



Roof rainwater harvesting is a simple technology that can be easily managed and operated on a household and community basis. It has improved the quality of the water supply and built the capacity of poor households to cope with the impacts of re-occurring droughts. The improved water supply has led to an improvement of income for households, especially in cases where roof rainwater harvesting has been combined with micro-enterprise development. However, because of the seasonality of rainfall, rainwater

harvesting does not suffice as the sole source of drinking water but needs to be combined with other water sources.

This simple, easily manageable, and highly effective technology needs to be publicized more.

Dissemination of this technology requires a “bottom up” approach rather than the more usual “top down” approach employed in most water resources development projects. Raising the awareness of the local communities and creating a demand for this technology calls for time and resources. Most water-related projects do not sufficiently appreciate these requirements.



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DATA SOURCES

Disaster Mitigation Institute 1999: “Wisdom of Tradition: Rainwater Harvesting in Deserts of India” DMI, Ahmedabad.

Data collected from 19 respondents in 5 villages in May 2002 through a questionnaire.

Data collected from 5 focus group discussions in 5 villages in December 2000.

COLOPHON

This note is the second in the series ‘Women Struggle for Water’ which documents best practices for community-based water supply evolved from SEWA’s water campaign. The series consists/will consist of the following:

1. SEWA’s Barefoot Water Technicians in Sabarkantha.
2. Roof Rainwater Harvesting in Gujarat’s Semi-arid Areas.
3. Revival of Traditional Water Sources in Patan District.
4. Rehabilitation of Dam Oustees in Baroda Districts.
5. Operation and Maintenance of Local Water Supply Schemes in Surendranagar district.
6. No Access to Water in Anand, Kheda and Ahmedabad districts.
7. SEWA’s Water Campaign in Gujarat

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WOMEN'S STRUGGLE FOR WATER

ROOF RAINWATER HARVESTING IN GUJARAT'S SEMI-ARID AREAS

"Wisdom of tradition in South Asia is mostly overlooked not only in social and economic development concepts but also in applied concepts of mitigation disasters and harvesting rains ... what works to ensure water for drinking and domestic use in deserts of India and South Asia are the traditional water harvesting structures" [DMI 1999: 1]. Many villages in Gujarat reel under the devastation caused by water scarcity, but the potential to harvest rainwater remains largely untapped.

Initiated on the demand of rural women in Gujarat, promotion of rainwater harvesting is a major initiative of SEWA's water campaign. Grassroots women play a leading role in disseminating information about and gaining local acceptance of roof rainwater harvesting technology as an alternative to more centralised water supply systems such as piped water supply. Till date, SEWA has constructed 1533 individual and 40 community roof rainwater harvesting structures.



ROOF RAIN WATER HARVESTING

In places where groundwater is not accessible or not fit for human consumption, and where there are no nearby rivers and lakes, rainwater harvesting provides a viable alternative to transporting water over long distances by pipelines and/or tankers. Of the numerous rainwater harvesting technologies, some are surprisingly sophisticated and enable people to survive at places that seem to be virtually inhabitable. But most of them, roof rainwater harvesting, for instance, are simple to install and to operate.

Roof rainwater harvesting structures use a roof to catch the rain; the water harvested is stored in a tank. In Kutch, with an average annual rainfall of around 300 mm a roofing area of 30 square meters provides a family with 9,000 litres of safe drinking water. This is enough to provide a family of five with 20 litres of water a day for three months.

Roof rainwater harvesting is an attractive alternative to more conventional water supply systems because:

- It provides safe drinking water at the doorstep, reducing the time women need to spend in collecting drinking water. Moreover, the water supply



can be managed at the household level. This reduces the dependency on water supply systems that are managed at

A simple, inexpensive technology—all that is needed is a roof and a storage tank.

a community level—ponds, wells—or at a central level—piped water supply and tankers.

- It is a simple technology that local people can be easily taught to use, while the required construction materials are mostly locally available. Local masons can be easily trained to construct roof rainwater harvesting structures, thereby creating employment at the local level.

- Construction costs are limited (around Rs. 15,000 or US\$ 300) while running

costs are almost negligible.

