In this paper, we are focusing on options b, c and d.

Recharging the source through appropriate water harvesting/water recharge structures

Recharging existing water sources through appropriate technologies has been advocated for quite some time, but has largely remained on paper because the water sector in Gujarat (and in most parts of the country) is divided into very rigid, non-integrated departments which look after different programmes/water issues i.e. irrigation department, the water supply boards, the groundwater boards, etc. (Ref: White Paper).

Many NGO's have been recharging existing water sources with recharge structures to improve quality or ensure availability for longer periods. For example in the fluoride affected village of Balisana the work done on reviving a large village tank and recharging the fluoride affected aquifer has helped to reduce the fluoride content considerably and making its use sustainable. GWSSB had also, for a brief period, provided funds for such work in the late 90's.

There are some lessons from the work done under the WASMO project , and therefore let us look at the learnings which emerge from the case studies of Dhandhalpur and Nagadka villages where the communities, WASMO and AKRSPI have worked together.

Village Dhokalva

Dhokalva is a village of 596 households in Chotila taluka. The village is located at a higher elevation and the groundwater is of poor quality. During summer, potable water from the hand pumps and well was a problem.

Under the WASMO – AKRSP (I) collaborative effort, there was discussion at the village level for in-village water distribution system. However, since there was really no reliable source, the villagers had little interest in a distribution system.

Hence, the village plan was to recharge the existing village sources and construct individual water storage systems (RRWHS) which could ensure water for houses located at a distance from the village level. 98 RRWHS and 2 checkdams have been constructed so far, while another 200 need to be constructed.

The choice of a rainwater storage system was because there were no real options. Even the regional and Narmada pipeline system would not reach (because of the high elevation) and even if it could, the pumping costs would be prohibitive.

Post monsoon, the village is water sufficient as it has a multiplicity of sources – well and hand pumps till winter and RRWHS during summer (the individual RRWHS are used as common sources during crisis – so families besides the owners also access them).

The total investment so far in Dhokalva was Rs. 23 lakhs (Rs. 5.3 lakhs for the 2 checkdams).Community contribution is 50% for the rainwater storage tanks and 10% for the check dams.

Village Nagadka

The village

Nagadka village is at a distance of about 20 km. from Sayla populated by 728 families from Koli, Bharwad, Darbar, Harijan and Vaghari communities.

Drinking water scenario

The Nagadka village water supply scheme, with 2 bore wells supplied water to 728 families. However, there was shortage during every summer. The check dams constructed under Nirmal Nir and 60:40 scheme did recharge the agriculture bore wells in the village but not the drinking water bore wells. During this juncture the WASMO project was discussed in GramSabha during February 2004. GramSabha passed consensus immediately to join in WASMO programme and in a detailed exercise, prepared a plan to undertake extensions of existing water supply scheme (covering areas not reached), one checkdam deepening and one new checkdam to recharge the drinking water borewells. The overall cost was Rs 34.4 lakhs, of which almost 50% was for water recharge structures. The community had to contribute 10% of the cost.

The process followed

After the resolution was passed in GramSabha to join WASMO programme, a PRA was conducted and participatory village action plan developed and plans and estimate prepared. A 13 member Pani Samiti was formed with representation from different sections of the community, level of understanding and leadership qualities. The Pani Samiti members were taken on exposure visits to see some good water and sanitation projects in Kutch.

The village took up the challenge to collect the contribution of Rs.3,50,000/- to execute the works worth of Rs.34,29,174/- The samiti decided to collect Rs.700/HH from better off families and Rs.300/HH from poor families. Those who were knowing that their agriculture borewells would be getting recharging benefits paid Rs.1500 to Rs.7000/HH. The village managed to collect Rs.3,36,505/- as community contribution. The deepening of checkdam and construction of new check dam were completed before monsoon 2005 while water supply works were completed by November 2005.

Recharging benefits due to WRM structure

The monsoon 2005 fortunately rained adequately and both the WRM structures overflowed in the first rain itself. There was both quantitative and qualitative improvement of groundwater aquifers and the saline water which was unfit for even making tea improved to a great extent. Tests done on the water before and after the WRM work show that TDS level has reduced from 1886 to 1300, chloride from 500ppm to 438 ppm and Nitrates from 323.39 ppm to 139.55 ppm

In addition to drinking borewells, water table went up in approximately 25-27 borewells near the new check dam and 7-8 borewells near deepened tank, which enabled the farmers to provide water for irrigation of to cotton crop.

Lessons and conclusions

The lessons we can draw from Nagadka are:

- The drinking water plan of the village should include provision of water recharging mechanism where ever possible to ensure source sustainability.
- As long as a structure recharges the drinking water sources, the probability of it helping irrigation wells should not be held against it.
- If the community mobilisation is done well, and the agencies are responding to the real needs of the villagers and not imposing standard plans, villagers will contribute.
- Recharge structure cost as a proportion of infrastructure cost may vary.
- Villagers can evolve differential contribution systems.

Cost/Houschold is Rs. 4697 while contribution per HH is Rs 460. In Nagadka there were three major investments, improvement of water supply schemes of Rs.16.65 lakhs where the community contribution was 9%, deepening of check dam of Rs. 6 lakhs with community contribution of 7% and construction of new check dam worth Rs.11.5 lakhs where community contribution was 13%.

In Surendranagar, WASMO has already promoted 57 (34 ponds, 11 checkdams, 12 small structures)such water recharge structures at a coat of Rs 1.2 crores. (Overall AKRSPI has as a part of its integrated water resource approach, already constructed 253 small and large water recharge structures (209 checkdams, 44 percolation tanks) in 60 villages. 25% of these recharge drinking water sources. While much work has been done more needs to be done in the future to make drinking water supply sustainable in this drought-prone district and other semi-arid regions of the country.

This would also have some implications on the existing water-related programmes of the Government.

1) If enough time and space is given for village level planning awareness building and planning processes, then the villagers will emerge with options which are holistic; i.e. address issues of long term sustainability. In most villages in Surendranagar, villagers will propose measures to recharge water sources as part of the plan and are willing to contribute towards the capital costs.
2) As can be seen, in water scarce regions there is need to have multiple sources of water for different uses and different seasons of the year. This planning is possible only if there is no rigid blueprint approach followed.
3) Most of the work done in these villages was within 18-24 months. This was ensured because decision making in the supporting and facilitation agency was quick. Speedy work ensured that the community could see the results of their plan and contribution, which made subsequent participation easier.
4) In difficult terrains (Dhokalva) typical technology may not work and costs may go up. Even individual structures may have to be agreed by the agency to ensure assured water supply.
5) 2-3 years of drought may affect the source, as there would be no recharge.

Village Dhandhalpur

Dhandalpur is a fairly large village of 615 households in Sayla taluka. It has always had a history of drinking water problems. Dhandhalpur was a part of the Dedhuki regional water supply scheme (of 23 villages) but the supply was erratic and inadequate. Hence the villagers were keen on their independent water resource.

In 2003, AKRSP(I) and WASMO worked with the Pani Samitis and a village action plan was prepared and subsequently implemented. However, the source (bore well) did not work as it had poor quality of work. The Pani Samiti then suggested a water harvesting structure near the bore and after much negotiation between the Pani Samiti and WASMO a structure was built which recharged an old village tank also.

This monsoon, the bore has recharged and the water quality also improved. In addition, wells nearby also benefited, improving support irrigation in the rainfed area.

If one looks at the village infrastructure, then expenditure on improving the drinking water distribution system was Rs. 14.6 lakhs, while that on the recharge structure to make the source sustainable was Rs. 3.58 lakhs.

The cost/household is Rs. 2960/HH and the community contribution was 10%. While it can be argued that it is too early to draw conclusions, the lessons which can be drawn from this case are:

1. Villagers, if given the freedom to plan on their own, will develop a drinking water plan which integrates water distribution with measures to improve source sustainability.
2. Villagers perceive that they can do little to influence a regional water supply scheme, especially its source sustainability, since the source is located far from the village. In drought prone areas, where sources are erratic, in-village sources have greater chances at being managed and conserved.
3. Domestic water needs have a range of water quality requirements, and villagers can identify different sources for different needs. In large villages and water-scarce regions, a single source satisfying all the needs may not be an option.

6) Cost per household would vary depending upon the village and hence there is a need to develop a system of assessment and fund allocation which recognises differing needs of villages and is not rigidly bound by unit costs. In many cases, costs have been much less then the norm also.

Reserving the drinking water/ground water source through appropriate legal/ institutional mechanisms

While conceptually it is the obvious solution, getting communities to reserve drinking water resources has been difficult, because

In regions of water scarcity, even the sole livelihood is dependent on the same common water source (groundwater aquifer or village tank). The case study of Dhamrasala shows how some norms of reservation have been worked out and are being observed even 3-4 years later. However, this remains an exception in Surendranagar and scaling up these remains a challenge.

Village Dhamrasala

Dhamrasala is a village of 272 Households in Sayla taluka. AKRSP(I) has been working in this village since 1990's and along with the village organisations, implemented a range of natural resource management interventions (biogas, soil and water conservation work etc.). Water being a critical source in the region, a percolation tank was a major intervention for the village.

The priority for this tank had emerged after discussions with the women's groups and the farmer's groups. The completed tank recharged nearby wells and made water available for domestic needs also.

However, conflicts soon arose as nearby farmers used engines and siphon arrangements to take water for the cotton crop. There was hardly any water left for domestic needs. The women's group protested and different groups (siphon users vs. engine users, cattle vs. agriculture etc.) fought daily with the police being called in to resolve conflicts. The panchayat could not take a decision. Finally the women's group and some enlightened farmers realised that this conflict was helping nobody. Every body was called to the temple near the tank, and a compromise was negotiated. Farmers could irrigate, but would have to stop at a 3 feet depth (mark indicated on the tank). The remaining water would be only for domestic use (drinking water for humans, cattle). This ensured that hand pump remain recharged even in summer.

This norm, taken in a religious place, holds and the village is secure for drinking water as long as the tank is filled. During drought also, the 3 feet norm ensures priority to domestic needs.

Lessons learnt

1. In water scarce areas, conflict amongst different users is inevitable and has to be anticipated
2. Rules governing the use and allocation of common water resources have to be evolved from within; they cannot be imposed.
3. In most villages, farmers are users both for irrigation water and drinking water. In such cases, there is likelihood that the common water resources be wholly diverted to irrigation use even if multiple-use was originally planned.
4. Women , who bear the major burden of drinking water collection have to be given a voice in the decision making process for use of common water resources.
5. State regulations which prioritize use of such resources would help in rule enforcement ;though regulations alone ,without being internalised by some part of the community would be of little help.

In many areas of Kutch, North Gujarat etc. where tanks are a traditional source there has been an acceptance that the large village tanks if managed properly are more reliable sources of drinking water. Therefore communities have divided these tanks for domestic, cattle and drinking water use or constructed wells in the middle of traditional ponds so that these wells are continuously recharged.

At the policy level the state of Maharashtra and Andhra Pradesh has enacted legislations to reserve the drinking water source. Maharashtra recently formulated a policy wherein no well or bore can be done within 500 meters of the drinking water source in the village. This regulation is supposed to be enforced by the village panchayat, it is assumed that because there is state support for such a policy Panchayat will be empowered to ban their villagers from digging bores for irrigation etc. Studies on the ground shows that this legislation has not been effective as Panchayat leaders find it difficult to enforce such rules on their fellow villagers. There is also a problem of ground water sources in each village which are differently located and therefore an arbitrary distance like 500 meters may not be relevant if the aquifer is a large one. AP also had a similar scheme with very limited success on the ground.

Implications on policies/ programmes

To ensure that water resource management is an integral part of village drinking water schemes, appropriate changes in policies, programmes and organisations are required. The integrated, partnership approach advocated by WASMO will have to be internalised in all departments who work on water issues in the state so that a "project" mode of working becomes accepted as a norm rather than an exception. Some of the major implications of making this happen are:

1) At the village and regional level, water resource planning will have to be considered holistically otherwise already scarce funds are being wasted in schemes/agencies which duplicate each others efforts. There are numerous government projects which emphasise recharge of ground water. These are watershed programes, forestry programmes and in the case of Gujarat programmes like Sardar Jalsanchay Yojana where in check dams are constructed in large numbers by village community. Since the objectives of these projects is to recharge the ground water while our objective is to make the ground water source sustainable they complement each other. Therefore developing convergence at the planning stage between these government programmes would help in mobilising resources and making the source sustainable. Recently, thanks to the efforts of the Development Support Centre (a Gujarat based NGO working on Policy issues) drinking water interventions have been given priority in the Hariyali watershed guidelines.

2) To ensure that what is planned is operationalised, there is need to create a district level supportive body to identify the service providers (individual technical persons, registered contractors, NGOs and institutes for consultancy having training, planning, implementing, monitoring and evaluation capacities etc.) to support village level organisations. The body should have legal or administrative authority to ensure that different departments at the district level work in tandem and possess a full time team of professionals from all stakeholders, but accountable to the village community.

3) Large and continuous investments in capacity building is required to bring about the necessary changes in attitude and behavior of all concerned; staff (of GOG, NGO's), Panchayat and village communities. Gujarat has the Gujarat Jal Taleem Institute(GJTI) which can scale up its work but other multi-disciplinary organisations can also be involved in this large task. A key role is awareness building, by making village communities aware about their fundamental rights and responsibilities to ensure pure and adequate water at their door steps .

Conclusions

- One of the major challenges for assuring safe drinking water in villages is to ensure that the infrastructure available for water distribution at the village level(both state supported and traditional) is sustained over time and through periods of low rainfall.
- While there are many factors affecting the sustainability, two key factors are the sustainability of the source and sustainability of the technology.
- Since the source in most villages is groundwater, which is also used largely for irrigation and industry use, conserving and/or recharging the groundwater are key means of sustaining the source
- In villages where the community is involved in developing a holistic plan for sustainable drinking water systems, village [communities, given exposure to all options, do evolve plans which are context specific and integrate water recharge with water distribution.] Communities are also willing to contribute towards the assets.
- Water recharge structures, while they do help in making the source sustainable, may be effective if groundwater overuse for irrigation/industry increases over time. Conserving surface/groundwater sources for drinking water is one option which is feasible if the community can

When given exposure to options, communities can evolve context specific plans that integrate water recharge and distribution

self-regulate itself. Scaling up of such efforts is difficult.

- Assuring safe drinking water in rural areas is a multi-disciplinary approach and can be best achieved by partnerships between a support agency which has the financial and technical backup like WASMO, NGO's which have a rapport and knowledge of local communities and conditions and village organisations which address the needs of their members.
- The work done by WASMO,AKRSPI and Village communities in Surendranagar provides some lessons; but much more needs to be done to comprehensively address the problems of drinking water in Gujarat.

ANNEX - 1

Villages affected by drinking water scarcity and poor water quality in Gujarat

Total Villages in Gujarat: 18594

Ground water overdraw affects water quality

Drinking water quality problems in Gujarat, India

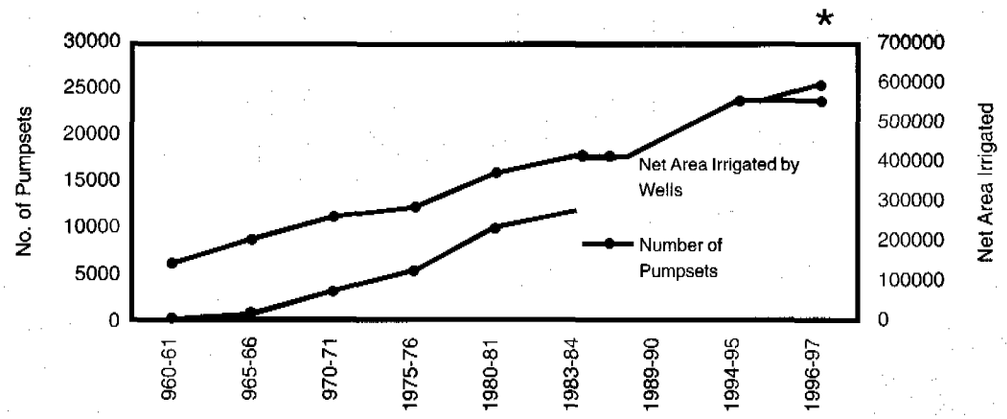
Indicator	Villages affected	Quality affected remaining villages/ habitations in 2000-01	Achievements as on 01-04-2002
Flouride > 1.5 ppm	2826 (15%)	2413 (13%)	2096
Salinity > 500 ppm	1048 (6%)	593 (3.40%)	823
Nitrates > 45 ppm	785 (4%)	655 (3.33%)	541

Coverage of habitations

Sr. No.	Year	Remaining habitations at the beginning of the year			Achievements at the end of the year		
		NC	PC	Total	NC	PC	Total
1.	1999-2000	437	4639	5076	144	1512	1656
2.	2000-01	293	3127	3420	103	892	995
3.	2001-02	190	2235	2425	94	458	552
4.	2002-03	96	1777	1873	68	564	631
5.	2003-04	29	1213	1242	28	1155	1183
6.	2004-05	1	58	59	1	22	23

ANNEX - 2

Growth in well irrigation in Gujarat



Source; White paper on Water in Gujarat by IRMA

ANNEX - 3

Status of the water supply schemes implemented by GOG

Sr. No.	Schemes	Nos of Schemes Constructed	Nos. of Schems not functioning
1	Regional Rural Water Supply Scheme (RRWS)	404 Schemes	190 Schemes
2	Individual Piped Schemes	7417 Villages	3800 Villages
3	Hand Pumps	108911 HPS	35% Rural, 55% Urban
•	47% RRWS not functioning		
•	51% Individual piped schemes are not working		
•	35% HPs in Rural & 55% in Urban areas not functioning		

ANNEX - 4

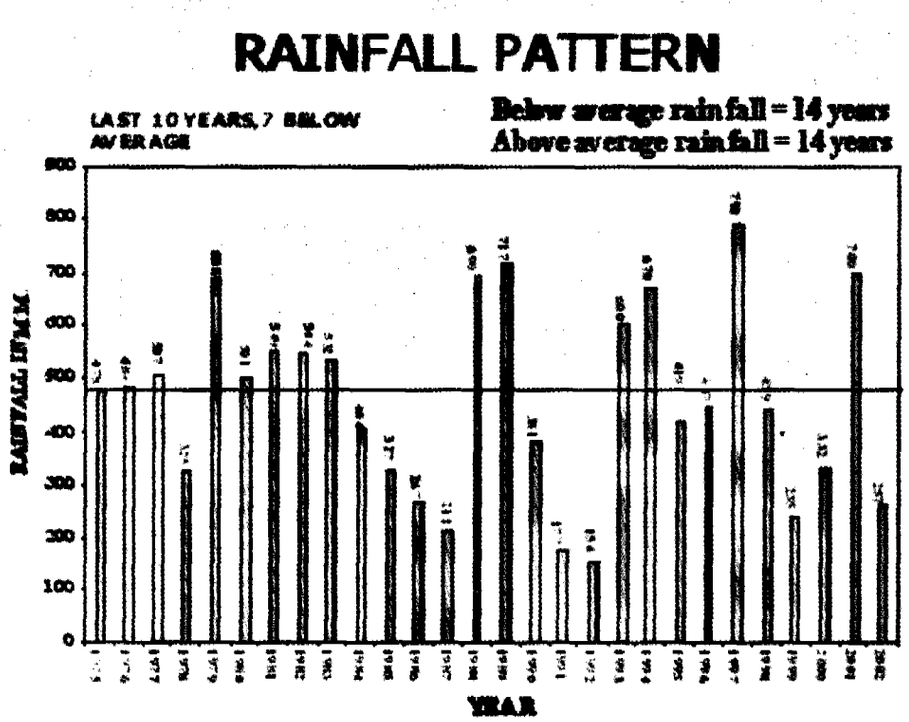
Salient features of Surendranagar district

Surendranagar - Important Statistics and Demography

Parameters	Surendranagar	Gujarat
Number of Talukas	10	226
No. of Towns	7	264
Total number of villages	655	18,622
Total population	15,15,147	4,83,87,270*
Rural population	11,12,472	3,01,60,219
Urban population	4,02,675	1,82,27,051
Percent of rural to total population	73%	62%*
Decennial population growth rate (1991-2001)	+25.34%	+22.66%
Area (in sq. km)	10,489	1,96,022
Density per sq. km	144	258
Sex Ratio (Females/1000 males)	923	921
Literacy rate (excluding children age group 0- 6)	62.27 (74.87 male, 48.72 female)	69.97(80.50 male, 58.60 female)

Background

Surendranagar is a drought prone (the only district which has all its blocks declared as drought affected by GoG) district of Saurashtra located between Ahmedabad and Rajkot. It has 7 towns and 654 villages (for the purpose of this paper, we will refer only to rural areas of Surendranagar and hence focus largely on the villages). As can be seen from the chart below, rainfall in Surendranagar is highly erratic.



The mean annual rainfall is 493 mm (White Paper on Water by IRMA).The coefficient of variation is also high, and the mean annual rainy days is only 25. If one looks at the rainfall pattern, almost 50% of the last 30 years have had below average rainfall and recently it has been worse, with 7 of the last 10 years having less than average rainfall.

The rural community

It is a heterogeneous district, with large number of communities. The main castes are Kolis, Bharwads, Darbars and Dalits .The Koli community,with agriculture and labour as the main occupation,forms 40% of the population while Rabaris and Bharwads, both pastoral communities form 25% of the population.Darbars,the erstwhile rulers and a dominant community form only 15% of the population but have a mojor influence in the villages where they reside.Harijans and Vaghris form 12% of the population,and have historically been discriminated in the access to drinking water at the village level.

Agriculture and animal husbandry are the principle livelihood sources in this district. With a large area being rainfed (more than 50% of the cultivated area) a large proportion of the farmers are also agricultural labourers. 25% of the population, mainly the Rabari and Bharwad communities, depend upon animal husbandry.

The implications of this social structure on the drinking water distribution system have been many.

a) Dalits being excluded in many villages – hence the need for separate infrastructure for them.
b) Inter caste conflicts affecting management and maintenance of systems.
c) Dominant castes controlling the major sources and distribution outlets.
d) The patriarchal system (pardah still prevails in many villages and in some castes) preventing women from voicing their problems and needs in open forum.
e) More time is taken for community organising and mobilization relative to other homogenous or less conflict ridden societies.

Surface and ground water sources

Only 9% of the surface water potential of Gujarat is in Saurashtra (White Paper) which is 3613 MCM. In terms of groundwater, the 1997 data (White Paper quoting GoG 1999) has a gross draft 354.21 MCM and recharge of 627.65 MCM. 70% of the utilisation potential has been tapped so far. However, since 1997, there has been substantial investment in groundwater in the district and there is less scope for groundwater exploitation now.

Drinking water supply

As far as drinking water supply is concerned, 448(68%) of the 654 villages are no-source villages (4 villages not covered, 213 villages(32%) partially covered and 231(35%)villages with quality problems)

ANNEX - 5

In Gujarat, the GoG has constructed a pipeline system which will provide drinking water to more than a thousand villages and many towns. This pipeline is a response to the frequent breakdown of the current drinking water system which is groundwater based, and as it draws water from a large surface water reservoir, the Narmada Dam, the availability of water is not a constraint. While it is early days yet, a preliminary assessment by PRAVAH-IWMI-TATA on the functioning of the pipeline as a means to supply water regularly shows that it is difficult for a centralised pipeline system to supply water daily to thousands of remote villages, especially when there are many farmers thirsting for water along the route of the pipeline. Cases of the Kutch drinking water pipe being broken en route for irrigation have been there – and it is impossible to police this 365 days a year, 24 hours a day.

In terms of drought, which is when the local water sources have depletion/quality problems, an external source could be used for replenishing the recharge/water harvesting structures (ponds, check dams, village tanks etc.) .However if the pipeline is projected as 'the magic bullet' which will solve all village water problems then this will only harm the cause of villagers becoming self reliant and managing their local/regional water resources (in many field units, the author had noticed villagers refusing to contribute for local water harvesting structures because they were then hopeful that the 'Narmada Pipeline' will solve all water problems)! WASMO and AKRSPI believe that a single source option cannot work in rural Gujarat and are therefore promoting local source development and in-village distribution systems even in villages where the Narmada pipeline is to deliver water.

Community participation in water quality surveillance

The community-based water quality monitoring and surveillance programme in Gujarat holds promise for assuring safe drinking water in villages

V M Shah and Chaitali Pandit

Summary

The paper investigates the need to initiate a community-based water quality monitoring and surveillance(WQM & S) programme in rural Gujarat. The drinking water quality in Gujarat is low and consuming chemically as well as bacteriologically contaminated water has serious health implications. It also throws light on why water quality monitoring by itself is not enough to prevent water borne diseases, which have become increasingly common in the last decade. Community-based water quality surveillance (WQS) initiated in Gujarat since a year targets at making the user community aware about quality and helps generating demand for safe drinking water. The paper investigates the viability of the approach and the challenges that lay ahead. Moreover, it also examines how Water Quality Surveillance has helped the community in keeping a track of improvement in water quality of local ground water sources through rain water harvesting.

Introduction

Gujarat is a water-stressed state with erratic rainfall and recurring droughts. In fact, for many years, there was a need to transport water through trains and tankers. Due to these vagaries of drinking water availability, the quality of drinking water has not been a very high priority for the rural community.

About 78 per cent of the rural water supply depends on groundwater, of which only two per cent is utilised for drinking purpose. The groundwater table in Gujarat has been rapidly depleting by 3-5 meters every year due to over-exploitation for agricultural and industrial purposes. The water obtained from low depth aquifers often has a high fluoride level. Another consequence of the decline in ground water is salinity ingress all along Gujarat's 1,650 km long coastline with two huge gulfs. Besides Salinity and Fluoride, Nitrate is also now increasingly found to contaminate groundwater due to excessive use of fertilisers in agriculture, poor sanitation and lack of solid waste management in villages. Consequently, the incidence of water quality problems has been on the rise in a large number of villages in rural Gujarat.

Moreover, lack of hygiene and poor sanitation in the villages have led to a rise in biological contamination of drinking water in the villages, thus making them susceptible to outbreaks of water-borne diseases such as gastro-enteritis, jaundice, cholera and typhoid. See box: Trend of waterborne diseases in Gujarat.

Extent of water quality problem in Gujarat

Within India, Gujarat is among the top three states that experience the most serious

Trend of waterborne diseases in Gujarat

Because of poor hygiene and sanitation conditions, the number of water related illnesses is high in rural areas. These diseases, when on an epidemic scale, lead to great losses in terms of human hours, absenteeism in schools and jobs and expenditure for health. "It is estimated that in India alone, 1.5 million children below 5 years die from diarrhoeal disease every year. Despite tremendous advances in medical knowledge and practice, morbidity and mortality due to water and excreta related communicable diseases continue to remain a heavy burden for all governments in the developing countries." [RGNDWM: Implementation manual on National Rural Water Quality Monitoring & Surveillance Programme: Pg. 32]. A comparative analysis of the number of cases and deaths due to gastro-enteritis and typhoid in villages across all 25 districts and 6 corporations of the state in the last ten years shows that though there is a decline in the number of deaths due to gastro-enteritis over the ten years, incidences of the ailment still persist. Moreover, in case of typhoid, it can be seen that the number of resultant deaths has been nil only in three out of the last ten years while the number of incidences has sharply risen (see Figures 1 and 2).

Figure 1: Gastro-enteritis incidence and death in Gujarat (1993-2003)

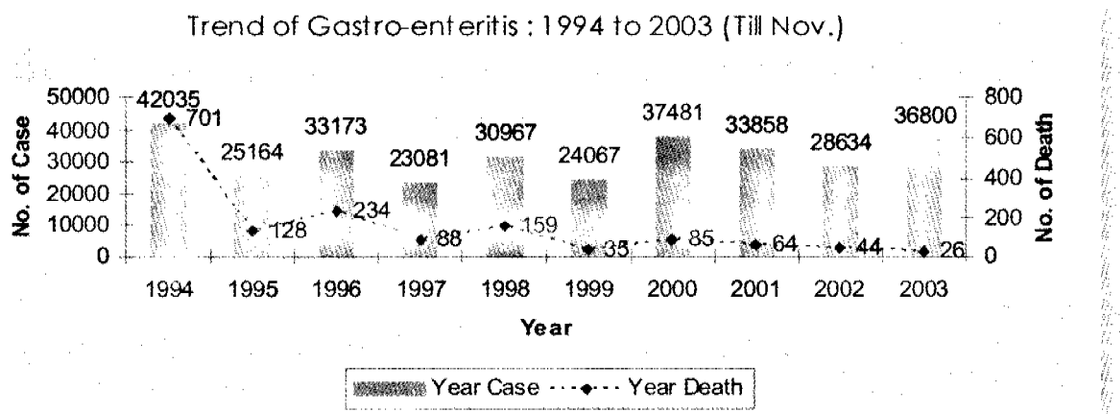
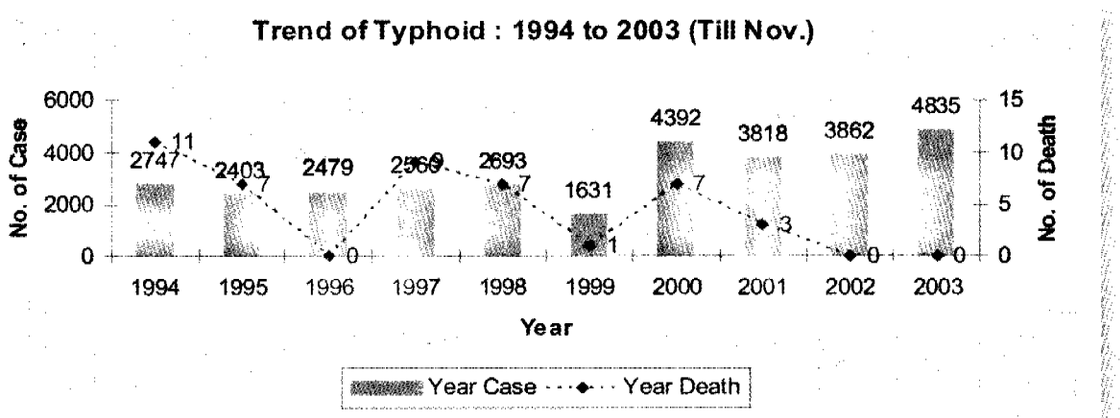


Figure 2: Typhoid incidence and death in Gujarat (1993-2003)



[Source of graphs: State Health department]

Note: The graphs reflect only the number of cases reported in the PHCs of respective villages and district corporations. The actual number of cases was probably much higher.

problems of fluoride contamination. Andhra Pradesh, Gujarat and Rajasthan are the three states of India where fluoride is endemic in 70 to 100 per cent of the districts.

The Bureau of Indian Standards (BIS), has specified the desirable and permissible limits for nitrates, fluorides and TDS in drinking water (see table 1). The desirable limit specifies the level in which a given parameter is allowed to prevail in drinking water. Ideally it must be equal or less than that. But there are places in rural India, including many villages of Gujarat, where alternate sources of drinking water are not available. For these, permissible limits have been set. In pockets of rural Gujarat where ground water sources are contaminated with Nitrate, Fluoride and Salinity, the extent of their contamination has been found in the ranges of 101.89 to 648.00 mg/ L, 1.51 to 11.60 mg/ L and 2008 to 24,150 mg/ L respectively. As per the latest habitation survey (2003), 7,675 habitations out of the total 34,845 surveyed are identified as quality problem habitations, wherein 4,187 have excessive Fluoride, 2,508 have excessive Salinity and 1,335 habitations are found to be facing high levels of Nitrates in ground water [Samples are taken from representative water supply sources under Group Regional and Individual water supply systems run by GWSSB i.e. wells, bores and tube wells].

Health implications of groundwater contaminants

Excessive fluoride intake through food and drinking water takes its toll on the body and leads to Fluorosis, a crippling disorder. It is a slow, chronic disease, affecting organs ranging from teeth to bones, muscles and blood cells. High levels of salinity in drinking water compound the problems of high blood pressure besides causing kidney stones etc. Excessive intake of nitrates through drinking water has been found to cause methamoglobinaemia, also known as 'blue baby syndrome' in new-born babies.

The chronic manifestations of excessive fluoride and salinity that occur in elderly people, especially women, are often sidelined as routine ageing problems. They are seldom attributed to the drinking water, and in those rare cases where they are, not many efforts are made to prevent them.

Chronic water related ailments are often sidelined as routine ageing problems

Surveillance by user community: need of the hour

There have been tremendous efforts to mitigate the quality problems in existing water sources of Gujarat. Though the quality of supplied water is being regularly monitored, yet there is a need of vigilance on water quality by an independent agency focused at the user community.

Water quality monitoring

Water quality monitoring (WQM) is testing of water samples from the sources of water supply to know that the drinking water supplied by agencies is safe. WQM is the responsibility of the supplier, which in case of rural Gujarat is the Gujarat Water Supply and Sewerage Board (GWSSB).

WQM in Gujarat started in 1972. District laboratories were functional in Vadodara and Rajkot at that time. Water samples submitted in the laboratories were tested for a fixed amount and an opinion on their potability was provided. But the number of

Table1: Water quality standards (as per BIS, 10500)

Parameter	Desirable limits (mg/ L)	Permissible limits (in absence of alternate source) (mg/ L)
Nitrate	45	100
Fluoride	1.0	1.5
Salinity	500	2,000

When water is available in local sources, communities refrain from paying for safe alternate drinking water

samples tested then was minimal. WQM gained impetus only in the late 1980s, when the central laboratory of Gujarat became functional. Gradually, WQM was introduced across the entire state with water samples coming from all 25 districts to be analysed for their chemical and bacteriological parameters. The Gujarat Jalseva Training Institute (GJTI) was established in 1989 as a training centre and the central laboratory of Gujarat. Presently, apart from GJTI, eight district laboratories carry out WQM. Apart from the routine WQM, this chain of water-testing laboratories also does decadal habitation survey to identify quality problem habitations with directions from the Government of India (GoI).

Problems of maintaining water quality

Inspite of many efforts to maintain the water quality, waterborne diseases have been on a rise. This is because the safe water supplied to the villages does not necessarily remain safe when stored, distributed, handled and consumed by the community. The following factors have a negative effect on the maintenance of drinking water quality:

a. Lack of awareness

Groundwater quality problems in Gujarat center on excessive fluoride, nitrate and salinity. Measures have been taken to mitigate them by using technological interventions. The state government has installed 238 de-fluoridation plants at the cost of Rs 19.33 crore and 29 desalination plants at around Rs 20 crore. However, these plants need skilled personnel for handling, which were difficult to find at village level. In these circumstances, the plants became defunct. The lack of awareness and community ownership also played a role.

To make safe water available to the water scarce as well as quality-affected villages in a sustainable way, the government is shifting from groundwater based to surface water based water supply systems through inter-basin transfer of water and ultimately, around 14000 villages will be covered through grid. Many such schemes are completed and it is observed that at many places, such as villages covered by Dharoi, many villages have yet to accept the water from alternate source. Surface water supplied through pipelines entails the community to pay a meager cost of Rs 14 per person per annum for it. Even though fluoride-affected villages of Mehsana have been provided safe water from Dharoi schemes, not all villagers use that water for drinking purpose. Instead, they drink fluoride contaminated water from local sources. When water is available from local sources, the communities do not want to pay for piped water. They do not appreciate the difference between safe and unsafe water and the health hazards involved in consuming unsafe water as they have been drinking this water since long. People thus need to be made aware of potential health hazards associated with unsafe drinking water. Besides, if they are able to test their own drinking water, they will realise the difference between safe and unsafe water. Knowing the value of safe water would motivate them to demand and pay for the same.

b. Inadequate infrastructure

For any water source, the groundwater quality may vary from season to season subject to the climatic patterns and rate of utilisation of resources. Given the current set up of laboratories in the State (9 water-testing laboratories for 25 districts), regular state-wide water quality monitoring is a difficult task. For the water supplied through Rural Regional Water Supply Schemes (RRWS) and bulk transmission pipelines, the suppliers, GWSSB and Gujarat Water Infrastructure Limited (GWIL) respectively get the water samples from sources tested regularly. But in many villages, village local bodies such as Gram Panchayats manage their own water supply schemes known as Individual Rural Water Supply Schemes (IRWSS). Also, in most of the villages, there

are a number of local sources and subject to the convenience of people, drinking water is availed from more than one source. Hence, the Gram Panchayats need to test a number of water sources to decide whether the drinking water used by the villagers is potable or not. This needs support of facility of laboratory nearby in addition to the money required for testing.

The alternative support designed is to provide them with field test kits along with training to operate and maintain them. The monitoring of drinking water quality would become a lot easier, simpler, and even cheaper. Moreover, by such testing, if only the cases found unfit at village level testing are referred to at district level, the load of the already inadequate district level laboratories would reduce. Also, when the communities would test their own water, they would know which source is safest for procuring drinking water.

c. Contamination of water in pipelines and village sources

Through RRWS, water from safe alternate sources is taken to distant villages, some times located 100 km, 200 km and in case of surface water even 400 km away from the source. Though the piped water is filtered and disinfected, it may not necessarily remain safe till it reaches the communities. When drinking water is transferred from such long distances, it is also susceptible to contamination due to leakages in the pipelines en route.

Poor sanitation in rural Gujarat further compounds the problem. Drinking water contamination is largely attributed to lack of hygiene and open defecation. There are instances where villagers were found to defecate right near the source of village water supply. The situation worsens during monsoons when the rainwater mixes with the excreta and percolates into the ground, contaminating the groundwater too. Under such conditions, testing/ monitoring done at the main source cannot be relied upon completely because by the time microbial contamination is detected in the distribution many people may have been exposed to the potential risk of infectious diseases and epidemics. This would render the expenditure done in terms of money, time and labour for such a long distance transfer of drinking water fruitless.

d. Monitoring of chlorination

Raw water supplied to villages through RRWS as well as bulk transmission pipelines is duly chlorinated by the supplier (GWSSB) at the headworks (starting point of distribution network). The amount of chlorine required to decontaminate the given quantity of water is known as 'chlorine demand' of that water sample. The chlorine dose at water supply headworks is adjusted in such a manner that not only is the chlorine demand of the water met, but there is also some excess 'residual chlorine' to tackle the contamination en route in the distribution network. The dose is arranged such that the villages located right up to the tail end of a distribution network receive 0.2 mg/ L of residual chlorine.

There are noted cases that the dose applied at the headworks is so high that the villages in the immediate vicinity have to bear consequences of high chlorine, while tail end villages may be without residual chlorine. Chlorine is safe as long as its intake does not exceed 0.5 mg/ L. Higher levels of chlorine cause damage to skin, eyes and hair. Besides, its strong odour and bitter taste restrains the villagers from drinking chlorinated water. Community-based water quality surveillance would be a great help in tackling this problem. When the community of all villages in the distribution network would start testing the residual chlorine level in their village water supply, it would help them decide whether it is in excess or inadequate and that would in turn help to adjust the chlorine dose more precisely at the headworks. This will also compel the

Contamination of treated water at houshold level renders all efforts futile

Water quality surveillance is to keep a watch on one's own drinking water

supplier to adopt technological solutions to the problem by installing a system for booster chlorine dose at intermediary places in longer distribution pipeline system. Besides, the community is made aware that if the level of chlorine is too high, they should keep the storage vessel open for an hour or more, so that chlorine, being unstable, would evaporate.

All these factors and others make it imperative to institutionalise a community-based water quality surveillance system at grassroot level.

Initiation of water quality surveillance in Gujarat

Water quality surveillance (WQS) is to keep vigilance on the quality of one's own drinking water. The mandate of a WQS programme includes generating awareness about the quality of drinking water among the communities, such that they test their drinking water on their own accord, demand for safe drinking water, and even pay for the same if required.

The concept of WQS by the user community and health department finds its origin in the National Workshop on Water Quality Monitoring and Surveillance in Rural Areas conducted in August 1997 by Rajiv Gandhi National Drinking Water Mission (RGNDWM). The recommendations and action plan formulated in this workshop emphasised on according highest priority to drinking water quality. "Realising that effective surveillance of water quality will be possible only when an independent agency is made responsible, it was recommended that Water Quality Surveillance should be the responsibility of the Department of Health which should involve the panchayats and the community in surveillance." [Proceedings of the workshop Pg. 9]

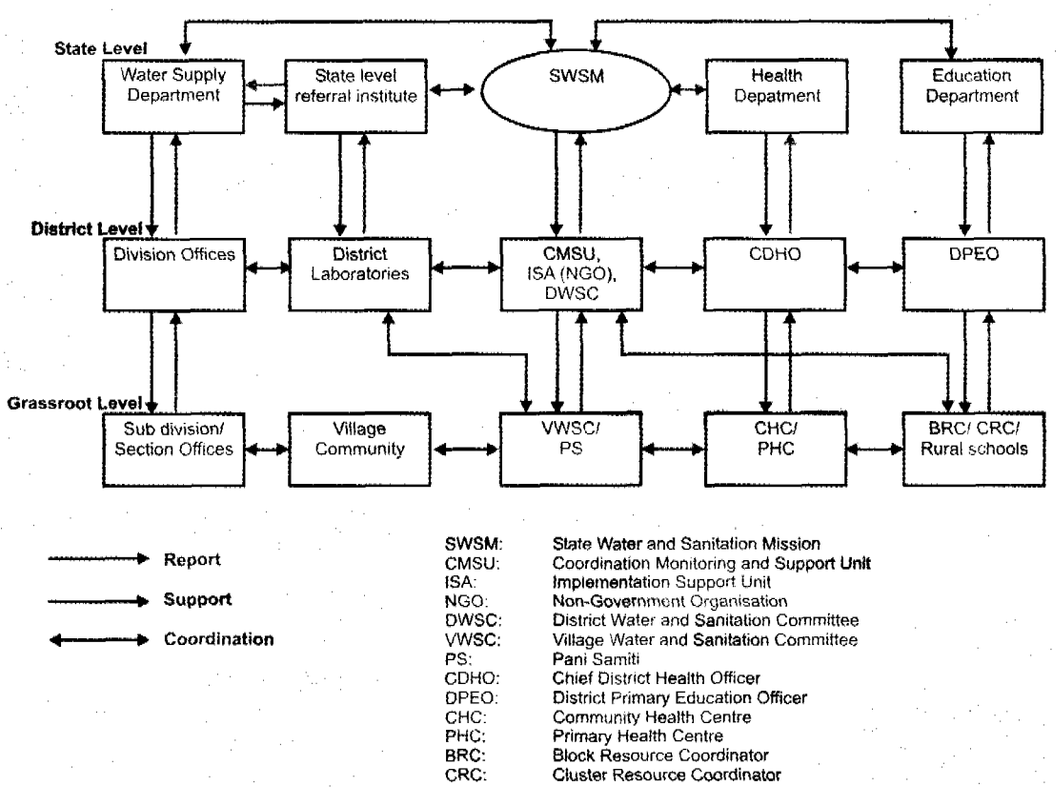


Figure 3: 3-tier model for water quality monitoring and surveillance programme

The Catchment Area Approach

Based on the recommendations of this workshop, it was decided to institutionalise a bottom-up, community-based water quality monitoring and surveillance programme through the Catchment Area Approach (CAA) to ensure the supply of safe drinking water. The Government of India issued guidelines to the states to institutionalise this programme with the following keynote:

"Water quality testing/monitoring and water quality surveillance are two distinct but closely inter-related terms. While the former is the concern of Public Health Engineering Department (PHED)/ Nigams at the State level, the latter is looked after by State Health Departments." [RGNDWM: Implementation manual on National Rural Water Quality Monitoring & Surveillance Programme: Pg. 160]

In Gujarat, in accordance with the CAA, a 3-tier model for water quality monitoring and surveillance has been devised as indicated in Figure 3.

This model shows how different stakeholders at all three Catchment levels can economise on cost by information exchange and convergence of functions at different levels. It is evident from past experience that an effective liaison between water supply and health departments not only helps in economising costs, but also proves to be very effective in combating health problems pertaining to water quality. The monsoon after the Gujarat earthquake in 2001 had posed a great threat of epidemic in the affected villages due to poor water quality, lack of cleanliness, hygiene and sanitation. The concerted and collaborative efforts of both water and health workers as well as local and international NGOs towards water quality surveillance works ensured prevention of any epidemic of water borne diseases.

In Gujarat, WQS was introduced in July 2004 as an activity independent of monitoring by the Water and Sanitation Management Organisation (WASMO), an autonomous organization promoted by the Government of Gujarat. It is institutionalised at the community level by making the masses aware of the importance of water quality and its effect on their health and well-being. Since such software activities are being carried out in the project villages of WASMO through NGOs functioning as Implementing Support Agencies (ISAs), the community-based WQM&S programme in Gujarat has been initiated in the project/ programme villages of WASMO on a pilot basis. Presently, in all WASMO projects, community WQS is being inbuilt to ensure that drinking water is not only secure but safe. The projects are:

1. Community-managed Ghogha regional water supply and sanitation project covering 82 villages of three talukas of Bhavnagar district
2. Community-managed Earthquake Reconstruction and Rehabilitation (ERR) Project covering 1,260 villages of earthquake-affected districts of Kutch, Patan, Surendranagar and Jamnagar
3. Government of India supported Swajaldhara programme covering 13 districts of the State
4. Government of Gujarat supported Sector Reform Scheme (State) covering 11 districts of the state

The activities being covered under this programme are classified Catchment level wise and described below:

Grassroot level activities

Grassroot level activities mainly centre on awareness generation and capacity building programmes. Including the component of water quality surveillance in the village water and sanitation programmes has led to the betterment of village life at large. See box: Spreading the message of safe drinking water and good health.

i. Exhaustive IEC campaigns are conducted involving print media as well

A bottom-up approach bringing all stakeholders together is being adopted

Spreading the message of safe drinking water and good health

Village people have realised the significance of safe water, health and hygiene.

In August 2004, 101 samples of drinking water from all the 82 project villages of Ghogha were tested to ascertain if the water was safe for consumption. Test results showed that 11 villages had water that was chemically unfit, while there were 41 out of 99 samples that were bacterially unfit. After one year of intense awareness campaigns, there was a marked change in test results and consumption patterns. The villages having bacterial contamination reduced to 26 due to regular chlorination at the village level. There were only three villages that had water which was chemically unfit. In fact, it was found that the inhabitants of these three villages had discontinued drinking water from local sources and were instead using alternative piped sources that served treated water.

The primary school in Vavdi village in Bhavnagar district has transformed into an ideal learning institution. The teachers here regularly inspect the nails, clothes and hair of each child to see if they are tidy and clean, leaving no stone unturned in promoting hygiene, sanitation and tree-plantation in the school. They also participate in capacity building programmes held for village communities and implement lessons of chlorination learnt here in the drinking water facilities of the school.

The health awareness among community in these villages is not limited to consumption of water from safe sources, but has also led the community to disinfect water distributed in at village level. The operator appointed at Bhuteshwar village in Bhavnagar has not had any formal education, but is very conscious of his responsibility of providing safe drinking water to the village. He not only chlorinates the water optimally now, but also keeps the entrance of sump and valve box covered with Acacia to prevent birds, animals and children from dirtying the 'water pot of the village'. As for the villagers, they believe that as long as they pay a meagre Rs 5 per family per month for the operator's salary, they will not have to dig deep into their pockets for paying hefty health bills.

The message of safe water has reached beyond WASMO's project villages. People have realised the role of safe drinking water as a key to good health. Padana village in Jamnagar has been facing drinking water contamination due to industrial pollution. The village community not only sent water samples from their handpumps for laboratory testing, but also wrote to a number of organizations, including WASMO, for helping them take corrective measures to tackle the problem. Complaints for industrial pollution of groundwater have also been reported from a few villages of Vadodara, Valsad and Bharuch.

as audio visuals through All India Radio and Doordarshan, wherein messages for promoting water quality, hygiene and sanitation among the rural community are disseminated strategically targeting the masses, especially the school children, Pani Samiti members and women.

ii. Such a system is being developed where the base line water quality surveillance at the grass-root level would be carried out by rural community [Village Water and Sanitation Committee (VWSC)/ Pani Samiti]. For this purpose, training programmes are being taken up to build the capacities of communities towards shouldering the responsibility of village water quality surveillance. Communities are empowered to test all their village drinking water sources by providing them with indicative field test kits. The test parameters of the kits depend on the prevalent water quality problem in the village be it Iron, Fluoride, Nitrate or Salinity. Besides, all kits contain Chloroscopes, pH strips, turbidity testing kits and H_2S vials for performing daily tests of residual chlorine, pH, turbidity and bacteriological contamination respectively. The village groups trained for this purpose mainly comprise of Pani Samiti members, pump operators, anganwadi workers and school teachers. Up to 5000 villagers have been trained so far across the project villages of WASMO, and around 150 villages, where project work has completed and where 'water has reached', have started testing their drinking water sources. The test results are compiled at district level. Apart from this, rural school children are explained with simple anecdotes and exercises the importance of personal hygiene, sanitation and safe drinking water. Children not only imbibe these values themselves, but also carry them home to their elders and help in bringing about a change for the betterment of families and the village at large.

iii. Sanitary surveys are conducted in villages atleast once a year. Sanitary survey is an overall inspection of the water works and distribution system of the village that provides information regarding potential problems and source of contamination. Such surveys also play

a role in preventing and controlling epidemics of waterborne diseases. In the year 2005, sanitary survey of all villages in the Ghogha project provided an insight to focus on awareness generation and drinking water chlorination in those villages where sanitary conditions and village health were poor. This resulted in zero epidemic in the year 2005, in spite of there being severe flood condition in the district.

iv. The Primary Health Centers (PHCs) supply chlorine tablets for household use to the community. Collaboration and exchange of information with these PHCs ensures that adequate supply of chlorine compounds is done especially in villages low on sanitation.

District level activities

At the second Catchment, the district level, the following activities are being undertaken:

i. Social mobilisers for water quality are hired at field offices i.e. Community-managed Support Units (CMSUs) to facilitate village level awareness and capacity building activities. In project villages of Swajaldhara and Sector Reform, these tasks are carried out through core team members in District Water and Sanitation Committees (DWSC). These players conduct trainings for water quality surveillance and use of field test kits for the community. They are instrumental in executing tasks assigned by the SWSM up to the village level and coordinating with various district level functionaries such as district laboratories and ISAs. The grass root IEC activities are strategised region-specifically at the district level, and are intensified in social events such as local fairs and festivals, and celebration of events such as World Water Day, International Women's Day, etc., where a larger audience can be reached.

ii. Before the commencement of construction work of any new village water supply scheme, water samples are collected from the prospective source and sent to district laboratories for chemical and bacteriological analysis to ensure that the particular source provides safe and potable drinking water to the village. Also, water samples from all completed project villages are being sent for laboratory testing twice a year, i.e. pre-monsoon and post-monsoon. Wherever sources are found contaminated, the respective Pani Samitis are informed about the same and are suggested remedial measures. Accordingly, either alternate sources are found or the quality problem is mitigated. Where neither of the two is possible, the community is informed about ways to tackle the problem. Dietary interventions are recommended when the drinking water has a high fluoride content. The community is urged to chlorinate drinking water wherever village water sources are found bacteriologically unfit.

iii. Demonstration field test kits are distributed among ISAs and social mobilisers. They serve the purpose of training the community for its use and simultaneously in conducting random spot surveys of village drinking water samples, which give an idea of the quality of drinking water used by the communities and their awareness level. Random spot surveys for residual chlorine are conducted by district level workers to survey the awareness level of community regarding drinking water chlorination. A database of the findings is prepared such that in pockets where repeatedly chlorination is not found, IEC activities are intensified. From December 2004 to May 2005, such spot surveys done in the 82 project villages of Ghogha showed that in almost 69 per cent of the 106 samples collected, chlorination was not found at the village level. The intensified IEC activities in these villages helped change the situation for the better.

Communities are trained to test their drinking water sources

Quality-affected habitations of Gujarat are mapped through MIS to monitor the extent of the problem

iv. Moreover, in order to ensure that the importance of drinking water quality gets inbuilt in the school going rural children at their young age, brainstorming workshops are held with rural school teachers through CRC programmes for sensitising them about the gravity of the issue. So far, WASMO has been able to introduce the concept of WQS before 514 rural school teachers through 13 workshops.

State level activities

At State level, the WQM&S programme is devised, strategised and monitored.

i. WASMO, as the SWSM, is the nodal agency for coordinating the programme; whereas GJTI is identified as the State level Referral Institute (SRI). Efforts are ongoing to establish linkages with the state Health department, Education department and NGOs at the senior level. The action plan for district level as well as village level surveillance activities are devised and monitored at the State level by SWSM.
ii. GJTI, the state level referral institute, works towards planning, executing and monitoring the collection, testing and reporting of water samples by state and district level laboratories. It also carries out decadal habitation surveys for water quality problems across the State.
iii. IEC material such as brochures giving guidance on drinking water quality and chlorination, posters showing effects of ground water contaminants on health, slogans and school stickers giving lessons on personal hygiene and sanitation etc. and even radio and TV programmes for awareness generation on water quality, health and hygiene are prepared at WASMO with inputs from various subject experts including health officials. So far, 4 posters and brochures each have been prepared for this purpose and distributed across all project villages.
iv. State level workshops are conducted to serve the purpose of Training of trainers (ToTs) in order to build the capacities of all district level players including social mobilisers of WASMO, health officials, ISAs and rural water suppliers for implementing the community-based water quality monitoring and surveillance programme successfully and mitigating the water quality problems of Gujarat. One such workshop on fluoride contamination in groundwater and fluorosis in Gujarat was conducted in Gandhinagar in September 2005. Renowned fluorosis expert, Dr AK Susheela, was invited to hold a talk on the subject. The workshop brought officials from water supply department, doctors from health department and NGOs and researchers together to deliberate over the issue and recommend remedial actions to relieve Gujarat of fluorosis.
v. An MIS system is being developed for reviewing the water quality problems of the State and analysing them to devise mitigation and prevention action plans. Quality-affected habitations of Gujarat are mapped through this to monitor the extent of problem.

Groundwater quality improvement

WASMO's efforts towards making safe and assured drinking water accessible to rural communities not only focus on bulk transfer of safe drinking water from surface water based sources, but also include augmentation of local groundwater sources to ensure sustainability. Though as per survey 2003, the local groundwater sources of 7,675 habitations of Gujarat are yielding water unfit for consumption, the measures being taken towards augmenting these sources by recharge through rainwater harvesting would improve the quality of groundwater in the long term and thus make the community self-reliant for safe drinking water availability. Moreover, on-field water

testing kits being provided to the community help them test the water periodically, judge its potability and then decide for themselves which source to use to avail of drinking water. See box: Avaniya's journey to safe drinking water.

Challenges encountered

Pursuing sustainable and effective community water quality surveillance in Gujarat faces the following challenges:

1 Effective coordination between concerned departments is still far-fetched.

2 In rural schools where majority of children belong to very poor and illiterate families, instilling values of personal hygiene in them is cumbersome. An inclusion of such lessons in the school curriculum would help a great deal.

3 When substances such as chlorine tablets and bleaching powder are given free of cost, it is difficult to drive the community to purchase these on their own when they are not available in required quantum at the PHCs. This in turn also hinders our efforts towards promoting safe drinking water as a socio-economic good.

4 Open defecation and lack of hygiene has been one of the greatest threats to village health all along. As long as hundred per cent households in villages do not have toilets, open defecation would persist in the villages and so would the threat of water borne diseases and even water related diseases such as malaria and dengue arising due to stagnant water.

5 Chlorination in drinking water in many cases is done by unskilled people whereas its monitoring requires expertise. Moreover, hiring of operators at village level does not have any criteria; most of the rural operators are illiterate. Hence, chlorine doses are not monitored properly. This causes the villagers to refrain from drinking chlorinated water, thus imposing bottlenecks when trying to convince them for the same.

Avaniya's journey to safe drinking water

Avaniya is a village with a population of about 3,250 people, located in Ghogha block of Bhavnagar. It had a history of struggle for drinking water for nearly two decades. Over-extraction of ground water, salinity ingress and erratic rains had culminated in acute paucity of drinking water. The Durbar women were at the mercy of the men as they waited until the men folk fetched water from virdas, field wells, village outskirts or sometimes, neighbouring villages. Although the residents of Avaniya knew that their water tasted different, they did not know that it was laced with fluoride until incidences of fluorosis began to emerge. In 1991, there were as many as 50 cases of fluorosis in the village.

Efforts from different quarters to improve water quality did not bring about significant change. When the Ghogha project was introduced in Avaniya, it received an overwhelming response. WRM structures were erected at strategic locations near drinking water sources to harness rain water. Simultaneously, Mahi water also reached the village and the people started getting safe and potable water. The impact of the piped water was quickly reflected in fewer aches and water-related diseases.

Yet, there were still occasional problems in the supply of Mahi water. The residents of Avaniya realized that they would need to ensure that their local sources were also well-maintained so that water quality problems were minimized and there was water security. The WRM interventions not only recharged ground water but also improved water quality. In 1998, the fluoride content in the ground water was 3 mg/L and TDS was 3000 mg/L. After the monsoon in 2005, the fluoride was within the permissible limit of 1.5 mg/L, and was at 1.4 mg/L. The TDS level was 2076 mg/L, only marginally higher than the permissible limit of 2000 mg/L.

Future course of action

1) The GoI supported WQM&S programme will now be implemented in a time-bound frame of 5 years beginning from the year 2005-06. Such a system will be built wherein testing of 100% village drinking water sources will be done by the communities. Of these, 30% of the contaminated sources will be tested by district laboratories, and 10% of the sources found contaminated in district laboratory testing will be cross-checked by the State level laboratory.

2) In order to relieve Gujarat of Fluorosis, a Fluoride mitigation programme has been devised to implement across all Fluoride-affected habitations (4,187 identified presently) of Gujarat. The programme is targeted to make options

School children carry home the message of clean water, sanitation and hygiene, making a significant difference

of safe drinking water available to all Fluoride-affected habitations in a matter of 3 years.

3) Since water quality surveillance programme focuses on bringing about betterment in the health of the community, collaboration will be done with CHCs that carry out health surveys to exchange health data and evaluate the benefits of the surveillance programme.
4) The State health department is carrying out an integrated disease surveillance programme in collaboration with the WHO. These efforts have brought down the outbreaks of epidemics because as soon as a few cases of waterborne diseases are diagnosed/ reported, the surveillance team takes preventive and control measures. Now similarly, water quality surveillance programme would help in ruling out even the bare minimum cases of waterborne diseases as contamination is checked by the user community itself. Hence, such collaboration would be done with the State health department such that disease surveillance and water quality surveillance would jointly work towards ensuring health for all in rural Gujarat. A constant exchange of water and health data between CHCs and DWSCs would help in evaluating benefits of the surveillance programme.
5) Schools would be targeted to intensify awareness generation activities for making the young minds conscious of personal hygiene and safe drinking water. Moreover, efforts would be made towards making the +6 class students test their drinking water for chlorination as a part of school curriculum.

Conclusions

Community-based WQS has become an imperative tool to ensure health of the rural community. Out of the large amounts already spent by the State after mitigating water quality problems, much expenditure is rendered fruitless. Hence, to ensure sustainability of water supply systems, maximising the stake of the community is now inevitable. And that would be possible only if the community would be made to pay for not only the safe drinking water made available to them, but also for surveillance activities including purchasing reagents for periodical testing of water, and chlorination compounds for disinfecting water.

Also, coordination between health and water sector will go a long way in maximising its results. A unique feature here is that school children, being one of the focus areas of such awareness activities, carry home the message of clean water and safe hygiene and sanitation and make substantial difference. But there's still a long way to go before the entire rural Gujarat voluntarily starts paying for safe drinking water. A great number of villagers are still resistant to drinking water chlorination, which will be overcome gradually by awareness generation. Moreover, community-based water quality surveillance would urge the community to use precious and safe drinking water judiciously. Presently, around 40 lpcd of drinking water is the basic quantity provided to the villages. Awareness generation would lead to such a situation wherein water, when demanded in more quantity, will be distributed on the basis of equity. Not only that, but when piped water is scarce, people would be able to make conjunctive use of it with water from their local sources, test if it is fit, and then distribute it for drinking. Once the users start keeping a watchful eye on their drinking water quality, it would not only ensure their health and well being, but also in turn also make the suppliers accountable for the quality of water supplied.

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TECHNOLOGICAL OPTIONS AND ALTERNATIVES

Cluster storage strategy: A solution for equity and social inclusion

Irrespective of socio-economic status, water is distributed on an equal basis through cluster-based storage systems managed by Pani Samitis in Kutch

Arun Mudgerikar and Rushabh Hemani, UNICEF

Summary

The traditional method of piped water supply in a village often meets with dispute of disparity in distribution. Post earthquake, in 2002 UNICEF and GWSSB introduced Cluster Storage Strategy (CSS) in ten villages of Kutch district as a solution for equity and social inclusion. But for the people the belief that ESR is indispensable for in-village water distribution system was difficult to do away with. After incessant persuasion with the community and technical experts CSS was developed in five villages.

The village Pani Samiti along with Panchayat manages CSS in village by forming two committees; one to look after the water supply till the cluster storage structure and one to distribute from it. This ensures community ownership of the asset and the responsibility of operation and management of the system. Each cluster gets sufficient water irrespective of the socio-economic status. At present as the State Water and Sanitation Mission, WASMO promotes CSS as a technical option for in-village water supply in its programme particularly in villages with uneven topography and large number of hamlets.

Background

Gujarat with its entrepreneurial spirit and openness to adopt new technologies has been on the forefront of economic and industrial development in India. In the domestic water supply sector, the state has adopted a mix of high technology and community based local approaches. Measures ranging from provision of hand-pumps to individual and regional water supply schemes based on open well, tube well or surface reservoirs, transfer of water through canal and pipeline based network from water surplus Southern Gujarat to water scarce region of Saurashtra, Kutch and North Gujarat have been adopted These have been complimented by large scale public initiatives on water resources management, which include rejuvenation of local water resources by construction of check dams, deepening of lake and restoration of traditional water resources in Gujarat.

After all these massive efforts carried out by the state Government, there was a need for solutions, which would enable equitable distribution of water within and across villages. In this context, Cluster Storage Strategy (CSS) can be one of the technical and community friendly solutions to address the issues of equity and social inclusion. This has also been demonstrated in five villages of Kutch district by a pilot project jointly funded by UNICEF and Gujarat Water Supply and Sewerage Board (GWSSB).

Almost in all cities and towns in Gujarat, the water supply is divided in different zones through Elevated Service Reservoirs (ESR). In these conventional systems, the ESRs are designed to secure the quantity and terminal

Though CSS leads to equity, it requires changing the traditional mindset on design

head required for regulating supply in their command areas. Whereas, the village systems are designed for supply through a single cistern connected to community stand posts and limited number of house connections.

The design norm for the distribution pipes beyond the ESR or village cistern is to size the distribution pipes for a peak factor of 2.5 to 3.0 for the discharge and pressure loss calculations. This is to cope up with the variations in the daily usage and consumption pattern in the community. However, it was generally observed that, while the systems were designed for 24-hour functionality they hardly had flowing water for 3-6 hours in a day. That meant, the daily demand of the community was required to be delivered at a peak factor of 4.0 to 8.0. This resulted in problems of inadequate pressures of supply among households and excessive leakages in the system.

In this type of general scenario, the concept of CSS was evolved in Gujarat. This process involved considerable efforts for concept and design development and opinion building among policy makers, engineers and the community. This paper gives a brief account of this concept, experience of its piloting and potential for its scaling up in Gujarat.

Cluster Storage Strategy

The Cluster Storage Strategy (CSS) can be defined in simple terms as providing *distributed water storages to small clusters* of 25-30 families in a village irrespective of their physical location and socio-economic status. Capacity of storage tanks, it's placement within a cluster is worked out based on the topography and population with the design norm of supply of individuals at 70 LPCD. These tanks would act as transformers in the water distribution system. On one hand, they will secure the required quantitative share of the community in the cluster tank, and on the other hand also protect the rest from excessive withdrawals by a particular cluster. In short, the community gets equitable water supply and thus also serves the intended purpose of social inclusion.

By moderating the discharge through the distribution pipes, the system would make more optimum utilization of the pipes and ensure excessive friction loss and wear and tear of pipes. The probable increase in cost of distributed storages as against bigger ESR can be compensated by savings on account of reduced operating pressures and sizing of the distribution pipes feeding the cluster tanks due to reduced peaking factor. A schematic lay-out of a traditional water supply converted to CSS is shown in Figure-1.

It is clear from the above diagram that instead of having one ESR with more height, a low height tank or ground level cistern at a strategic point in the village can be used as a feeder tank to supply water to the individual cluster storage tanks. An existing ESR or sump can also be used as a feeder for the rest of the cluster tanks. Thus, the CSS can also be introduced through augmentation of an existing system that was designed on traditional design norms.

A separate (sub) transmission network from the source to cluster storage tanks can be designed without any distribution peak factor. Care would have to be taken to disallow any direct tapping on this transmission network. Otherwise, the whole concept of insulating the system from unacceptable consumption pattern of community will be defeated. The stand-post or house connections would only be given from the pipes down stream of the cluster tanks.

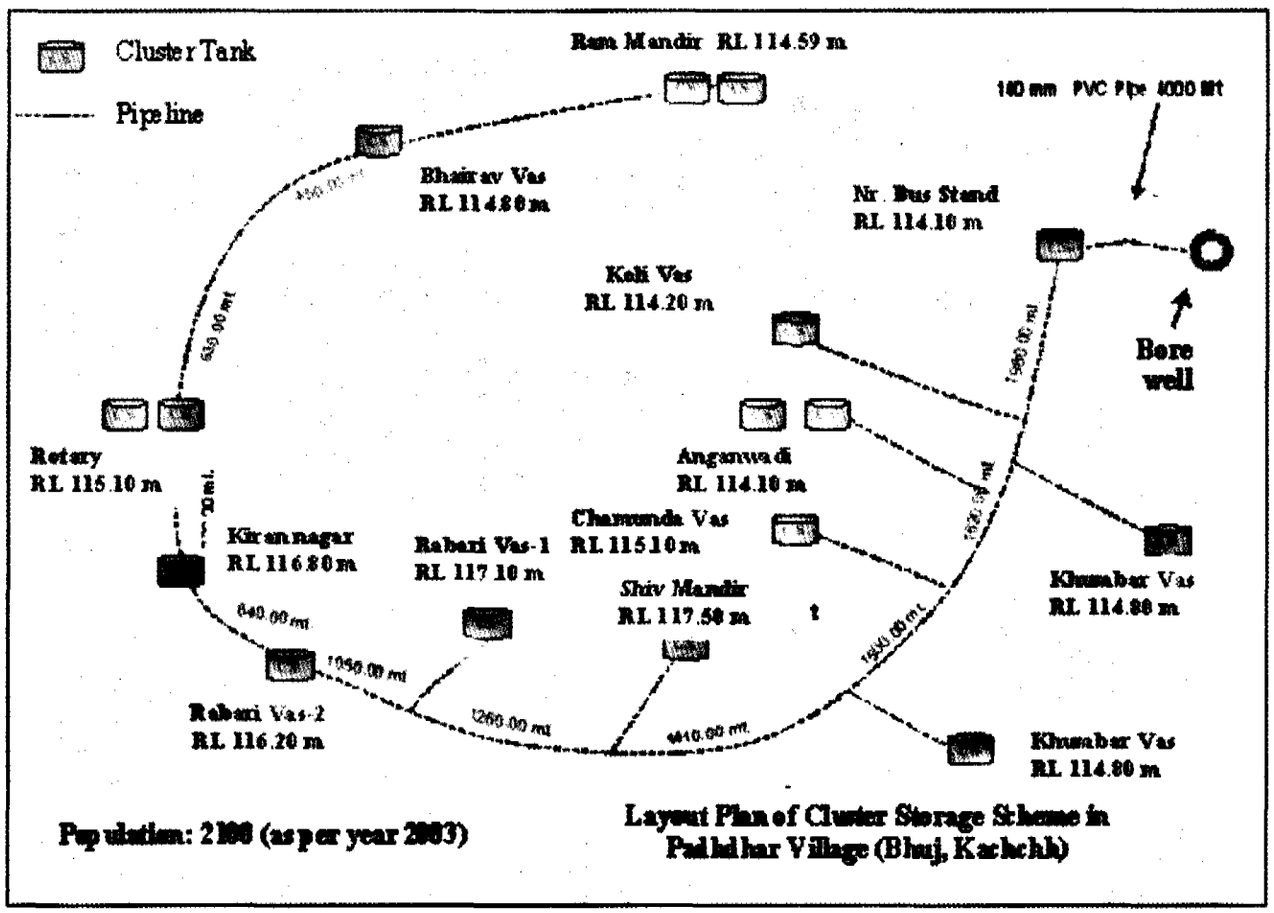
If people residing in a cluster are willing to pay extra water charges then individual

water connection can also be provided from cluster tank by the cluster level committee. Such connections would be taken through separate pipeline and responsibility of repairs and maintenance and additional water charges would be borne by the beneficiary. Water may be distributed from cluster tank at a time most suited to the community residing in the cluster. This would regulate the supply from the tanks to smaller and homogeneous society clusters without affecting the supply to other clusters in a better way.

The residents would be served from their respective cluster tanks, having a limited area of distribution zone and smaller lengths of pipeline, which in turn shall result into better management of the distribution network. It would also ensure community ownership of the asset and the responsibility of operation and management of the system.

Each cluster would have their share of water in their separate storage tank, which would ensure equitable distribution of water. If availability of water from the main source is less at the central feeder tank, then water in each cluster could be supplied on the pro-rata basis so as to ensure equity. Even during emergencies like frequent droughts, cluster storage tanks shall act as a good storage medium at every cluster leading to equitable distribution in such conditions. Especially, in case of emergencies and systems breakdowns, water supply by tankers can be better managed through the cluster tanks.

Figure - 1 Schematic diagram of CSS in Padhdhar village in Kutch district



Presence of two committees – at village and cluster level - leads to efficient management and reduced internal friction

The system shall result in less hydraulic loss and operating pressures in the distribution systems of individual villages leading to similar benefits for the regional system of transmission and related infrastructure. The saving in the recurring energy cost of increased operating pressure, under which the traditionally designed systems were working in the State, would be the bigger benefit of the CSS.

Piloting CSS

Despite all its advantages in concept and design, piloting of the CSS in the five villages involved a long process of changing mindsets of communities and technocrats, who were fixed on the traditional design approaches.

The idea was strongly advocated by UNICEF in early 2002, during the reconstruction phase of earthquake affected areas of Kutch district. Subsequently, it got further supported by way of a pilot with an offer of technical and financial support from UNICEF and GWSSB.

It was quite challenging to get the engineers and community to look at anything other than the impressive ESRs that they were used to. The Gujarat Jalseva Training Institute (GJTI) of the Government of Gujarat was supported to hold consultative workshops on the concept of CSS. As a result, a module for Training of Trainers (ToT) was developed, which will be useful to build capacity of the field engineers and technical staff to undertake village level orientation on CSS.

The common perception of the people about piped water supply was that 'bigger and higher the ESR, better and more efficient the water supply'. After a lot of community level mobilisation, a set of 10 villages were identified for introducing the system in 2002. However, these were under the continuous peer pressure for implementing the conventional design. This resulted in only five villages actually implementing the CSS.

Implementation of the pilot happened at two levels by forming two committees, namely the village committee and the cluster level committee. The former looked after the system up to the individual clusters and the latter took care of the supply within respective clusters. This has led to better management and also reduction in internal friction due to unequal water supply in the villages. Management of tube well, pumping machinery, etc. is carried out by central committee, whereas management of cluster level tanks and stand post is carried out by cluster committee.

The piloting experience has been documented in form of a video. Successful completion of the pilot has given an opportunity for enriching the training module and the audio-visual capsule by incorporating many technical, societal and practical aspects of the CSS based rural water supply. There are many micro-concepts of technical and community management, which need further refinement, even after acceptance of the CSS.

From the beginning of the year 2004, the concept of CSS is gaining increased support from the technical staff of WASMO and GWSSB, and as a result, WASMO has been able to scale it up to far-off villages of Banni desert.

Potential for scaling up in Gujarat

In Gujarat, GWSSB makes the necessary arrangement to supply water to a single point in the village. Water and Sanitation Management Organization (WASMO), as the designated State Water Mission for introducing sector reforms in rural water supply in Gujarat, plays a role of facilitator by providing 90% of the project fund along with technical and social inputs to the local Panchayats for provision of in-village water supply infrastructure. The actual work is

carried out by Pani Samiti of village formed with fair representation of each and every section of village community. The in-village infrastructure is operated and maintained jointly by Pani Samiti and the Panchayat.

WASMO has adopted the policy of demand driven project development, wherein community has the right to choose the option for in-village infrastructure. Based on the demonstration of CSS in the five villages supported by GWSSB and UNICEF, WASMO is offering CSS as one of the potential option to the community.

The training module and the audio-visual capsule developed for CSS would be useful in taking the concept to the Village Water Committees and enable them to make an informed choice of it. The village level demonstrations would also be useful for learning visits.

As a follow up to the pilots and related efforts, a technical design manual would be developed for implementing the CSS based schemes. This would help in promoting the concept in the emerging expansion of piped water supply in villages of Gujarat. One can also see an obvious potential for scaling this up in the rest of India.

Conclusions

CSS can be a potential solution in Gujarat, where more than 14,000 villages and all cities/towns would be fed through pipeline network based on dependable sources. While it has the direct potential to provide equity and ensure social inclusion in villages, it will have more positive impact on the system feeding a number of villages and towns. The potential benefits of the CSS could be summarized as follows:

- Equitable services and social inclusion by equal distribution in each cluster of a village.
- Reduction in the operating pressure in the transmission and distribution system leading to marked reduction in energy cost.
- Reduced peaking of flow in distribution pipes leading to reduced leakages.
- Provide emergency storage for each cluster and facilitate emergency water supply.
- Smaller capacity of tank is better suited in earthquake prone zone as compared to tanks with higher capacities.
- Ownership of the people residing in the cluster. It addresses people's reasonable demand for water and water-connection shall be satisfied.
- Reduction in long leads for fetching water, especially by women and girl child.
- Water availability of livestock shall also increase, which in turn shall lead to better cattle rearing. This shall lead to increase in income and nutrition levels.
- Effective ownership of cluster level systems leading to active community participation in O&M of the system.
- Community shall contribute water charges for operation & maintenance of the cluster level systems.

Water security in tribal areas of Gujarat

Integrated efforts of the State Government to provide safe and adequate water to the tribal areas will lead to overall socio-economic development

R N Shukla

Summary

A major part of the eastern Gujarat, covering 11 districts falls under the tribal belt which is home to 14.76% of the population of the state. Many villages in this region suffer from acute shortage of drinking water supply due to typical terrain and hydrogeological conditions as well as due to scanty rainfall in some areas. Lack of safe and adequate drinking water has hampered the socio-economic development of the tribal population in these areas.

This paper presents an overview of the approach of the state Government which emphasises on arresting the run-off, rainwater harvesting through a range of conventional and traditional techniques and development of mini schemes in order to counter this chronic shortage of water. It enumerates the integrated steps taken by the water supply department as well as departments like rural development and irrigation and others like installation of handpumps, construction of rainwater harvesting structures watershed development etc. The paper elucidates the need for systematic studies like remote sensing, geohydrological and geophysical studies in order to ascertain the location of recharge structures and ensuring their effectiveness. The paper also states that creating awareness and capacity building are two cornerstones of sustainable development of water resources and infrastructure.

Preamble

The water supply sector of Gujarat envisions a state where everybody has access to dependable, potable and sustainable water supply for human and domestic use. To attain this security Gujarat Water Supply and Sewerage Board functions with the prime objective of developing, restoring, conserving, managing and utilising the surface and ground water resources with social acceptance.

Gujarat is located on the western coast of India with a total geographical area of 19.58 million hectare. Total population of the state is 50.671 million (2001 census). Providing drinking water on a sustainable basis to the rural and urban population of Gujarat has been an issue of major concern. Water supply department of the state has the prime responsibility of supplying safe, sustainable and adequate drinking water to all, even during scarcity periods, which is a periodic phenomenon.

A major part of the eastern Gujarat, covering 43 talukas of 11 districts, along the border of Rajasthan, Madhya Pradesh and Maharashtra falls under the tribal belt. (see figure 1). Population of this tribal belt is 7.481 million, which is 14.76 % of the state population.

Water scarce tribal area

The tribal belt comprises of 33% forest area and has steep slopes. The soil cover is

Figure 1: Map showing tribal belt of Gujarat

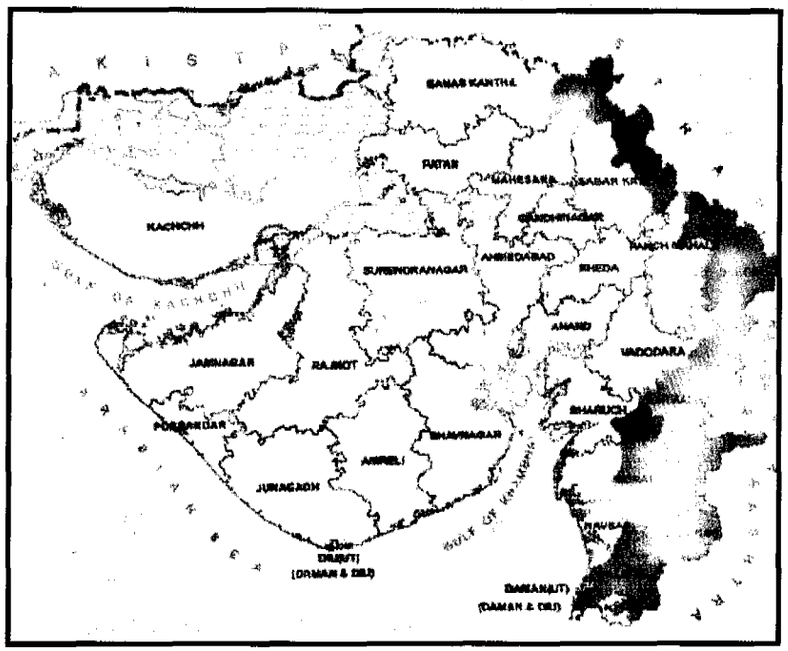


Table 1: Profile of the tribal belt in Gujarat	
No. of districts under Tribal Belt	11
Names of the districts	Banaskantha, Bharuch, Dahod, Dangs, Narmada, Navsari, Panchmahal, Sabarkantha, Surat, Vadodara and Valsad.
No. of Talukas	43, 15 pockets & 4 clusters
No. of Villages	5884 villages
Population	7.481 million (14.76 % of the state population)

generally thin. The average rainfall is 1224 mm but it has large spatial variations with 358 mm in Banaskantha and 2788 mm in Dangs districts. The rainfall in Gujarat is very torrential and occurs in few spells of 3 to 4 hours during 3 months of rainy season. Large parts of the area are characteristically hard rocks with poor porosity and permeability resulting in low yield from ground water sources. Adequate supply for drinking needs is not possible unless, water is stored in micro, mini and medium storage units, including check dams.

The tribal population lives in hamlets and hutments, which are scattered and the density of hamlets per square km varies. The surface water supply is highly dependent on the vagaries of monsoon. All medium and minor schemes have been completed but due to drying up of the small rivers and rivulets after December, surface water from streams is not available. The main source of water therefore is ground water, which can be exploited from certain geological features such as faults, fissures and crevices. Tectonically, the eastern part of Dahod and Godhra districts is highly fractured and controlling entire ground water movement. The deforestation coupled with stormy nature of the rainfall brings huge quantity of silt, which shortens the life of storage units as well as increases velocity of run off. Due to this the ground water recharge is very poor. Moreover, due to increasing population, coupled with unreliable and inadequate existing sources, the drinking water supply problem gets aggravated. For areas where quality problem exists (1032 villages,) sources have to be developed away from the problem area and regional schemes are required to be planned.

During the past two decades in particular, the water levels in parts of the area have been falling rapidly due to ever-increasing private extraction for domestic, agriculture and industrial uses. This decline in water levels is causing reduction in discharge, failure of wells/tube wells, quality deterioration, etc. Especially during summer months, the ground water sources dry out compelling the authorities to supply drinking water through road tankers.

Over a period of time, watersheds have been severely degraded due to above-mentioned factors. In view of this Government of Gujarat has taken watershed development measures together with rainwater harvesting on priority basis.

Social and health status

The tribal people many times have to migrate to areas where adequate facilities for

drinking water are available. They also often migrate to rural areas, where assured irrigation facilities exist and to the urban areas as welll in search of work. Influx of tribal migrants in towns and cities and their slum habitations create number of problems including environment problems.

Seasonal migration does not allow children to remain in school for the full year as they migrate to distant places with their parents. The rate of literacy in the tribal districts stands at 48.7% in males and as low as 29.7% for the females (2001 census). Such seasonal migration disturbs the family life and people in the region are unable to access to the benefits of several social welfare and social security programs because they are unable to stay in one place.

A sample survey done by the UNICEF in 1993 in selected 15 districts of the country has also indicated that the prevalence of diarrhoeal diseases was highest in the tribal district of Panchmahal (23%). This also establishes the emergent need of safe and potable drinking water supply facility in these districts.

In gender related development also, the tribal districts of Panchmahals, Dangs and Sabarkantha are at the bottom.

The socio-economic development of the tribal population in the concerned districts largely depends on supply of safe and adequate drinking water. Availability of drinking water within a reasonable distance would not only help women and girls to get more time to look after the family but would also provide them an opportunity to utilise their time in employment and income generation activities.

Hydrogeology

Geologically the entire tribal belt is composed of hard rock formations of Aravalli and Sahyadri ranges. The occurrence of groundwater in the belt depends upon the topography, nature and extent of weathering, distribution of fractures and joints, flow contacts and presence of vesicular horizons.

Table 2: Average rainfall of the tribal area of Gujarat

Sr. No.	District	Average Annual Rainfall in mm
1	Banaskantha	437
2	Bharuch	728
3	Dahod	761
4	Dangs	2418
5	Narmada	999
6	Navsari	1749
7	Panchmahal	826
8	Sabarkantha	887
9	Surat	1163
10	Vadodara	901
11	Valsad	2000

The tribal population in the belt depends on hand pumps and shallow wells for their daily domestic water needs. These sources are also not sustainable due to poor porosity and permeability of the geological formation. Due to the terrain conditions of the tribal belt water could not be provided from any perennial river of south Gujarat like the water being supplied from Narmada to other areas of central Gujarat, north Gujarat and Saurashtra region.

Ground water potential

Ground water potential of the tribal areas is very limited and difficult to develop on sustainable basis due to terrain conditions. Scattered population, migratory nature of the locals makes it more difficult to exploit the sources in a planned manner. As mentioned above, even though adequate rainfall is received in these areas due to hilly terrain and lack of water holding structures, most of the rainwater drains away without resulting into water storage as well as ground water recharge. The nature of rain is torrential but at the same time the precipitation is limited to a short span of 15 to 20 days.

Water quality

Erratic rainfall, uneven development of ground water, excessive runoff and lack of awareness has magnified the problem of water quality. The ground water sources contain fluorides, nitrate and salinity as a result of which they turn out to be unsafe for human consumption (see table 3). Inadequate quantity and poor quality of drinking water in the tribal areas of the state, has seriously affected the quality of life in terms of prevalence of water borne diseases, lack of nutrition, poor cattle and live stock development.

Proposed remedial measures

In spite of adequate rainfall, the tribal districts in the state are facing chronic shortage of drinking water, which gets aggravated in summer months. Supply of water through tankers is a common phenomenon. The solution of the problem lies in the following:

- Holding and storage of runoff by constructing under ground and above ground check dams (water harvesting structures)
- Development of mini water supply schemes by installing low capacity single phase water pumps on shallow bores and tube wells with facility to supply the water on stand posts in the villages / habitations.
- Innovative and unconventional methods of rainwater harvesting and storage of flood waters in hilly areas.
- Water capturing campaign at various altitudes by making collection sumps or by modifying existing natural depressions.

Table 3: Statistics indicative of the quality problem

Sr. No.	District	Total villages	Number of quality problem villages			
			Fluoride	Salinity	Nitrate	Total
1	Banaskantha	1241	507	58	69	634
2	Bharuch	662	24	132	25	181
3	Dahod	997	281	25	24	330
4	Dangs	309	0	0	0	0
5	Narmada	613	35	6	23	64
6	Navsari	370	22	59	2	83
7	Panchmahal	909	407	58	75	540
8	Sabarkantha	1386	513	63	213	789
9	Surat	1278	44	187	69	300
10	Vadodara	1548	350	167	84	601
11	Valsad	452	2	67	3	72

The options for solution of the water problem in the region will require active participation from the beneficiary community right from the stage of concept to commissioning involving therein the universally accepted principle of participatory management. As the population is predominately tribal and their rate of literacy is very low, the integrated approach would require special efforts in terms of community motivation and management, utilising appropriate methods of awareness generation and training at the grass root level.

Once the water harvesting structures are put into place it would also be off immense importance to operate, look after and maintain these facilities through participatory approach as a step in the direction of reforms in the water sector.

The emphasis would therefore be on decentralised management through the community and community based voluntary organisations with government and its agencies acting as a facilitator rather than a provider.

Thus, community awareness, training and capacity building also form a very vital and important aspect of the remedial measures.

Proposed plan of action:

The Government of Gujarat has decided to accord priority to schemes relating to

harvesting of rainwater by constructing under ground and above ground check dams. This would benefit the community by enabling efficient collection and storage of rainwater and further making it accessible for human consumption and domestic uses in a localised and decentralised manner. The benefits of such scheme are summarised as under:

- Collection and storage of rain water within accessible distance of its place of use.
- Continuous and reliable access to water for the community
- Creation of an alternative source for better quality water either seasonally or perennially.

Water harvesting conservation and recharge

areas having quality problems such as high fluorides and nitrates and salinity ingress were identified and regional schemes were proposed for them. Issues such as declining ground water table and finding economical source for enhancing the availability of ground water and improving its reliability were noted. Considering the limitations such as topography, high lift, scattered population, lack of communication etc. the following types of structures have been recommended:

1. Check dams (fully on river bed or partially under gound)
2. Under ground check dams (sub-surface dyke)
3. Recharge wells/Tube wells
4. Nala plugging
5. Percolation Tanks
6. Percolation wells
7. Trenches
8. Roof Water Harvesting
9. Watershed Development
10. Hand pumps
11. Hydro-fracturing of sick bore wells
12. Bore blasting to develop secondary porosity

Integrated approach to sustain water resources in tribal areas

In the present scenario many state government departments are working in the tribal areas to:

- harvest every drop of rainwater for the purpose of irrigation plantation;
- ensuring overall development of rural areas;
- mitigate the adverse effect of extreme climatic conditions;
- restore the ecological balance by harnessing, conserving and developing resources like land and water etc.;
- promote use of simple, easy and affordable technological solutions and institutional arrangements.

Activities carried out by Gujarat Water Supply and Sewerage Board (GWSSB)

Gujarat Water Supply and Sewerage Board (GWSSB) is committed to provide sustainable drinking water sources to the entire tribal area. As stated due to uneven topography of the area, main water supply sources are hand pumps. GWSSB has installed 1,01,520 hand pumps till December 2005. Mini water supply

Table 4: Details of hand pumps and mini water supply schemes

Sr. No.	District	HPs Installed	Mini W S S completed
1	Banaskantha	2155	-
2	Bharuch	3105	11
3	Dahod	22374	9
4	Dangs	2636	10
5	Narmada	5161	-
6	Navsari	8511	92
7	Panchmahal	10826	92
8	Sabarkantha	7786	39
9	Surat	14829	99
10	Vadodara	12092	22
11	Valsad	12045	89
	Total	101520	463

schemes have also been created in some parts of the area, wherever possible. The details of the installed hand pumps and mini water supply scheme are tabulated as under:

Details of Regional Water Supply Schemes functional in tribal districts

In order to maintain a sustainable water supply to the problematic areas more than 400 Regional Water Supply Schemes (RWSS) have been framed by GWSSB in various parts of Gujarat. Out of these, 61 schemes are operational in tribal belt to counter the non availability of potable water, inaccessible terrain conditions and hard rock formations of the tribal belt.

These RWSS cover 1152 villages, which include 844 tribal villages. Out of the total 5884 tribal villages of the state these RWSS account for coverage of around 14.5%.

Steps taken to sustain drinking water under 11th Finance Plan

To strengthen the present water supply sources in the entire tribal area GWSSB has constructed water harvesting, recharge and conservation structures in the following districts as given in table 6.

Table 5: Details of RWSS in tribal belt

Sr. No.	District	No. of RWSS	Villages Covered	
			Total	Tribal
1	Banaskantha	05	153	153
2	Bharuch	08	96	29
3	Dahod	01	76	76
4	Dangs	14	76	76
5	Narmada	08	28	28
6	Navsari	02	28	20
7	Panchmahal	06	387	229
8	Sabarkantha	05	104	104
9	Surat	06	100	47
10	Vadodara	03	83	65
11	Valsad	03	21	17
	Total	61	1152	844

In addition to this a technical study of Orsang basin has also been taken under 11th Finance Plan. This basin covers 809 villages and 6 towns, which have 83.5% tribal villages of eastern parts of Vadodara district and part of Panchmahal district covering:

i.) Chhota Udepur, district Vadodara
ii.) Kavant, district Vadodara
iii.) Jetpur Pavi, district Vadodara
iv.) Sankheda, district Vadodara
v.) Parts of Naswadi, Tilakwada and Dabhoi, district Vadodara
vi.) Parts of Jambughodha and Devgadh Baria, district Panchmahal

To site any effective water harvesting, recharge or conservation structure, the hydrogeological aspects of the area play an important role. Thereby, surface and subsurface features and their details are of immense use. Through the Rajiv Gandhi National Drinking Water Mission (RGNDWM), ministry of rural water supply, Government of India, the National Remote Sensing Agency (NRSA), Hyderabad has prepared ground water prospects maps of entire state on 1:50000 scale. These maps incorporate details about:

- Hydrology - surface and subsurface water availability
- Geology - Geological setup of the area
- Morphology - Surface features responsible for surface and subsurface groundwater control

For the implementation of 11th Finance plan in tribal areas these maps are used for locating proper site of the structures.

Activities carried out by Irrigation department in tribal area

The Narmada, Water Resources and Water Supply Department of Government of Gujarat, has under Sardar Patel Sahbhagi Jal Sanchay Yojana, up to fourth phase, constructed 12,106 check dams in the tribal areas of the state. As per reports available, the check dams are located at such a place

where maximum benefit could be given to the villager/farmer for his need of the water. The district wise details of the constructed check dams are given in table 7.

Watershed development and planning by department of Rural Development

A watershed is an area of land that is drained by a network of streams or rivers and is separated from other watersheds by ridge top boundaries. This may also be defined as geohydrological unit, which drains into one common point. Often called a drainage basin or a hydrologic unit, a watershed can cover large multistage area or a relatively small area. Large watershed is made of numerous small watersheds.

For practical purposes Government of India has issued the guidelines for taking up watershed projects as a unit of 500 hectares. The thematic maps generated from satellite data for different themes of land use, land cover, hydro-geomorphology, soils, etc. shall be used to delineate a watershed area for its proper development.

Need for watershed

- The watershed is a functional region established by physical relationship.
- The watershed approach is logical for evaluating the biophysical linkages of upland and downstream activities because these are linked within the watershed by the hydrological cycle.
- The approach is holistic, enabling planners and managers to consider many facets of resource development.
- The chain of environmental impacts that often result from land use activities and upland disturbances can be readily examined within the watershed context.
- The watershed provides a framework for analysing the effects of human interactions with the environment. Environmental impacts within the watershed are in a feedback loop with changes in the social system.

Table 6: Structures constructed for water harvesting, recharge and conservation

Sr. No.	District	No. of structures constructed
1	Bharuch	9
2	Dahod	13
3	Dangs	23
4	Narmada	94
5	Panchmahal	4
6	Sabarkantha	123
7	Surat	27
8	Valsad	98
	Total	391

Table 7: Check dams constructed by the Irrigation department

Sr. No.	District	No. of check dams
1	Banaskantha	106
2	Bharuch	77
3	Dahod	4430
4	Dangs	727
5	Narmada	149
6	Navsari	462
7	Panchmahal	2162
8	Sabarkantha	1269
9	Surat	460
10	Vadodara	1025
11	Valsad	1239
	Total	12106

Courtesy: NWR & WS Deptt., Govt of Gujarat

- The approach can be integrated with or be a part of programs including forestry, soil conservation, rural and community development and farming forestry, soil conservation, rural and community development and farming systems.

Watershed management and planning refers to the conservation, development and optimal utilisation of land and water resources for the ultimate benefit of the people. It is a process of formulating and carrying out a course of action involving

Table 8: Watershed development projects completed by Rural Development department

Sr. No.	District	Taluka	Projects Completed	Area covered under project 500 Ha./Project
1	Bharuch	Valia	34	17,000
	Total		34	17,000
2	Dang	Ahwa	48	24,000
	Total		48	24,000
3	Dahod	Dahod	25	12,500
		Garbada	23	11,500
		Limkheda	22	11,000
		Jhalod	33	16,500
		Dhanpur	31	15,000
		Fatepur	22	11,000
		Devgadhbaria	25	12,500
	Total		181	90,500
4	Narmada	Sagbara	22	11,000
		Dediapada	25	12,500
		Tilakvada	16	8,000
		Nandod	23	11,500
	Total		86	43,000
5	Navsari	Vansada	38	19,000
	Total		38	19,000
6	Panchmahal	Ghoghamba	23	11,500
		Santrampur	34	17,000
		Kadana	18	9,000
	Total		75	37,500
7	Vadodara	Chhotaudepur	46	23,000
		Naswadi	17	8,500
		Kanwat	21	10,500
	Total		84	42,000
8	Valsad	Dharampur	37	18,500
		Kaprada	42	21,000
		Umargam	19	9,500
	Total		98	49,000
	Grand Total		644	3,22,000

Courtesy: Department of Rural Development, GoG

manipulation of the natural system of a watershed to achieve objectives specific to the watershed.

The objectives are:

- Control of soil erosion and land degradation
- Reclamation and rehabilitation of waste and degraded land
- Land use revisions consistent with land capability
- Optimal management of croplands, grasslands and forests
- Conservation and management of water resources

Department of Rural Development has completed 644 watershed development projects in certain parts of tribal districts covering 3,22,000 ha. till December 2004., the taluka wise details of which are given in table 8.

Awareness, training and capacity building activities:

The literacy rate is very poor in these tribal areas, which results into lack of awareness and understanding on health and hygiene issues and need for community management. This will necessitate awareness generation and motivation of the community and training and local capacity building.

Empowerment through capacity building needs to reach the community to facilitate new roles and responsibilities for all. This can lead to greater opportunity at local levels, and increased capacities to manage their own resources, resulting in sustainable human development. In turn this will support individual growth and well being in harmony with humankind and nature.

Khedbrahma - a success story

In the preparatory stage prior to implementation it was necessary to take up

adequate geo-technical, social, economic and engineering studies in the project area to ensure and establish the project feasibility, viability and sustainability.

Khedbrahma taluka of Sabarkantha district is situated in the north eastern part of the state of Gujarat. Entire taluka has representation of tribal population. Out of total population of 2,23,502 scattered in 137 villages and hamlets 1,53,704 is tribal. The average rainfall of the area is 741 mm. Livelihood is mainly generated from agricultural activities. Forests cover nearly 40% of the area and hence a large populace is associated with forestry as well.

Due to scattered population, water supply is mainly based on open wells and hand pumps. Because of uneven topography, frequent droughts and un-availability of a perennial drainage system, major part of the area suffers from sustainability problem. Quality of groundwater is deteriorating gradually. Fluoride and nitrate are the major pollutants. While hard rock areas show excess fluoride concentration, the valley fill area, with agricultural activity, has excess nitrate concentration due to use of fertilisers.