Even during droughts, the storage tanks reduce the women's drudgery, as they can be used to store water that is brought by water tankers. Women in Sotavadh (Kutch district) have this to say about how roof rainwater harvesting structures have helped them: *"Before, there was always tension and we couldn't go to work as we had to wait for water. Sometimes there would be quarrels amongst the women when the tanker would arrive and water would be spilled. Now the tankers empty the water into the storage tanks that are part of the roof rainwater harvesting structures so we no longer have to wait and can go out for work."*

Self Employed Women's Association (SEWA)

SEWA is a membership-based movement and trade union with more than 400,000 poor, self-employed women members. Its primary goals are to organise women workers to obtain full employment and economic self-reliance. For this purpose, SEWA combines four specific strategies:

- ORGANISING WOMEN, since individual poor women have no voice.
- BUILDING NEW SKILLS AND CAPACITIES so that women can become owners and managers and not just producers and labourers.
- ENCOURAGING CAPITAL FORMATION, at the household, group and community levels with the income earned.
- INCREASING SOCIAL SECURITY to enhance women's well being and productivity and reduce the impacts of sickness or sudden crises on fragile household economies.

SEWA's Water Campaign

SEWA started its water campaign in 1994 on the demand of its members who consider water scarcity the major factor affecting their lives. The campaign seeks to give poor women access to reliable and safe water supply and to build their capacity to become owners and managers of the local water supply. Today, more than 200,000 women spread over 500 villages and 9 districts of Gujarat have joined the water campaign.

Significant achievements of the campaign include: ■ building of 2,000 roof rainwater harvesting structures; ■ repair of 190 village ponds and 105 wells; ■ maintenance of 1,501 handpumps by barefoot water technicians; ■ O&M of a piped water supply scheme by grassroots women; and ■ 21,000 women participated in awareness programs on saving water and hygiene. All this has had an enormous impact on the quality of the local water supply.

IMPLEMENTATION OF ROOF RAINWATER HARVESTING

Gujarat's history of rainwater harvesting dates back more than 600 years but villagers are no longer familiar with this technology. When asked for solutions to their water problems, all they can come up with is piped water supply and/or water tankers. Hence, SEWA needs to invest time and effort in raising awareness about alternative options such as roof rainwater harvesting. For instance, an exposure visit was organised to Sureel, a village where SEWA constructed 100 structures as a model for other villages. Other methods used to raise awareness are songs, stories, and one-to-one interaction with spearhead team members.

These spearhead teams consist of SEWA grassroots members with proven leadership qualities who have acquired an immense practical experience in fields such as water, savings-and-credits, and so on. They play a pivotal role in roof rainwater harvesting activities—and many other programs—as they are familiar with local conditions, easily relate to poor village women, and mobilise their social network to involve other women. They are supported by local SEWA organisers and civil engineers.

The usual procedure is as follows: ■ First, the SEWA team approaches the Sarpanch (elected village leader) to organise a village meeting to discuss water-related problems with the entire village. Often they have to meet the Sarpanch a number of times before he agrees to hold a Gramsabha

(village meeting). ■ Problems and solutions are discussed in the Gramsabha with SEWA ensuring that women speak up as much as possible as they are the traditional water users and managers. ■ A village water committee is then elected. SEWA insists that at least 70% of the committee members are women. This usually meets with a lot of resistance from the men as they feel that women are not capable of handling public affairs. ■ When households agree to contribute 10% of the construction costs in cash or labour, a resolution is passed in the Gramsabha. ■ The beneficiaries, with the help of SEWA's engineers, then select a site, prepare a cost estimate, order construction materials, and select a mason. Household members excavate the pit as part of their contribution. The active involvement of the local women builds their capacity to handle similar undertakings in future. Women are trained to maintain the structures. For instance, they are taught that the tanks should be cleaned with lime and the first rain should be used to flush the accumulated dust.

In villages where there are very few houses with thatched roofs, innovative community tanks have been constructed. The tanks use the roofs of community buildings such as schools, mosques, etc.

to harvest rainwater and have a capacity of 60,000 litres. The communities themselves have worked out a system to share the water equally.