Main constraints, observed during study, in providing safe, adequate and sustainable water supply are:

i.) Arid to semi-arid climate
ii.) Hard rocks cover the major part of the taluka
iii.) Erratic rainfall and excessive run-off
iv.) Scattered tribal population
v.) Unfavourable geological setup
vi.) Absence of confined aquifer system
vii.) Limited unconfined aquifers and their over exploitation
viii.) Deforestation
ix.) Occurrence of excessive fluoride and nitrate

In view of the above it became extremely necessary to harness the rainwater by

Figure 2: Population distribution - Khedbrahma taluka

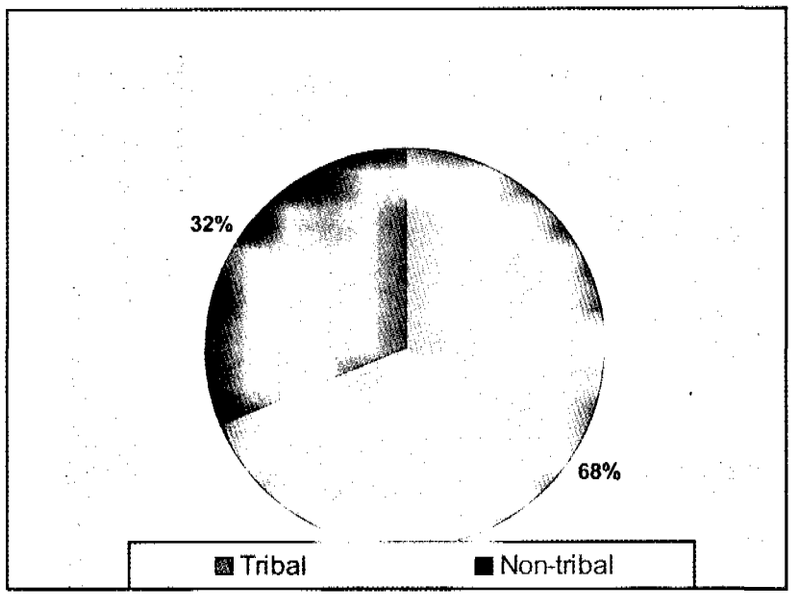
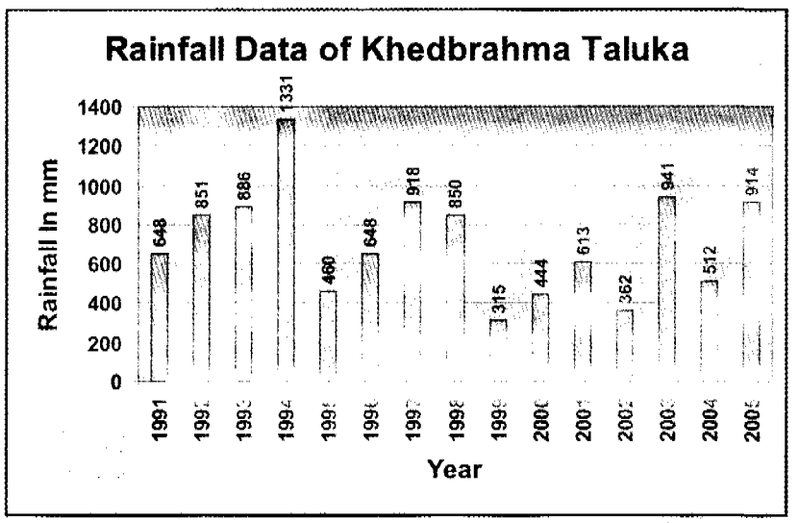


Figure 3: Rainfall data of Khedbrahma taluka



arresting the surface run-off. This was made possible by construction of harvesting/ conservation/recharge structures in entire taluka.

Approach adopted

Selection of location for recharge structures is of great importance for their effectiveness. To achieve the optimum benefit systematic and scientific study of the project area is necessary. The prime objective of this project was to establish an effective

recharge system by way of creating suitable structures. Systematic studies of the project area included:

- Remote sensing studies for delineating possible palaeo-channels, fractures, lineaments and water potential areas,
- Geohydrological studies for assessment of various aquifer parameters like permeability, porosity, etc.
- Geophysical studies for assessment of subsurface geological configuration.
- Use of expertise of skilled geologists for ensuring effective procedure and proper site selection of recharge structures.

After detailed survey and investigation procedure, type and location of recharge structures were finalised, which included:

- Traditional structures like check dams, underground check dams and recharge wells and bore wells
- Non traditional practices included hydrofracturing and bore blasting.

Water level and quality is being monitored in 47 villages to assess the impact of recharge after rainfall. Marked improvement in quality and quantity aspects of groundwater was observed. Comparing the data of October-2004 with October-2005 it was observed that in the areas where check dams were constructed water levels rose by 5 to 20 meters and in the areas where underground check dams were constructed water levels rose by 9 to 20 Meters. Nala plugging has helped in recharging the ground water and arresting of soil erosion.

Table 9: Recharging structures and activities carried out in the taluka

Sr. No.	Type of recharge structure	No. of structures dompleted
1	Check dams	68
2	Under ground check dams	09
3	Nala plugging	39
4	Hydrofracturing (126 Villages)	545 bores
5	Bore blasting (16 Villages)	38 units

Above recharge structures have helped the water seep in to the unconfined aquifers.

Hydrofracturing was carried out in 545 sick bore wells of 126 villages. Out of 545 sick bore wells 497 were rejuvenated with considerable increase in yield.

Bore blasting activity, to create extra/ secondary porosity in the shallow aquifer conditions, was carried out at 38 locations in 16 villages. Recharge activity got enhanced in the surrounding areas and nearby sources have been benefited, which is evident by increase in yield of these sources.

After analysing the monitoring data and taking feedback from the locals it is evident that water levels have risen considerably. As per the information of the local public, water supply shortage in the area normally starts from the month of November - December, but looking at the present water table conditions, after recharge activity, people feel that the sources will sustain till next monsoon.

However, it is felt that further strengthening by various recharging techniques will be helpful in the long run.

Monitoring and evaluation

On completion of such structures/projects it is necessary to monitor and evaluate the performance of these structures. So that modifications or improvements, if required in future projects and the benefits accrued in the form of water storage and recharge in terms of quantity and quality can be assessed. It is also proposed to install appropriate equipment and devices like the automatic water level recorders, data retrievals systems etc.

Suggestions for cost effective water supply

Gravity water supply from higher elevation

Gravity supply schemes can be the preferred option in the tribal area as they are simple, easy to maintain and lend themselves to a high degree of community participation.

A small sump/depression/tank/dam collects water from the upper reaches or higher elevations above the village/ habitation. Water can be piped through galvanised and MDPE pipe under gravity to a storage tank or distribution system.

Galvanised pipe is used in rocky areas and where a trench can be dug, MDPE pipe is used. Distribution in the hamlets is by a branch system where water stored at higher elevation in the village is released to the habitation at lower elevation. This requires no pumping machinery and water is supplied through gravity, without any dependence on electric supply.

Utilisation of solar energy for deeper aquifer exploitation

In certain areas where water level is deep and extra deep hand pumps are being installed, the possibility of utilisation of solar energy for running the power pumps can be assessed.

Benefits

Following benefits can be achieved:

- Sustainability of drinking water supply sources
- Supply of adequate, safe and reliable drinking water to the community
- Reduction in Infant Mortality Rate (IMR) and Morbidity due to improved quality of water.
- Providing increased opportunities to the women in the project area for income generation and overall socio-economic development.

Figure 4: Rise in water level after recharge activity

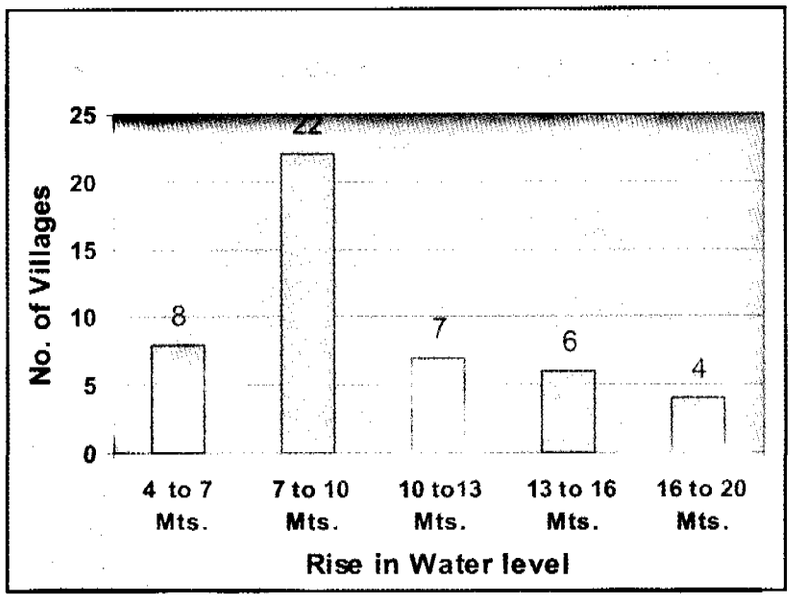
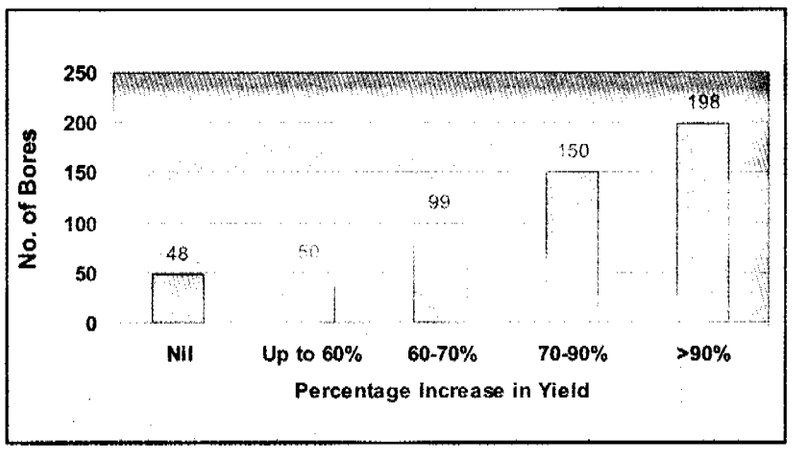


Figure 5: Increase in Yield after Hydrofracturing



- Providing increased opportunities to the children (particularly girls to get primary and secondary education in schools) thereby reducing the schools drop out rate.
- Active participation and empowerment of the tribal people would result into better upkeep and maintenance of the water supply systems
- Increased water storage facilities which would help fisheries and live stock development promoting nutritional standards

- Significant decrease in the seasonal migration of communities
- Improving ground water balance through water recharge
- Overall improvement in quality of life in terms of social harmony, managerial skills, peace and economic prosperity

Conclusions

Although substantial work has already been done and a lot of work is under progress, people of tribal areas, particularly those living in the far interior areas, are not much aware about Government policies, subsidies, new techniques and other benefits available to them. These amenities could make their lifestyle and livelihood better. It is necessary to identify such areas and real and dedicated NGOs, so that people could be made aware, motivated and sensitised.

Table 10: Details of tribal districts, talukas, pockets and clusters of Gujarat

Sr. No.	District		Taluka/Pocket/Cluster	No. of Total Villages	Area covered in Sq. Km
1	Banaskantha	1	Amirgadg (Palapur)	54	509
		2	Danta	124	562
	Total			178	1071
2	Bharuch	3	Valia	96	514
		4	Jhagadia	168	813
			1. Ankleshwar	38	226
			2. Amod (Mada Pocket)	16	85
			3. Utraj (Hansot)	13	92
	Total			331	1730
3	Dang	5	Ahwa	311	1764
	Total			311	1764
4	Dahod	6	Dahod	85	875
		7	Garbada	34	257
		8	Limkheda	152	1064
		9	Jhalod	151	798
		10	Dhanpur	90	466
		11	Fatepur	96	302
		12	Devgadhbaria	91	1145
	Total			699	4907
5	Narmada	13	Sagbara	98	364
		14	Dediapada	214	1024
		15	Tilakvada	97	245
		16	Nandod	204	1091
	Total			613	2724
6	Navsari	17	Vansada	95	600
		18	Chikhali	92	575
			4. Rahej (Gandevi)	32	129
			5. Sisodara Ganesh (Navsari)	75	283
	Total			294	1587
7	Panchmahal	19	Ghoghamba	95	747
			6. Mora (Godhra)	31	194
			7. Kathola (Halol)	61	224
			8. Govindi (Godhara)	21	90
			(a) Karoli (Kalol)	3	29
			(b) Jambughoda	23	59
		20	Santrampur	162	1360
		21	Kadana	136	428
	Total			532	3131

Sr. No.	District	Taluka/Pocket/Cluster		No. of Total Villages	Area covered in Sq. Km
8	Sabarkantha	22	Khedbrahma	137	846
		23	Vijaynagar	85	456
		24	Bhiloda	168	720
		25	Meghraj	129	545
			(C) Chorivad(Kesharpura) (Idar)	9	78
	Total			528	2645
9	Surat	26	Songadh	179	1192
		27	Uchchhal	68	622
		28	Vyara	150	813
		29	Valod	40	202
		30	Nizar	87	396
		31	Mandvi	149	723
		32	Mahuva	69	354
		33	Bardoli	86	369
		34	Mangrol	94	511
		35	Umarpada	63	271
			9. Kamrej	60	308
			10. Palsana	43	170
			11. Olpad	38	177
			(d) Wanz (Choryasi)	8	28
	Total			1134	6136
10	Vadodara	36	Chhotaudepur	145	768
		37	Naswadi	217	535
		38	Kanwat	133	605
		39	Jetpur Pavi(Jambugam)	211	806
			12. Vadali (Sankheda)	53	172
			13. Bhatpur (Sankheda)	61	250
	Total			820	3136
11	Valsad	40	Dharampur	106	713
		41	Pardi	82	426
		42	Kaprada	132	937
			14. Atgam (Valsad)	43	217
			15. Ronvel (Valsad)	30	157
		43	Umargam	51	361
	Total			444	2811
	Grand Total			5884	31642

SANITATION CHALLENGES

Promoting environmental sanitation in rural areas through simple and adoptable approaches: Experiences from the ERR Project

Villages and their residents sport a new and clean look as a movement in environmental sanitation gathers momentum

I K Chhabra

Summary

In January 2001, a massive earthquake with its epicenter near Bhuj caused heavy loss of lives and damage to infrastructure. In April 2003, a project was launched for achieving drinking water security and habitat improvement in earthquake-affected villages using a participatory approach. This disaster was used as an opportunity to go beyond restoration and into social development such as environmental sanitation and hygiene.

Through partnerships between WASMO, Implementation Support Agencies and the Pani Samiti, it has been possible to bring about a change in mindsets and practices of the village community on issues such as water quality, environmental sanitation, personal hygiene and habitat improvement, by following effective, simple and adoptable approaches that ranged from information drives, to capacity building and providing technical support.

Introduction

Despite enormous achievements made over the past two decades, an estimated one billion of the world's citizens do not have access to sustainable and safe drinking water while three billion do not have adequate sanitation. More than two billion children die every year due to sanitation-related illnesses. India, one of the most densely populated subcontinents in the world, has the lowest sanitation coverage.

Generally people identify sanitation as construction of latrines only. Though exposed human excreta are a major cause of disease transmission, the use of latrines does not always control the spread of diseases linked with poor sanitation.

Environmental sanitation is the prevention and control of disease by eliminating and controlling various environmental factors that may form links in disease transmission. It involves total village sanitation through appropriate disposal of wastewater, human excreta and solid waste (garbage and cattle dung), home sanitation, safe handling of drinking water and food and personal hygiene.

Environmental sanitation needs the active participation and involvement of the community and can be achieved only if the people are aware of the impact of their personal practices and prevailing environmental conditions on their health and are concerned about it. It involves practices that will bring improvement in habitat and consequent quality of life.

One of the projects that WASMO is facilitating is the implementation of the Community managed drinking water supply and sanitation in earthquake-affected villages of Gujarat project or the ERR Project. All 1,260 earthquake-affected villages are covered: 960 in Kutch, 73 in Santalpur taluka of Patan district, 137 in Surendranagar district and 170 in Jamnagar

Reduction in water and sanitation related diseases through habitat improvement is one of the major objectives of WASMO's efforts

district. The project was launched in April 2003 and will be completed in 2007.

The ERR Project

The ERR Project was launched with initial support from the governments of the Netherlands and Gujarat and the community. From April 2004, the Government of India has replaced the Netherlands support.

Broadly, the objectives of this project are to:

- Restore water supply to all earthquake-affected villages by establishing decentralised, demand-driven, community-owned and managed rural water supply and sanitation systems;
- Provide drinking water security through an integrated combination of pipe, local traditional water sources and multiple sources for alternative use;
- Conserve water through water resource management that includes rainwater harvesting and artificial recharge, conservation and renovation of traditional water sources;
- Build effective community institutions at the local level for in-village water supply and management by supporting capacity building and empowerment;
- Ensure that all community groups, including women, are able to participate in the decision making processes and benefit from programme improvements;
- Improve household and community environments with sanitation improvement and increased hygiene awareness in communities;
- Provide implementation support to communities through independent civil society organisations who will function as Implementation Support Agencies (ISAs); and,
- Initiate and support village level institutions in managing and maintaining their water supply and sanitation facilities.

This paper is restricted to environmental sanitation and personal hygiene-related issues only.

Promoting environmental sanitation

One of the main objectives of WASMO's efforts is habitat improvement, leading to a reduction in water and sanitation-related diseases and improvement in quality of life. The approach for promoting environmental sanitation includes:

1. Strengthening the Pani Samiti by empowering them with information and knowledge about water quality and the need to adopt environmental sanitation and personal hygiene practices.
2. Ensuring community involvement, management, ownership and sustainability of infrastructure by:
   a) Involving communities right from the beginning and seeking their contribution in cash, labour or kind;
   b) Focusing on several separate stakeholders such as teachers, school children, Pani Samitis and women's groups; and,
   c) Informing them about the need to sustain and operate the created infrastructure by collection of O and M charges.
3. Providing various technological options (for toilet construction, for example) as well as practices (for solid and wastewater disposal, for example) to the community.

Bridging knowledge gaps

Efforts are made to heighten awareness, bridge knowledge gaps and involve the community using various strategies. Pani Samiti members, women and school children are sensitised about water quality issues and the adoption of hygienic practices. Emphasis is laid on developing an understanding amongst the women on the nature of problems associated with health and sanitation in the village and their role in improving the existing scenario. They are informed about the repercussions of drinking

unsafe water in terms of waterborne diseases: their cause, treatment and prevention. The Pani Samiti and villagers are encouraged to maintain cleanliness within the village. Extensive sanitation drives, rallies, participation in fairs and sanitation-related events are organised to commemorate special occasions to encourage greater participation. Clean home and clean lane competitions and cleanliness drives are held.

With this kind of information and efforts to involve village communities, the rural community is now by and large convinced about the need to construct and use household sanitation units and stop open defecation. Some of the focus areas and strategies to promote environmental sanitation include:

1. Household sanitation promotion

Water scarcity is often stated as one of the reasons for not having individual toilet units. Now that water is or will be available through the ERR Project, the villagers are urged to construct individual household toilets. No financial support is offered while promoting this concept. Guidance for construction of low cost sanitation units is provided if needed. Some 6-10 low-cost sanitation units for demonstration are constructed for needy households (for example, where a widow is head of the family, or for handicapped persons, or for those below the poverty line) in every village. The ISAs support them by helping in construction of demonstration latrines and motivating the villagers through campaigns, meetings and discussions with women.

As of November 30, 2005, between 50-100 per cent of the households had constructed individual toilets in 234 villages.

2. Wastewater disposal

Inappropriate disposal of domestic wastewater leads to dirty streets and an unhygienic environment which can be a hotbed of disease. The community is informed about the repercussions of such an unhealthy environment and convinced to construct appropriate wastewater disposal systems.

Based on local geographical and economic conditions, different safe wastewater disposal options are proposed to the villagers before the commencement of water supply to individual households. The feasibility of soak pit construction is explored and design options for different soil conditions are provided.

Due to the large-scale awareness that has been generated, in several villages, all the households have constructed soak pits. As of November 30, 2005, between 50-100 per cent of the households have constructed soak pits in 214 villages.

3. Safe solid waste disposal

The villagers are informed on how to dispose off solid domestic waste and cattle dung and are also told about overall environmental sanitation. They are explained the need to transfer garbage to garbage disposal sites or compost pits so that the village is maintained clean. Dustbins have been provided in the villages at concessional rates. The Pani Samiti is responsible for ensuring appropriate solid waste disposal.

4. Village cleanliness

Concerted campaigns are held to convince the villagers to keep their village clean and contribute for the same. The need for ensuring that their surface or groundwater remains clean by disposing solid waste and domestic wastewater through appropriate disposal systems is explained. In fact, village cleanliness is a prerequisite in the programme and is an important indicator of the willingness of the community to join the programme.

It is the spirit of the community that has led to this campaign being a success with

With sustained IEC efforts, communities are by and large convinced of the need to use toilets and stop open defecation

Communities now have regular cleanliness campaigns to clean their villages

everyone getting involved in village cleanliness. Village cleanliness campaigns are now conducted on fixed dates as decided by the village. On no moon day or full moon day, villagers do not go for work and utilise their free time for village community work. In order to commemorate special events, village cleanliness drives are organised with the participation of the gram panchayat, Pani Samiti members, school children and teachers. In villages where no system for solid waste management or wastewater disposal existed, campaigns by ISA members have brought about significant change. The campaign has succeeded in motivating even those who were not ready to remove solid waste lying just beside their homes . Women groups in villages have been heavily involved in bringing about this change in the village.

In Surendranagar, 500 vertical brooms were distributed in 35 villages so that communities could keep their village clean. Often initiatives were taken by the villagers themselves, without any support from WASMO or the ISA. For instance, tractors have been engaged to remove the garbage. Roads are marked with white painted stones. Geru is painted on trees.

5. School sanitation and hygiene education programmes

Schools are targeted as a separate focus group with awareness and training programmes and provision of facilities. Details of the programme for school sanitation and hygiene education are given in the paper 'Future water and sanitation leaders: Grooming school children'.

6. Promoting plantation

Tree plantation has been promoted for eco sanitation and conservation of water resources around water structures within the village, in the school campus and in individual households.

7. Sanitation and education center

A Sanitation and Education Center is being planned to address the needs of people involved in road transportation. These people play an important role, but unfortunately their needs are largely neglected. Such centers will provide drinking water, bathing, toilet, resting facilities and lockers. They will be made aware of the need to adopt hygienic habits. This will raise their status and change the attitude of the community towards the people involved in transportation business and will bring respect to the profession. HIV/AIDS awareness amongst the truck drivers will also be created.

In addition, the Centre will serve as an educational resource for the local community where various technologies will be demonstrated or used. These include:

a) A reverse osmosis plant to de-mineralise water. This will give an idea to the community that even the local groundwater can be used for drinking purposes after purification using affordable technology;
b) The use of non-conventional energy sources. These include wind mills for pumping water from the borewell; solar pump for pumping the water from sump to the overhead tank; and biogas generation systems that utilise biological waste for lighting streetlights;
c) The recycling and reuse of bathroom and kitchen wastewater after treatment for efficient water use; and,
d) A rooftop rainwater harvesting system for capturing and using rainwater.

Results and observations

Community involvement in sanitation for health and hygiene is being built through a sustained campaign that broadly addresses three major areas – health issues that arise as a result of poor sanitation, the gender impact of poor sanitation with women suffering from lack of privacy while being burdened with additional tasks and the economic costs imposed by poor sanitation in terms of increased disease and mortality.

Consistent efforts that target different groups are required to change mindsets about environmental sanitation related issues and the results have been worth the effort. The programme is two and half years old. Tangible results are indicated in the table 1.

The inhabitants of economically poor villages are usually less concerned about issues of sanitation. However, through programme interventions in such villages, it has been possible to bring attitudinal changes, especially amongst women and children, so that they are positively inclined towards health and hygiene. While there is now a tendency to maintain cleanliness within the home, encouraging people to keep the village surrounding clean needs more concerted efforts.

Women are beginning to play a significant role in improving the hygiene and sanitation of the family. Despite their busy schedule, they ensure that their children and homes are clean and that washing and bathing are part of a regular routine. They have started persuading their men folk about the need for household toilets especially for women and aged people. In villages such as Boobvana in Surendranagar district, they meet every Sunday to cleanup their village.

Sanitation corners are being constructed in schools to encourage the use of toilets from a young age. Girls especially are comfortable if there are sanitation corners in schools. These corners have also had an impact on construction of household sanitation units, since once accustomed to toilets, children have considerable potential to influence their families for household-level toilets.

Some of the impacts of the programme include:

- Improved hygiene practices (washing hands before cooking and eating, brushing teeth, daily bathing, combing);
- Use of ladle to take out water from pots;
- Sustaining system within the village for solid waste and wastewater;
- Attitudinal change in use of individual sanitation unit;
- Cleaning up the village on one designated day every month;
- Construction of soak pits in 100 per cent households across some villages in different talukas;
- Increasing numbers of individual sanitation unit constructed in each village;
- Increase in number of villages where open defecation has either reduced or stopped; and,

Women are beginning to play a significant role in improving the hygiene and sanitation of the family

Table 1: Progress in adoption of environmental sanitation-related infrastructure

Activities	Kutch district and Santalpur taluka, Patan district	Surendranagar	Jamnagar	Total
Programme implemented villages	446	122	139	707
Construction of School Sanitation corners	353	95	123	571
Villages where between 50 - 100 percent households have constructed individual sanitation units	160	12	62	234
Villages where 50-100 per cent households have constructed soak pits	170	12	32	214
Number of nail cutters distributed	7,500	2,071	519	10,090
Number of dustbins distributed	6,843	1,942	2367	11,152
Villages where collection of water and sanitation tariff has started	344	56	44	444

- An empowered Pani Samiti which formulates and implements rules and regulations related to access to safe drinking water and maintaining sanitation in the village.

Every Pani Samiti in the villages is now responsible for three things (i) Cleanliness of the lanes; (ii) Marking roads with white painted stones; and, (iii) beautification. So enthused and confident are the villages that 25 of them have applied for the Nirmal Gram Puraskar, an award instituted by the Government of India.

Conclusion

Slowly but surely, the quality of life in the rural areas is improving with assured and adequate availability of safe water, improved sanitation and habitat and empowered communities. As they gain experience in managing their own water and sanitation systems, they are gaining confidence. Leadership, especially amongst women, is emerging as increasingly they have begun to participate and take active interest in village cleanliness affairs.

The remarkable impact of the programme is a reversal in the trend of migration. The availability of basic facilities and a clean environment has resulted in migrants returning to their native village. This has strengthened the social fabric within the village. The youth is now proud of their association with the village and have started conducting social functions within villages itself.

Grooming school children as future water and sanitation leaders

Agents of change, school children are provided sanitation facilities in schools and hygiene education to change practices and improve habitats and health

Shailja Kishore

Summary

Lack of safe drinking water and sanitation practices and facilities are the cause of many diseases. Special efforts are being made by WASMO to provide drinking water and sanitation facilities in schools and to convince the young students of the need for hygiene and modes of adopting personal hygiene practices and environmental sanitation. The purpose of this special effort is to (a) provide a clean environment and facilities to children in schools; (b) make children realise the importance of sanitation and personal hygiene so that they adopt relevant practices; (c) increase enrolment, especially of girls; and, (d) take advantage of their being effective agents of change for their home and village today as well as in the future. The approach includes both hardware (through the provision of necessary infrastructure) and software (through intensive information, education and communication campaigns) components and also addresses operation and maintenance issues. Institited in 2003, the impact of these efforts is already visible in the villages.

Introduction

An estimated one billion of the world's citizens do not have safe drinking water while three billion do not have adequate sanitation. More than two million children die every year due to sanitation-related illnesses. This accounts for around 15 per cent of all deaths under five in developing countries. Of all the diseases caused by water, 30 per cent is due to lack of proper supply, 45 per cent is due to lack of safe disposal and the remaining 15 per cent is due to unsafe hygienic practices.

Vision 21, developed by the World Water and Sanitation Collaboration Council describes the state of water and sanitation for 2025 as: 'Virtually every man, woman and child know the importance of hygiene and enjoy safe and adequate water and sanitation. People work closely with governmental and non-governmental organisations to manage water and sanitation systems so as to meet their needs while maintaining the environment. Everywhere in the world, people live in clean and healthy environments. Communities and governments benefit from the resultant improved health and related economic development.'

The Millennium Development Goals (MDGs) also include targets related to drinking water and sanitation. The MDGs are the world's time-bound and quantified targets to be met by 2015, for addressing extreme poverty in its many dimensions – income poverty, hunger, disease, lack of adequate shelter, and exclusion – while promoting gender equality, education and environmental sustainability. They are also basic human rights – the rights of each person on the planet to health, education, shelter and security which will be addressed.

These Goals include:

- eradicate extreme poverty and hunger
- achieve universal primary education
- promote gender equality and empower women

Efforts are made to provide school children safe drinking water and sanitation facilities along with promotion of adoption of hygienic practices

- reduce child mortality
- improve maternal health
- combat HIV/AIDs, malaria and other diseases
- ensure environmental sustainability
- develop a global partnership for development

The MDGs linked to school children, safe drinking water and sanitation include:

- Achieve universal primary education, since absence of sanitation facilities in school lowers attendance by students (specially of the girl child) and even women teachers;
- Reduce child mortality, by availability of safe drinking water and sanitation facilities and hygiene education;
- Improve maternal health, since these children will carry messages home and demand safe drinking water, hygienic practices as well as sanitation facilities at home. Also, girl students will grow up to be mothers; and,
- Ensure environmental sustainability by reducing the proportion of people without sustainable access to safe drinking water.

Addressing the student constituency

Inculcating the practice of sanitation and adopting clean hygienic habits is a challenging task. Experience indicates that communities express greater interest and readiness to invest in drinking water supply than in the construction of toilets and sanitation. Thus, to bring about a change in the mindset to improve their personal hygiene and to groom them to become future water and sanitation leaders, it becomes necessary to target them as a separate constituency.

School sanitation and hygiene education (SSHE) refers to the combination of hardware and software components necessary to produce a healthy school environment and to develop or support safe hygiene behaviors. The hardware components include drinking water facilities in and around the school campus. The software components are the activities that promote conditions at school and practices of school staff and children that help prevent water and sanitation-related diseases. Effective sanitation and hygiene in schools involves a healthy physical environment, active and organised children trained and committed school personnel and links to home and the community.

WASMO encourages the adoption of hygienic practices and habitat improvement by informing and educating the communities about issues like greening and cleaning of villages, health, hygiene, safe water, wastewater disposal and the use of toilets and soak pits. Since 2003, the organisation has made special efforts to reach out to school children by providing them with drinking water and sanitation facilities and for promoting environmental sanitation for a clean habitat, inculcating the use of toilets and the adoption of hygienic practices. While the children learn about hygiene and can avail of sanitation facilities in their school, they serve as agents of change, carrying the message and demanding the same hygienic practices at home.

Till November 2005, WASMO had successfully reached out to children through innovative and carefully designed programmes in 1,340 of the 2,410 villages wherein the organisation is currently engaged.

There were several reasons why WASMO decided to target school children:

Poor sanitation facilities in schools - head C
The level of sanitation facilities in schools continued to be unsatisfactory, in spite of several programmes that had earlier addressed the provision of these (see Box: School sanitation survey).

Effective learning

A clean, healthy and hygienic environment

helps children perform better. They grow up into healthy adults for whom maintaining personal hygiene, keeping surroundings clean, using toilets and ensuring that the water they and their families drink will be safe will become almost a second nature.

Enrolment and retention of girl student

The absence of separate sanitation facilities for girls discourages them from attending school. Parents too are hesitant in sending them. Providing separate toilets will increase enrolment.

Advocates for mass awareness

Children are effective in generating mass awareness in their community and village on environmental sanitation issues. Their ideas are innovative and their persistence convinces elders to listen.

Maintaining the water and sanitation facilities in schools

Children learn quickly and take their responsibilities seriously. If they are held responsible for maintaining cleanliness of water and sanitation facilities, these facilities will remain and will continue to remain usable.

School sanitation survey

A survey conducted in 150 schools across 81 villages covered under the Ghogha Project facilitated by WASMO revealed the immediate need of providing drinking water and sanitation facilities in schools.

The survey indicated that:

- Approximately 15 per cent of the schools did not have any sanitation facility.
- In the remaining schools, sanitation facilities existed, but were either inadequate when compared to the strength of students in the school, or unusable due to lack of maintenance or faulty construction, or common for girls and boys, in which case girls avoided using these. In some schools sanitation facilities were used only by the teachers. Kept under lock and key to limit regular cleaning and operational costs, these were unavailable to the students.
- In some schools sanitation units outnumbered class rooms. Yet the school wanted the School Sanitation Corner offered by WASMO under the Ghogha Project as the earlier complexes were non-functional.
- In spite of several efforts by various agencies to make drinking water available, students of more than 80 per cent of the schools had to carry their water bottles from home or go home to quench their thirst during summer. Though students were responsible for ensuring water for teachers, they were not allowed to drink it.
- In some villages, the schools have additional class rooms at one or two other sites. In such cases, drinking water and sanitation facilities have to be provided at all these places, which translate into more expenditure.
- Schools for girls only were better maintained and whatever facilities were provided, were maintained and in use.
- In about 15 per cent of the schools where the principal and teachers were active and concerned about the welfare of the children, such as in Sosiya, Gorkhi, Malpar, Isora and Kukkad villages, they managed resources from various sources for sanitation and drinking water facilities.

WASMO's strategy

WASMO developed and adopted a strategy that ensured that SSHE went beyond mere provision of hardware and facilities so that attitudes could change, increasing sanitation and hygiene levels. Interventions included a mix of hardware – such as construction of requisite facilities – and software components, in the form of intensive information, education and communication (IEC) campaigns.

Hardware Interventions

Hardware interventions in schools included:

- Provision of adequate number of toilets and urinals with wash facilities separately for boys and girls;
- Repair of existing structures;
- Linking the school to the village water distribution network to ensure regular water supply; and,
- Construction of rooftop rainwater harvesting structures to augment supply during lean seasons.

Software interventions

Simultaneously, software activities were conducted to embed in the young minds the need to use sanitation facilities and maintain personal and environmental hygiene. Different and interesting approaches were adopted for the IEC campaign to ensure that messages communicated were relevant, participatory, interesting and practical.

Communication with children continued even after drinking water and sanitation facilities in schools were constructed so that these could be maintained

The issues that were highlighted include:

a) Washing hands after defecation, before cooking and eating meals;
b) Maintaining personal hygiene by cutting nails, brushing teeth, bathing and combing hair;
c) Keeping drinking water clean;
d) Keeping houses, streets and the village clean;
e) Preventing defecation in the open and using toilets instead; and,
f) Maintaining water quality.

These IEC activities began before construction of the village water supply and sanitation schemes and continued after completion. Before construction began, regular sessions were held in schools to inculcate hygiene and sanitation practices amongst students and keep the village clean. The messages were conveyed through songs, games and locally developed printed material. Various activities and events were organised jointly with students amongst the village community. Some of these included:

- Regular awareness sessions with the school children
- Competitions for cut nails, wearing neat and clean clothes, oiling hair and bathing daily
- Distribution of nail cutters and dustbins in schools. Dustbins were placed at religious and public places as well
- Formation of Children Safai Committee and hands on training for cleaning of sanitation and drinking water facilities. These committees would be responsible for maintainance of facilities.
- Bal melas and children rallies for creating awareness in the community
- Performance of street plays based on personal health and hygiene, village cleanliness and sanitation
- Drawing and essay competitions
- Chanting of slogans, writing these on black boards and painting them on walls
- Distribution of posters
- Painting slogans and posters within school campuses to inform school going children about health, hygiene and sanitation
- The use of Lok Samvad, a quarterly newsletter published by WASMO to share the experiences and achievements of schools
- Distribution of education material such as posters, booklets and stickers on issues such as poor water quality and its impact on the body and personal health and hygiene
- School compound greening activities by school children where they plant and adopt one sapling each.

After construction of the school facilities was complete, regular meetings were held where the need for developing an appropriate mechanism for regular O and M of these facilities were discussed. Pani Samiti members and parents of the students were involved to see that their children would have access to basic facilities of drinking water and sanitation in their schools.

Efforts were made to target as many schools and villages as possible (see Box: Sanitation drives in Kutch). Since schools across several villages were to be reached, capable and interested volunteers were recruited and sent to schools after training. This proved to be a successful approach.

Operation and Maintenance

The SSHE campaign did not end with IEC and provision of facilities. For ensuring that the facilities continue to be in use, operation and maintenance (O and M) is essential. Members of the student safai committees are assigned specific responsibilities and informed on how to perform their role, thus building up their leadership qualities. One of the teachers of the school serves as the chairperson of the committee. The responsibilities of this committee include:

- Monitoring and maintenance of classrooms and sanitation facilities;

Sanitation drives in Kutch

Serious efforts were made to reach out to as many schools as possible through software activities. The scale of these efforts is indicated in the numbers of the different activities that were conducted:

- Awareness programmes on health, hygiene and sanitation: 2,030 programmes
- Awareness programmes for the use of sanitation facilities: 861 schools
- Awareness programmes on safe handling of drinking water by school children: 746 schools
- Awareness programmes on maintaining school cleanliness: 1183 schools
- Sanitation drive in the villages by students: 1534 villages
- Painting and essay writing competitions: Once in all schools
- Writing slogans: 17,000 slogans
- Paintings on sanitation and hygiene issues at strategic locations: 298 paintings
- Street plays conducted: 293
- Sponsored radio programmes: 98 episodes

Some of the activities undertaken during the campaign included:

i.) Distribution of print material: Posters and pamphlets on health and hygiene issues were distributed in schools and amongst villagers, government staff and NGOs.

ii.) Distribution of name stickers for books: These name stickers carrying couplets on health and hygiene issues and were a big hit with the children.

iii.) Writing slogans: Slogans depicting the perils of poor sanitation and hygiene were painted on the walls of prominent buildings, in schools and along highways. These slogans were selected through a competition wherein senior students from 360 rural schools participated and 160 entries selected.

iv.) Holding competitions: Drawing and essay competitions, solving sanitation puzzles, plays, forecast games, maintaining personal hygiene boards and passbooks, teaching songs, story telling, playing snakes and ladders and distribution of nail cutters all formed part of school activities. Winners of these competitions as well as neatly dressed children were awarded.

v.) Street plays: Lok Dayros (a traditional folk form of story telling in Saurashtra that uses poetry and rhythm to get messages across) and plays performed by school children focusing on basic health, hygiene and environmental sanitation were organised.

vi.) Rallies: Rallies comprising of children and elders walked along village streets with placards of sanitation and hygiene issues, shouting slogans, exhorting the community to use toilets and practice hygiene.

vii.) Using special days as messages: Some events organised on special days included:

- In Kathawa village, students performed a play called Bhagdo gandaki (throw the dirt out) to inform about sanitation practices on January 26, Republic Day.
- On the last day of 2003 in a school in Devgadh village groups of children cleaned up the village. They were given lessons in personal hygiene like washing of hands and taking a bath every day.
- On January 26, 2004, exactly three years after the devastating earthquake in Bhuj, the children of Nanavirani village paid tribute to those who lost their lives by starting the day with a Jan Jagrun yatra (public awareness walks).
- On January 30, 2004, Martyrs Day, the children of Naranpar Ravri village took matters into their own hands and armed with brooms and buckets, cleaned up this prosperous but dirty village. In a school health programme, the personal hygiene of each student was checked and deserving children were awarded prizes. The children took an oath to observe personal hygiene.
- On Makarsankranti, a five-day kite flying festival, some 1,800 kites carrying sanitation messages were distributed to students in 230 primary schools across 100 villages.

viii) Training programmes: Training programmes on sanitation, health and hygiene were organized for school children, teachers and the village community to promote hygiene practices, use of sanitation facilities and maintenance of clean village and household environments. Audio visual aids were extensively used while imparting training (see pix 8: Participatory training workshops enhanced learning).

Schools have adopted diverse means of meeting O and M requirements where students also contribute

- Maintenance of drinking water points;
- Cleaning and ensuring availability of water in sanitation blocks;
- Managing waste disposal in school premises;
- Peer education and monitoring of hygiene behavior among younger children;
- Monitoring the collection and use of funds;
- Reporting problems that need urgent action to the appropriate teachers;
- Encouraging participation by all the students; and,
- Regular water quality monitoring.

In some schools, the safai committee has been named the Safai Panchayat, with a designated sarpanch and ministers who have been assigned responsibilities.

Several training workshops were held to inform students and teachers on how to maintain sanitation facilities and check and maintain water quality. Guidelines were explained (see Table 1). A water testing kit has been provided to all the panchayats.

O and M includes a financial component as well, for which teachers are encouraged to come up with funding mechanisms. Different methods are already being used:

- In villages such as Nanapariya, Pipari, Bhaasar and Nana Nakhatarana, donors support the annual O and M funds.
- Students in Faradi and Hamirpar Moti have started kitties, wherein they contribute fifty paise or a rupee every week.
- In the Banni village of Gadiyalo and Sadai, every Friday (jumma), after offering namaz (prayers), the village community cleans up the entire village, including the school.
- In Varli village, the materials required for the cleaning and upkeep of the school sanitation corner are provided by the Pani Samiti.
- In Mathawada village, the school requests for contribution from the villagers during functions organised on August 15 and January 26, which are then used for O and M.
- In some villages such as Goriyali, the schools have student co-operatives, which buy books, notebooks and other requirements in bulk at discounted rates and sell these to the students at less than the market price. The profit generated is used for O and M.
- In Kukkad village, the school purchases the materials from the contingency fund and the students contribute labour.

Monitoring mechanisms

Mechanisms are in place to monitor changes in hygiene levels and sanitation practices amongst children and the upkeep of the school drinking water and sanitation units in schools by ISAs. The indicators monitored and recorded in school children include daily brushing, daily bathing, combed hair, cut nails, wearing clean clothes and slippers. Maintenance levels of facilities are monitored by the Pani Samiti members, parents, ISAs and WASMO. The monitoring indicators include:

- Proper use of sanitation and drinking water facilities;
- Regular cleaning of these facilities;
- Availability of bucket, mugs, brooms, soaps, brushes and acid required for cleaning; and,
- Proper implementation of responsibilities by safai committee.

Conclusions

Till November 2005, WASMO had successfully reached out to children through innovative and carefully designed programmes in 1,340 of the 2,410 villages wherein the organisation is currently engaged.

Monitoring by ISAs indicates that there has been a steady rise in the personal hygiene level of the students along with behavioral change. Children now come to school neat

and tidy. Hygienic practices such as hand washing after defecation and before cooking and eating, daily brushing of teeth and regular bathing combing and wearing clean clothes have increased. Behavioural changes are observed in the general community as well. Village and school cleaning drives has become a regular monthly feature in the village.

The children actively participated in creating mass awareness on environmental sanitation in their community and village. They have been able to convince their parents and neighbours to construct toilets and other sanitation facilities. There has been a considerable increase in the number of individual household environmental sanitation facilities like soak pits, compost pits and toilets.

Not only has there been a steady rise in the number of girl students in the school, but even the lady teachers who were posted in the single teacher / school units of the banni area have started coming to the school regularly, as was accepted by a lady primary school teacher in village Sadai (Banni). In the words of a Class VI student from Khara Paswaria, Anhjar taluka, "Earlier we would rush home if we wanted to use the toilet. Once home, there would be some work to be attended to, which would either make us late or miss school altogether. Now as we have this facility at school, we don't have to miss our school."

The impact of successful SSHE is at different levels. It starts from bringing about a change in the attitude and practices associated with personal hygiene and sanitation of children themselves. It moves on to ensuring that such practices are followed at home, in their neighbourhood and village, by motivating elders to construct and use toilets. After a few years, they are expected to participate in the active village politics and bring a change in their living conditions and governance. Subsequently some of them may move on to

Table 1: Guidelines for cleaning sanitation units

Activity	Frequency	Human resource	Materials	Tools
Cleaning squatting pan or seat, shelter, wash basin and floor.	Daily	Safai Mandal	Water	Brush, brooms, bucket
Disinfection	Weekly / Fortnightly	Leader of Safai committee.	Phenyl, Gamaxine powder	Gloves, buckets, mugs
Unblocking U trap when blocked or urinal outlets	Occasionally	Safai Committee	Water	Flexible brush / stick
Inspection of floor, squatting pan, wash basin, seat and urinals	Monthly	Teachers		
Repair of pan, trap, seat, collection pipes of rooftop rainwater harvesting systems	Occasionally	Teachers, Pani Samiti and local artisan	Local building materials	Bucket, trowel, hammer
Emptying septic tanks	Once in 5 years	Local artisan	Slab opening replacing materials	Spade, shovel, baskets, cart / trolley
Cleaning of the rooftop rainwater harvesting system	Pre monsoon and after first rain.	Safai committee	Scrubbers	Buckets
Regular chlorination of the water of the rooftop rainwater harvesting system and checking for residual chlorine	Fortnightly	Safai committee	Chlorine tablets and chemicals	Chloro-scope and water testing kit
Water quality surveillance	Fortnightly / monthly	Safai committee	Chemicals	Water testing kit

influence and make state and national level policy.

The students from Matru-chaya school have already flagged the issue of water quality at the national level. Supported by WASMO, the students of classes VIII and IX from this school are on their way to become change agents for drinking water quality. These students organised a Children's Science Congress on Drinking Water Quality. They surveyed more than 100 households and collected information on the practices of the people and their perception of the water quality. They collected water samples from various areas and later sent these for chemical and bacteriological analysis to WASMO. They made presentations on the importance of water quality monitoring, need for chlorination and household remedial measures for chemical and bacteriological treatment. They also had hands on experience with water quality testing kit and tested samples. The exhibition they held on the subject was visited by more than 1,000 students from schools in Bhuj. This project was selected for the National Children Science Congress held in Bhubaneshwar, Orissa, in December, 2005.

SCALING UP: LESSONS FROM THE PAST

Scaling up Sector Reforms: Lessons from the community-managed Ghogha regional water supply and sanitation project

The Ghogha project pioneered the community-managed approach within the state and provided valuable insight for implementing other programmes

Kruti Makwana

Summary

The approach of community participation was introduced in water supply and sanitation sector in Gujarat with the community-managed Ghogha regional water supply and sanitation project taken up to assure safe drinking water supply and sanitation facilities in 82 water-deficient villages of Bhavnagar district. The project was funded by the Government of the Netherlands and Government of Gujarat which was facilitated by the Water and Sanitation Management Organisation (WASMO), an autonomous body set up in 2002 by the Government of Gujarat to promote decentralised, community-driven, owned and managed in-village drinking water supply systems.

Approach of involving communities at each stage i.e. from planning to execution, operation, management and maintenance was adopted in the project towards attaining sustainability of the facilities created. Due to its approach, the project has transformed from a typical engineering water supply project into a process based programme. In-village water supply systems comprising of ESR, sump, and distribution system, water resource management activities and environmental sanitation activities like construction of soak pits, demo latrines, sanitation corners etc., were created in all 82 project villages to achieve the development objectives of the project. Availability of safe and reliable drinking water, strengthened local water sources and improved sanitation conditions are some of the visible benefits that the project has been able to achieve. Development and institutionalisation of Pani Samitis, improved social position of women and increased capability of the communities to take up the responsibilities are important project achievements.

Implementation of the project has provided a learning experience for everyone involved and guidelines for other similar projects. It has also set lessons to scale up the reforms introduced in the state in rural drinking water supply. This paper describes the project, its approach and strategies, implementation processes, problems faced, benefits and learnings from the Ghogha project.

Introduction

Community-managed Ghogha regional water supply and sanitation project, known as Ghogha project was initiated by GWSSB in 1994 as a solution to drinking water scarcity faced by the 82 villages of Bhavnagar district. Ghogha project defined as a third generation project, was launched in 1997 after the grant agreement for the project was signed by Government of India (GoI) and Government of the Netherlands (GoN). The concept of community participation in drinking water supply and sanitation was introduced by this project in the state. Limited involvement of the users in the first and second-generation WATSAN projects following a supply-driven approach has provided a lesson in community

Being a pilot project, the Ghogha project was a learning experience and provided a base to formulate other such projects

participation for ensuring sustainability of the water supply projects and has formed the base of the Ghogha project. A strategy of integrating community participation into the engineering aspect of a water supply programme was attempted in the project to attain sustainability.

Being a pilot project in Gujarat, the Ghogha project has been a learning experience for everyone involved. Benefits, challenges, lessons, strategies adopted and approaches followed have provided a base to formulate other such projects. This paper attempts to describe the history, project strategies, problems faced during implementation and efforts made to solve the problems that have helped in introducing reforms in rural water and sanitation sector.

Project and its objectives

Bhavnagar district in Gujarat's Saurashtra region had been facing drinking water scarcity for a long time. The region is characterised by hot summers and low rainfall. High salinity ingress and over extraction has resulted in deterioration of quality and quantity of ground water in the region. With an aim to provide safe and reliable water to 82 water deficient villages covering an area of 614 sq. km. in the coastal area along the Gulf of Cambay of Bhavnagar district, the CMGRWSSP was conceived with Shetrunji reservoir as the source of supply. The project covers approximately 2,00,000 population of 23 villages in Bhavnagar taluka, 34 villages in Ghogha taluka and 25 villages in Talaja taluka. The total fund of the project was Rs.5960.41 lakh of which Rs. 5088.06 lakh was shared by the Netherlands Government and Rs. 872.35 lakh was shared by the Government of Gujarat.

The project was implemented in two phases: first phase August 1997 to August 2002 and the second phase September 2002-December 2005.

Objectives

The project had the following objectives

a) To enable the local communities to have reliable, sustainable and safe drinking water in 82 villages of 3 talukas of Bhavnagar district of Gujarat
b) Reduce the incidence of water and sanitation related diseases in the villages by establishing safe hygiene practices amongst the communities
c) To develop local water sources for sustained provisions of water by integrating water resource management with water supply
d) Initiate and support village level institutions in managing and maintaining their water supply and sanitation facilities and to develop a sense of ownership of the facilities among the village communities.

Approach and implementation strategy

The success of any project is greatly dependent on the strategies and approach adopted for project implementation. The project strategies were - active involvement and participation of communities at every stage of project implementation, development and strengthening of local institutions (Pani Samiti), utilisation of understandable and affordable technological options and use of effective communication media to bring out community participation and to fortify their capacity.

Integration of different activities is the fundamental feature of the project approach, like water supply was integrated with WRM and sanitation and non-technical aspects like socio-economic, institutional, community participation, health awareness, development and strengthening of village level institutions, gender development parallel to technical attributes.

Project cycle

In order to develop and test the

methodologies and approaches, the project had decided to apply its approach to few pilot villages before actual implementation. A rapid village survey was done in all project villages to develop a preliminary understanding of existing water supply and sanitation situation and to gather background information of the villages. Based on the survey, eight villages were selected as pilot villages for Immediate Relief Assistance (IRA) in which existing water supply facilities were restored by quick repairs.

Typically, the project cycle began with informal meetings with the communities to introduce the project concept and activities, followed by Baseline survey (BLS) which included household survey, Participatory Rural Appraisal and Focused Group Discussions (FGDs) was conducted to gather the detailed information about the village, identify issues and problems and categorise priorities for actions. After BLS, based on the information gathered and verified by the communities, communities with the help of ISAs had prepared Village Action Plan (VAP) that included the present status of water supply and sanitation facilities and planning for the project activities on which the technical survey was conducted by GWSSB. The detailed technical design, capital and O and M cost estimates were presented to the communities in Gram Sabha for approval and/or feedback. At this stage, Pani Samitis formed before preparing VAP got almost accurate amount of O and M charges for which the communities formally agreed to pay and the pattern of contribution was decided. The scheme was sent for technical and administrative appraisal before it was tendered. In the Phase-I, tenders were floated and construction work was awarded to contract agencies . Construction activities were started only when Pani Samitis deposited one year O and M contribution in their account with a nationalised bank.

After completing construction activities, the schemes were tested for technical correctness and one-month trial run was made to ensure the functionality of the scheme, to resolve issues on equity of distribution of water and to give adequate onsite training to the operator. After the trial run, the in-village water supply schemes were handed over to the community through the Atmarpan ceremony. Atmarpan means dedicate to self. In this ceremony the Pani Samiti of the village accepted the responsibilities and took an oath in presence of community, ISAs and CMSU for operating, maintaining and managing the in-village water supply and sanitation facilities.

Implementation of the Ghogha project

Ghogha Project: Phase-I (August 1997 – August 2002)

Implementation of the Ghogha project began in November 1997 with feasibility studies, gathering data and finalising source for the water supply with GWSSB as a nodal agency. The possibility of sustained water supply from the Shetrunji reservoir was assessed and it was found that use of this source carried a risk of potential water shortage at intervals. Thereafter, to assess the ground water potential for developing local source based water supply system, the well development programme was conducted which revealed that only one-third of the project villages could be supported all year round by a local source on a sustainable basis. The outcome of the feasibility study, which compared various technological options combined with the well development programme, was multiple sourcing, which means a combination of individual village schemes based on local water sources, complemented with a connection from Mahi pipeline that provides water from external sources.

The Ghogha project integrated water supply, WRM and sanitation activities with active community participation

[1] In phase-II Pani Samitis took up the construction of in-village water supply schemes.

The establishment of WASMO to introduce changes and reforms in drinking water and sanitation ushered in the second phase of the project

The inception report comprising of the outcomes of extensive studies prepared in May 1999, has replaced the original project document and formed the basis for the implementation of the project. The project implementation began in June 1999.

Besides shaping project implementation strategies, software activities were initiated by the three NGOs who joined the project as Implementation Support Agencies (ISAs) for deriving community participation and building their capacity. The software activities were done to gather village information, to introduce the project concept to the communities, to encourage and prepare the communities for participation. Tools like meetings, baseline surveys (BLS) and participatory rural appraisal (PRA) were applied to assemble village level information while group discussions, fairs, campaigns, trainings and workshops were conducted to promote the concept of the project, to build capacity of the community and to generate awareness for sanitation and hygiene practices. Formation of Pani Samitis (Village Water and Sanitation Committee) was the first step to initiate the project implementation. After necessary technical surveys and procedures on the plan prepared by the communities, the construction work of in-village water supply schemes was awarded to four agencies, as was the common practice and PS took charge of monitoring the construction activities.

After five years of project initiation, work of in-village water supply scheme had commenced and progressed in only 27 project villages. The project had not achieved its targets in terms of physical completion of the activities. Uncertainty in deciding source of in-village water supply, lack of coordination in following the concept of the project between PSIU and GWSSB (NAPU), dissatisfaction of the community in the work done by the contract agencies and lengthy procedure adopted before the actual implementation resulted in delaying the project.

Progress review

In 2001, a mission from the Netherlands reviewed the project progress and institutional arrangement and recommended simplifying the institutional procedures by setting up an autonomous organisation independent from GWSSB[2] to facilitate the implementation of project and to disseminate learnings for promoting reforms in rural drinking water and sanitation sectors. Consequently, in May 2002, the Government of Gujarat established an independent and autonomous organisation-Water and Sanitation Management Organisation (WASMO) with the primary objective to evolve polices and strategies and introduce changes and reforms in the drinking water and sanitation sector in the state. In September 2002, the mandate for implementation and management of the Ghogha project was transferred from GWSSB to WASMO. The project period was extended up to December 2004 with added activities like WRM, connection to Mahi pipeline, demonstration latrines and school sanitation corners.

Ghogha project: Phase-II (September 2002- June 2005)

Role of WASMO

Subsequent to the setting up of WASMO in 2002, a revised project agreement for Ghogha project dated December 2002 was signed with WASMO as the lead agency and its main role in the Ghogha project was to facilitate the implementation of the project. WASMO was also responsible for coordination with ISAs, WAPCOS, Pani

[2] CMSU was set up within GWSSB to coordinate the project implementation, to integrate learnings from the Ghogha project and to support reforms in the state. Mission recommended replacing CMSU by WASMO.

Samitis and other institutions to resolve operational problems and smoothen the project implementation. Effective intra /inter organisational communications were maintained by WASMO to expedite the progress of the project.

Modification in project strategies

Modification in various project implementation strategies were made to expedite the progress of the project in Phase II. Assigning construction work to the Pani Samitis instead of the contractor, employing of technical and non-technical expert at Bhavnagar, appointing WAPCOS to support construction supervision and monitoring VWSS and WRM activities and modifying the GR to empower the Pani Samitis for taking up the construction activities were teh important modifications made.

In the Phase-II, transparency mandated in the project was followed robustly in procurement of construction materials, payment for the labour, collection and management of O and M contribution, regular record keeping, maintenance of bank account, etc. were done by the Pani Samitis. This has built faith among the community for government organisation/ project and resulted in active involvement of the community.

WRM activities and environmental sanitation activities like installation of dust bins, demonstration latrines, and schools sanitation corner were added in the second phase of project which increased effectiveness of the project activities especially hygiene promotion campaign.

Progress review

At the time of the final project progress assessment done by RNE in November 1994, work of 51 out of 82 in-village water supply schemes, 22 WRM structures, pastureland development in 658 hectare land and 21 school sanitation units had been completed. As the Pani Samitis were for the first time involved in construction activities, the progress of the project was less than planned. Besides, confidence built up due to the project and benefits of WRM activities have generated new demand from the community, which was accepted as the project was a demand responsive project. On the recommendation of the Mission, the Ghogha project was extended up June 2005 (six months) to accomplish all activities.

Modification in various project implementation strategies were made to expedite the progress of the project in Phase II

Eliciting community participation

Involvement of community in the project makes the project different from other supply-driven water supply projects. Responsibilities of operating, maintaining and managing water supply and sanitation facilities have been given to the Pani Samitis/community. Principally the project has been given equal importance to the process followed and physical progress of the project. ISAs had taken up comprehensive programme to obtain involvement of community, generate awareness and strengthen their competence for the effective implementation and management of the project. Formation and empowerment of Pani Samiti, awareness generation for meaningful involvement of community and women empowerment and their involvement in the project were major activities taken up by ISAs under community participation.

Formation of Pani Samiti

The Pani Samiti is seen as the key organisation which will implement and manage the facilities for long-term benefits. Formation of Pani Samiti is an important activity to involve community in the project.

After the baseline studies were completed and the communities acquainted with ISAs, formation process began with a Gram Sabha (village meeting) where the entire village, members of the ISA, PSIU/CMSU and the

The government made formal changes in the Pani Samitis that further empowered them and made their participation more meaningful

Panchayat members were expected to remain present. In the events that followed, the principle of forming a Pani Samiti, its functions and duties, GR of Pani Samiti and structure of Pani Samiti as the GR was explained to communities and questions raised at this stage were addressed.

The community then discussed and decided who should be in the Pani Samiti in which the ISAs played crucial role for democratic decision-making. Women were prompted to express their desire to become members of the PS. It was practice that the community tentatively selected the members of Pani Samiti in the first meeting and confirmed the in subsequent meetings. The GR stipulates the membership of Pani Samiti as 10 to12 persons. In certain cases, the watershed committee that existed and had been working was preferred as the Pani Samiti to avoid duplication and overlapping of responsibilities.

Some of the criteria adopted during formation of Pani Samiti:

- every caste group is adequately represented ;
- PS includes members of groups which are active;
- women are included as members of the PS;
- it was preferred to include members of the groups residing around the proposed stand posts and
- members with adequate amount of interest and enthusiasm were preferred.

Soon after the PS formation, a resolution was passed in the meeting of the Gram Panchayat regarding the formation of the PS which was endorsed by a GR.[3] The Sarpanch then informed the Taluka Development Officer (TDO) about the formation of the Pani Samiti and the date for the first PS meeting.

Management by the Pani Samitis

After Pani Samiti formation, a Memorandum of Understanding (MoU) was signed between the Pani Samiti, PSIU/CMSU and the ISA, whereby they declared to undertake their respective responsibilities. Pani Samiti members were trained and prepared to take over new responsibilities. In many villages Pani Samitis framed the following rules to ensure proper functioning which were adapted to varying degrees-

- the committee has to meet at least once a month,
- records should be kept for all decisions made,
- minutes of meetings are noted formally,
- any member not attending 3 consequent meetings automatically ceases to be a member of the Pani Samiti and
- the account of the Pani Samiti will be handled by any three chosen members of the committee.

In October 2002, the state Government modified the GR, which had enabled and empowered the Pani Samiti to take up construction of in-village water supply and sanitation facilities. Pani Samitis were reframed as per the modified GR in all project villages.

IEC activities

Recognising the importance, development and use of IEC activities was included as part of intervention strategy from the beginning of the project. IEC materials are effective participatory tools to bring about behavioral and attitudinal change in the people.

[3] The formation of Pani Samiti was endorsed by a Government Resolution (GR) passed in 1995 (Modified in October 2002 by Panchayat, Village Housing and Village Development Department, Government of Gujarat, dated 24/10/2002). This GR explained the need to form Pani Samitis, under the Gujarat Panchayat Act, as a statutory body within the Panchayat. The GR also stated that the Pani Samiti would be responsible for all drinking water related activities, operation and maintenance of the water supply schemes to provide regular drinking water in the village.

ISAs have experimented to develop new strategies for generating awareness and building capacity. Various printed materials like booklets, brochures, stickers, posters and manuals covering topics on guidelines for formation and function of Pani Samiti, hygiene practices, importance of water quality, best practices for health and hygiene were developed. Manuals on operation and maintenance of in-village water supply and sanitation facilities and technical and financial management were also developed to facilitate the Pani Samitis. WASMO has initiated a Gujarati magazine 'Loksamvad' meaning 'Dialogue with the Community', which has provided a platform for the communities to share their experiences.

ISAs had distributed the print materials in schools, PHCs, Panchayat, Aganwadis and Pani Samiti in all the project villages. 1854 slogans promoting/encouraging villagers to adopt safe hygienic practices were written, and 509 pictures depicting usage and benefits of safe hygienic practices were painted at strategic places in all project villages. Other than printed materials, street plays, movies, folk dances and campaigns were conducted to encourage health and hygiene practices.

ISAs had celebrated events like Women's day, World Environment day and World Water day especially for women to encourage their participation, sharing experience and cross learning among women of different villages. Drawing competitions and debates on health and hygiene practices and importance of better environment were conducted in schools for creation of awareness amongst the children. Events like balmelas (children fairs) and celebration of independence day were organised where various messages on health, hygiene, importance of water quality, safe solid waste disposal and latrines usage were promoted through folk dances, plays, flip charts and movies.

Training and workshop

Training and workshop, main component of software activities to build capacity had different objectives in both phases of the project. In the first phase, the focus was on promoting project and its approach, encouraging the community to participate and accept project activities, formation of Pani Samitis, explaining roles and responsibilities of Pani Samiti, management of accounts and bank procedures, pre-construction activities, material management, construction monitoring, women empowerment and their participation, hygiene promotion, importance of sanitation. Apart from training, exposure visits were organised which has provided good on-site learning and a platform where communities have come together to discuss and learn from their collected experiences.

Training workshops were the main components of software activities and their objectives shifted as the project progressed through different stages

In the second phase, most of the construction activities were started and in some villages, the in-village water supply schemes were commissioned, the activities were focused at post execution activities (O and M, repairs, water-tax, etc) and strengthening management skills (management of O and M funds, keeping accounts, etc). Training programmes and workshops were organised for Pani Samitis members and operators to strengthen their capacity for management of O and M funds, operation, minor repairs, regular chlorination, testing for water quality, management and handling of drinking water both at village level and at household level.

Women empowerment

The role of women in drinking water and sanitation is crucial as they are the ultimate users and are responsible for management of it. In project areas where influence and visibility of women in public was insignificant and gender discrimination was prominent, carefully planned efforts were made to empower women for their involvement in the project.

The involvement of women was ensured through their presence in meetings, reservation in Pani Samitis, and participation in project activities

Involvement of women was ensured through their presence in meetings, reservation[4] in Pani Samiti, participation in all project activities right from planning to operating and formation of Self Help Groups (SHG). Trainings and workshops especially designed for women were conducted to build their capacity, to encourage them to participate in the project implementation and to adopt hygiene practices.

PSs in the project villages have average 30 per cent women members and not only the strength has been increased but their involvement has motivated others to participate in the project. In most of the project villages, women played active role in site selection, monitoring of construction activity and collection of O&M contribution.

Formation of Self Help Groups (SHG) has enabled women to save money and gain access to credit. Capacity building through various trainings and participation in project activities has empowered many women to start their own business or any other income generating activities.

Role of ISAs (NGO) and performance

Three NGOs- CEE, Utthan and Medhavi were involved in January 1999 in three clusters comprising 28, 25 and 29 villages of the Ghogha project. In the project they are known as ISA- Implementation Support Agency. The name defines their role which would not be limited to advocacy and generating community participation but to mobilize, empower and support communities /Pani Samitis (implementers) in implementing the project in such manner that it could achieve the mandate of the project with the main inputs envisaged:

i. developing a people's participation strategy covering the entire gamut from project initiation to completion of technical inputs;
ii. forming and empowering a Pani Samiti- in each village to take over O&M responsibilities;
iii. assembling and empowering women for their involvement in the project as in domestic water sector they are the most affected group; and
iv. developing and conducting awareness programmes for personal and environmental hygiene and sanitation.

Performance of ISAs in phase-I

ISAs were actively involved with sincere efforts at every stage of the project implementation. Performance assessment study done by WAPCOS in January, 2003 on the completion of the first phase of the project, stated that the ISAs were able to create awareness among a large section of the project population, to develop a number of tools and methods to promote the project, to organise Pani Samitis and women for their effective involvement and good capacity building of community. Besides, the report has also stated that the awareness generation efforts have had a positive and lasting effect on approximately half population only, involvement of women was limited/formal in many of the project villages and functioning of Pani Samitis was formal.

The recommendations of the assessment were considered for the software activities taken up in the second phase of the Ghogha project. Besides, the construction activity was also taken up by the Village Panchayat /Pani Samiti. With the changes occuring in the project, focus of software activities done by the ISAs changed from generating awareness to enabling community in execution of the project activities. ISAs have also supported in maintaining records and making final payment of the work done.

[4] Government Resolution (GR) has mandated that one-third members of Pani Samiti must be represented by women.

Performance of ISAs in Phase-II

ISAs were active in organising Pani Samitis and preparing plans during Phase-I, while in Phase-II they were engaged in supporting Pani Samitis in construction activities. ISAs have also rearranged their staff and recruited technical persons to cope with their tasks. Though the ISAs were able to perform their responsibilities, high turnover and lack of trained staffed had affected the project. The involvement of ISAs ensured community participation, gender empowerment and their presence in field has eased the interaction with communities. However, in hygiene promotion and environmental sanitation activities, ISAs are not able to achieve equal success like in water supply and WRM activities.

Outcome

Efforts made under software activities in the Ghogha project have yielded a combination of positive and negative outcomes. Some of the outcomes were fortuitous and unforeseen. On the whole, the project was all about changing the mindset and each attempt made in the project has conferred learning experiences for all the stakeholders and to others in similar projects. The salient outcomes can be summarised as under:

- The most important achievement of the project is the learning and acceptance by the people that water can no longer be had for free; that it has environmental as well as economic costs. In the context of the villages and the cluster, this acceptance has led to consensual cost sharing arrangements which, while they may not be entirely satisfactory, are workable.
- The goal of people's participation at various stages was largely achieved. Villagers have become fairly aware that environmental hygiene and sanitation are crucial to the quality of life of the whole village.
- Training the end-users to supervise construction of the hardware components has led them to realise that they have a right not only to approve the work done but also to reject it if they find it substandard. In most of the project villages the quality of construction is of acceptable standard and the efforts of Pani Samitis are also appreciated by the Final Project Progress Assessment.
- ISA's efforts to empower people have borne interesting results. One requirement of WASMO was that, while total capital cost for water supply schemes would have been borne by WASMO, it would be executed only if the villagers took responsibility for O and M (generally 1 per cent of the capital cost per year) and demonstrated their commitment by collecting contribution and depositing in a bank an amount equivalent to a year's O and M costs. Given the differences between households in ability to pay, each village devised its own collection formula according to the people's potentials and constraints.
- Intra-village rivalries between castes and factions, often an obstacle to any developmental work, are gradually (albeit selectively) withering away with the realisation that water, sanitation and hygiene are issues of equal concern to everyone.
- Efforts to empower women have earned mixed results. Women Panchayat members elected through quotas mandated by law, are often puppets in the hands of their men-folk, who continue to be the real movers. In some caste groups, where women are by tradition forbidden social contacts beyond immediate household and family, their empowerment can only be a distant dream. Despite social constraints, there are an inspiring number of cases where women came forward and participated actively.
- A major outcome of the project, projecting in a positive light both ISA's efforts and community learnings, were

The most important achievement of the project is the learning and acceptance by the people that water can no longer be had for free

A major outcome of the project was bringing in innovations into hardware delivery mechanisms

the innovations brought into 'hardware' delivery mechanisms. A number of Panchayats chose to take up themselves the responsibility of construction. WASMO has welcomed the idea and promoted the same for all the project villages and in other similar projects. WASMO agreed that this could be allowed subject to the Panchayat opening a separate bank account to receive the funds to be disbursed, and evolved sound processes of financial management. The Panchayat could either assign the task to a contractor on a turnkey basis, or do it by procuring and providing material (steel, cement, sand, aggregate, bricks, pipes etc.) to a labor contractor who would take up construction at approved labor rates.

Components of the project

Strategically, components of the Ghogha project can broadly be divided into two categories 'software activities' and 'hardware activities'.

Hardware activities

Hardware activities mainly comprises inputs of an engineering nature which were coordinated by GWSSB in the first phase and WASMO in the second phase. In-village water schemes, water resources management structures and environmental sanitation were the components included in the project in order to assure drinking water security and improving living standards of communities of the project villages.

In-village water supply scheme

Elevated Storage Reservoir (ESR), water storage sump, pump house with pumping machinery, distribution pipeline network, stand posts, cattle troughs and washing facilities forms a completed in-village water scheme. These schemes have been connected to Mahi pipeline network through Tansa zone covering 44 villages and Budhel zone covering 38 villages for assured and safe water supply and the local source. The total cost for in-village water supply is RS. 1551.10 Lakh which is 26 per cent of the total project cost. Table 1 shows the activities done under the in-village water supply schemes.

a) O and M Contribution
Creating infrastructure may solve the problem of availing drinking water but only effective operation, maintenance and management can ensure its long-term benefits. O and M contribution is anticipated as one of the major indicators of community participation, financial viability, sustainability of the system and key to inculcate sense of ownership and responsibility for the water supply. It is directly related to institutionalisation of Pani Samitis, as collection and management of funds through procedures helps in development of local institution. Hence, the PSs/communities are responsible for operation and maintenance of their in-village water supply and sanitation facilities and the procedure for the collection of contribution was decided at Gram Sabha or general village meeting in presence of ISAs.

A total Rs. 33.03 Lakh has been collected as O and M contribution from the project villages, which is 84.2% of the total estimated O and M contribution[5]. The status of O and M contribution collected is summarised as given in table 2:

b) Water quality surveillance
Recognising the importance of quality of water, water quality surveillance was included in hygiene promotion activities from the beginning of the project.

[5] Total estimated O and M contribution is Rs. 39.24 lakh.

Women, school teachers and children were specially focused on in hygiene promotion trainings to educate them about significance of quality of water, its impact on health and best practices for handling drinking water at household as well as village level. In the year 2004, Water Quality Surveillance unit was set up to promote water quality surveillance at village level. Water testing kits for problem specific parameters and chloroscopes were distributed in all project villages and PS members and operators were trained to use these simple, indicative field test kits such that they could keep vigilance on the quality of all their drinking water sources. Besides, 22 workshops and trainings were conducted to sensitise the community/Pani Samiti members, operators, women, schoolchildren and teachers, about importance of water quality, water quality surveillance, chlorination, water borne diseases, hygiene practices, etc.

Table 1: Activities done under in-village water supply schemes

S. No.	Components	No	Remarks
1.	Elevated Storage Reservoir	84	83- ESR 01- HGLR
2.	Storage sump	84	
3.	No. of household connections	2307	13 villages
4.	No. of stand-posts	956	484 SP- 2 taps 251SP- 3 taps 221SP- 4 taps
5.	No. of washing facilities	149	46 WF- 5 taps 50 WF- 9 taps 53 WF – 13 taps
6.	No. of cattle troughs	135	

Table 2: O&M contribution collection

S. No	Yearly O & M cost achievement for VWSS (in percent)	No of villages
1.	1-50	25
2.	51-99	18
3.	More than 100	39

Water Resource Management

WRM component included and implemented in the second phase, envisaged collection, storage and utilisation of monsoon flows through suitable water harvesting structures. The purpose was to impede the flow of water and store the runoff to augment the local drinking water sources. WRM activities incorporated in the project are check dams, construction and repairing of pond, well recharge, well up-gradation, drainage of water points, injection wells.

Apart from water storage structures, pastureland development activity was included in the project that served the dual function of improving overall environment by retaining/conserving water through plantation and producing good varieties of fodder to village livestock. Under pastureland development 658 hectare land in 36 villages, 52 van talavadis, 07 matipala and 02 protection trenches were developed with help of Social Forestry department. This activity has not only helped in improving ground water but also provided fodder for village cattle. In many villages, Pani Samitis have generated income by selling the fodder, which will be utilised for maintaining in-village water supply and sanitation facilities. Activities done under water resource management are tabulated in table 3.

Total RS. 1251.12 Lakh has been allocated for WRM activities and the community has contributed 10 per cent of the capital cost.

Environmental sanitation

As sanitation is closely related to water supply and health, environmental sanitation activities have been considered as an important activity under the project. Efforts have been made towards improvement of personal and household hygiene practices in all the project villages. Besides the hygiene promotion activities and campaigns,

Table 3: WRM activites carried out under the project		
S. No	Activities	Structures
1.	Large/medium check dams	25
2.	Medium/small check dams	50
3.	Tidal control structures	03
4.	Pond repairing	24
5.	Construction of Ponds	21
6.	Injection well	10
7.	Well recharging	124
8.	Well up gradation	83
9.	Drainage of water points	147
10.	Pastureland development	658 Ha in 36 project villages

soak pits, demonstration latrines, dust bins and school sanitation units were taken up under environmental sanitation. Apart from this, centralised waste water drainage, community toilets, loan latrines were also added based on the demand of the community. Table 4 gives the activities that were taken up at a cost of Rs. 299.91 lakh.

Software components

Primarily, 'software' inputs were the responsibility of the ISAs and their strategic interventions comprised of mobilising communities, building capacity and supporting the communities in implementing the project. PSIU and WASMO have extended their support through trainings and workshops for ISAs and communities.

Table 4: Environmental sanitation activities taken up underthe project		
S. No	Activities	No
1.	Construction of soak-pits	22753 in 75 villages
2.	Centralised waste water disposal	18562 meter in 8 villages
3.	Installation of dust-bins	795
4.	Demonstration latrines	456
5.	Slogan writing	1854
6.	Wall painting	509
7.	Distribution of water quality testing kits	83

Major software activities taken up could be briefed as under:

- Informal meetings for introducing the project and its concept, role of each stakeholder were done in the project villages;
- Baseline survey (BLS) of 30per cent households in each phaliyun (caste or community-specific geographic quarter of the village) of each project village has been conducted to gather information and promote the project. Information on season-wise availability of water the local sources (well/hand pump/pond), location of drinking water sources and distance from the village, quality of water available, prevailing practices for handling and management for drinking water, prevailing sanitation condition, personal hygiene, perception of community about health, hygiene and sanitation, etc were collected in baseline studies. 100 per cent household listing has been done in all project villages;
- Participatory Rural Appraisal (PRA) was conducted, primarily to generate information about the village, help communities to analyse their problems, identify issues and categorise priorities for action. PRA was conducted through a Gram Sabha, faliya-wise meetings with individual caste-groups and with women's groups, of available water resources, their status, and their season-wise qualitative, quantitative and location adequacy vis-à-vis present and foreseeable water needs. PRA thus motivated and mobilised people for further action.
- Resource-mapping (material, spatial and institutional) of village in terms of water sources, garbage disposal, sanitation potential and CBOs has been done for the planning of water supply and sanitation facilities to be created under the project.
- guiding and assisting the community in the formation and working of Pani Samitis (at different stages of the project

these were constituted/reconstituted using different norms: first they had caste-wise representation; following a GR of 1995, they were reorganised as a subset of the Panchayat with the Sarpanch as president and the talati as Member Secretary; a subsequent amendment of the GR of 2002 has authorised the Sarpanch to delegate his/her powers to an alternative member of the Panchayat);

- Selecting sites on village common lands for hardware components in partnership with PS and women's representatives from each faliya; in this process ISAs had a major responsibility to ascertain the legal status of the site selected and, if it was encroached upon, to guide and support the Gram Panchayat/PS to follow up with the concerned authorities to vacate the encroachments;
- Mapping the scheme, as envisaged by the village, for submission to the district level authority (GWSSB/WASMO) to enable them to carry out a technical survey prior to preparing a Detailed Technical Scheme (DTS); and
- Presenting the DTS to the community for comments, modifications and approval before finalisation, and submitting final map to PSIU/ WASMO.

In addition to the above mentioned processes, which were primarily a means to support the implementation, ISAs have taken up initiatives aimed at empowering the community which enabled them to participate in the project.

- Educating villagers through pre-construction trainings, to build their capacity to assess the quality and quantity of construction materials used, and of adherence to specifications and quality of workmanship of the hardware components;
- Operating the in-village water supply scheme, performing elementary repairs, identifying reliable skilled persons to carry out tasks which were beyond their abilities to perform, essential accounting and banking procedures etc. were explained to operators and Pani Samitis in O and M trainings.
- Helping with the modalities of collecting and administering community contributions towards routine O and M costs—a precondition for the inclusion of the village in the project—including opening and operating PS bank accounts for this purpose;
- Organising village level events involving school children, inter-village interactions and exposure visits for the villagers to promote the project and reinforce its achievements;
- Helping to organise and guiding women's Self-Help Groups (SHGs) to play an active role in the project;
- Enlisting support of village level education and health functionaries to reinforce the hygiene and sanitation components of the project;
- Participating in Panchayat/PS meetings to help conflict resolution, build consensus between different factions, and find a way around ingrained traditional biases with respect to gender and caste roles in the traditional dynamics of the community;
- Serving as an intermediary and a channel of communication between the community and WASMO and various authorities at the taluka, district and state levels;
- Helping develop ways and means for villages to share experiences, pool resources and exchange know-how for effective and efficient implementation of the project.

Among the software activities of the project were facilitation for O&M activities and creation of systems for tariff collection

Financial aspects

The Netherlands Government and Government of Gujarat have funded the CMGRWSSP. The total project cost is Rs. 5960.41 Lakh. Component-wise fund allocation and expenditure is given in Table 5.

Figure 1 gives the component wise expenditure of the project in per cent. Total fund allocation shows that 26 per cent of the total project cost has been allocated for developing in-village water supply schemes while 38.60 per cent (highest) has been provided for the Mahi pipe line and 21 per cent provided for WRM activities which assures safe and reliable supply of drinking water. 3.35 percent of the project cost has been provided to the ISAs to carry out the soft activities while approximately 2 per cent cost has been spent for institutional development and building capacity of the stakeholders (project staff and ISAs).

Problems faced and their solutions

The Ghogha project started in November 1997 and was completed in June 2005.During this period, the project has succeed in developing in-village infrastructure ensuring safe and reliable water and better hygiene condition with participation of communities in all 82 project villages. Being a pilot project, it has provided a unique learning to all those involved in the project. During the process of implementation of the project, a number of issues came up. Many of them were tackled by the project and this contributed to a better understanding of pitfalls and consequently of ways to address some of the complexities in the project implementation. Difficulties faced across in Ghogha project can be briefed as follows:

a) The initial stage of the project suffered from conflicting opinion about the choice of a sustainable source. Experiences of past projects explained that water supply with local source have greater sustainability than that of regional water supply while the groundwater assessment studies of project area revealed that the groundwater potential were inadequate and unreliable in terms quantity and quality of available water[6]. This uncertainty has delayed the project. Strategy of developing the dual source in-village water supply system - local sources strengthened by water resource management, backed by bulk water transfer through the Mahi pipeline network was contemplated as the answer for assured and sustainable water supply. As part of strategy of assuring drinking water and strengthening local sources, water resource management component was added in the revised project.

b) Prolonged procedures and norms of GWSSB followed in the Phase-I left little scope for community's involvement. Since the community was involved in the

Table 5: Component-wise fund allocation and expenditure

S. No	Components	Project provision in Rs. lakh	Provisional expenditure in Rs. lakh	Percentage utilisation
1.	In-village water supply scheme	1556.39	1551.10	99.66
2.	Water Resource Management	1251.14	1251.12	99.98
3.	Mahi Pipeline	2300.66	2274.81	98.87
4.	Environmental Sanitation	300.15	299.91	99.92
5.	Handling fees (H/W)	67.33	67.33	100.00
6.	Operational cost	117.00	117.00	100.00
7.	Additional Investments	10.00	10.00	100.00
8.	Running cost	39.00	38.99	99.97
9.	Community participation	199.89	199.15	96.62
10.	Institution HRD	105.00	104.37	99.65
11.	Handling fees(S/W)	13.85	13.85	100.00
	Total	5960.41	5927.68	99.45

[6] Conclusion of Ground water potential studies -40per cent of the project villages were supplied water through tankers during summers. Only 20per cent of the project villages have reliable and adequate drinking water sources."- The Ghogha Experience, June 2001

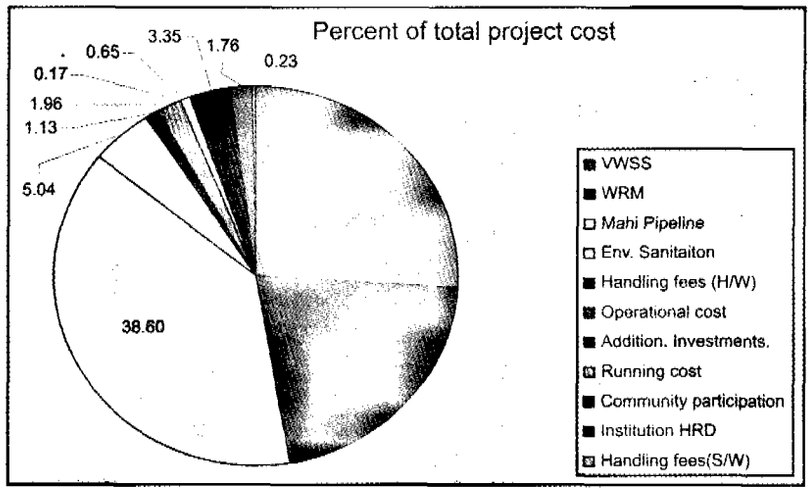
construction monitoring, conflicts about the quality of construction of water supply scheme went up between community and contractors. This developed dissatisfaction among the community and affected the progress of the project. At the end of Phase-I, construction of in-village water supply could start only in 27 villages.

c) In Phase-II, a process was initiated to encourage Pani Samiti/Gram Panchayat to undertake the construction activities. Community's response was positive and in 40 project villages construction of water supply scheme has been done by the Pani Samitis. Apart from water supply, construction of WRM structures and Environmental Sanitation with the support of ISAs has been carried out by the Pani Samitis of the project villages.

d) Communities agreed to take up the construction activities but when the actual physical activities started, it was realised that the existing GR on Pani Samiti (1995) gives limited powers to take up project activities. To overcome this, modifications were made in the GR and a new GR, which has empowered the Pani Samiti, was passed by the state Government in October24, 2002. Pani Samitis were reframed as per the new GR in all project villages and they could undertake project activities.

e) The project has brought new roles for each stakeholder, lack of which held back the progress of the project in its initial stage. GWSSB being a traditional organisation has not been able to internalise full involvement of the communities in planning and implementation, on the other hand even communities were faltering because of the responsibilities given to them. The role of NGOs was also different from their traditional society support role. Basically, it was all about changing the mindset and working with a new approach to implement the project. Eventually as the project progressed,

Figure 1: Component-wise expenditure of the project



stakeholders have adopted the concept of the project and their responsibilities.

f) In terms of institutional arrangement, confusion over responsibilities of the facilitators (PSIU/WASMO), the supporters (ISAs) and implementers (Pani Samitis) was one of the major difficulties faced. After formation of WASMO, efforts were made to address this difficulty.

g) The project has conferred equal importance on hygiene promotion and environmental sanitation as that on water supply. Activities like construction of demonstration latrines, school sanitation corners and installation of dustbin were added in the Phase-II parallel to sincere promotional efforts through campaigns and other communication media (street plays, competitions, discussions, movie, etc.) to attain the development objective of improving personal and overall hygiene in the project area. It is unfortunate that the project has not achieved 100 per cent of its overall environmental sanitation objectives. Traditional customs, social beliefs and low literacy rate are the major reasons for low response of the community. Apart from these, water supply has always been given priority over sanitation. However,

The greatest benefit of the project has been the increased availability and easy access to clean, safe, adequate and regular drinking water in all project villages

the environmental sanitation component with most beneficial impact is household soak pits, both demonstration and subsidised.

Benefits and Lessons learnt

Benefits/outcomes

This multi-component project has succeeded in achieving noticeable benefits in most of the project villages. The first is increased availability of clean, safe, adequate and regular drinking water provided through stand posts/household connections in all project villages through a gravity flow piped distribution system within the villages at a maximum distance of 150 meters to the houses. WRM activities have resulted in increase of ground water level by 3 to 7m and improvement in quality of local water sources.

Until year 2002, in 33 villages water was supplied through tankers in summers and in 50 per cent of the local sources were unable to fulfill water requirement. With the project intervention, none of the project villages were supplied through tankers since 2003.

The project has not only reduced the drudgery of fetching water but also improved the social position and influence of women as involvement and empowerment of women were emphasized. That the project has had an impact on the availability of water and on sanitation and hygiene practices is best described by women themselves. One women leader mentioned that the project has added five years to her life (Monghiben at a focus group discussion in Neswad village, November 2004). In some villages, women reported that water consumption had increased by 50 per cent, there was visible drop in skin diseases and in level of diarrohea, attendance of girls in schools has improved and they have more time for socialising and productive work.[7]

However, the environmental sanitation activities did not achieve 100 percent success. The efforts made under the project resulted in 4000 individual latrines constructed by the communities[8] (22 per cent of total house hold) and in more than 90 percent households soak pits are made.

Formation of Pani Samitis and their involvement in implementation, operation and maintenance of water supply sanitation facilities has initiated the process of institutionalisation, which is one of the development objectives of the project.

Learnings

Besides, remarkable benefits the project has been able to attain, the implementation of the project has provided important learnings as well which are utilised in framing other similar projects. Lessons learnt in relation to project implementation are listed as under:

a) In a demand driven project priority should given to villages that are eager to participate in the programme. Instead, in the Ghogha project the number of villages was fixed. There was no addition or subtraction of villages during the project implementation.
b) Clarity of roles and responsibilities and proper coordination among various institutions involved in the project is of uttermost importance for any multidisciplinary and/or multi-organisational project. Confusions over roles and responsibilities were one of the reasons of slow progress of the project though vertical and horizontal integration has happened to a considerable extent.

[7] "Which water?" Final project progress assessment report, November 2004.
[8] Latrine coverage was 3 per cent before project.

c) The initial stage of the project suffered from conflicting opinions about the choice of sustainable source. While the government of Gujarat believed that using a bulk water system (firstly Shetrunji reservoir and later Mahi pipeline) was only the feasible option, GoN emphasised decentralisation and greater user involvement by using local sources, to improve sustainability. Finally, after extensive review of the different possibilities for sustainable water supply in the project area a strategy of multiple sourcing has been adopted.

d) Collection and management of O and M contribution is possible (39 out of 82 villages have collected more than 100 percent O and M contribution) but it needs continuous follow up. Apart from that, flexibility in deciding total amount instead of fixing it to 1 per cent[9] of the scheme cost should be there. Villages with less than 1000 population, estimated O and M cost was much higher (around Rs. 500 per household per year) than their paying capacity which resulted in less than estimated collection of O and M contribution.

e) Development of a local institution or institutionalisation of Pani Samiti is critical for sustainable management of the system created.

f) Lengthy procedures followed in the Ghogha project have disheartened the involvement of the communities/Pani Samitis. Supporting communities /Pani Samitis to operate in a cohesive, systematic and procedurally correct manner is difficult and requires flexibility in following norms and procedures with persistent support.

g) Information servicing, awareness and education without matching hardware are difficult. Delays in progress of hardware activities lead to discouragement of the communities.

h) Software activities conducted during the project have made a significant contribution to building capacity of communities but sustaining community's interest and motivation level requires new and inventive strategies.

i) Women's and disadvantaged groups' participation is critical and requires special efforts.

j) Open wells, which is widely used as drinking water source in most of the project villages, should be covered and protected to prevent contamination.

k) Community toilets are not a preferred solution for sanitation.

l) Community washing facilities are less preferred as they do not provide a sense of openness and not avail adequate water.

m) Though the soak pits have improved the sanitation condition visibly, it is not the long-term solution for wastewater disposal. Sewerage network for wastewater disposal needs to be considered along with the water supply networks.

n) In most rural areas the social control on the disposal of garbage and wastewater in public areas is still weak. It has to be nurtured carefully.

o) School programmes help as entry point activities and one of effective medium to promote the health and hygiene practices among the children and their parents.

That the institutionalisation of the Pani Samiti was critical to the management of new water supply systems was an important lesson of the project

Withdrawal strategy

As the project is based on community-managed, demand-driven and decentralised system, sincere efforts have been made to set up the local committee and institutionalise the system so that it emerges as a sustainable and reliable system for managing water supply and sanitation in the project villages. To reduce the dependency

[9] Amount of O and M is calculated as per the norms.

Special attention continued to be given in the project withdrawal phase to enable communities to maintain vigilance over water quality

of local community on Government, sustainability of the system created for long term benefits are of major concern and are the main objectives of the exit strategy. The withdrawal strategy is planned and followed gradually instead of sudden backing out. The Pani Samitis were given adequate support and strengthening so that they can take the responsibilities of operation and maintenance of the facilities. The exit procedures were started in June 2005 to end the project in December, 2005. The activities performed during this period are listed below.

a) Facility completion team- In December 2004, a survey of all project villages was done to asses the functionality of the facilities and progress of the project. The analysis of the survey showed that minor repairs were needed to improve the functionality of in-village water supply schemes in most of the project villages. To correct these deficiencies, ensure lasting water supply scheme and its user friendliness, a Facility Completion Team (FCT) had been formed. The FCT consisted of an experienced community organiser, plumber, engineer, mason, electrician and a financial administrator familiar with water and sanitation issues. Two teams were formed to visit all project villages for a one-time intervention in each project village to ensure all facilities of in-village water supply and sanitation are functional and to strengthen the O and M.

b) Ensuring water quality- To ensure the proper disinfection and regular chlorination in each village, chlorinators have been appointed in each in-village water supply scheme. A field kit for water quality testing was given, which included a standard kit having chloroscopes, pH strips and H2S vials, and wherever the problem of TDS and Fluoride persisted, those villages were given TDS meters and Fluoride testing kits as per the problem found. Communities were trained to use these simple, indicative field test kits such that they could keep vigilance on the quality of all their drinking water sources.

c) Seminars and trainings- To ensure successful O and M, trainings for Pani Samitis and operators were organised covering themes like post construction activities, operation and maintenance of water supply and sanitation facilities, management of O and M, handling and management of drinking water, chlorination and chlorination practices, importance of water quality and hygiene practices.

d) Cleanliness drive- Sanitation improvement and changing habits of the community, has been the most difficult task under the project. This needs continuous efforts. As a part of exit strategy and to set standards in hygiene and environmental sanitation, cleanliness drives was taken up by the ISAs where involvement of community made sure to promote hygiene practices amongst them.

e) Management of pastureland- The Social Forestry Department will monitor the pastureland development activities for two years, provide technical assistance and train the Pani Samitis in the grassland management to generate income and other benefits.

f) Closing workshop- A day three workshop was organised on 28-30th June 2005 on completion of the physical activities. Pani Samitis of all the project villages participated and shared their experience gained under the project. Senior officials from WASMO and ISAs have motivated the Pani Samitis to take up the responsibility of operation and management of the system created to get benefits for long term.

g) Documentation- A comprehensive document which includes technical, financial and social aspects of the project and the experiences gained which can act as a guiding material for other projects is being prepared.

Beyond Ghogha: Scaling up and replication

The Ghogha project has been a learning experience for everyone involved. Benefits, challenges, lessons, strategies adopted and approaches followed have provided a base to formulate other such projects. The most significant project where WASMO sees the lessons of Ghogha being implemented is Community-managed water and sanitation programme in Earthquake-affected villages of Gujarat (ERR) initiated in April 2003 with financial support from Royal Netherlands Government and Government of India. The ERR project has been implemented to restore and develop water supply and sanitation facilities in about 1,260 earthquake-affected villages in the districts of Jamnagar, Kutch, Patan and Surendranagar.

Considering experiences of Ghogha where confusions on clarity of role and coordination among the project partners has affected the progress of the project, perspective on partnerships were developed through capacity building workshops with all 28 NGOs focusing on team-building, role clarity and shared responsibilities deriving from complementary skills.

Provision of multiple sources is one of the unique strategies adopted by the Ghogha project. Its approach of integrating water resource management with drinking water has also been appreciated. Success of both the strategies to ensure regular and reliable water supply can be replicated in other similar projects.

One of the most important learnings is the need of water quality surveillance at community level. Water Quality Surveillance Unit has been set up in year 2004 by WASMO with the objective of disseminating information of safe drinking water and making the rural community aware so that they would demand and maintain safe drinking water and even want to pay for it. To facilitate WQS at village level Pani Samitis are provided with water testing kits for problem specific parameter, trained to perform indicative water quality test and empowered to demand safe drinking water.

There is also an 'evolved approach' to community contributions which allows communities to determine their own O and M based on realistic listing of all O and M activities and expected cost rather than prescribing them as the norms.

Empowering Pani Samitis in taking up construction activities, procuring material and managing funds in the presence of the WASMO official and concerned ISAs has reduced the bureaucratic lengthy procedures and generated faith of the communities in the Government system.

Transparency mandated throughout the project implementation has also built level of faith on the Government as well community among themselves. Transparency is one of the major reasons of active involvement of the community and their willingness to pay for the water supply and sanitation facilities.

Last but not the least, role of WASMO in rural water and sanitation sector has been recognised in Gujarat. WASMO is now leading agency for supporting reforms, particularly large programmes such as Swajaldhara and has ability to facilitate partnership between a wide variety of the professional, consultants, NGOs, community organisation and other Government organisations.

Experience gained in the Ghogha project helped WASMO to scale up and replicate the community-managed approach through other programmes

The Ghogha project, 1997 – 2005: Perceptions and reflections

As a pilot undertaking, the Ghogha Regional Water Supply and Sanitation Project has provided many lessons for decentralised, community-managed and operated programmes

Dr. Bouwe Grijpstra

Introduction

The period of the Ghogha Regional Water Supply and Sanitation Project (GRWSSP) extended from the end of 1997 until the end of 2005. In November 2004 a final project assessment was made. The final assessment team concluded ambiguously: "without doubt most of the 81 villages and Ghogha town had benefited from the project". But this mission also reported that it had seen hardly any village water supply system functioning "due to lack of power, operators away with keys and incomplete works".

Generally the feeling among the different stakeholders in the project is that the results are meager, considering the input of money, manpower and expertise. Doubts exist about the functioning of the Pani Samitis (committees of water users), the beneficiaries' willingness to contribute to Operation and Maintenance (O&M) funds, the quality and the functionality of the facilities. With regard to the latter the mission observed that the quality is generally acceptable although the finish is often visually rough and user facilities are generally in poor condition with many requiring rehabilitation.