However, construction of roof rainwater harvesting structures has not been easy:

For some women having water at the doorstep is unthinkable. In Zumaro, a remote village in Kutch district, women say *"We get up between two and three in the morning and go to bed at around eight in the evening. We spend 5 to 6 hours on fetching water. This is a woman's life and it cannot be changed."* In these places, a demand-led approach does not work; it has to be combined with awareness programs to convince women that things can change for the better.

The 2001-earthquake and the consecutive droughts destroyed people's livelihoods. Hence, they do not have the means to make the needed 10% contribution. Moreover, people give priority to the reconstruction of their houses.

The same earthquake created a shortage of skilled masons and construction materials.

The remoteness of the villages placed a heavy burden on the SEWA organisers in terms of materials management and travel.

Making people receptive to this alternative method and actively involving them in the construction and maintenance work.

Semi-arid areas of Gujarat

The semi-arid districts of Gujarat—Kutch, Patan, and Surendranagar—have been frequently hit by disasters such as the 2001 earthquake, recurring droughts, and cyclones. Rainfed agriculture, animal husbandry, and embroidery work are the main sources of livelihood for the majority of the poor. For more than a decade, SEWA has been involved in integrated rural development programs comprising micro-watershed development, micro-enterprise development, savings-and-credits and insurance programs, health and child care, and domestic water supply program. Spread over the three districts, SEWA has more than 75,000 poor women members.



THE IMPACTS AT THE GROUND LEVEL

The structures are not only used to harvest rainwater but also to store water that is brought by tankers to the villagers during summers and droughts. Thus safe drinking water is available at the doorstep even in times of severe water stress, such as droughts and earthquakes, like the one in 2001. Women no longer have to carry heavy loads of water over long distances, nor do they have to stay at home to wait for the water tankers to turn up.

Table 1 shows that women save 4.6 and

Major time saving for women and availability of larger quantities of safer water.

3.8 hours in monsoon and summer respectively. Part of these time-savings is allocated to income-generating activities. At a daily wage of Rs.40/- (approximately US\$ 0.80) these time-savings translate into a gain of income of Rs.12.50 and Rs.17.50 daily.

In addition, more and safer water is available; the introduction of roof rainwater harvesting technology has improved water supply, especially the quality of the water (60% of the respondents) and the reliability of the

water supply (77% of the respondents). This has a positive impact on the health of the villagers, especially when combined with hygiene awareness programs.

An indirect benefit is that the construction of roof rainwater harvesting structures has given the SEWA members confidence in their ability to manage water supply; they know now that they need not depend on water boards or private water vendors. At a policy level, SEWA's programme has induced the Gujarat government to formally include roof rainwater harvesting in its water programs.

TIME PROFILES BEFORE AND AFTER THE CONSTRUCTION OF ROOF RAINWATER HARVESTING STRUCTURES

	M O N S O O N			S U M M E R		
	BEFORE	AFTER	DIFFERENCE	BEFORE	AFTER	DIFFERENCE
Sleep	6.1	7.4	1.3	6.0	7.0	0.9
Household work	6.6	7.3	0.7	6.9	6.3	-0.6
Fetching water	5.9	1.3	-4.6	5.2	1.5	-3.8
Communication & social activities	1.1	1.3	0.1	1.4	1.4	0.0
Income generation	4.3	6.8	2.5	4.5	8.0	3.5
Total Hours/Day	24.0	24.0	0.0	24.0	24.0	0.0

Table 1: Time profiles (in hours) before and after the construction of roof rainwater harvesting structures (N = 6 focus group discussions)

WHAT REMAINS TO BE RESOLVED ?

People continue to remain dependent on the erratic monsoon rains. During droughts, the local communities depend on natural resources—which are affected as well—or on the unreliable tanker service from the government. Arranging tankers from the local water board is a time-consuming endeavour with uncertain outcomes for SEWA organisers and local communities. Therefore, CBOs, NGOs, and local government organisations should work in tandem to ensure that tankers services are

timely and adequate, and that there is local storage capacity.

When economic opportunities are (made) available, women can use the time they have gained by virtue of having drinking water at their doorstep for income generating activities, thereby reducing poverty and improving gender relations. SEWA's approach—micro-enterprise development and improving local water supplies—thus has the potential to alleviate poverty and reduce vulnerability.