Many believe that the providers (bureaucrats, engineers, consultants, contractors, NGOs, donor) did not perform well enough. Main deficiencies mentioned are: no common understanding of prevailing problems, defective planning, unnecessarily maintaining fixed ideas and procedures, prioritising institutional interests, lack of co-ordination, and insufficient consultation of the beneficiaries. On the other hand, the villages have not sincerely taken up ownership of the facilities provided, neither before nor after the Atmarpan (handing-over) ceremonies.

This rather low level of satisfaction makes one wonder about the causes behind this lackluster performance and to what extent these were inherent to the project. Questions that have to be answered are: how could such a situation arise and how can it be prevented to happen again in a similar project.

This paper looks back at the project, its history, the style in which it was conceived and organised, the basic assumptions underlying the project, the positions and roles ascribed to the different actors and their perspectives, and the changes that did and did not occur throughout the project period.

Project concept

The Gujarat Water Supply and Sewerage Board (GWSSB) was the initiator of the Ghogha project. It came with a solution, the Shetrunji reservoir, to a problem, a shortage of drinking water in the Ghogha area. The problem was presented through analyses of erratic patterns in annual rainfall, declining

In the Ghogha project things would be done differently. It was a pilot project

water tables, salt intrusion, etc.[1]. To the GWSSB the needs and the way they had to be addressed were clear.

On the other hand in most of the villages targeted the actual demand for quality drinking water was rather low. The female members of the household fetched water for drinking, cooking and utensil cleaning purposes. For many villagers bathing was (and still is) not a daily activity. Clothes were washed and animals were drenched near a source of water. The local water sources provided enough for the larger part of the year. During dry spells the government supplied water with tankers at no cost, a solution that suited the villagers well. As such at the beginning of the project the male decision makers in the villages did not feel there was an urgent need for new water sources and supply systems. But, of course, no one wants to be left out when an investment scheme is about to start.

After the start of the project it became clear that the capacity and reliability of the Shetrunji reservoir would be insufficient. Thereupon it was decided to make use of local water sources as much as possible and to have the Mahi bulk water pipeline as a back-up facility. At the same time a water resources management (WRM) component was added to the project.

The Ghogha project was owned by the Government of Gujarat through the GWSSB, receiving financial and technical assistance from the Netherlands' Government through the Royal Netherlands' Embassy in New Delhi. It was not their first co-operation in the drinking water and sanitation sector. With the objective to improve the effectiveness and sustainability of their joint efforts it was decided that the Ghogha project would be participatory in order to motivate the beneficiaries to take up the responsibility for the O&M. At the time participation had been a popular concept in the international development co-operation for two decades. Gujarat was said to be one of the places where it happened first. Scholars and studied how the dairy co-operatives, and miicro credit schemes for women had effectively and sustainable reached out to the poor. Also the programmes of international reference and training centres emphasised the importance of participation. Despite the number of trainees from Gujarat that had been exposed to these new ideas surprisingly little of these had been internalised by the GWSSB. It continued to produce engineering solutions to rural drinking water problems to be realised and maintained by a bureaucratic organization, denying the beneficiaries any sense of ownership. But in Ghogha things would be done differently. Both partners looked upon it as a pilot project.

In 2002 the responsibility for the Ghogha project was shifted from the GWSSB to the newly created Water and Sanitation Management Organisation (WASMO). WASMO introduced a number of changes in the project management, making it more people-oriented than before, but the pattern set in five years remained.

Technology

It was planned to implement a standard package of facilities in all villages. User consultations did not take place. Technical norms about hydraulic head, consumption per capita per day, reservoir capacities, etc. resulted in a choice for pressurised systems to be built by construction firms. The major elements are a sump that is filled by the Mahi pipeline and/or from a local borehole, and an elevated reservoir with half the capacity of the sump. To lift water from the sump into the elevated reservoir electric pumps were planned. The supply of three-phase electricity in the project area was not reliable, however.

[1] It is remarkable that the attempts to quantify groundwater extraction for irrigation, as supported by cheap electricity mainly benefiting the rich, were comparatively few.

Beyond these two works in concrete the village systems are rather simple. Water distribution is usually through standposts, which function during certain hours. House connections are rare. They have not been actively promoted, probably for concerns about costs, high water consumption and paternalistic ideas that these would be too sophisticated for simple rural dwellers. House connections, however, could have instilled feelings of ownership with the individual households and responsibility for maintenance and tidiness.

Project area and target group

A consequence of the original idea to utilise the Shetrunji reservoir was that the project area was compact and clearly delineated. Without exception, all villages in that area would be included in the project.

The project area has never been redefined, even as it could have been done when the Shetrunji reservoir was no longer considered to be a viable option. At the time it could have been decided to enlarge the group of target villages with the understanding that the villages eager to co-operate with the project would be dealt with first. In turn, successful examples would convince the lagging villages to follow suit, making the whole process more efficient. Such a differentiation in target villages has never been given a serious thought. All were considered to be equally ready or at least capable to integrate the project's benefits in the same period of time.

The project staff, however, did not know what to do with villages that showed little interest. Progress has always been measured in terms of: 'so many out of the 82 villages' which has put the staff in the field under stress to show results in all of them.

Without doubt, the inhabitants of the project villages have been aware of the pressure that was put on the project field staff. They have exploited this circumstance by doing and contributing less than could have been possible.

Social engineering delegated to NGOs

Bureaucrats believe that whatever they have ordered will happen, simply because they ordered so. A water supply engineer's idiosyncrasy is somewhat different. Engineers know that because of gravitation water flows from high to low. Therefore they take pride in designing and constructing closed pressurised systems in which water can also flow from low to high.

Bureaucrats and engineers have dominated the formulation of the Ghogha project. To them the needs of the people were clear as well as how these could be met. In the last decades it has become common to talk in terms of "putting people first" and "participative development". The Ghogha project was no exception in this regard. But in this case, as often, participation only meant getting the people's co-operation and agreement to the plans of the project initiators. To this purpose a year after the start of the project the services of three Gujarati NGOs have been engaged, as Implementation Support Agencies (ISA).

To many the existence of social sciences is justified because the practitioners are supposed to avail of a bag social engineering tricks. It is believed that with these techniques, known as awareness raising, participatory rapid appraisal, group discussion, etc., people can be motivated to do things they would not do on their own. It is not realised, however, that social life is invariably more complicated than the set of parameters that governs hydraulic processes. The effectiveness of social engineering is therefore considerably less than that of hydraulic engineering.

Eager and capable villagers should be given priority to provide an example to the others

Social life is invariably more complicated than the set of parameters that governs hydraulic processes

Soon the activities of the ISAs were addressed as "software", in contrast to the "hardware" of the engineers. The ISAs had to explain to the people why and how the project would be of benefit to them, a role that they accepted. The project management's inclination to take note of the ISA's observations at the grassroots' level and to act upon these was limited to improvement of persuasion techniques. Ideas for essential changes in the project's design were not entertained.

The ISAs have been very active in the formation of Pani Samitis (PS) and their training in the operation and management (O&M) of the facilities to be constructed. They were very effective with regard to the participation of women and the introduction of health and hygiene practices, especially through school children.

Co-operation in and with Pani Samitis

The present policy in India is to hold the Gram Panchayat (GP) responsible for the infrastructure at village level, including the management and utilisation of water resources, water supply, environmental sanitation, etc. The role of the state and central government is to provide financial and technical assistance to the GP. A Government Regulation specifies the position, composition, tasks and obligations of the Pani Samiti as a functional committee under the supervision of the GP. Donors as the RNE are in favour of this decentralised approach and support its implementation.

The assumption behind this quest for decentralisation is that in a village the homogeneity in the needs for water will surpass whatever differences and conflicts might exist in other respects. This assumption is similar to the once globally accepted expectations with regard to village-level co-operative societies. Indeed the history of the co-operative movement includes many important lessons for the functioning of PSs, in particular with regard to the presumption that a PS would function along the principles of equality, rationality and transparency. In the sometimes highly politicised GPs these principles are not always commonly adhered to. however,

Besides, the O&M of the standard VWSS with a ground-level sump, elevated reservoir and standposts is rather complex, both technically (limited capacities, unreliable power supply) and financially (setting a tariff, collection of water charges, supervision and payment of operator, repairs and replacement of parts and chemicals). It is essential that the PS members are capable, responsible and sensible persons that can stay aloof from every day politics. Such qualities are rare and in high demand, in - and outside villages.

It is frequently overlooked that during the course of a drinking water and sanitation project the character and function of participation change. In the beginning, when the idea of a drinking water and sanitation project is introduced, the active participation of all community members is welcome. Everybody's ideas and wishes should be taken into account as much as possible. This would create a common high level of satisfaction in later phases. But once major decisions have been made, and the project has moved through construction into the utilisation of the facilities, user participation should be rather passive. In the phase of O&M the management should be delegated to an elected board of trusted and capable people. Other community members should not interfere in day-to-day affairs. Their participatory role becomes restricted to attending (annual) general meetings, paying dues, and, most important, using the facilities correctly and taking guard that no one damages these.

If differences between the inhabitants of a village make it difficult to form an effective

PS, capable to manage a complex water supply system with ground and elevated reservoirs, unpredictable power supply and dual water sources, it could be tried to find a technical option with more simple management requirements. E.g. the management of ground-level reservoirs fitted with handpumps in population clusters is much less complicated than that of an elevated reservoir that supplies public standposts. Private household reservoirs fitted with handpumps, to be filled with roof water and commercial tankers, would be an option that is institutionally even simpler.

Convenience and service level

The project's package of facilities that was on offer to the villages might have had a high-tech outlook, because of the elevated reservoirs that are visible from afar, but their service level is not that great. Even when electric power is available the standposts function at most during one hour in the morning and one hour at the end of the day. The restricted and irregular hours for water collection make it difficult for the households to amass a quantity of water that goes beyond their requirements for drinking, cooking and to do the dishes. Consequently there is little scope for bathing and washing in the privacy of the homestead, and not at all for a pour-flush toilet. The capacity of reservoirs and the diameters of pipes might have been worked out well, but it was overlooked that the women would have to rush to carry an increased supply home. Standposts restrict the possibilities to allocate one's time over the day. The person with the wrench to open and close the supply to the standposts determines the daily rhythm in a village.

Besides, to avail of sufficient water under all circumstances, especially during power cuts, it is necessary that also the traditional local sources as open wells and handpumps are maintained. Quite a number of households might find the latter more convenient to use because water can be obtained at all times.

For these reasons in a number of project villages the new water supply systems are normally not in use. They look neglected, dirty and with taps missing. It is said they will be used in times of drought, when the traditional sources have run dry. At the time some rehabilitation work will be necessary.

As part of the water supply systems, in most villages one or more communal washing cum bathing facilities have been built. All are of the same design with high walls and a narrow entrance. A small reservoir, filled from the elevated reservoir in the village, supplies water to 10 – 20 taps fitted on a pipe within the facility.

The washing facilities are hardly used for what they have been built, but commonly abused as a toilet. It is clear that something has gone wrong with the design that includes modern gadgets as pipes and taps and high walls to protect the women's modesty. The pressure on the taps is so low that a bucket cannot be filled quickly, the level in the reservoir cannot be checked at a glance, and the high walls cause feelings of claustrophobia and insecurity when only a few persons are inside. A simple open trough from which a bucket of water can be scooped would have been a better alternative. Walls that are only chest high allow those inside to see who is approaching and those outside to check whether a user is there for washing or for other purposes. Roving eyes could be made harmless by building the washing facility on a small elevation.

Another common facility is the cattle trough. These open rectangular reservoirs are easy to operate and very much appreciated by the animals, the herdsmen and, unpredictedly, the women who use them to fill their buckets with washing water.

Sanitation

In the predominantly rural area of the project defecation in open spaces is common. The dry air and bright sunlight that prevail most

Once a water supply system is constructed, the people's participation boils down to attending the annual general meeting, paying dues, using the facilities correctly and taking guard that no one damages these

For teenage girls school toilets are essential to complete their education

of the year limit the spread of germs. But waiting for the dark is not always convenient. Community toilets are hardly an option because in most villages there are no persons willing to clean them.

Individual toilets provide comfort but are costly. They could become popular as an indicator of modernity, a luxury gift to the women in the family. However the rocky underground of large parts of the project area reduces the feasibility of pour-flush latrines connected to cesspits.

In nearly all schools sanitation blocks have been constructed by the Pani Samitis and financed by the project. For teenage girls school toilets are essential to complete their primary education. The success of this programme will depend very much on the sustained interest of the teachers to supervise the regular cleaning. Water reservoirs and ceramic urinals are the most vulnerable parts.

After the commissioning of the water supply systems and the increasing amount of wastewater in the village lanes, the project and ISAs started the promotion of household wastewater soakpits. The project paid a small subsidy when certain standards were met. Some energetic small-scale contractors have seized this opportunity. By employing labourers from elsewhere they are able to do the work within the limits of the subsidy. Their offer was quickly taken by a large number of households. Village lanes have become less muddy and it is said that the doctor has less patients. The small soakpits need regular maintenance. The effectiveness of social control in this regard is still to be seen. Low cost sewerage lines, open or closed, have been constructed where the rocky underground limits the effectiveness of soakpits. Toilets should not be connected to these lines, though,

Garbage disposal also depends very much on social control. Though private courtyards are meticulously swept, clean public spaces and surroundings are hardly appreciated. In fact these are places where private garbage is dumped. Critical comments could quickly lead to brawls. The dustbins the project provides at a subsidised rate are small and ineffective. Most of them are placed next to a shop and the shopkeeper is expected to burn the garbage daily.

To change the outlook of the villages more drastic measures are needed. Externally promoted village clean up campaigns might give the inhabitants of a village the first experience of a sense of cleanliness and boost social control in this regard. Clean village competitions could install a sense of pride in clean surroundings.

Water resources management

The WRM component of the Ghogha project started only after WASMO became responsible for the project's management. Construction of checkdams in the beds of rivulets to enlarge the infiltration of rainwater into the soil was the main activity. The villages had to contribute 10% of the construction costs, at least 5% in cash and the balance in labour. Door-to-door collections did not have to be organised.

It is not difficult to understand why this sub-programme became popular very quickly. First of all it brought money and employment into the village. Secondly, the O&M of a checkdam was considered to be negligible, for which no special organisation is required. Thirdly and most importantly was the farm lobby. A rising water table accessible through wells and handpumps is good for all, but especially a boon to the rich with pumps to irrigate their fields. A sound economic analysis of the benefits from the actual and proposed investments in WRM is warranted. Another consideration is that an effective WRM programme will boost the quality of the local drinking water sources and reduce the

interest to use the new water supply schemes.

Willingness to pay

In India, traditionally, water is seen as a gift of God. And since independence water distribution is considered to be the duty of the government. Nominal fees have been declared, but are seldom paid, not even in the state capital of Gujarat.

For the Ghogha project it had been decided that the O&M costs of the village water supply systems had to be born by the villages concerned. Construction in a village would not start unless an O&M fund equal to 10% of the construction costs was established. The ISAs were charged to explain this regulation and to assist the PSs with the actual collection of contributions. Many villages, however, were very slow in collecting the required amount, except in those cases where it was advanced by an interested party. Nevertheless everywhere construction has been started. This leniency cannot but have created the impression that on the point of financial contributions there would be ample scope for bargaining with the project. The PS members and other villagers became convinced that there would always be outsiders to take charge of maintenance. Their cunningness and political acumen in this regard are substantial.

Other reasons for the unwillingness to pay are the fact that the O&M contribution was asked up-front and considered to be much higher than needed in the first year after commissioning, and the long gestation and construction period of the project that made people afraid that their money would get lost in the process. Another important reason is the low service level of the water supply systems, as analysed in a previous paragraph. The villagers consider them useful for periods of water scarcity only. But providing drinking water is those periods is seen as the responsibility of the government.

Institutionalisation

There are a number of villages in Gujarat that have a drinking water supply system for already 30 years or more. These systems have been established at the initiative and the expense of the villages concerned. Over the years the systems' O&M have been developed by trial and error along with improvements and extensions of the systems as necessary. External assistance in these developments has been welcome, but the villages clearly remained in the driver's seat. The day-to-day running of the systems has become fully institutionalised and is supervised by a committee of responsible and capable people that keeps it insulated from local politics. Nearly all households have individual connections for which they are happy to pay their dues. The poor are supplied through standposts for which the contribution is less.

In the large majority of villages in Gujarat, however, including those in the Ghogha area, such an evolution did not occur. One can guess about the reasons. It is not the lack of technical knowledge because in every village there is no dearth of people that pump groundwater and distribute it to their fields and, for payment, to the fields of other households.

Generally the Gujaratis are proud about their business acumen. Nobody, however, has taken the initiative to sell drinking water to co-villagers. Asking money for drinking water is considered not done. But many well owners limit the group they are willing to give water to relatives, regular providers of services and/or members of the same caste.

Neither has any private drinking water business evolved, nor have some well and pump owners come together to pool their capabilities and start a village water supply scheme. It could be that any water supply beyond the traditional open well is considered to be the responsibility of the government

The willingness to pay depends very much on the day-to-day convenience of the water supply system

Comfort, taste, vanity and its counterpart shame might prove to be more effective ways of persuasion, rather than rational messages about health and hygiene

for whom one waits patiently and passively. Probably the perceived benefits were and are not enough to overcome the large and petty differences and quarrels that might exist within a village[2].

In the absence of local individual or group initiatives the Ghogha villages have obtained facilities that rather reflect the paternalistic benevolence of the external providers than the local needs. To outsiders an elevated reservoir might look good. But the beneficiaries find the service level of the connected standposts low. It enhances their view that water from public taps is a kind of emergency service for which one does not have to pay.

Those who thought that an acute and severe drinking water crisis existed in the Ghogha area and therefore expected all villagers to happily support the newly created PSs that have been put in command of the O&M of the water and sanitation facilities might feel disappointed. This was not a realistic expectation, however. Viable, sustainable, independent and efficient institutions cannot be established overnight. First a process of institutionalisation has to occur for which social guidance is needed. But this does not have to take six years as in the Ghogha project.

Learning from the market

In the Ghogha project the promotion of clean water and sanitation is mainly done on the basis of the intellectual and rational argument that it would improve health. The message does not always come across, however, as the relationship between cleanliness and health is not clear to all. Old people say I have come of age anyway. Others would argue that it is good to harden oneself in order to be fit to survive under all circumstances.

But human nature has other aspects than rationality. Comfort, taste, vanity and its counterpart shame might prove to be more effective ways to persuasion. Commercial marketing is usually focused on these feelings rather than on knowledge. But water and sanitation facilities must have a high service level if they are to be promoted as objects of individual pride. That means house connections instead of standposts and private washing facilities instead of public ones at a distance.

It is not only the contents of the promotional message that matters; equally important is the style in which it is presented. The Ghogha project has relied on lecturing and preaching where in commercial marketing one would rather opt for providing a first experience by handing out free samples.

A door-to-door garbage collection programme in Goa[3] that started on a pay-as-you-like basis is an example of the second approach. As soon as the positive effects became clear the large majority of households started to contribute. The subsidized provision of soakpits in the Ghogha project might become a similar success.

Lessons to be learned

The Ghogha project started as a supply-driven project. The initiators had little confidence in the capacities of the target villages to decide for themselves on what they needed. Participation was called for, but only to sell the project, not to adjust it to the needs of the target villages. It proved to be very difficult to redirect the project in the course of time. The decisions made at the beginning and their effects could not be undone. The village

[2] The fact that drinking water facilities are exclusively used by women does not stimulate things either.
[3] Reported during the Water and Sanitation session of the Education for a Sustainable Future conference at CEE, Ahmedabad, on January 18 – 20, 2005.

populations did take ownership of the constructed facilities halfheartedly. Where possible they prefer to use their traditional water sources, refurbished through WRM measures.

Many lessons can be drawn from the Ghogha project. The most striking one s follow below.

- Rural drinking water supply and sanitation projects should give priority to villages that are eager to participate in the programme.
- The popular assumption that existing social relations in a village provide a sound basis to a new modern organisation created for a specific purpose like water supply management is false. Rational businesslike, i.e. paying for water that so far has been free, is not easily accepted.
- Where factionalism is strong, communal village water supply schemes might not be feasible. Instead individual solutions in water supply should be looked into, like private reservoirs with handpumps, to be filled with roof rainwater and/or commercial tankers.
- The interest of each village participating in a drinking water supply and sanitation programme should be assessed regularly. If it subsides, the assistance should be put on hold until the interest rises again. Simply continuing the efforts of social engineers is not a solution.
- Village water supply schemes should have a high service level, i.e. water should be accessible at all times of the day in or next to the homestead. To this purpose individual and cluster storage reservoirs must be promoted by all possible means.
- A high ground level reservoir supplying a number of cluster reservoirs fitted with a handpump offers ample service hours and the opportunity to store water. Individual house connections are another high service level option.
- The negative impact of power failures on the service level of a village drinking water supply scheme can be minimised by constructing additional sumps with handpumps, by making use of elevations in the terrain to supply water by gravity or by installing diesel pumps and generators.
- A rural water supply project could start with WRM activities that would enhance the productivity of the traditional sources of drinking water. It is comparatively easy to implement and might initially have an important effect.
- In the promotion of water supply and sanitation facilities seductive arguments as comfort and luxury could be more effective than teaching and preaching about health and hygiene.
- Community toilets are not feasible.
- School sanitation blocks need to avail of water at all times.
- Washing facilities that don't provide a bucket of water in seconds are useless.
- Village women prefer to do their washing in the open, where they can see all and are protected by the eyes of all.
- If provided sufficient individual storage of water is possible Bathing is preferably done in the privacy of a courtyard. The same will enhance the installation of private pour-flush toilets. In most rural areas the social control on the disposal of garbage and wastewater in public areas is still weak. It has to be nurtured carefully. Providing the experience of clean surroundings might be much more effective than a stream of lectures on the subject.

House connections have a high level of convenience. Moreover, they make individual storage, private washing/bathing rooms and pour-flush toilets a viable option

Scaling up from Ghogha project to ERR project

The experience gained under the Ghogha project laid the foundation for scaling up the sector reforms and moving on to the ERR project.

R.K. Sama and Sabyasachi Sarkar

Summary

The lessons obtained from the Ghogha project have been incorporated in the formulation and implementation of ERR project. ERR project is a scaled-up project to cover 1260 villages in earthquake-affected areas and the project period is 5 years. While reviewing Phase I of the Ghogha project, it was felt that a special purpose vehicle would be necessary to implement such projects. WASMO was created for this purpose and Phase II of Ghogha project and ERR project were facilitated by it. This paper describes the ERR project, its components, implementation structure and the current challenges it is faced with.

Preamble

The experience of Community-managed Ghogha regional water supply and sanitation project are presented by Ms. Kruti Makwana elsewhere in this compendium and thus that paper may be referred for details of Ghogha project. The learning from this project is incorporated in formulation and implementation of ERR project. ERR project is a scaled up project to cover 1260 villages in earthquake affected areas and the project period is five years. While reviewing Phase I of the Ghogha project, it was felt that a special purpose vehicle would be necessary to implement such projects. WASMO was created for this purpose and Phase II of Ghogha project and Community-managed development of water supply & sanitation programme in earthquake-affected areas of Gujarat be facilitated by WASMO. Experience and learning from Ghogha project is in Annex 1.

Introduction to the ERR project

On January 26, 2001, the Gujarat state was hit by a devastating earthquake measuring 6.9 on the Richter scale. The earthquake resulted in a great loss of human lives and destroyed infrastructure in Kutch district, and to a lesser extent in the districts of Jamnagar, Patan, Rajkot and Surendrangar. Water supply systems in urban and rural areas were severely affected. Piped water supply systems, in-village facilities, water harvesting systems and traditional water storage structures – essentially the lifeline of these drought-prone districts – lay destroyed. Earthen dams and small reservoirs that provided water for irrigation,

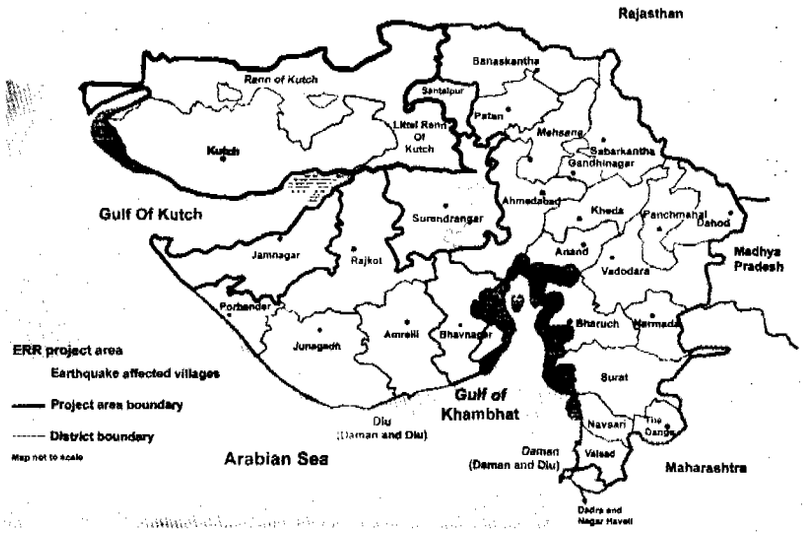


Table 1: Details of the ERR project	
Component	Details (Amount in Rs lakh)
Total project provision	17,226.78
Royal Netherlands Embassy (RNE) Share	2632.00
Government of India (GoI)	12,248.00
Government of Gujarat (GoG)	1620.00
Project period	5 years
Start date	October 1, 2002
Closing date	September 30, 2007

Table 2: Programme coverage of ERR project		
Programme coverage	Number of talukas	Number of villages participating
ERR project		
Kutch district	10	875
Santalpur taluka, Patan district	1	103
Surendranagar district	7	136
Jamnagar district	10	146
Total	28	1260

industry, rural and domestic needs were damaged. The need for substantial overall reconstruction was evident.

The community-managed development of water and sanitation programme was conceptualized to rehabilitate and reconstruct drinking water supply systems, local water resource management and environmental sanitation in 1,260 earthquake-affected villages of Jamnagar, Kutch, Santalpur taluka of Patan district and Surendranagar district of Gujarat state. This five-year project incorporates reconstruction of water and sanitation facilities on the principles of sector reforms in the water and sanitation sector.

Objectives

This five-year project incorporates reconstruction of water and sanitation facilities on the principles of sector reforms in the water and sanitation sector. The primary objectives of the programme are to:

i. Restore water supply to all earthquake-affected villages by establishing de-centralized, demand-driven, community-owned rural water supply and sanitation systems, planned, approved, implemented, operated and managed by the local community, thus ensuring sustainability.
ii. Provide drinking water security through an integrated combination of pipe, local traditional water sources and multiple sources for alternative use.
iii. Conserve water through water resource management that includes rain water harvesting and artificial recharge, conservation and renovation of traditional water sources.
iv. Build effective community institutions at the local level by supporting capacity building and empowerment.
v. Ensure that all community groups, including women, are able to participate in the decision making processes and benefit from programme improvements.
vi. Improve household and community environments with sanitation improvement and increased hygiene awareness in communities.
vii. Provide implementation support to communities through independent civil society organizations who will function as Implementation Support Agencies (ISAs).

Implementation strategy of ERR project

The focus of the programme is community participation at all stages of the programme, right from work identification, planning and execution, to management of the created in-village water supply and sanitation facilities.

Programme cycle

A programme cycle for village community facilitation and dispersal of funds has been developed to facilitate implementation in an organized manner. The first six months of implementation is essentially to facilitate the

programme implementation by mobilizing the community and assisting the Pani Samiti in organizing the work where:

- The programme is introduced and accepted.
- An assessment of water and sanitation requirements is made.
- The Pani Samiti is formed.
- An in-village water and sanitation action plan (VAP) is prepared and accepted in the Gram Sabha.
- Technical options are generated by Engineering Support Cell (ESC) in consultation with Pani Samiti. ESC team conducts survey, prepares design and estimates in vernacular language for the works accepted by the Pani Samiti. Work plan arrangements including contracts are prepared by Pani Samiti.
- The villagers are organized for implementation of the VAP.
- Simultaneous capacity building exercises are done to ensure proper implementation.

The next twelve months is for execution of the activities planned as a part of Village Action Plan:

- Community-managed and monitored construction activities are implemented.
- The completed and commissioned water supply and sanitation systems are operated and managed by the community.

Gram Sabha is an important tool in raising awareness among the community and eliciting their participation. It facilitates decision making, helps in resolving conflicts and contributes towards building up transparency in the entire process of programme implementation. Gram Sabhas are conducted for forming Pani Samiti, preparation of village action plan, deciding on community contribution, acceptance of village action plan, presentation of work plan arrangements incl. contracts, approval of expenditure, appraisal of work and for final settlement of accounts. These Gram Sabhas are attended by representatives of ISAs / Coordination, Monitoring and Support Unit (CMSU).

Operational structure

Physical Operation

The programme pivots on community participation at all stages, from work identification, planning, execution to management of the in-village and water sanitation facilities created. Institutions have been set up at the village, district and state level to facilitate this process.

- Pani Samiti
  Pani Samiti, as an extension of Gram Panchayat is formed in every programme village to shoulder the responsibility of programme implementation, improvement in the water and sanitation facility in the village. These Pani Samities are formed in accordance with the Government Resolution issued by the State Government. The Pani Samiti is responsible for planning, implementation and subsequent operation and maintenance of the facilities created and is formed by Gram Panchayat in Gram Sabha. Women in the village are encouraged to actively participate at all stages of the programme.

- Empowered Committee
  In every village, an Empowered Committee, comprising of members of the Pani Samiti, representative of ISA and CMSU is constituted. The member of ISA and ESC assists the Pani Samiti in procurement of material and fixing of labour contract thus ensuring execution of quality work and timely completion of the programme.

- Coordination Monitoring and Support Unit
  Coordination Monitoring and Support Units (CMSU) are set up at the district

WASMO was set up to facilitate reforms in rural drinking water supply and sanitation sector

The implementation of the project is facilitated and supported by a Steering Committee and Implementation Support Agencies

level for supporting, coordinating and monitoring the implementation of the programme. The CMSUs provide guidance and facilitate the functioning of the Pani Samiti/ Gram Panchayat and Implementation Support Agencies and monitors the progress of the programme. It also promotes the sector objectives and represents WASMO.

- Engineering Support Cell
  Engineering support cells are established to provide assistance to the village community in construction related activities. The engineers provide assistance in investigation, conducting feasibility studies, identification of sources and technical options that are cost effective both in terms of capital cost as well as operation and maintenance cost, preparation of design and engineering drawings of the activities identified as a part of Village Action Plan. The team of engineers also assists the Pani Samiti in preparation of contracts and sourcing of material of acceptable quality, supervision of the quality and timely completion of works.

- Head Office, WASMO
  The Head Office promotes and facilitates the demand driven, decentralized and community-managed water and sanitation system in the programme villages. It facilitates the implementation of the programme through development of guidelines, appropriate operational procedures, coordinates and monitors the implementation of the programme at the state level. It is equipped with multi disciplinary team members from management, engineering, social sciences, information technology, finance and environmental science.

- Steering Committee
  The implementation of the ERR project is facilitated through a Steering Committee which meets bi-annually. This Committee comprises of representatives of partner organizations, academicians from renowned educational institutes like Institute of Rural Management, Gujarat Institute of Development Research, Chief Executive Officer, Chief Engineer and the Unit Managers. This Committee works on evolving strategies for expeditious implementation of the programme and suggests improvements needed for successful implementation of the programme. The Steering Committee also reviews the progress with special emphasis on community participation, work done by Gram Panchayat and Pani Samitis, performance of field units, ISAs and other partner agencies.

- Implementation Support Agency
  The Implementation Support Agencies provide implementation support to the Pani Samities and the village community. The ISAs who have capacity to effectively partner in the programme, have a strong presence in the programme area and have experience in water and sanitation sector have been selected to facilitate programme implementation. 31 Implementation Support Agencies are partnering in the programme. These ISAs are equipped with a competent team of a coordinator, social and technical engineer and community mobilizers who have expertise and experience in community participation, gender, capacity building, training, rural technology and conversant with the programme.

  The ISAs support the formation and capacity building of the Pani Samiti members and community organisation in the villages through a learning and consolidation process, provides guidance and training on a wide range of issues. Workshops are conducted at CMSU where ISA and CMSU functionaries have interactive sessions on important

aspects of programme implementation. This is an ongoing activity during the entire programme duration. A close partnership is forged between ISA, CMSU and ESC.

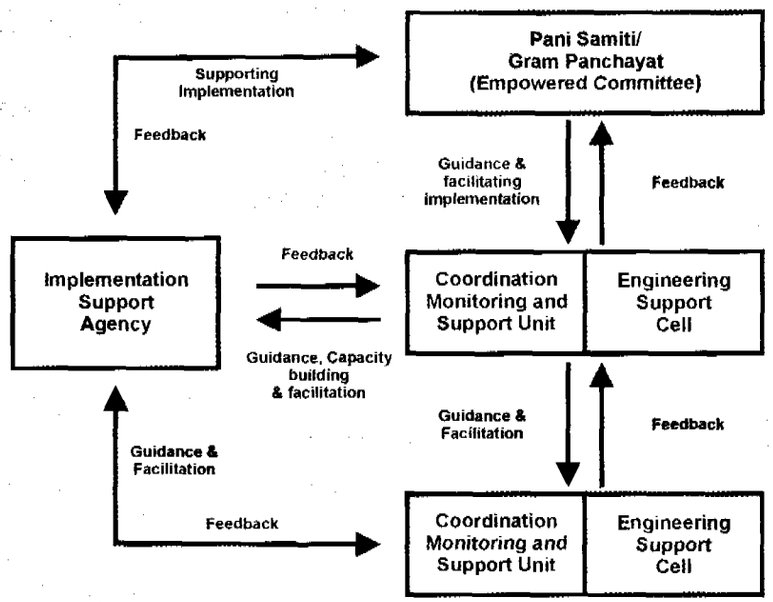
Financial operations

The WASMO head office disburses funds in installments to the CMSU which in turn disburses these to Pani Samitis for programme implementation and to ISAs towards meeting their operating costs. All efforts are made to ensure transparency in funds released and utilized.

Steps for programme implementation

1. Formation of Pani Samiti with Gram Panchayat and Gram Sabha involvement and in coordination with the ISA.
2. Planning for village water supply and sanitation facilities.
   - Preparation of proposal.
   - Fixation of household community contribution as proposed by Pani Samiti and presented in the Gram Sabha.
3. Opening of bank account in the name of Pani Samiti and deposit of the community contribution.
4. Submission of proposal to the CMSU for financial and technical assistance.
5. Technical assessment and preparation of VAP by Pani Samiti members and villagers along with representatives of ISA and engineers.
6. After acceptance of VAP by WASMO, presentation of the same in the Gram Sabha for approval.
7. Disbursement of funds by CMSU.
8. Implementation of VAP under supervision by Pani Samiti with support from the ESC and ISA.
9. Maintenance of all accounts and records by Pani Samiti.
10. Monitoring by the ISA and CMSU to ensure:
    - Progress of work structures.
    - Quality of work maintained by using standard materials in the structure.
    - Transparency maintained and the details of VAP and its financial sanction displayed at a prominent public place.
    - All prescribed standards and procedures adhered to by Pani Samiti.
11. Award of fund utilization certificate by WASMO after successful completion of work.
12. Operation and maintenance methodology by the Pani Samiti.
13. Fixation of water tariff charges by the Pani Samiti and its approval in the Gram Sabha.

Figure 1: Operational Mechanism



Capacity Building

WASMO training activities focuses on the following main four areas:

Orientation workshops for ISA Representatives

At various stages of the programme workshops are organized with ISAs with different objectives viz.(a) common understanding of the programme (b) For discussion of work plan for implementation of the programme(c) For communicating the spirit, approach and implementation strategies of the programme.

For programme effectiveness, an array of IEC interventions using different media was implemented

Pani Samiti Orientation

Training to Pani Samiti members are given to make them aware of their roles and responsibilities. Also they are trained on maintaining books of accounts and records, technical and quality issues.

Construction Management

Training on construction was imparted to 180 masons. One demonstration toilet unit was constructed by one of the trained masons which had served three purposes: Upgrading skills of masons, sanitation awareness among village community and providing the unit to a poor household.

Operation and Maintenance

Training on operation, maintenance and fixation of water tariff was conducted for Pani Samiti members and water supply system operators. Technical details of the facilities created, routine operation and maintenance schedules, inventory management, attending to minor repairs, methods of fixing tariffs and record keeping were parts of this training module.

Water Resources Management

Water Resource Management (WRM) training was given to different stakeholder with an objective to educate them the importance of water recharging, measures to be taken to select the sites and structures for WRM, the budget estimation and mobilization of fund and rationale use of water

To address above-mentioned areas, following training modules are used

1. Orientation programme about decentralization approach - reform programme
2. Capacity building of Pani Samiti members
3. School health education and sanitation programme
4. Women involvement in Pani Samiti
5. Pre construction training
6. Operation & maintenance
7. Water quality surveillance
8. Water resource management

Information, Education and Communication

For effective implementation of the programme the following IEC strategies are devised

i.) Printed material for information and education

Various brochures, leaflets, posters, banners on sanitation cleanliness have been developed. Booklets and detailed guidelines for Pani Samiti have been developed to make them aware about the concept and their role and responsibilities as a member of Pani Samiti.

ii.) Painting of slogans

Slogans giving various messages on water conservation and its proper use, importance of hygiene and sanitation are painted on community buildings to educate people.

iii.) Airing of messages on All India Radio

Messages weaving around programme objectives are aired on All India Radio.

iv.) Street plays and Lok Dayro

Street plays are organized to convey the messages on basic health, hygiene and sanitation.

v.) Melas

To get across the messages on cleanliness, personal hygiene, health and AIDS awareness to the rural mass, WASMO actively participated in local melas.

Challenge of this project

- To forge partnership with NGOs, CBOs, village community and create synergy of action to facilitate empowerment of community and build up capacity of Gram Panchayat/ Pani Samiti.

- To create an enabling organisation, which genuinely has trust and faith in the capacities of community and partners, equip and empower them with tools to plan, implement and manage the in-village drinking water and sanitation system of their own.
- Ensuring sustainability of the system by framing efficient O&M mechanism by Pani Samiti and designing a tariff system themselves so as to pay for the services.

The following aspects were considered and due care was taken to incorporate them.

Institutional aspects

Decentralisation

The responsibility for its implementation has been largely transferred to three CMSUs in Bhuj, Surendranagar and Jamnagar, each with one or more Engineering Support Cells (ESC). Most of decision making is done at CMSU or ESC's level. For important decision, committees have been formed to take collective decision in which one or two persons from Head Office also participate.

Personnel of field offices

WASMO selected and recruited the personnel, mostly from the open market and from the GWSSB and other department on the basis of deputation. The three CMSU managers are non-engineers, seconded by an executive engineer. As a result the CMSUs have been peopled-oriented from the beginning, functioning in an integrated way. The team thus created is young, energetic and is motivated to learn and grow. They are provided guidance by very senior experienced persons, and are managed by system, which is designed to assist them to perform.

Prior selection of target villages

The ERR was designed for 1,260 earthquake affected villages, too many to deal with at one time. Those villages that approached a CMSU at their own initiative were given priority, to set examples and to gain experience. The limited number of villages that have been unable to unite internally for an express of interest in the project have been put on hold, to be dealt with later, which other affected villages are included to make up for numbers

Position and role of NGOs

31 NGOs is involved in the ERR project. They were selected because of their experience in the area and in the water and sanitation sector, and assigned to the villages they were involved in because of earthquake relief works. The NGOs play an important role in motivating the villages to improve their water supply and sanitation in the preparation of the O&M of the facilities. The CMSUs are clearly in command and direct the whole process, though.

Construction execution- head C

In the project the facilities are constructed village by village. The village Pani Samitis decides to engage a contractor for all or parts of the works and which activities (e.g. procurement of materials) will be done under their own management.

Implementation aspect - head B

Beneficiaries contribution - head C

In the ERR project villages have to at least contribute 10% of the capital costs. Their commitment in this is regarded as proof that the project is really demand-driven. The CMSUs see to it that all households pay their share as decided by the Pani Samiti. Construction advances are released in relation to the amount that been contributed. The second and following installments are paid only when 90% of the previous advance and corresponding village contribution have been spent. The expenditure for O&M has to be met completely by the water users.

Beneficiaries' influence on the selection of facilities

The water and sanitation facilities are the main subject of Village Action Plan (VAP) that

Care has been taken to ensure that the institutional structure supports and lends itself to achieve programme objectives

is compiled by the Pani Samiti with support of the NGO and CMSU. It is evolved by multi level group consultation and discussion in Gram Sabha. Participation of women and deprived class is ensured by having separate meeting with them. It may happen that the villagers simply ask for the same facilities as they have seen elsewhere, without giving due consideration to the scope for improvement to suit their needs. But in general they want user friendly facilities for their, and the project's money. House connections are preferred over stand posts, if there is adequate water source. This also motivates them to construct latrines, storage and bathrooms. Cluster storage reservoirs with hand pumps are an alternative way to make quality water available around the clock.

Hygiene awareness

Hygiene and especially the importance of clean water is part of all communication with villages in the project. It enhances the interest in water supply schemes. The message is spread in many ways brochures, talks, exposure visits, radio, street plays, etc. School children are targeted along with the construction of roof water harvesting activities and sanitation corner for boys and girls separately on the school premises. All the aspects of hygiene, safe handling of water, waste water disposal alongwith solid waste management and planting of trees in school premises is encouraged. The protection of open wells from which water is drawn for the local scheme has been targetted. Individual soak pits or other waste water disposal system is a precondition for sanction of the project. Motivation to build bath rooms and latrines by individual became high in these villages and around 90 villages are nearing hundred percentage coverage.

Arrangements for O&M

From the very start of the contacts with the villages the condition that the Pani Samiti will be responsible for O&M is brought up. The CMSUs and ISA's representatives spend much time on guiding the village communities how to decide on the water tariff. Transparency is an important factor in reaching agreement on a tariff considered to be just and affordable by all. In a sizeable number of villages the collection of water rates started even before the commissioning the schemes.

Role of women

The RR project started not long after a Government regulation had ordained that women should occupy at least one third of the positions in a Pani Samiti. The CMSUs and NGOs have always seen to it that women were actively involved in decision making. After all they are the users of water. New leadership is emerging, as communities especially women, begin to participate and take active interest in their village development.

Annex - 1

Physical and financial progress as on March 31, 2006

The community-managed development of water and sanitation programme was launched in April 2003 and has made commendable progress with whole hearted involvement and tremendous response from the communities. The programme has been introduced in all the 1260 villages of Kutch, Santalpur taluka of Patan, Surendranagar and Jamnagar district. 31 Implementation Support Agencies are partnering in the programme and all the 1260 villages have been allotted to these Implementation Support Agencies.

Pani Samitis have been formed in 1193 villages out of which village action plans have been prepared in 964 villages. District wise physical and financial progress at a glance is given in Table 3.

Table 3: Physical and financial progress of ERR

Activities	Kutch	Patan (S'Pur)	J'Nagar	S'Nagar	Total
Formation of Pani Samiti	803	72	167	151	1193
Opening of Bank Account	756	70	162	137	1125
Preparation of Village Action Plan	609	66	149	140	964
Finalization of VAP	574	65	143	135	917
Disbursement of funds	451	61	142	130	784
Start of work	440	50	128	130	748
Work nearing completion/ completed	291	30	22	56	399
Fixation of water and sanitation tariff	339	9	13	70	431

Financial progress (cumulative expenditure)

Total cost of project is Rs. 172.28 crore. Initially it was agreed that 90 % of project cost would be financially assisted by Government of Netherlands and remaining 10 % by Governmentt of Gujarat. Share of financial assistance of Government of Netherlands was taken over by Government of India with effect from April 01, 2004

(Rupees lakh)

Table 4: Financial progress of ERR project

Components	Bhuj + Patan	J'Nagar	S'Nagar	HO	Total
VWSS	2512.52	729.67	958.84	0.58	4201.61
WRM	1034.83	64.97	118.21	10.35	1228.36
Sanitation	221.76	123.94	68.42	0.00	414.12
Pani Samiti	24.05	0.00	8.32	0.00	32.37
Initial O & M	12.44	0.00	0.00	0.00	12.44
R & R	70.38	0.26	23.43	18.17	112.24
NGOs Cost	569.07	90.00	68.61	33.27	760.95
CMSU Cost	188.90	50.80	73.01	28.84	341.55
ESC Cost	113.80	61.01	69.25	23.45	267.50
Total	4747.75	1120.64	1388.09	114.67	7371.15

Annex - 2

Experience and learning from Ghogha project

Introduction to Ghogha Project

Ghogha was a pilot project in the rural water supply and sanitation sector with a focus on community participation and ownership. Its history predates that of WASMO. Its first phase, jointly supported by the Government of Netherlands and the Government of Gujarat, lasted from August 1997 to August 2002. It was in the second phase, from September 2002 to June 2005, that WASMO stepped in. The project covered an area of 614 square kilometers in the coastal area along the Gulf of Cambay, a region that is characterized by erratic rainfall, poor water quality and inadequate sanitation. The project benefited 82 water-deficit villages in Bhavnagar district. About 200,000 people now avail of safe and chlorinated drinking water and sanitation facilities through the construction of village-level drinking water and sanitation systems. This project is also a landmark as it managed to achieve equity and women's empowerment in a traditional and caste ridden society.

Table 1: Details of the Ghogha project

Component	Details (Amount in Rs lakh)
Total project provision	5,960.41
Royal Netherlands Embassy (RNE) Share	5,088.06
Government of Gujarat (GoG)	872.35
Project period	7 years, 11 months
Start date	August 7, 1997
Closing date	June 30, 2005

The project was overseen by a WASMO's Community Management Support Unit in Bhavnagar, with the help of Implementation Support Agencies (ISAs). Together, they assisted village level pani samitis in developing and maintaining local water and sanitation systems. Experiences of community-managed Ghogha Regional Water Supply and Sanitation Project (1999-2005) is presented else where in this compendium, which may be referred for details.

Gains of the Ghogha project

The important learnings are captured here, which provided base for community-managed development of water supply and sanitation programme's formulation and implementation in Gujarat.

Physical benefit of the Ghogha project

i. Increased availability of clean, safe, adequate and regular drinking provided through stand posts in all project villages and 2307 household connections in 13 villages[1]. Water is being supplied through a gravity flow piped distribution system within the villages at a maximum distance of 150 meters to the houses.
ii. Drinking water at village level has been assured by connecting each of the project villages to Mahi pipeline network through Budhel and Tansa zones. Treatment plants at both the zones provide water after treatment and disinfection.
iii. Ground water level in most of the project villages has gone up by 3 to 7 meter because of construction of water resource management structures. Apart from increase in quantity, quality of ground water has also improved.
iv. The prospects of improving health and hygiene at household as well as village level are increased with the activities-soak pits / drainage, Wash Facilities (WF), demonstration latrines, school sanitation corners and hygiene promotion campaigns and constructing latrine by themselves.

[1] In all 13 villages, the facility of household connections for water supply has created by the Pani Samitis and communities themselves with out any financial support from WASMO or other agency and as per their requirement.

Socio-Economic benefits especially to women

i. The project has provided a unique occasion for the community to come together irrespective of their caste and status to work for their water supply and sanitation facilities.
ii. Reservation in Pani Samiti for deprived sections and women and involvement of user groups in site selection for the facilities has offered an opportunity to communities to be part of decision making process in the village. Many of them have taken lead.
iii. Availability of drinking water has reduced the time and drudgery in fetching water, and now more time is available for economic and social activities.
iv. Involvement of community in construction activities especially in construction of check dams has built their skills to take up such activities for generating income.
v. As quoted by communities in many villages, expenditure on medicine and hospital bills has been reduced as numbers of incidence of water-borne diseases are decreased.
vi. The project has a major impact of adequate availability of water, sanitation, and hygiene and is best described by the women themselves: one woman leader mentioned that the project has added five years to her life (Monghiben at a focus group discussion in Neswad village, November 2004)[2]. In some villages, women reported that there is visible drop in skin diseases and incidence of diarrhea. Attendance of girls in schools had increased and they have more time for socializing and productive work.
vii. Women's involvement in Pani Samitis, SHGs and project activities has also improved their social position, influence and visibility in public life, though practices of purdah (seclusion) and gender discrimination remain major constraints for improving gender equality.

Institutional development

i. Functioning of Pani Samitis with community participation ensured through Gram Sabha is a giant step in developing panchayat system to facilitate decentralization in decision-making and enhances transparency.
ii. Transparency mandated under the project has increased the faith of the community in the Government. Communities are paying their O&M charges regularly, which are being managed by the respective Pani Samitis.
iii. The increased development and reliance on local sources for the water supply system in addition to pipe line has led to a faith that regular and adequate water supply will be available, thus increasing their control to obtain drinking water security.
iv. Detailed Technical Specifications have been translated in Gujarati (local language) which has helped the communities to understand and follow the technical aspect of the project.[3]

Problems faced and lessons learnt

Though, the Ghogha project has been able to bring appreciable visible benefits, these have not been commensurate to efforts made and high cost of delivery. It is due to various constraints. The project had to be extended in period, but it certainly broke new grounds. The major problems that emerged while implementing the Ghogha project are as follows:

i. Number of project villages were predefined and villages were not given flexibility for not participating in the project. This led to supply driven project, rather than demand driven.
ii. In the initial stage, the project had suffered by conflicting behavior of the implementing organizations. GWSSB, being a traditional engineering organization, was not able to obtain full involvement of the communities in planning and implementation. Lack of coordination among the GWSSB staff and ISAs had led to operational problems. Besides, non flexible procedures and norms of GWSSB left little scope for communities to get involved in designing their water supply structures, the service levels they required and in choosing the technology most appropriate for them. By and large it remained supply driven.

[2] "Which water?" Final project progress assessment report, November 2004.
[3] Translation of technical norms and specifications has been done for the first time in Tamilnadu and than in Gujarat.

iii. The primary stage of the project suffered from conflicting opinions about the choice of sustainable source. While the government of Gujarat believed that using bulk water system (firstly Shetrunji reservoir and later Mahi pipeline) was the only feasible option, Netherland's experts emphasized on decentralization and greater user involvement by using local sources, for improved sustainability. Failures of tube wells drilled led to extensive review of the different possibilities for sustainable water supply in the project area. A strategy of multiple sourcing along with strengthening of local sources strengthening by WRM activities with additional water from Mahi-based pipeline to assure drinking water availability in the project area was adopted.

iv. Water Resource Management has started in late 2003 which took considerable time to survey, plan and internalization by the community. Once they visualized the benefits, the demand for more structures led to delay.

v. Hygiene promotion and environmental sanitation component got delayed in absence of village water supply facilities, which got considerably delayed.

Institutional aspects

Decentralisation

The Gujarat Water Supply and Sewerage Board (GWSSB) owned the Ghogha project, receiving financial support from the Royal Netherlands Embassy, who followed the project closely. The opinions of these stakeholders on what was essential for the target villages did not always converge immediately and completely. A Project Support and Implementation Unit (PSIU) and a Netherlands Assisted Project Unit (NAPU) were set up in Bhavnagar, near the project area. The PSIU had little autonomy. All plans and decisions needed to be sanctioned by the GWSSB main office, which was a time consuming process. When WASMO took over the responsibility for the project the PSIU became a Coordination and Monitoring Support Unit (CMSU) and was given more freedom.

Personnel of field offices

Initially the staff of the Ghogha PSIU consisted entirely of GWSSB engineers with NAPU providing consultants of a more varied background. When WASMO, took over, the composition was changed to become more people-oriented.

Prior selection of target villages

The number of villages in the Ghogha project was decided in the project documents and has never been changed. This led to a situation, where community visualized it as a need of the project, rather than their need.

Position and role of NGOs

The three NGOs engaged under the Ghogha project as Implementation Support Agencies (ISA) were introduced to make the project participatory. Their role was to promote hygiene and to prepare and train the village Pani Samitis for the O&M of the facilities to be constructed. Also, they were responsible for the collection of initial O&M funds, regarded as expression of the village's sincere interest in the project. The NGOs supported by the RNE, considered themselves to be independent stakeholders in assistance for only these activities. Roles and responsibilities of ISAs were not only unclear, but not suitably prescribed. Thus, software activities were not supportive to creation of facilities.

Construction execution

In the Ghogha project the GWSSB contracted two firms for the construction of the water and sanitation facilities. It was thought that only selected firms would be able to provide quality. Their schedules conflicted with the conscientisation processes started by the NGOs resulting in serious delays. Later WASMO allowed the village Pani Samitis to engage in the construction directly in remaining villages.

Implementation process

Beneficiaries contribution

In the Ghogha project no contribution towards the capital costs of the schemes has been asked from the villagers. However, to demonstrate the sincerity of their interest in the facilities, they would have to deposit an amount equal o 10% of the capital costs prior to the start of the construction. From these the O&M costs in the first year would be met. The NGOs supervised the collection. But it was often thought that the amount was far more than would be needed. Therefore villagers reserved the right to withdraw their contributions. It also happened that a party interested to start construction without further delays advanced the amount. Not all villages have collected the amount set; nevertheless no village was dropped because it failed to meet the condition.

Beneficiaries' influence on the selection of facilities

In the Ghogha project the PSIU engineers decided on the design of the water and sanitation facilities. They opted for a standard set for all villages. This led to duplicating some of the existing facilities. Engineers had no faith in Pani Samiti to entrust the construction work and negotiated relatively large contracts with contractors. Their standard set included a sump to be filled through a bulk water pipeline and where, possible, from a local source, a pump-house with machinery, and an erected storage reservoir from which water would flow to stand posts and washing facilities at certain times of the day. It was overlooked that the traditional sources of water, when functioning, were usually more convenient to the users than the stand posts. Also the design of washing facilities was not user friendly and the fact that community facilities are used as the last resort. Consequently both types of facility are underutilized.

Hygiene awareness

In the Ghogha project creating hygiene awareness was a major activity of the NGOs engaged as ISAs. They developed information materials, organized campaigns and competitions, etc. These activities were effective, especially among the school children. Their personal hygiene improved and they also insisted on clean practices in the home, storing and handling of drinking water. At the end of the project also the interest in waste disposal increased. Subsidised soak pits proved to be very popular. But also the number of toilets went up, even without a subsidy.

Arrangements for O&M

In the Ghogha project it was the ISAs who took the lead in the preparation of the O&M arrangements. They explained the details of the scheme, arranged for technical training of operators and training in management and accounts for Pani Samitis. The NGOs had a hard time in convincing the future water users of the necessity to pay their contribution to the O&M of the schemes.

Role of women

The ISAs in the Ghogha project have made great efforts to reach out to the women in the area, which was not easy because of prevailing cultural traditions. Efforts did bear fruits and were not limited to improving hygiene, but they responded by acting at crucial moments to maintain their villages' interest in the project and to see to it that quality standards were adhered to.

Implementing Swajaldhara: Evolution, experiences and scaling up

Within two years considerable progess has been made in implementing Swajaldhara in true spirit. With the committment to implement all rural drinking water schemes on reform principles, challenges are many and can be met through appropriate and flexible strategies that build upon experience

R K Sama and Divyang Waghela

Summary

More than two years have lapsed since implementation of Swajaldhara started in Gujarat. Approximately 456 schemes have been completed and commissioned, several of which have been taken over by the community for operation and maintenance.

This paper describes the process involved in the implementation of Swajaldhara, including institutional mechanisms, processes adopted, activities undertaken, achievements and issues that emerged. It proposes a road map for future reform initiatives and for scaling up. More importantly, it describes how implementing Swajaldhara is in a transitional stage; indicating that the programme is flexible and efforts are being made to incorporate changes in the process of implementation wherever a need is perceived.

Introduction

Reforms in the rural drinking water supply sector were initiated in 1999 when pilot projects were taken up in selected districts of the country. In Gujarat, these pilot projects were launched in Mehsana, Rajkot and Surat districts.

The basic principles of these reforms are that in-village rural drinking water supply schemes will be community-driven and owned, where they will be involved in planning, implementation, O and M and management. This is a paradigm shift from

(a) a supply-driven to a demand-responsive;
(b) centralised to decentralised management; and,
(c) top-down to bottom-up approach, in which the role of the government is of a facilitator and not provider.

In December 2002, these reforms were universalised when Swajaldhara was launched throughout the country. In Gujarat, Swajaldhara was launched in mid-2003, and is currently being implemented in 13 districts. Since then, considerable demand has been generated through intensive information and capacity building drives. To meet the demand and to scale up the reforms throughout the state, the state government has initiated Sector Reform Scheme (State) in 11 districts supported from the state budget. With this, through various projects, all districts are being covered with rural drinking water supply programmes that are based on reform principles. As of March 31, 2006, this reform programme has been initiated in 4,500 of the 18,000 villages. The state government has resolved to cover all villages on reform principles within a definite time frame.

Need for reform

1999-2000, was a landmark year in institutionalising community participation and ownership in village drinking water supply. Prior to this, rural water supply programmes were supply-driven, designed

Swajaldhara was a landmark change in rural drinking water supply. Communities would now be the focus of efforts

and implemented by the government or its agencies. Though extensive coverage was achieved, over the years, sustainability of water sources and water supply systems proved to be a problem. The results were not commensurate with the investments.

The reforms stressed the adoption of a demand-responsive strategy and institutionalisation of community participation for sustainability of drinking water supply sources and systems in rural areas. It was expected that a participatory, demand-driven approach would provide the community with the level of service they required. Community participation in turn could be elicited if they (a) owned the assets; (b) have themselves planned and installed the systems; (c) are actively involved throughout the process; (d) are trained to do simple maintenance; (e) know that the government will not maintain the in-village systems; (f) have sufficient funds for maintenance; and, (g) have to pay for the O and M. There were already several examples from India and elsewhere which confirmed that this approach would go a long way in sustaining water sources and supply systems.

The Government of India also approved a revamping of the Accelerated Rural Water Supply Programme (ARWSP)1. This included a proposal to institutionalise a community-based, demand-driven rural water supply programme, gradually phasing out the technical norms-driven and centralised planning approach for implementation of rural water supply systems. Policy changes were brought about at the Center through the 73rd Amendment of the Constitution. The subject of rural water supply was placed under Panchayati Raj Institutions (PRIs) which were made responsible for providing safe drinking water with empowerment support from the Government of India. In Gujarat, three districts were identified for piloting sector reform (see Box: Sector Reform Pilot Project).

Swajaldhara: beyond sector reforms

In December 2002, sector reform was taken to a national level in the form of Swajaldhara and revised guidelines were issued in June 2003. The fundamental reform principles of Swajaldhara are:

(a) Demand-driven and community participation approach;
(b) Planning, implementation, O and M and management of all drinking water supply schemes by panchayats or communities;
(c) Partial capital cost sharing by the communities in cash or kind and 100 per cent responsibility of O and M;
(d) Adoption of water conservation measures such as rainwater harvesting and groundwater recharge systems for sustaining drinking water supply sources; and,
(e) Shift in the role of government from direct service delivery to that of planning, policy formulation, monitoring and evaluation and partial financial support.

Communities contribute a minimum of 10 per cent of the capital cost for a service level of 40 litres per capita per day (lpcd). In case of a service level of 55 lpcd, community contribution is set at 20 per cent. If the service level is more than 55 lpcd, the costs incurred over 55 lpcd will be borne by the community.

[1] In view of the magnitude of the problem and to accelerate the pace of coverage of the problem villages (PVs) in 1972-73, the Government of India introduced the Accelerated Rural Water Supply Programme (ARWSP) to assist the States and Union Territories with the cent per cent grants-in-aid to implement the schemes in villages. The ARWSP aims at providing safe and adequate drinking water facilities to the rural population by supplementing the efforts made by State Government / UTs under the State sector Minimum Need Programme (MNP).

Institutional framework

The institutional framework for implementing Swajaldhara has been formulated from the village to national level:

- National Swajaldhara Monitoring Committee (NSMC) as the national level monitoring agency;
- State Water and Sanitation Mission (SWSM) as the state level coordinating agency;
- District Water and Sanitation Committee (DWSC) as the district level coordinating and implementing agency; and,
- Village Water and Sanitation Committee (VWSC) as the village level implementing agency.

Swajaldhara in Gujarat

Swajaldhara is being implemented in 13 districts namely Ahmedabad, Anand, Bhavnagar, Bharuch, Banaskantha, Junagadh, Panchmahal, Patan, Rajkot, Sabarkantha, Surat, Vadodara and Valsad. To cover village water supply schemes in all districts under reform principles the State Government introduced the Sector Reform Scheme (State) in October, 2004 with provisions for funds from the state budget. This is being implemented in 11 districts namely Amreli, Dahod, Dangs, Gandhinagar, Jamnagar, Kheda, Mehsana, Narmada, Navsari and Porbandar, Surendranagar. Kutch district is not included under these programmes as it is included in the Earthquake Rehabilitation and Reconstruction programme which is also based on reform principles.

With this, all the 25 districts in the state are now covered under reform.

Facilitating Swajaldhara

Some of the initiatives taken in the state to facilitate sector reform and Swajaldhara include:

(i) The establishment of WASMO in 2002 as an independent organisation to facilitate in-village decentralised, demand-driven community-based drinking water supply and sanitation systems;

(ii) Designating WASMO as the SWSM for implementation of all reform-based programmes in the state;

(iii) Revision of the Pani Samiti Government Resolution (GR) in October 2002 to implement sector reform in true spirit. This GR specifies the position of the Pani Samiti as a functional committee of the gram panchayat, its composition, tasks and working procedures. Of the 12-15 members of Pani Samiti, one-third must be women. Reservation for SC and ST members is in proportion to their population in the village. The Pani Samiti is chaired either by the gram panchayat sarpanch (president) or a panchayat member elected by the Pani Samiti. This is in accordance with the 73rd Amendment in the Constitution, wherein the gram panchayat is held responsible

Sector Reform Pilot Project

In Gujarat, Mehsana, Rajkot and Surat districts were identified for pilot sector reform projects (SRP) with a funding provision of Rs 400 million each.

At the state level, the Gujarat Jal Sewa Training Institute (GJTI) coordinated the programme. The Secretary (Water Supply) was the Chairman of the State Water and Sanitation Mission (SWSM) and the Chief Engineer and Director (GJTI), the State Coordinator. At the district level, a District Water and Sanitation Mission (DWSM) were formed with the District Collector as chair and Executive Engineer of GWSSB as Member Secretary. An exclusive team of technical and non-technical officers deputed from GWSSB was responsible for overall coordination, implementation and monitoring. NGOs were selected to facilitate information, education and communication (IEC) campaigns, impart training for developing the capacity of the village community and to provide assistance to the Village Water and Sanitation Committee (VWSC).

Around 833 schemes were taken up for implementation. The extent of process-based implementation with active involvement of the community was perhaps not up to the desired levels, due to the sudden shift in approach and changed roles and responsibilities of the implementing agency and the community. Communities were not always forthcoming with their participation. It should perhaps be looked in the proper perspective, since this was a major shift in implementation process which involves a change in mind-sets at all the levels including that of community which takes time. In addition, targets that follow a process approach are still to be achieved. The State government has initiated a 'Rapid Assessment Study of SRP districts' to learn from the project, results of which are awaited.

A Government Resolution has been passed that mandates the implementation of rural drinking water schemes on reform principles

for planning, designing, implementing, operation and maintaining in-village drinking water supply schemes;

(iv) Issuance of a GR on September 5, 2003 for introduction of Swajaldhara;

(v) Issuance of a GR on September 24, 2003 mandating that all in-village water supply schemes will be implemented in reform mode and on Swajaldhara principles throughout the state;

(vi) Introduction and financing of the Sector Reform Scheme (State) in 11 districts.

(vii) Bulk transfer of water through pipeline networks up to village entry points to support local water sources. Even though local water sources are preferred and are strengthened with appropriate rainwater conservation measures, these may need augmentation during dry periods. The supplier will give water on volumetric basis and charge for the same. Within the village, the water supply system will follow reform principles.

Several other steps taken for effective decentralisation and management of sustainable in-village water supply included:

- Strengthening of existing institutions and setting up of new ones at the village, district and state level with defined roles (see Box: Institutional responsibilities);
- Forming networks, partnerships and linkages that bring together government institutions and departments, civil society organisations and research institutions to mobilise the community; bridge knowledge gaps; provide appropriate technology and management systems; and, empower the community;
- Community mobilisation, awareness and capacity building; and,
- Involving women at all stages and ensuring that they have a voice.

Implementation process

The following process is adopted for implementation of the scheme:

a) A Gram Sabha is convened where the drinking water supply situation in the village is discussed along with what Swajaldhara has to offer. If the Gram Sabha agrees to join the programme, a Pani Samiti is formed according to the GR and a resolution is passed.

b) A PRA is conducted with the help of the Core Team and NGO and a village action plan for drinking water supply, based on the demands and requirements of the people is prepared.

c) The Pani Samiti discusses various techno-economic options with the DWSC and a suitable water supply scheme is finalised.

d) The Pani Samiti collects the community contribution for the capital expenditure and deposits the same in a newly opened bank account. It maintains records and issues receipts for the same.

e) The Pani Samiti selects the executing agency with the help of the DWSC and the ISA, awards the contract and monitors the implementation of the scheme.

f) The Pani Samiti shares the accounts of the scheme expenditure on regular basis in the Gram Sabha.

g) Once the scheme is completed, the Pani Samiti takes over its O and M and decides the user charges. These are approved in the Gram Sabha and then operationalised for tariff recovery.

Progress

As of March 31, 2006 Pani Samitis have been formed in around 2,000 villages. Several activities were undertaken to generate demand from the villages which are made fully aware of their responsibilities and need for active participation. Efforts have been made to empower them so that they have the confidence and ability to develop and manage their drinking water supply system. It has included developing and strengthening the institutions at all levels in addition to undertaking activities as part of the programme.

Institutional responsibilities

An institutional framework for implementing Swajaldhara has been developed and includes the villagers, NGOs, GWSSB, Core Teams and WASMO, each of which have well-defined roles and functions.

1. State Water and Sanitation Mission

At the state level, as the SWSM for Swajaldhara, WASMO's responsibilities include:

a) Providing policy guidance;
b) Monitoring and evaluation of physical, financial and management performance of the water supply and sanitation projects;
c) Arranging for independent certification of the quality of construction in Swajaldhara projects;
d) Integrating and operating IEC and capacity development programmes for water supply and sanitation; and,
e) Interacting with the Government of India and funding agencies.

A Swajaldhara unit consisting of professionals in the fields of water engineering, management, finance and accounts has been established in WASMO to coordinate and monitor the programme. This unit avails of the services of other units of WASMO such as Documentation and Communication, Water Quality and Finance to add value to the programme. The added advantage with WASMO coordinating Swajaldhara is the experience and learning that is available with it. Since its inception, WASMO has been facilitating implementation of two Netherlands assisted community managed projects covering 1342 villages. In addition, the in-house expertise, infrastructure and strengths available in WASMO are also available for Swajaldhara.

2. District Water and Sanitation Committee

At the district level, DWSCs have been formed under the chairmanship of the District Collector. The Executive Engineer, GWSSB, is the Member Secretary. The GWSSB is responsible for all rural water supply schemes up to the village head and for overall implementation of Swajaldhara as well. As a facilitator for the village community through Pani Samiti, DWSC's functions include:

a) Sensitising public representatives, officials and the community about reform principles;
b) Generating demand by introducing Swajaldhara principles;
c) Undertaking IEC campaigns and capacity building of Pani Samitis;
d) Supporting Pani Samitis in formulation and execution of Swajaldhara schemes;
e) Scrutiny and approval of the schemes submitted by the Pani Samiti up to a maximum of Rs 25 lakh; and,
f) Monitoring of Swajaldhara progress.

3. Core Team

To provide implementation support to DWSCs and VWSCs mainly on social aspects of the process, a Core Team comprising of professionals from the field of water engineering, community mobilisation and documentation and communication have been set up in all 24 districts. The focus area of this team includes:

- Bridging the gap between technical and social engineering and working as a link between the DWSC and VWSCs;
- Implementation of social processes in the village, including Participatory Rural Appraisals;
- Sensitisation of the village community about Swajaldhara principles;
- Capacity building of the Pani Samiti in all aspects of the process such as record-keeping, construction management, quality monitoring and control; and,
- Facilitation of the community in scheme implementation.

4. Village Water and Sanitation Committee

At the village level, Swajaldhara is implemented through the Pani Samiti. The Pani Samiti is chaired by the gram panchayat President/ panchayat member who is elected by Pani Samiti members. This Samiti is responsible for planning, designing, implementing and operating and maintaining in-village drinking water supply systems constructed under the Swajaldhara programme.

Being a demand-responsive programme, the role of the Pani Samiti is crucial for mobilising the community to participate actively at every stage of the process. They have to collect community contribution and opt for a scheme which they are confident of managing on their own and which is equitable. Management of funds for the scheme rests with the Pani Samiti for which it has to build up trust amongst the community and maintain transparency as well.

5. NGO partners

In 2005 NGOs were invited to partner in the programme to utilise their outreach capability to ensure active participation of community at large. After a rigorous selection procedure, thirty experienced NGOs were selected to work as Implementation Support Agencies (ISAs).

Considerabe investment is being made to build up the capacity of all stakeholders to make Swajaldhara a success

Information, Education and Communication

Information, education and communication (IEC) campaigns informing about Swajaldhara principles and community participation are conducted in all the programme villages. IEC material in the form of posters, pamphlets, brochures and manuals focusing on specific issues relating to water and sanitation are developed and disseminated to the Pani Samiti in particular and the village community in general. This includes:

a) Swajaldhara brochure which provides information of project components;
b) Manuals such as the Pani Samiti Margdarshika (implementation guidelines for Pani Samitis), Technical and Financial Manual and an Operation and Maintenance Manual which provide detailed information to the Pani Samiti;
c) Posters which provide information about project components, importance of community participation and other issues. These have been displayed in gram panchayat offices, schools, aanganwadis, primary health centres and other institutions;
d) Painting of slogans related to water, sanitation, health and hygiene at public places in each programme village. So far, about 10,000 slogans have been painted.

Table 1 : The project cycle of Swajaldhara varies between 12 to 15 months and is divided into the following phases

Activities	Approximate duration (in weeks)
Programme introduction and acceptance	2
Formation of Pani Samiti and community mobilisation	4
Community contribution collection, opening of bank	
account and preparation of Village Action Plan (VAP)	
for the water supply system	8
Work organisation, planning and management	4
Physical implementation	28
Commissioning and taking over for O and M	6
Total number of weeks	52

Capacity building

Implementation of Swajaldhara is a significant shift from the previous mode of rural water supply. Considerable capacity building is thus necessary for all the stakeholders to make the programme a success.

Orientation workshops for Member Secretaries and staff of the DWSCs were conducted at the state level, where the lessons learnt from SRP and strategy for the process of implementation of Swajaldhara was shared. Orientation and subject-specific trainings for the implementing staff were organised. These trainings have helped GWSSB staff to understand social processes and its importance. Around 350 GWSSB staff directly involved with implementation have been trained so far.

The Core Team has a major role to play in Swajaldhara. Induction programmes and subsequent thematic trainings for around 60 core team members have been conducted. This programme is a combination of classroom training, experience sharing with WASMO staff and exposure visits to WASMO project sites. Subject-specific trainings for specific target groups have been provided as well and include Participatory Rural Appraisal (PRA) training for social mobilisers, technical training for water engineers and communication strategy training for documentation and communication personnel. These trainings have enhanced the knowledge base of the Core Team members and helped in implementation.

Pani Samiti members are provided training on construction management, quality control, record-keeping, operation and maintenance, community participation and water quality. Several symposia, workshops and IEC campaigns have already been

conducted in all the 24 districts. These efforts have raised awareness levels in the village. Villagers are now demanding schemes in their village from the DWCS and quality work from the contractors.

Sanitation activities

Though not a part of Swajaldhara, sanitation drives and cleanliness campaigns to promote clean households and clean villages have been conducted. These include rallies and clean home and clean village competitions. To create awareness about the importance of water, water quality, its impact on health, safe health and hygiene practices etc. posters, stickers depicting messages to schools have been distributed.

Water quality

For maintaining and improving drinking water quality, the Catchment Area Approach is being adopted. District officials have been made aware about the need of water quality surveillance and have been provided with water quality testing kits to carry out basic indicative water testing. Villagers and particularly the waterman have been given training on chlorination techniques and its importance, so that the villagers themselves can check and maintain water quality. Field test kits have also been provided to the Pani Samiti where schemes are being operated and maintained by the community.

In 289 schools various activities such as essay writing, quizes, debate competitions, rally, skits relating to water and sanitation awareness have been organised, so that school children act as agents of change and spread appropriate messages and practises throughout the village.

Encouraging women involvement

Since women benefit the most from easy access to drinking water supply, their involvement in all the stages, particularly while taking decisions on the location of the stand post/storage structure in the village or habitation is imperative. Experience indicates that when women are involved, maintenance of the water supply scheme is effective. Special efforts made to mobilise women included holding habitation-wise meetings where they are given a platform to get involved in the decision making process. Special events such as exhibitions and rallies are organised on International Women's Day in all the districts as well.

Monitoring mechanisms

Mechanisms have been built to monitor progress at all levels.

1. In villages, as the scheme is implemented through the Pani Samiti, the main responsibility of monitoring and supervision lies with them. For this, they are supported by the engineering staff of GWSSB and Core Team members.
2. At the district level, the DWSC is responsible for monitoring.
3. At the state level, the Secretary (Water Supply) has initiated a system of monitoring Swajaldhara progress by holding a meeting of field teams consisting of the Member Secretary, DWSC, Core Team members, and NGOs every Monday. In a month, the progress of six districts is reviewed and issues are sorted out by direct intervention of the policy level officials. This reflects the sincere and sensitive efforts to implement the reforms in true spirit.
4. At the state level, a quarterly review focusing on social processes is conducted with the Core Team members by the CEO and Chief Engineer, WASMO. The main objective of the review is to understand field level problems and support needed for smooth process functioning. These reviews also help in sensitisation of the implementation staff. Where performance is not up to the mark, consultations are held with the implementation staff of districts by the SWSM to solve practical issues and

Monitoring mechanisms at different levels - from the village to the state - have been put in place to support appropriate implementation

The previous experiences and core competency of WASMO have helped in effective implementation of Swajaldhara

provide flexibility for effective implementation.

5. At the state level, a State Water and Sanitation Committee chaired by the Chief Secretary meets once in a quarter to review Swajaldhara progress. The Chief Secretary reviews the progress directly with the District Collector and Chairman, DWSC, through video conferencing as well.
6. A state level review committee undertakes social and technical audits of the schemes inspecting the schemes and providing guidelines for improvement to villagers as well as the district administration. This committee comprises of experienced professionals from the fields of water engineering, community mobilisation, finance and accounts and civil society. This practice has made the process more effective and transparent. As of December 2005, around 42 villages in 10 districts have been visited by this committee and recommendations for improvement have been received.
7. To maintain financial discipline and strengthen the Pani Samiti in fund management, independent auditors are appointed at the district level to provide guidance to the village community in accounting, financial and administrative matters.

Physical and financial progress

Till March 2006, 456 schemes were completed and commissioned and water tariff in 94 villages was computed and adopted by Pani Samitis and community.

Since October-2003, Rs 75.63 crore have been allocated for this reform programme in 24 districts. Response from the villages has been largely satisfactory. Villagers have come forward and deposited their community contribution share in the bank accounts. Around 2,000 Pani Samitis have been formed, of which the schemes of around 1,500 VWSCs amounting to Rs 1390.92 crore have been approved. A community contribution of Rs 13.39 crore has been deposited upfront by the community towards capital cost contribution. Schemes have been completed in 456 villages.

Implementation experiences

Before the launch of Swajaldhara, WASMO already had experience through the Ghogha and ERR Projects. Coupled with Swajaldhara, WASMO is involved in the facilitation of community managed in-village drinking water supply and sanitation in about 4,500 villages. The learning from this experience has been internalised for Swajaldhara as is indicated in the form of new approaches that include exposure visits for Pani Samiti members, capacity building for all stakeholders, formation of various management committees in the Pani Samiti for different responsibilities, involvement of NGOs as ISAs, adopting successful IEC strategies, and promoting health and hygiene.

There have been certain issues that have delayed progress. Some of these include:

a) The slow release of funds on some occasions. Once the villagers deposit their contribution, a delay in getting government funds discourages them and it gets difficult to raise their trust again. Requirements for disbursement of fund from the Government of India to the state and therein to the district and PRI need to be explicitly defined to facilitate smooth fund flow.
b) Though the community contribution has been mobilised from the community itself, villagers are sometimes not fully aware about the principles of the programme. Intensive IEC efforts could help eliminate this gap.
c) In some cases when, the time taken after the programme is introduced to the time schemes are executed is longer, it

reduces enthusiasm of Pani Samiti members and the community. This lowers morale as well as the efficiency of the Pani Samiti and sustainability of the scheme.

d) The Pani Samiti needs easier and timely access to technical and managerial support. This needs to be ensured.

e) In the interests of accessibility, utility, sustainability and equity the participation of women and marginalised communities needs to be ensured.

f) The use of a region and culture-specific IEC strategy that addresses differences in population, gender equations, awareness levels, economic status, water supply coverage status, paying capacity, need of the people and other socio-economic factors rather than a uniform IEC strategy could improve results. ISAs have been encouraged to change and adopt the IEC as needed.

g) After completing the scheme, the Pani Samiti gets merged with the Gram Panchayat which then assumes the responsibility of O and M. The funds collected as water tax could occasionally be used for other purposes.

h) Local water resource management through water conservation has not found place in village action plans since the focus is on coverage with limited fund availability. There is a need to build in the component of WRM.

i) With most of the resources of GWSSB being occupied in implementation of bulk water supply projects, O and M of 432 regional water supply schemes is not getting the attention it warrants and, the organisation finds it difficult to give priority to Swajaldhara because of paucity of staff at lower level (no recruitment in last 30 years). Also, it is unfair to expect them to change their approach from a purely engineering focus to one that stresses on social issues within a couple of years. The involvement of Core Teams and NGOs, coupled with their sensitisation is bringing about change.

Swajaldhara today

In Gujarat, Swajaldhara is a little over two years old and as is the case of most programmes which involve a significant shift in approach, achievements have been accompanied with problems as indicated earlier (see Box: Beacons of hope).

What has helped the programme has been the experiences of WASMO which are available for Swajaldhara and the flexibility to adopt approaches. Providing Core Team to the DWSC has to be very useful as it complements effort of the GWSSB, which is occupied in providing water up to the village head. Technical members of this team augments efforts of GWSSB engineers.

Towards the end of 2005, a decision was taken to involve ISAs in implementation to held achieve the objectives of the programme. Subsequently, 30 experienced NGOs were selected and engaged as ISAs.

The role of the ISAs is a combination of change agent, intermediator, source of knowledge and process manager.

As change agent the ISA will need to create interest and capacity amongst the villagers to establish community- managed water supply schemes and associated institutional arrangements.

As an intermediator the ISA will need to take care of the establishment and good functioning of the Gram Panchayat, Pani Samiti, approved consultants and contractors, DWSC field and head offices and any other relevant office.

The ISA will need to function as a primary source of knowledge in the fields where the Pani Samiti might lack competence, as in technical aspects, accounting and legal issues for example, and assist in making

The Core Teams effectively complement the technical capacity of the DWSC and help in combining social and civil engineering

Beacons of hope

With adopting Swajaldhara in their villages, communities have shown their mettle.

- In Chogath village of Bhavnagar district, the villagers have designed their own radial distribution system to provide water to various areas with same pressure to ensure equitable distribution.
- In Vibhapar village of Jamnagar district, after discussing various technical alternatives with the DWSC, the villagers decided to implement a distribution system wherein each household would keep their tap on a same level so that all could receive get water with equal pressure.
- In Mohnakanchali, a remote and tribal village located in the hills in Kaparada taluka of Valsad district, Jaldhara, a youth group voluntarily took over the responsibility of collecting community contribution in cash or kind.
- In Virpur village of Sabarkantha district, villagers initially hesitant to contribute towards a government programme now express satisfaction and experience a sense of ownership after scheme completion. The experience with Swajaldhara has encouraged them to take on other initiatives such as regular cleanliness drives in their village as well.
- In Vasna Iyava village of Ahmedabad district, a self motivated sarpanch, keeps all records and accounts updated. Whenever he is called by the DWSC, he comes with a bag containing all vouchers and documents. He shares all the information with the Pani Samiti members regularly to maintain transparency.
- In Jahirpur-Molipur village of Mehsana district, Pani Samiti member Mahmudbhai does not let his physical disability get in the way of his personal involvement in implementation of the scheme. He supervises and monitors all construction work, keeping a close vigil on the contractor to ensure quality work.
- In the primary school of Vasna-Iyava village of Ahmedabad district, a three-member school children Safai Committee (Cleanliness Committee) is responsible for the weekly cleaning of the water tank.
- In Lakh village in Mandvi taluka of Surat district, the atmarpan ceremony (when the Pani Samiti takes over the responsibility of the O and M of the completed water supply scheme) was one where the women from each household contributed. Decorations for the stage of the ceremony comprised of colourful sarees that were contributed by these women.
- Mansinghbhai Chaudhary, president of the Navi Umari village in Mehsana district has the following to say in a letter to WASMO: "Water used to be a scarce commodity in our village. Normally we get water from the Dharoi dam but when the supply is not there, we have to fetch the water from nearby farms. Villagers discussed the issue several times within the panchayat, but funds were never available to solve the crisis. Finally, we found a ray of hope in Sector Reform (state) Scheme. We have formed a Pani Samiti in the village and planned our own water supply system. The construction is almost complete. We maintain transparency in all our financial dealings. We are aiming for the excellence in our work. To achieve that, we require constant guidance and monitoring by officials."

linkages with external expertise when necessary.

As process manager the ISA will need to provide the different stakeholders with relevant information and knowledge and make conditions conducive to decision making and their execution.

A customised IEC strategy is being formulated in WASMO in collaboration with the DWSCs and local organisations to maximise community response from different regions. To have uniformity in the implementation process throughout the state, Implementation Process Guidelines depicting clear roles and responsibilities of each stakeholder is under preparation.

Swajaldhara is being implemented as a demand-driven programme. In two years, around 456 schemes have been completed and commissioned. Swajaldhara has also reached tribal and remote areas where the communities now have easy access to safe and assured drinking water. People have started operating and maintaining the scheme and water tariff mechanism is also initiated. Capacity building exercises have empowered the community with knowledge. The communities are interested in being key partners of the programme and it is important that their reservations be addressed. They now have a sense of ownership and feel motivated to take proper care of the assets.

Swajaldhara is a significant step towards scaling up effective and sustainable community management of water supply in Gujarat. The commitment of the state government to provide drinking water security to all 34,000 habitations of 18,000 villages is a huge challenge with many dimensions.

WASMO is aware of the challenges that lie ahead.

- The biggest challenge perhaps is to

implement a target-driven programme that follows a process-driven approach.

- Translation of principles and guidelines into action will require intensive capacity building of the communities, PRIs, district level staff SWSM and NGOs.
- Efforts are on way for intensive and consistent IEC campaigns that are effective and address location-specific requirements. Effective monitoring mechanisms for various aspects of the programme such as expenditure, quality of participation, ownership, participation by women and all communities as well as O and M is to be put in place.
- Funds will need to be mobilised from various sources to meet the demand of the community.
- Along with the high capital investment, incentives for O and M for completed schemes to ensure sustainability of the system will need to be taken into consideration and a system that offers some support to the community after scheme completion will have to be worked out.

WASMO has been set up solely to facilitate sector reform in rural drinking water supply. It has been successful largely through community empowerment that has elicited meaningful participation. Believing that the users of water are the best managers of water, considerable investment has been made in capacity building. Coupled with an approach that builds partnerships so as to draw on the strengths of each partner to make available to the community the state-of-the-art, an attitude that recognises gaps and makes suitable efforts to fill these, incorporates flexibility and learning into its programmes and builds up its own strength, this challenge can be met with optimism.

As an organisation dedicated to implement sector reform, WASMO as SWSM should be able to effectively deal with emerging challenges

Scaling up the paradigm shift, from Ghogha via ERR to Swajaldhara

A comparative analysis of institutional aspects of three drinking water and sanitation programmes in Gujarat

Dr. Bouwe Grijpstra

Summary

This paper compares the three WASMO programmes in terms of their conceptualization and strategic decisions, institutional set-ups and systems, roles and responsibilities of players and implementation processes. It takes a look at the aspects important for scaling up like effectiveness and sustainability. It also states that lessons obtained and feedback from past experiences and projects need to be consciously incorporated into new programmes such that the systems and methods are fine-tuned to improve the overall effectiveness and extent of success of projects.

Introduction

Many are inclined to think that the social marketing of a utility for an essential commodity is easy. Especially if the package offered is heavily subsidised and is meant for people who know about modern amenities and living standards. However, when the commodity is drinking water in rural areas the going is tough. The track record of development co-operation is strewn with failed rural water supply projects. Also in Gujarat the rural water and sanitation sector has had its share of problems. Usually the blame for the disappointing results is attributed to one or more of the stakeholders in the sector, as follows:

a) The rural people who are not familiar with the management of joint enterprises and therefore prefer the government to take up the responsibility and meet all the expenses. To them the provision of drinking water is the duty of the government, especially when prior to the monsoon the traditional sources have run dry. Usually, however, the traditional sources function for the larger part of the year, and there is a choice from where to obtain drinking water. Under these circumstances the rural people use the most convenient source. Convenient means to them that the source is in or near their homestead and water can be drawn without payment at all times of the day. The willingness to make an effort to obtain clean and safe water is low.

b) The technicians who are too bureaucratic, operating in a top-down manner. They have little regard for the wishes and expectations of the users of the water facilities they provide. Instead they are preoccupied with meeting the technical standards and norms set by their department. It has resulted in the ubiquitous erected storage reservoirs and stand-posts designed to squirt water for a limited time in the morning and evening. In return the villagers tend to look upon these structures as the toys of the boys of the agency rather than their own service facilities. Besides, the technicians are inclined to believe to operate at a war footing. The justifications for their projects often refer to emergencies as "extreme poverty" and "almost every other year being a drought year". In case of emergency, time and quantity are important, not the level of convenience.

WASMO was able to bring about a paradigm shift in the motives and interests of the stakeholders in the rural water supply and sanitation sector

c) The Sarpanches and their trusted aides enlisted by the technical departments for the construction of in-village schemes. They are first of all interested in obtaining infrastructure that would become a monument to their term of service. The level of user-friendliness of the facilities and the convenience these would offer when correctly maintained and operated come only second.
d) The NGOs engaged to prepare and train the villagers for their responsibility for the operation and maintenance of their scheme through a user committee. The NGOs tend to see poor people's participation as their raison d'être and a goal in itself. They excel more in describing the target group's plight and the relief brought than in developing withdrawal and replication strategies.
e) The government that is eager to demonstrate that it cares for the plight of the masses. It puts up money for crash programmes first and only secondly looks into the institutional aspects that would lead to sustainability.
f) The consultants who speak with the voice of their paymasters.
g) The donors who turn a blind eye to the positions and motives of the other actors. Their focus is on the project documents that should contain fashionable terms as poverty alleviation, empowerment of women, participation and sustainability.

In this minefield of motives and interests of stakeholders in the rural water supply and sanitation sector WASMO (Water and Sanitation Management Organisation) has been able to bring about a paradigm shift. In 2002 the Government of Gujarat, with support from the Netherlands, created WASMO as an autonomous organization. WASMO developed and introduced a demand-driven approach for community-managed facilities. In this regard it referred to the 73rd Amendment to the Constitution of India that stipulates that in-village water and sanitation are the responsibility of a Pani Samiti, a functional committee of the Gram (village) Panchayat.

WASMO learned lessons from the process of trial and error in the Netherlands assisted 82-village Ghogha project and from the national pilot Sector Reform project that included three districts of Gujarat. These lessons were applied when in 2002 WASMO took over the responsibility for the Ghogha project and next in 2003 when it started the Earthquake Rehabilitation and Reconstruction (ERR) project that comprises 1,260 villages. The positive responses the ERR project got from the village communities and the effectiveness of its approach have contributed towards WASMO's appointment as the state's water and sanitation mission. In this capacity WASMO is charged with the co-ordination of the nationally funded Swajaldhara programme. The Swajaldhara guidelines are similar to the procedures that were developed in the Sector Reform and the ERR project. The essential point is that an in-village water supply scheme is granted only upon the demand of the village that must be ready to contribute 10% or more of the capital costs. In addition it must express its willingness to assume the full responsibility for the management and operation of the scheme. The Swajaldhara programme is planned to extend to all 18,000 villages in Gujarat in the course of a number of years.

Objective

In this paper a comparison is made between the three projects/programmes WASMO is involved in. First the focus is on institutional aspects and other strategic decisions made at the start of a project, in particular:

- Decentralisation through project offices
- Personnel of project offices
- Prior selection of target villages
- Position and role of NGOs
- Construction execution.

Next the most important features of the implementation process are compared, these are:

- Beneficiaries' contributions
- Beneficiaries' influence on the selection of facilities
- Hygiene awareness
- Arrangements for operation and maintenance (O&M)
- Pani Samitis / Village Water Supply Committees (VWSC)
- Women's participation.

The final and concluding paragraph of this paper deals with the main question in the scaling-up of rural water and sanitation programmes: which aspects are crucial for effectiveness and sustainability and therefore cannot be treated lightly or left out.

Institutional aspects

Decentralisation

At first the Gujarat Water Supply and Sewerage Board (GWSSB) owned the Ghogha project, receiving financial support from the Royal Netherlands Embassy, who followed the project closely. The opinions of these stakeholders on what was essential for the target villages did not always converge immediately and completely. A Project Support and Implementation Unit (PSIU) and a Netherlands Assisted Project Unit (NAPU) were set up in Bhavnagar, near the project area. The PSIU had little autonomy. All plans and decisions needed to be sanctioned by the GWSSB main office, which was a time consuming process. When WASMO took over the responsibility for the project the PSIU became a Coordination and Monitoring Support Unit (CMSU) and was given more freedom.

WASMO is responsible for the ERR project. The responsibility for its implementation has been largely transferred to three CMSUs in Bhuj, Surendranagar and Jamnagar, each with one or more Engineering Support Cells (ESC). When necessary the CMSUs contact the WASMO main office by phone.

The Swajaldhara programme is coordinated by WASMO that has been appointed as the State Water and Sanitation Mission. The implementation has been entrusted to District Water Supply Committees (DWSC). The GWSSB district Executing Engineer (EE) is member-secretary of the DWSC. The latter's office functions as project office. In the WASMO main office the Swajaldhara unit grows steadily. It arranges for training to disseminate the lessons learned in the ERR project and also produces a stream of instructions to the DWSCs to this purpose.

Personnel of field offices

Initially the staff of the Ghogha PSIU consisted entirely of GWSSB engineers with NAPU providing consultants of a more varied background. When WASMO took over, the staff composition was changed to become more people-oriented.

WASMO selected and recruited the personnel of the ERR CMSUs from the open market and from the GWSSB and the Forestry Department on the basis of deputation. The three CMSU managers are non-engineers, seconded by an EE. As a result the CMSUs have been people-oriented from the beginning, functioning in an integrated way.

In its first year of the Swajaldhara programme the DWSCs depended for field implementation entirely on the GWSSB engineers. These engineers have limited time because of other obligations. To complement their expertise WASMO has recruited three-person core-teams. In the field the engineers and core-teams operate rather separately. The number of field staff in a district is small considering the task it is confronted with and compared to the Ghogha and ERR CMSUs.

Prior selection of target villages

The number of villages in the Ghogha project was decided on in the project documents and has never been changed. The rate of progress was invariably expressed in the number of villages being in a certain stage, irrespective of their interest in the project.

The CMSUs of the ERR project have been people-oriented from the beginning

NGOs play an important role in motivating villagers to improve their water supply and sanitation

The ERR was designed for 1,260 earthquake affected villages, too many to deal with at one time. Those villages that approached a CMSU at their own initiative were given priority, to set examples and to gain experience. The limited number of villages that have been unable to unite internally for an expression of interest in the project have been put on hold, to be dealt with later.

The Swajaldhara programme will ultimately address all 18,000 villages in the state. The DWSCs decide on priorities, by selecting the villages to take part in orientation workshops.

Position and role of NGOs

The three NGOs engaged under the Ghogha project as Implementation Support Agencies (ISA) did not yet have extensive contacts in the project area. They were introduced to make the project participatory, as the PSIU did not have social mobilisers. Their role was to promote hygiene and to prepare and train the village Pani Samitis for the O&M of the facilities to be constructed. Also they were responsible for the collection of the initial O&M funds, regarded as an expression of the villages' sincere interest in the project. The NGOs, supported by the RNE, considered themselves to be independent stakeholders in and the saviours of the project. The engineers saw the NGOs as providers of software that would make their hardware work. But the NGOs felt that they were treated as messengers. Over time the relations somewhat improved and the NGOs were included in the project Steering Committee created by WASMO. The sensitivities remained, however.

A large number of NGOs is involved in the ERR project. They were selected because of their experience in the area and in the water and sanitation sector, and assigned to the villages they were involved in because of earthquake relief works. The NGOs play an important role in motivating the villages to improve their water supply and sanitation and in the preparation of the O&M of the facilities.

The CMSUs are clearly in command and direct the whole process, though.

Also in the Swajaldhara programme NGOs are to be involved. The selection process has been completed. The DWSCs are in dire need of support in the field.

Construction execution

In the Ghogha project the GWSSB contracted two firms for the construction of the water and sanitation facilities. It was thought that only selected firms would be able to provide quality. Their schedules conflicted with the conscientisation processes started by the NGOs resulting in serious delays. Later WASMO allowed the village Pani Samitis to engage in the construction directly.

In the ERR project the facilities are constructed village by village. The village Pani Samitis decide to engage a contractor for all or parts of the works and which activities (e.g. procurement of materials) will be done under their own management.

So far in the Swajaldhara programme construction by a GWSSB approved contractor has been the norm. Increasingly it is, however, the village that floats the tender, engages the contractor and supervises the works.

Implementation process

Beneficiaries' contribution

In the Ghogha project no contribution towards the capital costs of the schemes has been asked from the villagers. However, to demonstrate the sincerity of their interest in the facilities, they would have to deposit an amount equal to 10% of the capital costs prior to the start of the construction. From these the O&M costs in the first year would be met. The NGOs supervised the collection. But the villagers often thought that the amount was far more than would be needed. Therefore they reserved the right to withdraw their contributions. It also happened that a

party interested to start construction without further delays advanced the amount. Not all villages have collected the amount set fully; nevertheless no village has been dropped because it failed to meet the condition.

In the ERR project villages have to contribute 10% of the capital costs. Their commitment in this is regarded as proof that the project is really demand-driven. The CMSUs and NGOs see to it that all households pay their share as decided by the Pani Samiti. Construction advances are released in relation to the amount that has been contributed. The second and following installments are paid only when 90% of the previous advance and corresponding village contribution have been spent. The expenditure for O&M has to be met completely by the water users. The deliberations on the tariff are time consuming, but often collection of the charges could start before the commissioning of a scheme.

In the Swajaldhara programme the villages have to contribute 10% of the capital costs. Frequently demands to the DWSC to benefit from the programme are accompanied by proof of a first deposit of Rs 20,000 or more. It has happened, though, that the money was not collected from the households in the village but advanced by the Gram (Village) Panchayat. In those cases the first contribution does not really show participation and commitment. The O&M costs are to be borne entirely by the water users.

Beneficiaries' influence on the selection of facilities

In the Ghogha project the PSIU engineers decided on the design of the water and sanitation facilities. They opted for a standard set for all villages. This would make it possible to negotiate relatively large contracts offering benefits of scale. The standard set included a sump, to be filled through a bulk water pipeline and, where possible, from a local source, a pump-house with machinery, and an erected storage reservoir from which water would flow to stand-posts and washing facilities at certain times of the day. It was overlooked that the traditional sources of water, when functioning, are usually more convenient to the users than the stand-posts. Also the design of the washing facilities was not user-friendly. Consequently both types of facility are underutilised.

Traditional sources of water are usually more convenient than stand-posts

In the ERR project the water and sanitation facilities are the main subject of the Village Action Plan (VAP) that is compiled by the newly created Pani Samiti with support of the NGO and CMSU. It may happen that the villagers simply ask for the same facilities as they have seen elsewhere, without giving due consideration to the scope for improvement to suit their needs. But in general they want user-friendly facilities for their, and the project's, money. Frequently house-connections are preferred over stand-posts. House-connections make individual storage tanks and bathrooms feasible. Cluster storage reservoirs with hand-pumps are an alternative way to make quality water available around the clock.

Also in the Swajaldhara programme VAPs are prepared. Since the presence of the core-teams they have become more elaborate and are compiled in a participatory way, creating space for the wishes of the users. Earlier the Sarpanches and the GWSSB engineers mainly decided on the facilities. They were inclined to put the infrastructure first, overlooking the quality of the service it should provide. In other words, the men dreamt of big erected storage reservoirs while the women wanted to have water at their doorstep.

Hygiene awareness

In the Ghogha project creating hygiene awareness was a major activity of the NGOs engaged as ISAs. They developed information materials, organised campaigns and competitions, etc. These activities were effective, especially among the schoolchildren. Their personal hygiene

From the very start of the contacts with the villages the condition that the Pani Samiti will be responsible for O&M is brought up

improved and in turn the children insisted on clean practices in the home, storing and handling of drinking water. At the end of the project also the interest in waste disposal increased. Subsidised soakpits proved to be very popular. But also the number of toilets went up, even without a subsidy.

Hygiene and especially the importance of clean water is part of all contacts with the villages in the ERR project. It enhances the interest in water supply schemes. The message is spread in many ways, through brochures, talks, exposure visits, radio, street plays, etc. School children are targeted along with the construction of roof water harvesting activities on the school premises. Individual bathrooms and toilets are becoming increasingly common, as well as sewers for wastewater disposal. The necessity to cover the open wells from which water is drawn for the new local schemes has been largely overlooked so far.

Under the Swajaldhara programme there is no financial provision for sanitation facilities. But the core-teams do organise total sanitation campaigns in cooperation with other departments and encourage individuals to take the lead in toilet construction.

Arrangements for O&M

In the Ghogha project it were the NGOs who took the lead in the preparation of the O&M arrangements. They explained the details of the scheme, arranged for technical training of operators and training in management and accounts for Pani Samitis. The NGOs had a hard time in convincing the future water users of the necessity to pay their contribution to the O&M of the schemes.

From the very start of the contacts with the villages the condition that the Pani Samiti will be responsible for O&M is brought up. The CMSUs and NGOs of the ERR project spend much time on guiding the village communities how to decide on the water tariff. Transparency is an important factor in reaching agreement on a tariff considered to be just and affordable by all. In a sizeable number of villages the collection of water rates started even before the commissioning of the schemes.

In the orientation workshops of the Swajaldhara programme the message about the responsibility for O&M is clearly brought up. It tends to be forgotten, however, when not followed up by training and guidance how to reach agreement on an O&M tariff.

Role of the Pani Samitis /VWSCs

At the start of the Ghogha project the villages were not given a leading role, neither could they decide on the lay-out of the schemes and the design of the facilities, nor were they required to contribute to the capital costs. But they were asked to form a Pani Samiti for O&M once the scheme would have been completed. The NGOs have spent much time on the formation and training of the Pani Samitis. Upon the issue in October 2002 of the revised Government Regulation on Pani Samitis they had to be reconstituted so that at least one third of the members would be female and all groups and factions in a village would be represented. Despite these efforts many Pani Samitis never felt to be the responsible owners of the new facilities. In stead they developed the tendency to get the most out of the project at little or no contribution from their side. Also after the commissioning of the schemes and the ceremonial handing-over the Pani Samitis still look for external support in their O&M tasks. In a number of villages they decided to use the new schemes only in times of drought, to limit their obligations and to save money.

In the ERR project right from the moment contacts with villages are initiated the CMSUs and NGOs are focused on the formation of Pani Samitis and their preparation for scheme design, collection of contributions, construction management and O&M. A Pani Samiti must feel to be in the driver's seat

from the very beginning but also meet the conditions that have been set by the project. Funds are released only after a Pani Samiti has collected the contribution from the individual households. In general this approach has resulted in active and responsible Pani Samitis.

The formation of a VWSC is an important condition to villages that want to benefit from the Swajaldhara programme. However the time the few field staff can spare for the explanation of the tasks of a VWSC and the training of the members is still rather limited. Consequently many VWSCs lapse into inactivity after the completion of a scheme's construction, leaving the O&M to the Gram Panchayat.

Role of women

The NGOs in the Ghogha project have made great efforts to reach out to the women in the area, which was not easy because of prevailing cultural traditions. But their efforts did bear fruit and were not limited to improved hygiene. The women responded by acting at crucial moments to maintain their villages' interest in the project and to see to it that quality standards were adhered to.

The ERR project started not long after the revised Government Regulation had ordained that women should occupy at least one third of the positions in a Pani Samiti. The CMSUs and NGOs have always seen to it that women were actively involved in all matters. After all they are the users of water.

In the beginning of the Swajaldhara programme the DWSCs and GWSSB engineers directed their communications mainly at the male village leaders. By fielding core-teams with female staff this tendency is being corrected.

Concluding remarks

The Ghogha project started as a supply-driven project. Though NGOs have been involved early on to enhance participation, the villages could wield little influence over the implementation process and the infrastructure to be built. The NGOs were engaged only to "sell" the project and to train the Pani samitis how to use and maintain the hardware. To a certain extent WASMO has been able to redirect the Ghogha project. It asked the project office to take initiatives in sations and WRM and changed the composition of its staff to make it more people-oriented. Also it offered the villages the possibility to take the lead in the construction of their schemes and facilities. Certain other conditions like the initial selection of target villages and the up front financial contribution for O&M could not be changed, however.

The striking differences between the Ghogha and the ERR project are all based on conscious lessons obtained from the first. Important differences are the position of the project offices and their staffing, and the partner role offered to the NGOs. In the relation with the villages the focus is on social guidance enabling the Pani Samitis to assume their responsibilities from the very beginning. At the same time the ERR project applies strict conditions in this regard. Demands for participation in the project to avail of safe drinking water and improved sanitation conditions have to be genuine and backed by financial commitments from all the future users.

Also between the ERR project and the Swajaldhara programme the main difference is in the institutional set-up, in particular the background of the personnel, the number of staff and the time they can put in. The desire to scale-up the new approach quickly and extensively left the existing government apparatus was the only alternative available at short notice. As a result certain drawbacks from the first years of the Ghogha project are appearing again. The level of participation is still low. The emphasis tends to be on targets, technology and investments rather than

A Pani Samiti must feel to be in the driver's seat from the very beginning and also meet the conditions that have been set by the project

Only schemes that meet the expectations of the users and their transparent management will be sustainable

drinking water security and convenience. To safeguard the ambitious Swajaldhara programme WASMO monitors the DWSC activities intensively. Especially the GWSSB staff has to go through a transformation process from being supply-driven technicians to people-oriented problem solvers that act on demand. WASMO provides training and operational instructions where and when it seems fit. A certain level of flexibility and autonomy for the implementing offices is necessary though, to prevent a rigid bureaucracy to develop. WASMO also recruits additional staff, directly and through NGOs. However, to bring the DWSC offices at par with the CMSUs of the ERR requires large numbers.

The subject of the size of the field staff brings back the question posed in the first paragraph of this paper: wouldn't an attractive and well tested package for an essential commodity as safe drinking water sell itself? For the time being the answer is no. The rural clients are clearly interested. But the operation and maintenance of the infrastructure requires a village level management unit (Pani Samiti) that is accepted and supported by the users. The villagers have no ready models to rely on. Therefor, guidance how to develop and internalise the O&M arrangements is very much needed. Only schemes that meet the expectations of the users and with transparent management will be sustainable. In this regard the participation of women, the actual users, is indispensable.

Two years of Swajaldhara: Impressions from Ahmedabad district, Gujarat

Through learning by doing a top-down, technocratic and supply driven beauracracy is being transformed into a people-oriented organisation

Lata Brahmbatt, Hetal Shah, Hiral Oza and Bouwe Grijpstra

Summary

Swajaldhara is an innovative and very ambitious rural water supply programme. In Gujarat it is co-ordinated by the recently created WASMO while the field activities have been entrusted to the GWSSB. The latter is to be transformed in and by the implementation process from a top-down bureaucracy into a people-oriented organisation. This paper describes how the large-scale demand-driven approach of the Swajaldhara programme is put into effect in the villages of the Ahmedabad district.

Introduction

Paradigm shift

Since its creation in 2002 WASMO (Water and Sanitation Management Organisation) has brought about a paradigm shift in the rural water supply and sanitation sector of Gujarat. The traditional approach to in-village water supply used by provision-oriented government institutions was based on centrally executed and managed infrastructure. Increasingly it had been recognised that this approach has led to the poor functioning of many in-village schemes due to long-distance operation and maintenance. WASMO developed and introduced a demand-driven approach for community-managed facilities. In this regard it referred to the 73rd Amendment to the Constitution that stipulates that in-village water and sanitation are the responsibility of a Pani Samiti, a functional committee of the Gram Panchayat (village council).

Upscaling

WASMO learned lessons from the process of trial and error in the Netherlands assisted 82-village Ghogha project and from the national pilot Sector Reform project that included three districts of Gujarat. These lessons were applied when WASMO took over the responsibility for the Ghogha project and next in the Earthquake Rehabilitation and Reconstruction (ERR) project that comprises 1,260 villages. The positive responses the ERR project got from the village communities and the effectiveness of its approach have contributed towards WASMO's appointment as the State's Water and Sanitation Mission (SWSM). As SWSM WASMO is charged with the co-ordination of the nationally funded Swajaldhara programme and the State Sector Reform Project, planned to extend to all 18,000 villages in Gujarat in the course of a number of years.

Swajaldhara*

The Swajaldhara objective is to provide safe drinking water in a sustainable way through community managed schemes. It is expected

* From here onwards the Swajaldhara programme and the State Sector Reform Project will be addressed as Swajaldhara.

The core-team has encouraged the GWSSB staff to have faith in the villagers to respect their needs and to interact with women

that the people's participation will lead to their empowerment and an increased ability to take their destiny in their own hands. The Sawajaldhara guidelines are similar to the procedures that were developed in the Sector Reform and the ERR project. The essential point is that an in-village water supply scheme is constructed only upon the demand of the village, which is ready to contribute 10% or more of the capital costs. The village must also express its willingness to assume the full responsibility for the management and operation of the scheme in its geographical area. To this end it must form a Village Water Supply Committee (VWSC) also known as Pani Samiti. District Water and Sanitation Committees (DWSC) have been formed in each district of Gujarat to inform, to support, to train, etc. the VWSCs. The DWSCs are headed by the District Collectors. The members are officers of the different departments that deal with water, sanitation, health, rural development, etc. The Executive Engineer of the Gujarat Water Supply and Sewerage Board (GWSSB) in the district is the member-secretary of the DWSC. He avails of technical staff. These technicians, however, do not work exclusively for the Swajaldhara programme. They are also involved in other projects, usually technically more sophisticated and more capital intensive than in-village water supply schemes. To complement the technicians, WASMO has added so-called core teams of contract employees, who facilitate the interactions between the DWSC and the VWSCs. The latter are formed when a village is ready to begin a working relationship with the DWSC. The VWSCs are responsible for the implementation of schemes of their own choice and the operation and maintenance of these.

Objective

This paper describes how the large-scale demand-driven approach of the Swajaldhara programme is put into effect in the villages of the Ahmedabad district. In this regard it is interesting to see how the GWSSB offices and staff function in the institutional set-up of the Swajaldhara programme. Not long ago their style of working was top-down and supply-driven. Special attention is given to the villagers' preferences, expectations and wishes. How are they brought forward and to what extent are they honoured? Are the schemes different from the facilities that were provided under the traditional top-down approach? In particular, are they effective, user-friendly and sustainable?

Background

The Ahmedabad district comprises 556 villages. It is a peri-urban area surrounding the largest city of Gujarat. Consequently the population density, the levels of education and income as well as the aspiration for a modern lifestyle are higher than in rural areas in the rest of the state. As such it provides an opportunity to observe what will be common in the near future all over rapid developing Gujarat.

In December 2003 the Swajaldhara programme became effective in the Ahmedabad district, at first executed by GWSSB staff only. With the arrival of the core team in December 2004, a female element has been introduced into the male domain of the GWSSB. The three core-team members, a social mobiliser, an engineer and a communication specialist, had taken part in a short introductory programme organised by WASMO. The capacity building of both the GWSSB staff and the core-teams is a continuous process. WASMO arranges for training and issues instructions to disseminate the latest procedures. Because of the large number of villages to be addressed also NGOs are being engaged to support the implementation process.

Swajaldhara in action

Orientation workshops

To inform villages about the Swajaldhara programme and to explain the conditions for participation one-day orientation workshops

are organised for Sarpanches (heads of Gram Panchayats) and Talatis (secretaries to a number of Gram Panchayats). The District Collector chaired the first of these workshops. His presence instilled with the participants the feeling that it concerned a serious programme. Villagers look upon the government as a reliable partner that will stand by its promises. The participants are expected to discuss the information obtained through the workshop in their respective villages and to motivate the Gram Panchayats to formally express their desire to participate in the Swajaldhara programme. As proof of its sincerity the application letter is often accompanied by evidence of a deposit of some Rs 20,000. That will be the first installment of village's 10% share in the capital costs. All the 30 villages that attended the first workshop responded positively and another seventeen villages that had heard about it applied as well. It happened, though, that a Gram Panchayat advanced the deposit instead of it being collected from the households. This might indicate that the idea to go for the construction of an in-village water supply is not yet supported by all villagers. Another three workshops have been held in 2005, attended by respectively 50, 15 and 15 villages.

Guidance to the VWSCs

The villages that express interest in participating in the Swajaldhara programme are to receive a series of visits from the DWSC office. At first the role and responsibilities of the VWSC are explained and when agreed a VWSC is formed. The opening of a bank account is one of its first official acts, after which the collection of the village contribution starts. The planning of the scheme begins with a Participatory Rapid Appraisal (PRA) by village leaders and district staff. The PRA provides the information needed for the scheme file. The scheme file consists of:

- a general report on the village;
- a Village Action Plan (VAP) which specifies the population, geology, rainfall, sources of water, infrastructure, agriculture and animal husbandry, etc., along with the needed facilities;
- a scheme design;
- cost estimates;
- a copy of the bankbook with a list of contributors and the amounts paid; and
- a Gram Panchayat resolution stating the willingness to construct and maintain the water supply scheme.

Prior to the posting of the core-team no PRAs were made and the scheme files were less elaborate, including a general report but not a VAP. In general the technical aspects of the scheme file are taken care of by the GWSSB staff and the Sarpanch, assisted by other leaders who know the local geography and gained understanding from involvement with previous schemes. The core-team supports the VWSC in making the general report and the VAP. The core-team spends more time at village level than the engineers, meeting men and especially women of all groups and corners, assessing their needs and gaining their trust by giving respect, being useful and reacting quickly to requests and suggestions. The main purpose is to sensitise the village population about the importance of drinking water facilities. The VWSC members are trained in writing a tender letter and evaluating bids, construction management and quality control, keeping accounts that will be subject to regular inspection, etc., in order to prepare them for their role in scheme implementation and management. At first training is conducted for one village at a time, later, when self-confidence emerges, for participants of several villages. The increasing availability of brochures and leaflets prepared by WASMO enhances the training efforts.

Technical options in drinking water supply

The geographical conditions in the Ahmedabad district are rather uniform which results in very little differences between in-village drinking water schemes. The pipeline

The gap between a Sarpanch interested in monumental infrastructure and the women dreaming of having water at their doorsteps needs to be closed

House connections do away with the female drudgery of fetching water. Water in the courtyard preconditions individual wash/ bathrooms and pour-flush toilets

carrying Narmada water will become effective in 2006. For the time being the schemes have to rely on local sources of groundwater. Where necessary new and usually deeper tubewells up to 500 feet are drilled to reach sufficient quantities of potable water. No electricity charges apply to drinking water schemes. The water is lifted first into a sump and next into an elevated storage reservoir (ESR). The joint capacity of these reservoirs is equal to the daily consumption of the village (two-thirds in the sump and one-third in the ESR). Water is supplied for limited periods, usually twice a day. Power failures might disrupt this practice. For water distribution increasingly house-connections are preferred over stand-posts, though stand-posts are still placed at public places as temples and schools. Cattle troughs are also provided as a public service. Many households have installed plastic reservoirs with capacities up to 5000 liter to circumvent the effects of power failures.

Sanctions and construction

Once finalised a scheme file is put up to the DWSC for approval. Upon signing an agreement with the DSWC a VWSC receives an advance to start construction. It then invites bids from contractors approved by the GWSSB. On December 12, 2004 a number of 47 schemes had been sanctioned. Because of some misunderstandings and communication errors, eighteen villages of the first batch failed to report to conclude their agreement with the DWSC. Because of this observed lack of interest the DSWC has put their requests aside. The newly appointed core-team looked into the matter and found the interest to be still there. Meanwhile some complicating circumstances had emerged. A change in the schedule of rates had increased the estimated construction costs. Another problem was the start of the Sujalam Suphalam Yojana (potable water and cleanliness scheme). This bulk water scheme is also implemented by the GWSSB, which in this case deals with the Sarpanches only. The Sujalam Suphalam scheme will deliver Narmada water up to a village entry point, for which it provides sumps and pumps. But the villages do not agree to the elimination of these items from the scheme files submitted for the Swajaldhara programme. They would like to have both.

The VWSCs of the first batch relied heavily on assistance by the GWSSB staff in the tender process, the selection of a contractor and the construction supervision. Through these interactions they learned what they had missed in the preparation stage.

To date eight schemes have been completed and another nineteen are in progress. Two applications have been dropped because of a change in status from rural to urban (nagar palika) area. After the first batch another three schemes have been sanctioned. Their tenders were conducted by and in the villages concerned. Eighteen scheme files are waiting for approval. The process of preparing scheme files has slowed down because of limitations in the capacity of the GWSSB staff and the core-team and the time consuming guidance to the VWSCs.

Operation and maintenance

Eight schemes have been completed and commissioned. They have become the responsibility of the VWSCs who, however, frequently leave the operation and maintenance to the Gram Panchayat, including tariff collection. No separate bank accounts have been opened. The annual contributions have been set and vary between Rs 14 and 50 per household when stand-posts are used and Rs 100 to 250 in case of house-connections. Though in the orientation workshops it has been clearly conveyed that the total scheme operation and maintenance costs would have to be borne by the users this principle is not yet commonly accepted. Occasionally complaints are heard and petitions to politicians are made. Additional training and guidance in the principles of operation and

maintenance and the necessity to collect the water charges are provided by the core-team.

Sanitation

The Swajaldhara programme does not provide for sanitation facilities as wash-cum-bathrooms and toilets, either individual or communal, soakpits, waste dumps etc. But the core-team promotes the subject of sanitation through total sanitation campaigns, as part of an existing government programme aimed at education for all. The campaigns follow a multiple-channel approach, in co-operation with the public health and education departments of the Zilla (district) Panchayat. The education in sanitation and hygiene is especially directed at school children who remind their parents about the importance of cleanliness and unpolluted water. But the core-team also recruits volunteers who pledge to construct an individual toilet facility and to motivate others to follow their example. Also gram sevaks (government appointed educated volunteers) are trained to watch over the sanitation practices in the village.

Observations

The impressions presented in the previous chapter relate to the Ahmedabad district only and some will be unique for the district. Nevertheless the following is worth to note:

- The urgency to provide drinking water to all villages in Gujarat has caused the implementation of the Swajaldhara programme to begin in a rather traditional technocratic and top-down fashion. The guidelines specified a participatory approach, but the staff of the GWSSB was not familiar with this approach.
- The arrival on the scene of the core-team has extended the involvement of villagers beyond the limited circles of a Sarpanch with a few trusted and knowledgeable aides. In particular the core-team created the possibility for women, the actual users of domestic water, to come to the fore and occupy their rightful position in the VWSCs. Considering the size of the district with 556 villages the core-team is extremely understaffed, however.
- The presence of the core-team has encouraged the GWSSB staff to have faith in the villagers, to respect their needs, to interact with women, and to work together with other departments, volunteers and students. The transformation of the technocrats and their amalgamation with the core-team is a time consuming process, however. Also the integration of NGOs needs attention. Their position should be that of a partner and not that of a sub-contractor.
- Also in the villages a mental transformation is needed. Traditionally a Sarpanch is interested in the building of infrastructure that will be a monument to his term of service. The common villagers simply dream of having water at their doorstep. Intensive social guidance is needed to create a clear picture that is shared by all of convenient and user-friendly facilities and how to maintain these in a sustainable way.
- The Swajaldhara programme does not provide finances for sanitation facilities. The increasing share of house-connections in the distribution of domestic water, however, enables a fast growing number of households to arrange for individual toilets and bath/washrooms in their premises.
- The concurrence of the old fashioned top-down Sujalam Suphalam scheme and the demand-driven Swajaldhara programme is confusing for both the GWSSB staff and the villagers.

In conclusion it can be said that two years after its start the Swajaldhara programme in the Ahmedabad district is still looking for the balance between social guidance and technical and financial support. Both the increasing awareness about the necessity of

Women the actual users of domestic water, have to come to the fore and occupy their rightful position in the VWSCs

social guidance, and the limited human resources at hand, contributed to a serious slow-down in implementation. WASMO as the Swajaldhara co-ordinator is facing an enormous task.

Training and exposure visit

On January 11, 2005, the DWSC organised training in O&M and village level water quality testing in Kambha village for representatives of several villages. After the classroom session the Sarpanch Ms Dipikaben Patel showed the participants the sump, pump room, cattle trough and the roof water harvesting facility constructed in her village. She emphasised that these structures have to be kept in a safe mode of operation and tidy. E.g. clothes should not be washed at the cattle trough and manholes in the reservoirs should be closed to prevent children falling in.

Keeping accounts

Keeping accounts was the subject of a capacity building session held for VWSC members at the Jal Bhavan. Mr Bharatsingh, Sarpanch of Vasana Iyava village stood up and showed how he maintained the records of the scheme in his village in a special kit. The resource persons were happy with his example and recommended the other participants to follow it.

Quality water for all

Mr Abdulbhai is the Sarpanch of Gibpura village since 1972. At the time there was a conflict between the Muslim and the Hindu-Harijan inhabitants about access to the village well. With the help of a NGO Mr Abdulbhai could put the quarrels to an end. However, over time the well water has become increasingly saline. The Swajaldhara programme made it possible to solve this problem too.

School showing the way

When the core-team visited Vasana Iyava village for a school sanitation day it was surprised to find that the students already knew about chlorination and were actually practicing it. They had a clear understanding of the importance of safe drinking water. Encouraged by the teachers and the Gram Panchayat the students had formed sanitation committees in each class, taking turns in the monthly cleaning of the school's drinking water tank and its surroundings, and the chlorination of the water.

Scaling up what?

The challenge of Sector Reform

Ashoke Chatterjee

Summary

This paper explores the meanings now attached to the terms 'sector reform' and 'scaling up' and suggests the need for re-definitions that reflect global experience. Reform and going-to scale must be understood as processes of empowerment and equity, and not merely as numbers. The Millennium Development Goals give added significance to these dominating buzzwords in watsan management, and added urgency to the need for better understanding.

Introduction

For over a decade "people's participation" has become the central issue within the development dialogue. When it ratified Vision 21 at the World Water Forum in The Hague in 2000, the global watsan community placed people-centered watsan action as the fundamental prerequisite for achieving universal access to drinking water and sanitation. The core points of Vision 21 were to 'place people first' and to use watsan as the entry point to human development and poverty elimination. The right to these basic services was to be achieved through "committed and compassionate leadership" and a synergy of action (between authorities, institutions and communities). Specific attention was drawn to issues of gender, the urban poor, mobilisation for affordable services, integrated and shared resource management --- and to hygiene and sanitation as a "revolutionary priority" at the very top of the political and social agenda.

Six years ago, the hope among many in India was that sector reform would be understood in these terms — as scaling up of people's power that could translate into scaled-up health and wellbeing. That hope is yet to be fulfilled in an environment that, respite much rhetoric, remains wedded to numbers and hardware.

Decentralisation: half-full and half-empty

The decentralization experience over the years since 2000 in India and across the globe demonstrate a glass that is half-full or half-empty: universal acceptance of the need for change and a major inability to satisfy it. With the introduction of the Millennium Development Goals of halving by 2015 the proportion of those who lack access to safe water and sanitation, the challenge has become one of 'reforming' watsan systems (both government and non-government) in order to 'scale up' at a rate that can achieve the 2015 targets. 'Reform' has come to mean decentralisation, and scaling up the ability of decentralized systems to achieve the access that centralized, top-down systems have failed to deliver after thirty years of trying. The risk today is that MDGs may once again become a rush toward numerical targets, rather than being understood as social and political reform for empowerment --- the empowerment upon which MDG sustainability depends. In India, scaling up and sector reform are primarily seen as Swajaldhara, under which water supply

Sustainability is about people's power to manage WATSAN according to local needs and local wisdom

schemes in villages (water supply, it is to be noted, not water supply and sanitation) are to be decentralized, demand-driven, community planned, implemented, operated, maintained and owned. Three years down the road, it is difficult to reach any kind of conclusion about Swajaldhara as the way ahead. There has been no dramatic transformation of the sector. It remains Government-driven, despite demonstrations of and assistance to the strength of people's action. Decentralized achievement is indeed taking place all over the country — yet these islands of experience have yet to add up to a powerful alternative. Although the Swajaldhara programme is now being implemented in all states, WASMO in Gujarat remains a pioneering experiment in partnership between authorities and communities. The experiment is rich in opportunities, yet constrained by older attitudes and administrative patterns. WASMO's future, as well as that of the sector as a whole, may depend on an ability among partners to now examine terms — people's participation, sector reform, scaling up — afresh and with greater attention to the meanings presently attached to them and the meanings they should have.

The Background Paper for this conference speaks of the need for "an entirely different institutional set-up" if rural watsan community participation and management is to be achieved. It speaks of several prerequisites including local managerial capability, technical expertise and of human, financial and legal resources as well as powers. New roles for sector institutions in the context of the 73rd Amendment are sought to be defined, as well as institutional systems at every level of government in which stakeholder responsibilities as well as accountability are clearly set out. The need is underlined for a genuine sense of ownership by user communities matched by genuine responsibilities for what is owned. Among the key questions raised for this deliberation is whether the decentralisation proposed would improve accountability and a genuine transfer of power and whether sector reform will lead to sustainability. The last question is perhaps the most fundamental of all. Sustainability to have any meaning must embrace not just the supply of water (and sanitation) but the capacity and the power to manage it according to local needs and local wisdom.

Semantic confusion

In the Tenth Plan document, decentralization of rural water supply is described in terms of economic development and social justice, with a participation of stakeholders at all levels: planning, design, location, implementation and management (ref 5.5.1). This would lead India to the achievement of sustainable safe water drinking supply to all habitations by March 2004. Two years later, we are nowhere near that objective. Why? The Tenth Plan acknowledged that this objective demanded "a radical change in the management system" and that "the participatory approach, which is a part of the sector reform, must be seriously addressed in the Tenth Plan". The sector reform process itself is limited in the document as "incorporating institutionalization of community participation through capital cost sharing and shouldering of full O&M responsibilities". In this critical section (5.5.26), issues of social justice and radical management reforms are left to the reader's imagination. Civil society should be "involved" because "NGOs are particularly good at outreach and have the advantage of being able to sharply focus on and activate the participation of communities". As in so many watsan documents around the world, crucial terms are left imprecise. Participation, involvement, sustainability — what do these terms really mean at the gut level of a village household that continues to lack potable water and sanitation nearly 60 years after Freedom?

The semantic confusion continues in the draft National Water Policy. Here again there is a call for "involvement" and "participation" of stakeholders and beneficiaries at all stages, right from project planning, in order that equity and social justice are achieved. The Policy demands that existing institutions be reorganized and that new institutions be created. WASMO is one of the few examples we have of this intention moving into action. This underlines once again how critical the WASMO experiment is in a national (and even a global) context. Learning from the past toward the future is made more difficult by the fact that the status of water and sanitation in India has not been subjected independent review since the mid-term Ninth Plan appraisal about a decade ago. Assessment is still based on "coverage", a concept that tells us little about actual use, quality, ownership or any of the benchmarks listed in policy documents. Massive financial resources are earmarked for rural drinking water in the Tenth Plan although officially 95% of this population is "fully covered". Sanitation continues to fall between the cracks, while global experience demands a thorough integration of hygiene awareness, sanitation and safe water supply. Swajaldhara ignores sanitation although without sanitation safe water is impossible. Departmental responsibilities for watsan are divided, almost as if to ensure that safe water cannot and will not happen. Urban water and sanitation finances remain uncertain, with a wide range of estimates, the latest (by WaterAid India) of which suggests a financial gap of Rs1,000 billion ($22B) for the sector. These estimates suggest that even if India achieves its MDG targets for urban and rural watsan, 388M rural citizens and 112M urban citizens will still be without basic sanitation in 2015 and 244M and 90M rural and urban citizens will still lack safe, sustainable water. Clearly, in this situation looking ahead and learning from the past is no easy task.

Sanitation: our laboratory of failure

The global scandal of over 3 billion men, women and children without access to a functioning toilet is more than matched by Indian's own colossal failure. Gandhiji's injunction of a century ago that true liberation begins with hygiene awareness and sanitation practice has been forgotten for sixty years after freedom. The estimate of 500 million Indians without basic sanitation in 2015 --- even after MDG achievement — is a spectacular example of watsan failure. What should scaling-up mean in sanitation? Certainly not the acceleration of existing attitudes and schemes. A recent brainstorming in New Delhi revealed why: success in sanitation requires a rejection of much that has come down through decades of top-down programmes. It demands an ability, finally, to listen to what people — primarily women - – are saying. The watsan 'twinning' has meant sanitation losing out to the survival and political importance of water. While sanitation is a priority for women, their voices are muffled in a male-dominated society where 'people's participation' still means people doing what the powerful tell them to do. Technical solutions of the one-size-fits-all variety do not correspond to the range of user's needs, demands and abilities. Solutions continue to be passed down by engineers rather than by those who understand need and behavior. Reliable data is missing. Sanitation demands convergence, and there is as yet little or no synergy between those who administer water, health, education, family welfare, environment as well as rural and urban affairs — or between the Total Sanitation Campaign and the Swajaldhara sector reform programme. Schools lack toilets, and children (particularly girls) are forced to drop out. Financial mechanisms are woefully inadequate. Corruption can absorb as much as 20% of investment. Manual scavenging

Sanitation neglect continues, even though global experience demands strong integration of hygiene awareness, sanitation and water supply

This is not a technical exercise but a political and social challenge

persists, despite the law and the Constitution. The list of failures continues as millions of Indians still struggle for the basic right to defecate in dignity and safety. For them, 'people at the centre' of watsan remains a dream, and will remain that way unless scaling up sanitation comes to mean listening to users and putting them, not engineers or officials or donors, in the driver's seat.

Global experience: no blueprints for replication

It may be useful to see what lessons we can draw from watsan experience outside India. In global terms, reforming the sector is also about scaling up, and about using community management as the concept and model for implementing watsan systems. Scaling up has come to mean indefinite sustainability (scaling up in time) and 100% coverage (scaling up in space). At international forums, the conclusion is always and clearly for a paradigm shift away from top-down government programmes toward communities taking responsibilities for implementing, managing and raising resources for watsan. As in India, the experience on the ground is that of a management struggle. There are two basic challenges: ensuring that community watsan services are sustainable in the long term (which requires adequate institutional arrangements to support community management) and to increase coverage from pockets of success through the participatory approach to reaching entire populations. There is little clarity anywhere about how to define and implement "scaling up". The things that make a community managed watsan systems more sustainable (attention to detail, taking time to build institutions) also make it more difficult to scale up. How then are we to adapt the slow, intensive participatory processes essential for building community capacity and community institutions in order to achieve rapid, low-cost implementation of watsan services? How do we ensure that the systems and institutions that we develop have the stamina for longer-term sustainability? There is still insufficient evidence to support the success of the new paradigm on a large scale, and no blueprint for scaling up. What is clear is that this is not a technical exercise, but a political and social challenge which demands major shifts in power structures, in a world where power is so often entrenched and so often linked to oppression and corruption. If there is no magic tool kit that we can use for sector reform and scaling up, the strength for the future must comes from the clear experience (through the '70s, '80s and '90s) that the old top-down model does not work. Therefore the question is not whether organizations like WASMO are needed or not, but rather how to innovate and use them for a shift that has been talked about for three decades --- and build the other institutional frameworks that the WASMOs of tomorrow will need for partnership.

The absence of blueprints and tool-kits is keenly felt in a global scene today dominated by the MDGs. Scaling up is the latest development buzz phrase being used to push for implementation at higher speeds and over bigger areas. The real risk now is that once again attention will go into the construction of systems and hardware. Statistics of 'coverage' and finance may again take attention to construction and engineering solutions, while the mechanisms for sustainability may be left for some other conference to weep over another decade down the road. As an IRC document describes it: "That is why scaling up in time is crucial: creating the mechanisms for water and sanitation services managed by communities. Without the conditions for sustainability in place, increasing coverage will be a disinvestment and will raise false expectations....." The risk is real. "When figures and targets skew a programme, it is often the poorest who pay

the price" (Ravi Narayanan, WaterAid). The preoccupation with 'replicating success stories' needs to be replaced with extending the learning that comes from experience — experience that must include both 'success' and 'failure'. Solutions cannot be transplanted because situations and communities are never the same. If these cannot be 'replicated', than neither can related watsan action. Yet the process of decision-making, action and learning can certainly be extended as a resource from one community to another, from one location to the next. Therefore words like 'participation' and 'involvement' must be understood to mean the end of formulas and a stress on the ability and stamina to cope with a huge variety of situations and needs. "These terms mean different things to different people. No one is being forced to consider the practical implications of such phrases, and as a result we have been slow to turn jargon to turn something that might be useful: specific, realistic policies..... vague, ill-defined vocabulary of recent years (must be) properly thought through" (Sandy Cairncross, LSHTM).

Community participation requires community institutions that are genuinely representative and accountable. Issues of gender, caste and politics can affect any watsan committee and turn "demand-driven" goals into exploitive power politics. Commitment to principles is therefore more important than distinctions between structures: government, NGO or CBO. It is the core principles of Vision 21 that will ultimately decide sustainability. Coverage needs now to be seen in institutional terms rather than in terms of hardware. In the words of Bolivia's Marco Quiroga, a civil engineer, "The fact is that a huge amount of time and money has been spent on learning on how not to do it.... After 40 years of work we have finally started to go to scale with a strategy that works and the most important thing is that we stick to the combination of technology-with-social support that has already brought sustainable solutions to several hundred thousand poor people. We must continue to reinforce the services that these communities are now running for themselves". Another engineer working on watsan transformation, Dipak Gyawali of Nepal, is promoting the concept of 'social auditors' who can take a hard look at watsan institutions and hold them accountable — bureaucrats, donors and CBOs: "A stable and sustainable policy terrain depends upon the robust presence of this 'third leg' of social activists. It is only they who can provide a corrective to profit seeking and bureaucratic rigidity." That social audit can be a powerful weapon in battling corruption, the least discussed reason for sector failures, is reinforced in an on-going WES-Net e-discussion. Participants reveal the impact of corruption on efforts at genuine reform in their regions. They suggest a series of monitoring mechanisms that can be incorporated in project design and implementation as a critical component for scaling up.

Radical redefinitions

Thus the new approach to scaling up that is emerging around the globe reflects a common message that success depends on sparking a radically different kind of watsan "demand creation" and an equally radical redefinition of "community participation". At the just concluded World Water Forum in Mexico City, a panel representing Africa, Asia and donors observed that scaling up "is not only or primarily about construction. It focuses on behavioral change....." (FT 3.08, WWF 2006). Demand creation has to respect the contours of culture and custom. In settings as diverse as Colombia and Bangladesh, demand creation has meant allowing communities to see themselves through new perspectives of pride, self-respect as well as shame. The result has been watsan demand of a qualitative different kind: "an urgent, determined, not-to-be-denied kind which is capable of leading to permanent change." Community

The real indicator is not statistics but changes in power, behaviour and health

participation has also to move from lip service (e.g. participation in a hygiene lecture) to a political process that is about the community organizing itself to take decisions and to take action, challenging relationships and negotiating around political barriers. In the words of Colombia's Mariela Garcia "The people who live everyday with inadequate water and sanitation already possess resources of experience and knowledge that are essential for improving their situation..... not as passive beneficiaries of a programme but as key participants". A major requirement is to ensure that women are in charge of watsan — not just as participants but as leaders.

Finally, the indicator of a new approach and of a genuine paradigm shift can no longer be the coverage statistics so enshrined in government literature.Instead it must be the recording of changes in use, behavior and above all, in health. The lesson of experience is that scaling up is first about people's power and well being. It is only then that numbers can have a chance to be sustained.

Global experience suggests a lack of willingness to learn from past failures

Global experience suggests a lack of willingness to learn from past failures

"At the core of that failure has been the attempt to 'deliver' solutions from the outside --- usually in the form of installing hardware --- to communities who have had no involvement in, or ownership of, the process".

"The important point is that almost all of those who work closely with poor communities to improve water, sanitation and hygiene now believe that a 'method breakthrough' has now been made, or at least that the principles of success have been laid bare.....But this optimism everywhere is subsumed under a suspicion --- in some cases a certainty --- that the lessons of these years are not being heard or applied".

"The 'new approach' has been pioneered over at least two decades. Its basic ideas and above all its vocabulary --- 'community participation', 'people-centered', 'demand-driven', 'empowerment', 'rights based' --- have entered into the mainstream of national and international discussion. Indeed....agencies today would find it difficult to discuss the issue without a ritual chanting of the new liturgy. Nonetheless, we are clearly dealing here with a religion that is more honored in the letter than the spirit, and lip-service at national and international levels disguises the fact that the new strategies are not gaining significant traction on the ground. ....there is as yet little sign of 'going to scale'.

The common core of the message.....is that success depends on sparking a radically different kind of demand for water and sanitation, and on an equally radical definition of 'community participation'".

("Listening", WSSCC 2004)

RELATED THEMES

Overview of water supply in Gujarat

Adequate and safe drinking water and sanitation is one of the most important challanges faced by Gujarat for its development. New initiatives focusing on decentralisation and community-management have been taken to achieve drinking water security

WASMO

Water, the backbone of human development and social advancement, is critical for survival of all living beings. Improved access to water supplies, adequate sanitation infrastructure, and good hygiene practices can improve human health. It can also bring many secondary benefits such as greater chances to enhance socioeconomic development, increased standard of living, and improved nutrition. Water supply and sanitation pose one of the most important development challenges in this century. There are over one billion people around the world without access to safe drinking water and over 2.4 billion who do not have access to sanitation. More than five million people die every year from water-related diseases. Recognising the importance of water and sanitation the United Nations too, has as a part of the Millennium Development Goals pledged to reduce by half the proportion of people without sustainable access to safe drinking water.

Water scenario in Gujarat

Gujarat ranks 6th among the 15 major Indian states in terms of human development index (National Human Development Report, 2004). However, the acute problem of water scarcity which has substantial effect on human development is a major hindrance. It is known that Gujarat is one of the most water stressed states in India second only to Rajasthan. Fresh water resources in the state are limited and not evenly distributed. On an average, one of every three years is a drought year. These conditions, together with increased demand of water by the agriculture sector, puts very high pressure on the availability of potable water on a sustainable basis.

About 95% of total annual rainfall occurs during the short monsoon period between June and September. The highest rainfall, of about 2000 mm, is received by the South Gujarat region, whereas, it ranges from a meager 300 mm to 500 mm in the North Gujarat and Saurashtra regions. Water storage in the aquifers and percolation for ground water recharge is also precariously low due to typical geological formations existing in the state. Water supply in the state is heavily dependent upon ground water, which does not get sufficiently recharged due to low rainfall during the 3-4 months of monsoon.

A long coastline and two huge gulfs make the situation still difficult for ground water quality in the adjoining areas. The entire Little Rann of Kutch and Greater Rann of Kutch are inundated with saline sea water for quite a long period of the year and it deteriorates the ground water quality in the adjoining areas.

Over drafting of ground water mainly for agriculture and depletion of aquifers in the

The state is shifting from ground based water supply system to surface water based water supply system through 'Statewide drinking water grid'

process has had a great impact on the water availability in a large area of the state during the recent past. Recurrent emergence of not covered or partially covered habitations is observed in spite of taking up strong measures to cover these habitations for drinking water sources. Out of the total 225 talukas in Gujarat, 41 fall in the overexploited category, although in 1984, the overexploited taluka was only one. Similarly, talukas falling in grey category have increased from 13 in 1984 to 40 in 2002. The talukas affected by salinity have increased from 1 in 1984 to 13 in 2002. Groundwater table/level is going on depleting at the rate of 3 to 5 m per year due to over exploitation of groundwater.

The water quality problem in terms of excessive fluoride content, nitrate as well as salinity is observed in significantly high number of habitations. There are several reasons for problems related to water quality in the state viz., a long coast line in the country adversely affecting the ground waters and causing salinity ingress; over drafting of ground water, which is a major source of drinking water in the state, has resulted in mineralisation of water; less than satisfactory control of industrial discharges or poor treatment of sewerage have contaminated ground and surface water; use of pesticides and chemical fertilisers in agriculture; less than satisfactory maintenance of sources of water supply also has resulted in contamination of drinking water. There are 8252 habitations suffering from one or the other type of water quality problem, with even new areas emerging as quality-affected. Even those villages where a safe or alternate source of water has been provided and the quality problem has been mitigated, over a period of time, many habitations have re-emerged as problem villages.

The problems in the state can be summarised as moderate to low rainwater harvesting infrastructure; groundwater is over-exploited; ecological degradation compounds problems of re-charge and water quality; and the drinking water supply is not adequately managed. The management of water supply includes poor maintenance of pump houses and other infrastructure, as well as water leakage and pilferage in some areas.

New initiatives

The Gujarat state government has accorded highest priority to providing safe drinking water to all to tackle the challenge of water scarcity.

In keeping its commitment to eradicate drinking water scarcity in the state and achieve long-term drinking water security, during last few years, several policy initiatives were undertaken. The new strategy incorporated novel ideas on how sufficient water can be made available to all in an equitable manner. It involved ensuring sustainability of water sources and water supply systems through the development of physical infrastructure as well as social interventions based on the water resources available, monsoon pattern, topography and need.

The major elements of the strategy are:

- A 'Statewide Drinking Water Grid' is being established, which on completion in 2007, would provide drinking water to about 14,000 villages and 154 towns, covering three-fourth population of the state. Thus, the state is shifting from groundwater based water supply system to surface water based systems where the transfer of water from water-surplus South and Central Gujarat to water-deficient North Gujarat, Saurashtra and Kutch will be carried out. In these areas, surface water resources and groundwater quality are poor. About 75% drinking water supply in the state will be from surface resources. As a significant part of this grid, through the

Sardar Sarovar Canal-based drinking water supply project, infrastructure is being developed for transfer of bulk water to provide safe and assured drinking water to 21 million people in 8,215 villages and 174 towns. For providing safe water to the rural population, series of treatment plants are being set up. For urban areas, raw water will be supplied which will then be treated by the respective municipalities and municipal corporations, and distributed among the people.

- Implementation of rainwater harvesting and developing gravity-based water supply schemes in tribal areas of South Gujarat. These are forested areas with high rainfall and undulating land terrain. The schemes are low cost, easy to operate and maintain and are best suited for the scattered tribal population. In order to achieve drinking water security, the construction of household level tanks has been provided for the community in the chronically drought prone and water scarce areas of the state.
- Shift from supply-driven, government-owned systems to decentralised demand-driven, community owned water supply and sanitation systems, with emphasis on empowerment and capacity building of the local communities. Village-level institutions are responsible for planning, owning, operating and maintaining water supply systems within villages. This approach is in consonance with the 73rd Amendment of the Constitution and sector reform in rural drinking water supply. It is also in line with the decentralised governance systems being actively pursued in the state.

Towards decentralisation

Experience the world over suggests that for any permanent and sustainable solutions to be achieved, substantial stake of the users needs to be there in creating, operating and maintaining drinking water and sanitation facilities in the habitations. This calls for institutional innovations at the state and grassroot levels. The Government of Gujarat too realized that the existing institutional arrangements would not serve the purpose and that an organisation that would focus specifically on the empowerment of the user communities in the villages had to be conceived. With this need in mind, the Government of Gujarat established Water and Sanitation Management Organisation (WASMO) in 2002 as an independent and autonomous organisation to facilitate reforms in the rural drinking water supply and sanitation sector. WASMO was created for capacity building, information, education and communication, monitoring of social aspects and all the software activities that need to precede the implementation of decentralised in-village, community-managed water supply systems in the rural areas. WASMO has also been retained as the State Water and Sanitation Mission (SWSM) for universalisation of sector reforms.

WASMO was set up to facilitate reforms in rural drinking water supply and sanitation sector

Gujarat state had legalised the process of community intermediation and empowerment of PRIs. This has been done by bringing out a Government Resolution on the formation of the Pani Samiti as a sub-committee of the gram panchayat which was passed in 1995 to provide an institutional mechanism for in-village water supply management. The responsibility of overseeing and supervising the formation of Pani Samiti lay with the TDO. This Samiti would be responsible for the in-village water supply and would be concerned with water distribution, O & M of the system and recovery of water cess. The GR on Pani Samiti was revised in October, 2002 to meaningfully implement reforms and decentralize the sector. It specifies the position of a Pani Samiti as a functional committee of the gram panchayat, and

outlines its composition, power, tasks and working procedures. Of the 10-12 members in a Pani Samiti, the GR stipulates that one-third must be women, while there is also a provision for the reservation for SC and ST in proportion to the village population. The Pani Samiti is chaired either by the gram panchayat sarpanch (president) or a panchayat member elected by the Pani Samiti. In accordance to 73rd Amendment to the Constitution, the gram panchayat is responsible for planning, designing, implementing, operation and maintaining the in-village drinking water supply scheme.

A decision was taken to launch all in-village water supply schemes in reform mode from April 1, 2004. So far, through various projects, in-village water supply and sanitation schemes in about 4,500 villages at a total cost of Rs. 425 crore are being implemented. Today the works have been completed or are nearing completion in over 1751 villages.

Salient Features of Gujarat State

1	Area:	
	Total:	195984 Square Kms.
	Tribal:	20912 Square Kms.
	Drought prone:	53860 Square Kms.
2	Number of:	
	Districts:	25
	Talukas:	223
	Villages:	18066
	Towns:	242
3	Population:	(As per 2001 Census)
	Total:	50671017
	Tribal	7481160
	Schedule Caste:	3592715
	Rural:	31698000
	Urban:	18899000
	Density	258 persons per Square Km.
4	Physiography:	(Grouped in to Five Regions)
		Eastern Hilly Tracts (300 to 1400 Mts.)
		Upland of Saurashtra and Kutch (150 to 500 Mts.)
		Alluvial Plains of North Gujarat, Kutch and areas around Gulf of Khambat (20 to 150 Mts.)
		The Low lying Saline Coastal tracts (3 to 20 Mts.)
		The Marshy and Saline Desert of Rann of Kutch.
5	Drainage:	
		Except the Rivers Narmada, Tapi and Mahi all other rivers in the Eastern parts of the state originate from the Western slopes of Eastern hilly tracts. The rivers of north Gujarat disappear in to the low lands of the little Rann of Kutch and the Arabian Sea. The rivers of Saurashtra and Kutch have Radial pattern. Except Narmada, Tapi and Mahi all the rivers are seasonal rivers.
6	Climate:	
		Most of the area is Semi- arid except South Gujarat area, which is Humid to Sub-Humid.
		State has very high Drought *Frequency (Recurrence being approximately about* 3 to 5 years)
7	Rainfall:	300 to 2000 mm
		South Eastern hilly tracts receives the highest rainfall, while as Kutch area receives lowest.
8	Temperature:	
		Summer Temperature ranges between 350C to 450C, Winter Temperature ranges between 170C to 350C

9	Geology:	
		Geological formations range in age from Archean to Recent. Hard rock area is 109304 Square Kms. And Alluvium area is 86680 Square Kms.
10	Total Dynamic Ground Water Resources:	
	Total Ground Water Recharge:	18001.45 MCM / year
	Utilizable Ground Water Recharge:	14401.16 MCM / year
	Gross Ground Water Draft:	11401.93 MCM / year
	Ground Water Balance:	2999.23 MCM / year
11	Overall Ground water Development	
	Overall Development:	Grey
	%Development:	79.17 % of the available Ground Water resources.
	No. of White Talukas:	123
	No. of Grey Talukas:	40
	No. of Dark Talukas:	06
	No. of Saline Talukas:	13
	No. of Over Exploited Talukas:	41
12	Quality of Ground Water:	
		In general quality of aquifers is deteriorating, Coastal areas are mainly affected by salinity ingression. All districts, except Dangs, have reported sources with excessive Fluoride. Nitrates & TDS are also on rise.
13	Fresh Water availability:	
	Gujarat:	1137 m3 per capita per annum
	South Gujarat:	1932 m3 per capita per annum (70% of State Resources)
	North Gujarat:	427 m3 per capita per annum
	Saurashtra:	734 m3 per capita per annum

Source: Reference Manual for Hydrogeologists, GWSSB, 2005

Community empowerment: Rhetoric or reality?

While there have been encouraging examples of empowerment in the WATSAN sector, women continue to face challenges

Nafisa Barot and Utthan team

Summary

One of the most serious issues confronting women continues to remain access to safe drinking water. It was only in 2000 at the Second World Water Forum that a gender sensitive and people-centred approach was upheld for the first time by the international community.

In Gujarat, the experience of Utthan reveals the diverse and continues challenges faced by women at all levels. This paper cites a few examples of these problems and how these were overcome. It outlines a road map for actualising community – especially women – empowerment.

Introduction

The key features of Utthan's emergence, awareness raising, mobilising and organising the most vulnerable communities in particular women, opposing both powerful interests/castes as well as the centralising approach of the government, suggesting alternatives, can be viewed as a significant part of the history of gender sensitive decentralised water supply in Gujarat. Initiating this process in 1981 in the severe drought prone region in Dhandhuka taluka, of Ahmedabad district and after the formation of a local organisation called Mahiti, Utthan carried forward its learning to the coastal regions in Bhavanagar, Amreli and the Adivasi areas of Dahod and Panchmahal.

One of the direst issues identified by women almost 25 years back and even now, has been that of safe drinking water. Utthan's major learning arose from helping communities to organise, challenge the existing patriarchal/ feudal interests, exploitative governance and leadership, as well as demonstrating to the authorities and the community itself, the possibilities of gender sensitive, people centered alternatives, such as that of rain water harvesting in lined ponds and roof rain water collection tank.

For the first time, a gender sensitive and people centered approach to genuinely address the issue of safe drinking water and sanitation was upheld by international community at The Hague in 2000 in WWF2, for which Utthan together with other partners in the Water Supply Sanitation Collaborative Council (WSSCC), did strong advocacy. Gujarat was the only state which came up with a shared vision on water and sanitation, called Jaldisha. International, nationally and state wide goals for access to safe water and sanitation were set with commitment to ensure access to all by 2025, while India has a commitment to attain this before 2015. Empowerment of the most un-served and deprived has been accepted as non negotiable for the attainment of WATSAN or any other goals although the understanding and implementation of this has varied, both within civil society and the government.

Understanding empowerment

Empowerment is understood through

Empowerment is a process that enables a community to deal with rights and responsibilities

various terms such as community participation, decentralisation, devolution of power, ability to challenge various types of existing discrimination, exploitation and injustice. At the same time it is also understood as the community's ability to take charge, make choices, manage resources and institutions, address various conflicts through transformation as well as making their voices heard at different levels for their rightful demand, building newer capacities to deal with challenges of today and tomorrow, etc. Though there is wider acceptance that process of empowerment encompasses all the above and is a holistic and a continuous process, much of this remains as rhetoric.

At large, the integration of underlying non-negotiable principles such as that of gender equality, equity, justice, peace, accessibility, sustainability, improved quality of life, ensuring spaces for the voices and perspectives and equal learning opportunities of the most vulnerable sections and communities of the society such as women, dalits, adivasi and minorities, etc. in WATSAN programmes are quite superficial. Successful examples of empowerment can be seen only where the long term efforts have been invested and focused towards helping communities create spaces and opportunities through organising women's sangathans, youth groups, water sanitation committees, watershed committees etc., for those who are invisible and oppressed due to socio, political and economic reasons. These provide the space within the larger community, to collectively discuss their issues, analyse, express their own perspective, aspirations and choices. At the same time where efforts have also concentrated in organising and enhancing capacities of these communities through shared information and learning that would enable desirable change for the betterment of society from a human rights- including women's rights – perspective. For the larger impact, this process has to influence other sections of society who are either part of the problem or solutions and this is achievable only through networking, collaboration and meaningful partnership at different levels and with different actors. There has to be clarity on issues and the inter-linkages to facilitate this process.

Dispute over inequitable distribution of resources and their benefits between urban and rural and rich and poor cannot be addressed without sensitising and influencing the mindsets of different sections of the society for their responsible actions. Those who consume more water have to realise that it is the women and vulnerable who suffer the most. Hence empowerment can be broadly seen as a process that enables a community to deal with rights and responsibilities.

According to Prof. T. N. Narsimhan, 'Public interest groups and non- governmental organiastions strive for equitable distribution of water among all segments of society and for protecting the environment and the biological habitat for future generation. Amid all this there is absence of a coherent national water policy. Water has to be given an important place in the constitution to guide and empower the legislature, the judiciary and the executive to regulate its use.' If community empowerment is desirable, then emphasis has to be on activating India's constitutional rights to basic services.

Value-based leadership

Many of the local water committees in Ghogha region of Bhavanagar, Amreli, and Dahod where Utthan works have been challenged or taken over by women leaders when they fail to deliver services. In Neswad village of Bhavanagar district, the Pani Samiti could not collect the contribution towards maintenance from some of the dominating families due to which many other families refrained from giving their

contribution. The women's group called a village meeting and took the Pani Samiti to task for failing to maintain the water system. But they also came forward to support the Pani Samiti through consensus in the gram sabha that those who will not pay for maintenance will not be allowed to take water from the tap. Different members took responsibilities in different sections of the village for monitoring. This committee also decided not to take contribution from very poor families and their share was paid collectively by all as the community's share. Women leaders such as Baluben, Monghiben and Samjhuben played an important role in mobilising the women's group to take action.

Empowerment process initiated amongst women in WATSAN within Ghogha and other districts such as Amreli and Dahod has led to challenging traditions of patriarchy at many levels such as the family and community and in political participation. Perhaps for the first time at such a large scale, women have led interaction with authorities at district and state levels and have even begun to negotiate with donors. Baluben, one of the women leaders from Neswad village, challenged her brother-in-law who was the sarpanch of the village to stop mechanical excavation for laying the pipeline for water distribution in the village. A number of families who were to migrate had approached her as a leader to help them get this labor work. The sarpanch attempted to stop Baluben, using family pressure through his brother, Baluben's husband. When Baluben's husband was not able to change her stand he restricted her mobility. Baluben, used the same pressure and restricted his mobility too! Finally both the brothers gave in to the continued pressure from the women's group and Baluben's strong stand, resulting in poor families getting work, strengthening Baluben and her husband's relationship, transforming him and the sarpanch as supporters of women's groups and development in the village as well as in strengthening the women's group to take on more challenges.

Women in some of the villages in Dahod and Panchmahal districts who had faced violence during carnage, desire peace which they know cannot be fully realised until they get justice to the wrongs done. Yet they say that they do not wish ill or carry grudges on those who inflicted violence on them. They are now very actively coming together with women from other communities (adivasis and dalits) around their common issues of safe water and sanitation thereby creating opportunities for conflict transformation. Building a common property resource such as a check dam, rooftop rainwater harvesting water tank, washing ghats, toilets through revolving fund is helping not only in the daily lives of women, particularly those from minority community, but also in healing wounds and building securities for the future due to dialogue. These initiatives are therefore simultaneously rebuilding and expanding democratic spaces.

All the above and many such examples could not have come about, without the long term support in sensitisation, capacity building campaigning and demonstrating viable socio technical alternatives, which has been the major contribution of NGO activism. These experiences are not so uncommon elsewhere, both nationally and internationally.

However, what is common are obstacles and resistance on many fronts. In a number of the villages where Utthan has worked and where women had challenged patriarchy at one level, they are still struggling to address the issue of equitable distribution of water, especially when it comes to ownership of water, its sharing and access by others or misuse by those who pollute it. Within this process, caste and communal conflicts are greater then the class. Obviously this is a manifestation of the absence of clear regulations and good governance that would

Collectively building a common property resource like water helps expand democratic spaces

Institutionalisation of the empowerment process helps establish democratic and self-sustaining systems

support such action at various levels. At another level, in many villages of the Ghogha region and elsewhere, where regional piped water supply has been planned by the government, the women face constant struggle to build their local resources first.

Institutions

Individual leadership and empowerment are no doubt extremely important but equally or more important is the task of institutionalising the process of empowerment, thereby establishing democratic and self sustaining processes, reducing the dependency on individual/s and converting individual learning into institutional one. Villages where strong women's and men's groups have emerged, there are strong individual leaders who have taken the group ahead within which their leadership gets accepted. However, it takes long or sometimes much longer, before the group's identity as an institution is established and accepted by the larger community. Normally, individuals identities emerge much stronger then the group's. Although leaders like Baluben, Monghiben, Bhavanaben, Ratnabai and many such leaders belonged to women groups or Pani Samitis or watershed committees, it took a long time before the organisations they belonged to got visibility. This happened only when different members in the group were seen actively getting engaged in different activities. Also, they have demonstrated transparency, inclusiveness and greater participation in the process, by holding the meetings in public places or rotationally in different falias. As a result today, in villages like Mithi Viradi, Chayaa, Neswad and many others, communities approach different members of the committee for any WATSAN issue, instead of just one leader.

In the official WATSAN programme in Gujarat, Pani Samitis have been identified as an institutional mechanism formed or endorsed by the gram sabha, with the village sarpanch as the President. There are various issues emerging in the context of these institutions from the context of empowerment. In most cases, these committees are more on paper, where communities hardly know the committee members nor do the committee members show any commitment through their actions towards the issue.

Some of the empowered leaders from the communities have found it extremely difficult to find space to work within this framework, as in many cases they have been excluded for challenging some of the established interest that stand as barriers to the vulnerable sections receiving their due rights. In one of the villages in Rajula taluka of Amreli district, a sarpanch who belonged to the upper caste, would hold Pani Samiti meetings in his house. This automatically created problem for the dalits and women who were discriminated against others in terms of their sitting arrangement, as well as in terms of giving their opinions freely. The question is not only of the conduct of the sarpanch but also of how empowered the gram sabha is, which selects or endorses a committee. The larger issue here is of the commitment of the Government as well as of the civil societies to invest their energies in sensitising and helping enhancing capacities of the members as well as Pani Samiti as an institution. The issue linked to this is therefore of democratising local governance structures, of building the capacities of the Panchayats, women and youth groups.

There have been successful and somewhat not so successful examples of Pani Samiti's efforts in addressing the local WATSAN needs. Developing local resources first, through rainwater harvesting, recharging and priorities to the Panchayat or Pani Samiti or local group for implementation of WATSAN work instead of the contractors, has surely been given due recognition officially. Initially, in the Ghogha water supply and sanitation project, work for the construction of some

of the overhead tanks and distribution of water supply network and sanitation facilities was given to the contractor. Many of the Pani Samitis, with support from the other community members, strongly put up a joint front before the government showing cases of delays, poor quality work and corruption thereby allowing them to implement, which was accepted by the government. However, decentralisation requires new norms of accountability including those of finance along with the articulation of new roles and responsibilities within different partners.

Both in Saurashtra and Adivasi areas, through Pani Samitis and women's groups, women have demanded latrines that provide the added advantages of safety (not just from molestation but also from snakes and scorpion bites), privacy, longer lasting and more appealing than low cost toilets targeted at below poverty families. They demanded micro finance (at low rate of interest) and expanding the latrine options beyond the present subsidy models targeted at poor to an approach that had women as the focus. Leaders like Rudiben, Roopaben and many others have argued with the officials that there is a very important gender empowerment dimension in being able to access some support in terms of 'subsidy' and low interest loan for sanitation to leverage family commitment towards their needs. This demand has yet to find appropriate response.

Institutional reform and support can be slow. Yet it is most critical to the 'paradigm shift' that the empowerment approach seeks. The WATSAN challenge demands an integrated approach from authorities concerned not only with water supply and sanitation but equally from health, agriculture, education, forestry, industry, power generation and other management of natural resources. Institution such as WASMO can be used to reflect such integration in their governance and activities. Programmes such as Swajaldhara need clearly articulated missions, principles and goals to focus on the processes of change that are equally important to those on physical structures. Swajaldhara objectives cannot be met unless district level WATSAN committees acquire clout and capacity for people centered roles and responsibilities. Also, local governance structures need to be transformed.

A major change is needed in the allocation of financial resources which are now largely confined to limited project periods. The paradigm shift to which India is committed demands resources for social and political change that can seldom be achieved within project schedules dominated by infrastructure supply. A deeper understanding is needed of what it takes to achieve decentralisation that is truly demand driven and that can achieve genuine shifts in power. Investment in awareness and in capacity building need acceptance as pre requisite for attaining WATSAN goals in which empowerment is embedded. NGOs can play a major role and have responsibilities to assist this process which demands a new sense of professionalism. Movement such as the Right to Information will need to be strengthened not only to improve the very poor database upon which WATSAN decisions are now made but also to ensure feedback to communities on schemes and programme they are encouraged to control. It will also ensure accountability from public officials and more clarity on their roles.

Facilitation

Civil society faces different challenges in facilitating processes of empowerment. First of all, it has to internalise within its organisations, the values and processes that are non negotiable and practice them before preaching to others. Organisations like Utthan, where its members come from different sections of the society, invest in

Civil society organisations must internalise non-negotiable values and processes before facilitating empowerment

Devolution of power implies addressing problems locally and equitably through dialogue

overcoming their own blocks, change in their behavior and attitude. While discussing sanitation issue from the gender perspective within the team, we found that there were a number of members who did not have toilets in their house. When the effort was made to ensure 'we practice before preaching', many of these male members either offered typical arguments which one hears from the community, such as, ' our women are not very comfortable in relieving themselves within the closed walls,' or, ' financially we cannot afford it,' while the same family would spend lavishly for ceremonies such as marriages.

Starting with our own self gives us a first hand experience in understanding the effective facilitation process. Such as we understood what it takes to keep the office, toilet clean and ensuring adaptation of good practices, such as using the ladle for water. Initially we would find our own members forgetting to practice this during larger meetings. But close monitoring and persuasion helps in practicing and changing behavior. This is clearly an organisational development issue.

Decentralisation and devolution of power means addressing the problem where they are and has to be through a dialogue where different actors responsible are actively involved, keeping the views and needs of the communities most affected as the focus. It also means helping the communities with accurate information and objective analysis that enables them to make choices and take better decisions. In Ghogha and many other districts, communities were given exposure, understanding and an opportunity for a healthy dialogue on sustainable water resources and management systems, both centralized systems such as regional water supply systems, community level sanitation systems as well as decentralised water supply and sanitation systems. This led to women strongly demanding the building of local resource first or for roof water tanks for water security or for common bathing facility but family toilets in the house.

Most important is ensuring implementation of principles of empowerment at all levels. Utthan, had to withdraw from some of the villages where community did not want to accept some of the principles while demanding that as facilitators we should help them implement WATSAN as they want. For example, in few villages, contractors paid up community contribution of 10 per cent towards the capital cost of the system as they were sure they were to recover this money from the work they would get at the cost of low quality. Or where the community refused to give space to women and other vulnerable community members in the decision making body.

Swajaldhara, which is the programme based on communities' informed choices of implementing sustainable WATSAN system on the basis of gender equity and their active participation. Invariably conflict is seen between what community wants (design, systems) and what officials 'instruct', prior to the community consultation, which is just the continuation of previous mindset, obstructing the process of change, where communities are taking decisions and ownership of processes.

All this requires a strong belief rooted in organising the vulnerable communities towards a self reliant, well governed, society and commitment towards it. This in turn requires long sustained efforts and resources with a transparency. Experiences show that with limitation of resources and appropriate governing mechanism, character of facilitating organisations changes to becoming structure oriented or target oriented, losing transparency and the rigor for facilitating processes of empowerment.

Lastly, communities and civil societies will have to be empowered to monitor, facilitate

the planning process and have the twin ability to partner and confront the authorities. In turn, authorities will need to not merely tolerate but encourage shifts of power, even when empowerment is untidy and noisy. Democratic motivation for change needs to be reflected in the governance of new institutions, including WASMO. It is clear that WASMO cannot stand in isolation; institutional changes at other levels are a must. Empowerment has its basis in value-based self reliance that requires support mechanisms for a medium or long term hand holding efforts.

To ensure that empowerment goes beyond mere rhetoric there is a need for:

- Membership of WATSAN that is truly representative;
- Legitimacy for local institutions and management to address local needs;
- Civil society to assume a major role in sector capacity building;
- Capacity-building at all levels toward gender sensitivity, equity and sustainability in WATSAN action;
- Recognition of women/youth groups SHGs, water committees; and,
- Minimum 50 per cent representation of women in decision-making bodies.

In order to do this:

- All WATSAN authorities should ensure credible representation of all stakeholders, particularly women;
- Priority should be accorded for training at all levels to ensure capacity for new roles and responsibilities;
- Appropriate criteria for civil society representation at every level of decision-making should be developed; and,
- WATSAN resource and learning centers should be set up.

Role of networks in mobilising action on drinking water and sanitation: Experiences of PRAVAH in Gujarat

Networks can play a vital role in generating awareness on managment of water supply systems at grassroot level and generating demand for safe drinking water and basic sanitation amenities

Pravaah

Summary

The access to safe drinking water and sanitation facilities is getting complex day by day and the role of communities has become important at this juncture to take leadership and start a movement which is self driven rather than project driven. Over the years PRAVAH has seen many changes in its approach for advocacy for policy changes through networking with various stakeholders in Gujarat.

PRAVAH has moved from a State level advocacy body to regional level advocacy body through its regional centers and members, this move from centralized working to decentralized functioning has helped in bringing more partners at the regional level. Regional based issues at the local level have been identified by the members and a district- region- state level advocacy chain has been established which reaches not only the State government but also the NGO's and communities.

The essence of a network is its presence in various parts of the region and strong connecting links for presentation - sharing of experiences with other members in the region as well as at state level. The development of regional level platforms- Regional Centers by PRAVAH has helped in establishing the link: communities- village- taluka- district- state. This paper tries to capture the experiences of three important lessons learnt by PRAVAH namely: Sankalan Samiti, campaign and Lok Manch. Various institutional systems have been experimented like Sankalan Samitis at the regional level for implementation of various activities of PRAVAH and a formation of team to take ahead the vision of PRAVAH.

Campaigns have been organised not only to motivate people to demand for self reliance but also to take up the responsibility of ensuring that the local sources are developed for drinking water purpose. The role of PRAVAH has been quite instrumental in this entire phase as it has developed further actions to reach out to more communities through its members via the Campaign. The importance of issue based networks like PRAVAH in the present scenario is very much required in the state to increase the access to safe drinking water and sanitation facilities. Over the years, sanitation and hygiene have also been adopted by PRAVAH members as an important aspect in holistic definition of access to safe drinking water being promoted by PRAVAH.

Lastly, there is always a demand from the communities for providing water during summer season and all the 'providers' and 'facilitators' end up establishing system for

[1] PRAVAH is a State level network of NGOs, Academicians, Researchers and Individuals working to mobilize action on drinking water and sanitation

PRAVAH's mission is to initiate an integrated movement for safe and adequate drinking water supply and mobilise action on creating sanitation facilities

providing drinking water but effort needs to be done in educating the communities about the importance of optimizing the use of water during the rest of eight months of the year. The role of government in situation of scarcity or calamity cannot be ruled out but the dependency on government to provide water has to go. People will have to take up the responsibility of managing their water and become self reliant. This entire process cannot be achieved without the active support from government and other NGO's whose role should be that of facilitators of the movement for self reliance.

The Genesis of PRAVAH[2]

A State level consultation workshop was organized by Utthan organisation to discuss the "Dynamics of drinking water in rural Gujarat" this study was conducted by Dr. Indira Hirway and Prof. P. P. Patel. The findings suggested a need for policy changes in the drinking water sector which would lead to greater access to safe drinking water by rural areas. PRAVAH- was formed as a platform to mobilize action on drinking water in Gujarat. Over the years the membership of PRAVAH has reached to 130 (both individual as well as organizational). The journey over the years has been quite challenging and dynamic for the drinking water and sanitation sector.

Vision

By the year 2007, 5000 villages in Gujarat will have safe, sustainable and adequate drinking water and improved sanitation facilities. The people in these villages will have complete control over the resources and the distribution of water will be equitable. Women and vulnerable communities will have their voice and active role in decision making at all levels. The Government will have adopted these objectives and will play the role of an enabler and a facilitator for promoting decentralization, sustainability, gender mainstreaming and empowerment of vulnerable communities.

Mission

To initiate a movement in Gujarat for ensuring safe, adequate and sustainable water supply for drinking and other domestic purposes to all and effective sanitation facilities, throughout the year.

Objectives

- Safe drinking water for all: To ensure that safe drinking water and sanitation facilities are available for all people through out the year
- Equity: To ensure that the issues in equity of drinking water and sanitation are addressed
- Local source development: To promote development of the local sources for drinking water which are low cost and based on local traditional systems
- Decentralisation: To encourage people's participation through decentralised approaches in planning, implementation and management of drinking water and sanitation systems.
- Gender mainstreaming: To ensure and encourage maximum participation of women in the process
- Sustainable drinking water and sanitation systems: To make sure that the entire process leads to providing sustainable drinking water and sanitation systems.
- Advocacy issues: To advocate decentralised and people centered policies for drinking water and sanitation.

Goals

- To help the partners in building the right understanding and perspective on the various dimensions of the drinking water issue at the micro as well as the macro level through mutual learning.

[2] Details of PRAVAH structure and outreach is given as Annexure-1

- To help the voluntary organizations in empowering communities (especially women) through awareness creation and active participation in planning, implementation and management of water harvesting (or supply) systems.
- To promote decentralized sustainable and equitable water harvesting (or supply) systems.
- To influence government policies for drinking water interventions, towards meeting the above mentioned objectives.

Decentralised Institutions for Advocacy: Sankalan samiti[3]

The Sankalan samiti at the regional level is the steering committee which plans and implements various programmes of PRAVAH. The Sankalan samiti has a very different kind of role in the region; it plans the activities for the advocacy efforts of PRAVAH at the regional levels. This is done through sharing of responsibility in implementation and taking a lead to organize and ensure more participation at the district levels.

The initiation of the regional centers required identification of institutional mechanisms like the support/host organization, which would be the place from where PRAVAH would carry out its activities of networking and advocacy in the region. The formation of Sankalan samitis in various regions and defining the roles and responsibility of the Sankalan samiti members was done in the initial phase.

The experience of Sankalan samiti and its functioning has helped PRAVAH in evolving a decentralization process of formation and functioning of the Sankalan Samitis coming out with norms and process to be followed.

These efforts have strengthened the mobilization action on drinking water and sanitation in context of the regional issues. The Sankalan samiti has grown in terms of understanding more about PRAVAH and the difference in the type of working of a voluntary grass root organization and that of a network. Following are some observations:

- The members showed less interest initially as they did not have any clarity on the activities and their role in PRAVAH as a larger network.
- There were some members who were just interested in holding the position of Sankalan Samiti member.
- Role of Regional Coordinator as a facilitator was seen as a person responsible for PRAVAH.
- The support from the local members in organizing PRAVAH meetings/ activities has been noteworthy.

The establishment of decentralized units has been a learning experience for PRAVAH. At the same time there are certain challenges which we see for the Sankalan Samitis to function independently which would bring about decentralization in the true sense.

Challenges

- Capacity building of the Sankalan Samiti members for advocacy skills
- Ensuring finance control and clarity at the regional level
- Ensuring that systems are in place to help sharing of information amongst all stakeholders
- Documentation of best practices and sharing with larger group in Water and sanitation
- Consolidating the efforts in a region and the upscaling strategies

Sankalan samiti can be an effective decentralised institutional arrangement for

Experience of Sankalan Samiti has aided PRAVAH in evolving a decentralisation process for water and sanitation sector

[3] Sankalan Samiti is regional level steering committee formed to plan and implement the activities of PRAVAH. There are five regional Sankalan samitis which are functional covering 25 districts of Gujarat

Campaigns were organised to understand the impact of salinity ingress on drinking water as well as impact of industrial pollution

taking ahead the movement for self reliance in drinking water and sanitation in Gujarat.

Campaign: Movement for self reliance in drinking water and sanitation[4]

At PRAVAH we believe the movement for self reliance in drinking water and sanitation has to be led by 'people' and the role of network like PRAVAH should be to act as a facilitator for the entire process.

A series of campaigns have been organized by PRAVAH and its members to advocate decentralised- local source development-people centered approaches in drinking water and sanitation. A major campaign was launched across the state in the year 2003-2004.

Campaign for self reliance in drinking water in 1200 villages

The objective of this campaign was to create awareness in the villages about the need for becoming self reliant on the lines of Gandhian principles. The members undertook the responsibility of organizing the campaign in their respective areas. Total of 24 districts of Gujarat were covered. The campaign was through a Jatha team which had a group of volunteers performing street plays, songs and interacting with the villages regarding the need for self reliance and other issues like decentralization, community participation and development of local sources.

The outcome of the campaign was quite iinteresting as PRAVAH got to know what is the scenario in drinking water and sanitation in these villages at the same time the demand of people for self reliance in drinking water and sanitation was also voiced. This resulted in formation of 'District level Manchs' which would interact with various stakeholders in future to ensure that the participating villages became self reliant.

Following this, various activities were organized by PRAVAH to strengthen the movement. They mainly consisted of regular meetings with NGOs, Lok Manch members and formation of pani samiti to create village action plan. During these activities there was a constant demand from the members to organize campaigns at the regional level which would focus on issues that had come out of the campaign in 2003.

The year 2004-2005 saw another turn in responding to the demand of Lok Manchs. Various regional level issues were identified and subsequent meetings were organized to strategize the limited resources available for effective advocacy.

As a result, three regions jointly organized campaigns in the month of May 2005. The issue for two regions was common. The campaigns were aimed at understanding the

1) Impact of salinity ingress on drinking water in Coastal Saurashtra
2) Impact of industrial pollution on drinking water in South Gujarat.

Salinity is one of the key problems faced in the coastal areas of Gujarat; the state having 1600 kms of long coastline, the biggest in the country has been affected by "development" over the years. The objective of the campaign was to bring awareness about importance of quality of water and that it can be tested at the village level. This campaign was organized in more than 300 villages of Saurashtra during summer which is considered to be a peak period for scarcity of drinking water.

Industrial development has brought about the importance of the role of communities, industries, government and also NGO's for collective work towards ensuring that the

[4] Campaign has been an important tool for mobilizing people on drinking water and sanitation

environment is sustained and healthy environment is available for the future generations. The objective of this campaign was to bring awareness about the need to become self reliant in drinking water and sanitation requirements. The campaign covered 108 villages of South Gujarat which has been affected by industrial pollution.

Learning from the Campaign

Impact of salinity ingress on drinking water:

- The findings of the campaign were not very "sensational" as expected by many members
- The clarity on the financial aspects of the campaign was quite helpful
- The campaign has given directions for further campaigns which could be more focused in the areas where the quality of drinking water is deteriorating
- The mixing of water from two sources: local source as well as Narmada water was found in most places
- The results of testing were shared in public for the first time in many villages
- Capacity building of organizations and field workers in handling water quality tests, knowing the importance of drinking water quality and its parameters.

Impact of Industrial Pollution on Drinking water:

- Many organizations had visited some of the villages which were highlighted by the media earlier hence the response in those villages was quite strong as they expected that some thing should be done to improve the living conditions.
- Some of the villages were selected which were not affected by Industrial pollution
- At some places, the industries on hearing such campaign being organized in the village stopped discharging pollutants in open for some days.
- New partners were identified as part of this campaign who would carry out the work of PRAVAH in these regions.

The water quality testing has to be carried out by other regions where the quality of drinking water is deteriorating. This campaign should not only focus on spreading awareness about the quality of drinking water but also about the formation of village level institution: Pani Samiti to manage drinking water and sanitation facilities at the village level so that self reliance is attained in the true sense with community participation and Government and NGOs playing a role of facilitator in this process of strengthening Pani Samiti.

PRAVAH has grown over the years through its experiences of organizing campaigns; this entire process has brought the members of PRAVAH to have more concrete actions during and after the campaign.

The first campaign was more about creating awareness, the second was about having a dialogue with the communities with practical work, the next campaign would be to ensure how the outcomes of both the campaigns could be used to form Pani Samiti and develop their capacities to realize the dream of self reliance in drinking water and sanitation. The use of campaign as a tool for advocacy has to be understood well. The completion of the campaign is not an end but the movement continues till the objective is not achieved.

Lok Manch: Platform for Peoples voice[5]

The outcome of the campaign for self reliance was the formation of Lok Manch in seventeen districts. A quick stock of these Lok Manchs reveals that all the Lok Manchs have not been successful in maintaining the tempo that was generated during the campaign.

PRAVAH believes that the Lok Manch has to be a forum which is really a 'Peoples Forum' and it is not 'run' by local NGO's. Thus, communities which have shown interest have

Lokmanch - People's forum were formed to voice the needs and concerns of the rural communities

The role of PRAVAH in Lokmanch is to develop multi stakeholders' forum for addressing issues in the drinking water and sanitation sector

had the support of PRAVAH in presenting their cases to various district level authorities as well as GWSSB officials.

- Right to information can be used as a tool for effective implementation of various schemes for drinking water and sanitation
- To create consensus on local source development- decentralization- people centered approaches for the benefits of the villages

Brief Information: Lok Manch

The campaign for self reliance initiated by PRAVAH brought forward many issues in drinking water and sanitation sector. These issues would be the base for future activities of PRAVAH and its movement for self reliance in drinking water and sanitation. It was decided that as part of the culmination of the campaign at the district level, district level Lok Manch should be formed. There were many questions arising in the minds of members as well as people who had participated in the campaign regarding the future course of this campaign.

Who could be members of the Lok Manch

Any Sarpanch/ Gram Panchayat member/ member of the women's group from the village along with representatives of the voluntary organization working in the region/ district can be members of the District level Lok Manch. There can be any number of members in a Lok Manch starting from 20-2000 per district.

What is the membership fee for the Lok Manch

The members of the Lok Manch after consultation will decide whether to have membership fee or not.

Steering Committee of the Lok Manch

Every Lok Manch shall have a Steering committee consisting of members of the Lok Manch who are:

- Concerned about the drinking water and sanitation in their areas
- Willing to motivate other people about making this Manch as a movement
- Willing to contribute time and other resources if required voluntarily
- Able to have dialogue with the government authorities
- Ready to meet at the district level to plan for various activities in the district

Activities of the Lok Manch

The Activities of the Lok Manch shall be decided by the members of the Lok Manch/ Steering committee to ensure that the villages in their district become self reliant in drinking water and sanitation.

The major focus shall be to build a rapport with the government officials at the district level which would enable the Lok Manch to play an active role as a civil society movement

Role of PRAVAH

The role of PRAVAH in the Lok Manch is to 'support' this movement and help develop multi stakeholder fora for addressing issues in drinking water and sanitation in Gujarat.

Contributions of the Members of PRAVAH

'Social capital in coalitions that is not quantifiable but is of major contribution to the network's growth' and thus it should be capitalized (the halo of some members adds to the network's strength)'. The role of the members in the effectiveness of the network is important and has to be acknowledged at all levels.

[5] Lok Manch have been formed as a result of Campaigns organized by PRAVAH

PRAVAH organizes various activities through the different committees formed. The committees comprise of members who give their valuable time and expertise to organize various activities of PRAVAH. In monetary terms they charge nothing but the valuable contribution made is par excellence.

An appreciation and acknowledgement is warranted for the efforts and voluntarism of PRAVAH members. One thing should be considered that the meetings are attended by chief functionaries of various member organizations who are already working on various development issues in Gujarat. Their invaluable time can not be quantified but if we look at the costs involved, it would be :

1. Human day cost of the chief functionary/ participant
2. Travel cost in all the meetings barring some of the workshops where in the participants were provided with travel cost (not allowance)
3. Consultancy for expert skills offered to organize activities

It is not a one way process; even members get a platform to voice, influence and move things at various levels.

The Lok Manchs are in various stages of development and it is expected that these forums would act as a voice of people to interact with the government officials at the same time get a chance to understand their side which would enable them to understand the reality and demand action to solve their problems.

Lessons learnt

A network has lessons to be learnt which needs to be documented well in time and shared with the concerned stakeholders to enable continuity and effectiveness of the bonding. The following is the highlights:

- Involvement of the members in planning-implementation- monitoring brings about the effectiveness of programmes
- Transparency in financial matters builds trust amongst members
- Emphasis should be also on the quality of drinking water and sanitation
- Linkages with various stakeholders is necessary
- Dialogue with the government at all levels is necessary.
- PRAVAH should have a training team which could help in capacity building at all levels
- Documentation of various processes and reports should be done in time and it should reach the stakeholders in time
- Policy advocacy demands dialogue with government to improve the system
- Internal resources of the Network should be utilized for various activities
- Capacity building of PRAVAH Team is to be done on regular basis

Challenges

PRAVAH has grown over the years in establishing itself as a network for mobilizing action on drinking water and sanitation. The advocacy efforts of its members and founder members has brought PRAVAH to a level that today there are regional level platforms to share the water and sanitation issues but at the same time we see some challenges in front of the network:

- To build ownership in PRAVAH and maintain it
- To make the Lok Manchs more effective for the demand of self reliance
- Regular follow up of programmes at all levels.
- To maintain the consensus building process in PRAVAH
- Prioritize programmes based on their needs
- Members are the strength of PRAVAH but motivating members to give membership fees in time is a challenge
- To create dialogue with government at all levels
- To take the campaigns and other activities in programmatic phase

The challenge ahead is of regular follow-up of the activities and implementation

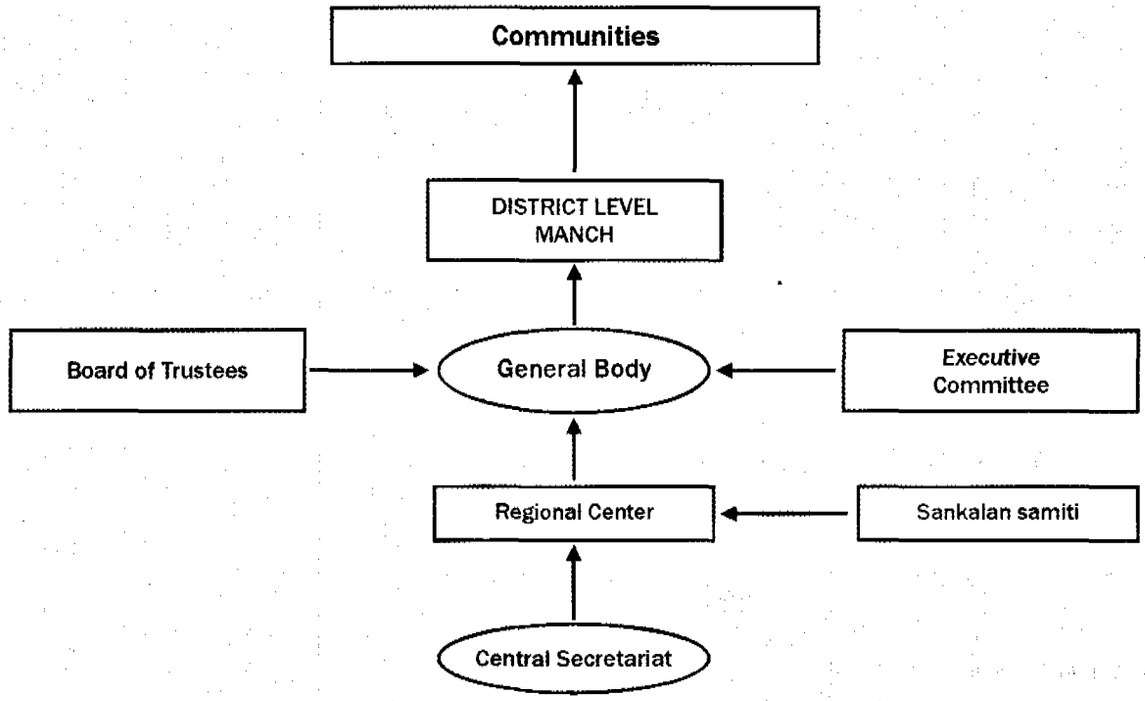
Annex - 1

Overview of PRAVAH

Programmes

- Advocacy
- Networking
- Information Sharing
- Research and Documentation

Organisation environment



Organization Structure

PRAVAH is a registered body under the Public Charitable Act and Societies Act, hence it has a Board of Trustees in the policy making decisions and the General Assembly to take ahead the agenda of the network. PRAVAH uses both the forms of body for its advocacy efforts.

The Executive functions are decided by the Executive Committee which consists of 4 members representing the Board of Trustees, 5 members representing the five regions of PRAVAH's work and 4 members are co-opted members for their individual expertise in the field of water and sanitation.

The Central Secretariat office is based in Ahmedabad and acts as a facilitator for the implementation of the decisions taken in the Executive Committee. It also acts as a facilitator and coordinating agency for the regional centers for its various programmes.

Membership: Year wise

2001-02	2002-03	2003-04	2004-05
90	103	93	130

- PRAVAH membership has grown over the years
- Increase in outreach to 25 districts of Gujarat through various networking and advocacy activities.

Outreach of PRAVAH

Today PRAVAH is working in all the districts of Gujarat through its five regional centers. The regional center is housed in one of the host organization which is a member of PRAVAH and believes in the principles of PRAVAH.

Each regional center covers approximately 3-5 districts in each region, the activities in the regional center is being coordinated by a regional level steering committee which comprises of two members from each district covered by the regional center. The steering committee meets once in 3 months prior to the EC meeting at State level to discuss certain regional issues which have to be presented at the State level. The discussion at the State level comprises of the regional issues and advocacy strategies to be adopted.

Regional Centers

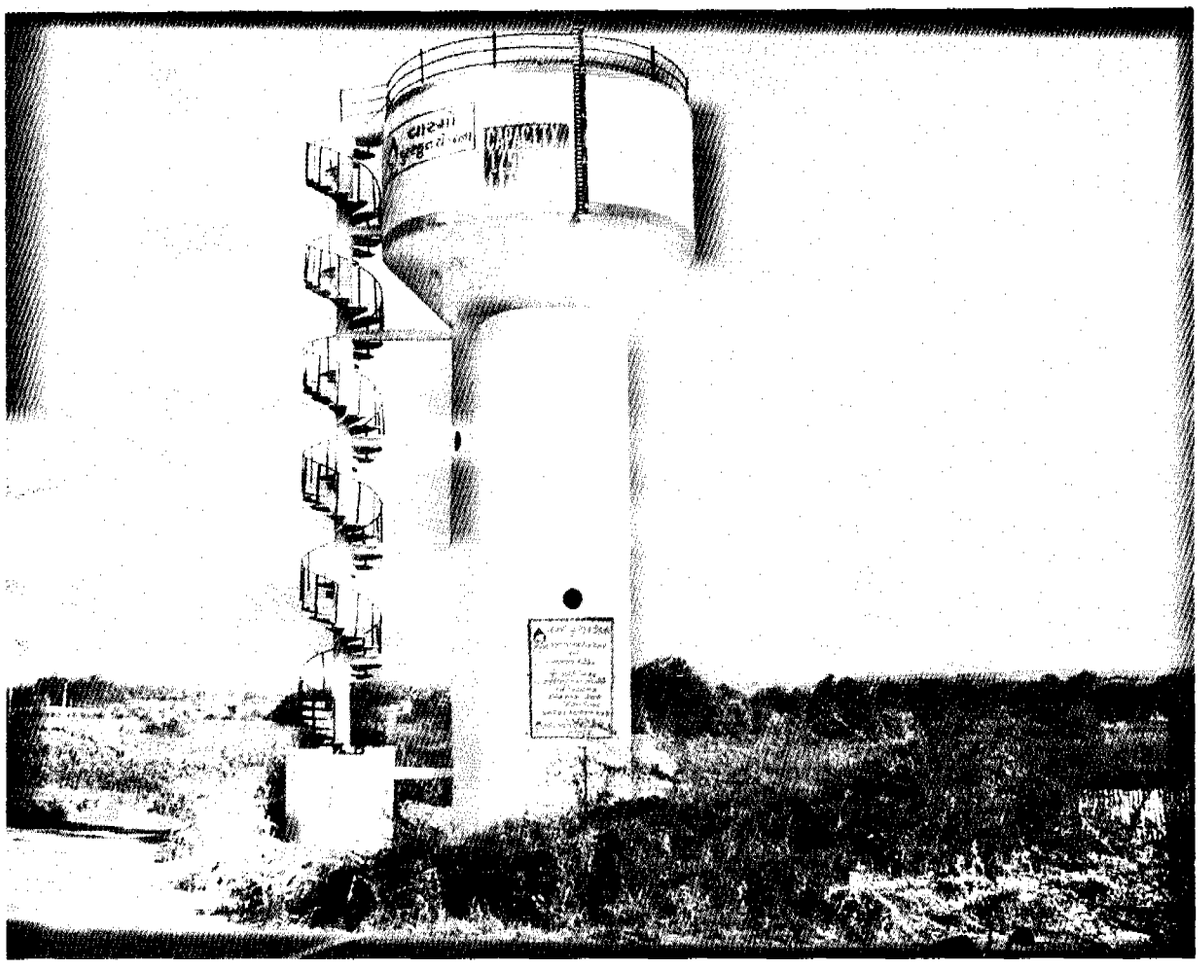
Region	Support Organisation	Districts Covered
Saurashtra-1	AKRSP(I), Sayla	Surendranagar, Rajkot, Jamnagar, Kutch
Saurashtra-2	Utthan, Bhavnagar	Porbandar, Junagadh, Amreli, Bhavnagar, Ahmedabad
North Gujarat	Manav Kalyan Trust, Khedbrahma	Mehsana, Patan, Banaskantha, Sabarkantha, Gandhinagar
South Gujarat	Independent office at Surat	Anand, Kheda, Bharuch, Narmada, Surat, Valsad, Dangs, Navsari
Eastern Tribal belt	N.M. Sadguru Foundation, Dahod	Vadodara, Dahod, Panchmahals

List of External Authors

1. Acharya Binoy, Director, Unnati, Ahmedabad
2. Barot Nafisa, Executive Trustee, Utthan, Ahmedabad
3. Chatterjee Ashoke, Ex-Director, National Institute of Design, Ahmedabad
4. Grijpstra Bouwe, Team Leader, External Advisory Services
5. Hemani Rushabh, Consultant, UNICEF, Gandhinagar
6. Iyengar Sudarshan, Vice Chancellor, Gujarat Vidyapeeth, Ahmedabad
7. Khurana Indira, Doumentation Consultant, External Advisory Services
8. Manek Mahesh, Manager Finance (Internal Operations), WaterAid India, New Delhi
9. Mudgerikar Arun, Project Officer, UNICEF, Gandhinagar
10. Oza Apoorva, Chief Executive Officer, Aga Khan Rural Support Programme (India), Ahmedabad
11. Oza Sachin, Executive Director, Development Support Centre, Ahmedabad
12. Patel Raman, Development Associate, AKRSP (I), Ahmedabad
13. PRAVAH, Ahmedabad, A network of NGOs working on drinking water issues.
14. Sarkar Sabyasachi, Manager, IDBI, Mumbai
15. Sehgal Manmohan, WRM Expert, External Advisory Services
16. Shukla R. N., Sr. Geo-hydrologist, GWSSB, Gandhinagar
17. Vaghasiya Dalsukh – Programme Officer, Development Support Centre, Ahmedabad

List of WASMO Authors

1. Ahuja S V, Technical Advisor, CMSU Bhuj, WASMO
2. Brahmbhatt Lata, Dy. Coordinator (Community Mobilisation), Swajaldhara, Ahmedabad
3. Chhabra I K Unit Manager, CMSU Bhuj, WASMO
4. Khosla Hemant, Dy. Manger Training, CMSU Bhuj, WASMO
5. Kishore Shailja, Environmental Sanitation Expert, CMSU Bhuj, WASMO
6. Majithia P G, Unit Manager, CMSU Surendranagar, WASMO
7. Mistry Brijesh, Dy. Manager, Documentation & Communication, CMSU Bhuj, WASMO
8. Makwana Kruti, Ex-Dy. Manager (Project), WASMO, Gandhinagar
9. Oza Hiral, Assistant Coordinator, Documentation and Communication, Swajaldhara, Ahmedabad
10. Pandit Chaitali, Assistant Coordinator, Water Quality, WASMO, Gandhinagar
11. Sama R K, Project Director, WASMO, Gandhinagar
12. Sarkar Manisha, Dy. Coordinator, Social Mobilisation, CMSU Bhuj, WASMO
13. Shah Amita, Dy. Manager, Technical, CMSU Bhuj, WASMO
14. Shah Hetal, Dy. Manager, Technical, Swajaldhara, Kheda
15. Shah Radhika, Manager, Documentation, Board and Funding, WASMO, Gandhinagar
16. Shah V M, Manager, Water Quality Surveillance, WASMO, Gandhinagar
17. Thaker Kosha, Manager, Documentation and Communication, WASMO, Gandhinagar
18. Waghela Divyang, Manager, Swajaldhara, WASMO, Gandhinagar



In pursuance of implementing the 73rd Constitutional Amendment and sector reform, WASMO was set up as an autonomous organisation by the Government of Gujarat in 2002 to facilitate rural communities to demand, plan, construct, operate and manage their in-village drinking water supply systems and sanitation facilities.

Since its inception WASMO has reached out to villages in all 25 districts through various programmes, including Swajaldhara. In less than four years, Pani Samitis have been formed in around 4,500 villages. This outreach has been with the support of the user community and NGOs.

The state is committed to reach out to all its 18,000-plus villages within a limited time span. The challenge is tremendous yet exciting.

This publication is a compilation of the rich experience gained by WASMO and its partners. It includes perceptions by experts who have not directly been involved in the programme. Issues such as institutional frameworks, productive partnerships, community empowerment, assuring safe drinking water, technological options, sanitation challenges and scaling up have been addressed.

Scaling Up Sector Reforms: Looking Ahead, Learning from the Past informs about community involvement and empowerment and the unique partnerships that have redefined rural drinking water sector in the state. It provides valuable insight into water and sanitation-related issues to all involved with drinking water and sanitation, extending beyond to community empowerment and local self governance.

WASMO

Water and Sanitation Management Organisation

3rd Floor, Jalsewa Bhawan, Sector 10 - A, Gandhinagar - 382 010
Tel.: 079 - 2324 7170 - 71, 2323 7075 Fax: 2324 7485 Website: www.wasmo.org e-mail: wasmo@gujarat.gov.in

The Royal Netherlands Embassy