

Managing Water Together

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Today, many villages in India are facing severe water scarcity. Erratic rainfall and poor soil and water management, including relentless ground water extraction has led to cycles of droughts and ongoing water scarcity. As a result, there is renewed interest in rehabilitating the small, traditional water harvesting and irrigation systems that have existed in India for centuries.

Here we describe the efforts of a community and their government to take 'rehabilitation' beyond technical interventions, to include farmer participation and coordination of the efforts of different institutions. Over the past two years, people in the community have not only demonstrated a capacity to understand and analyse their own problems, they have also invited several partners with different resources to join them in their efforts to rebuild their water resources.

The setting

The Marathwada region of Maharashtra is a drought-prone area in Western India. Almost 80 percent of this region is under rain-fed agriculture. Aurangabad, one of the largest districts in the region, receives on average around 700 mm of rainfall per year. For the past three to four years, farmers in the district have been forced to meet their needs with only 50 percent of average rainfall. Most of the "talukas" (units of civil administration within a district) have been declared permanent drought-prone areas and even talukas with a reasonable rainfall pattern have been struck by famine in recent years.

The majority of farms in the area are small and medium sized. Around 55 percent of the farmers can be categorised as smallholders, with an average land holding of up to two hectares. Medium-sized farms are between two and five hectares, of which between one and two hectares is irrigated. The rest is rain-fed agriculture. Most of the large farms have been divided between family members in order to take advantage of government schemes and subsidies for smallholder farmers. Most farmers labour on their own farms and find hiring tractors more efficient and more economical than hiring agricultural labour.

Inspired by a farmer

While documenting indigenous technical knowledge in the area, officers of the Agricultural Technology Management Agency (ATMA) met a farmer called Shri Vasant Katbane. Shri Katbane had tried out the two-pit well recharging technology in 1985, and went on using it for about ten years with only nominal maintenance expense.

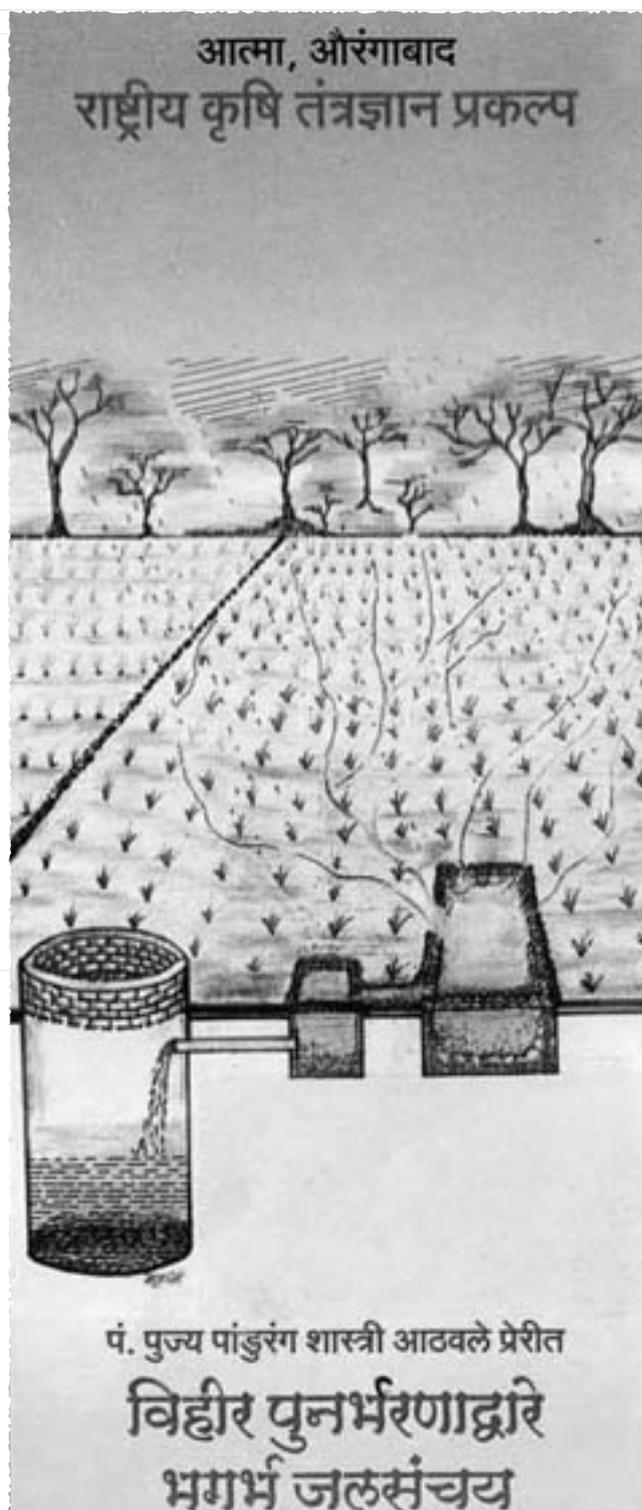
Satish Shiradkar, Deputy Project Director of ATMA, Aurangabad, describes the origins of the programme:

"It all started on 24 July, 2001 in a brainstorming meeting called by the Divisional Commissioner of Aurangabad to address the severe drought problems of the district. Several government officials and NGO representatives were present when our Project Director Mr KV Deshmukh shared information about a successful well recharging experiment carried out by a farmer in Dhangaon in Paithan Taluka eight years ago...."

"At first everyone was apprehensive, but when our District Collector showed interest, we organised an exposure visit-cum-workshop to see Shri Katbane's well. He was the only farmer in the area who had enough water to irrigate a Rabbi (winter) crop in a dryland area. As several senior government officials and progressive farmers came along, the visit got a lot of media

attention, and also generated curiosity among farmers in neighbouring villages. In all, over 2000 people came for this workshop in August, almost at the end of the monsoon season."

After the initial visit-cum-workshop, ATMA officers conducted block-level meetings with village heads to share the technology. A prominent social activist and expert on water management joined ATMA in their efforts to motivate farmers in *Garaj*, one of the most water-scarce villages in the district. The farmers here took up recharging works as a group activity and, as a



Diagrammatic representation of two-pit technology.

result, 52 out of the 102 wells in the village were recharged. The people provided their labour and an initial investment to meet the cost of pipes, and the agriculture department provided technical inputs. The village was fortunate to receive the last monsoon showers in September and early October and these filled the recharged wells to the brim. Careful use of the artificially recharged water made it possible to give protective irrigation to the existing Kharif (summer) crop, and also offered farmers the opportunity to irrigate an additional 50 hectares. They were convinced of the benefits of the technology. ATMA officers recorded the performance of the 52 wells, and their observations formed the basis for launching a more comprehensive 'water resource and agriculture improvement management' programme - the *Amrutdhara Jal Abhiyaan*. This programme was designed with the help of people who volunteered their time, labour and met the initial costs of the interventions. In April 2002, a start was made with 114 villages and about 50 of them became focus villages for the programme. ATMA provided an inventory of other simple, low cost technologies (see Box).

Amrutdhara Jal Abhiyaan programme components

- 1) **Well recharging for agricultural purposes**
- 2) **Rooftop rainwater harvesting**
Individual pucca houses
Government buildings
- 3) **Revitalising existing structures**
Collective de-silting
Sluice gate management
- 4) **Soil and water conservation works**
Plantations on farm bunds
Loose boulder structures
Low-cost water harvesting structures e.g. farm ponds, check bunds
Continuous Contour Trenches
Kisan nurseries
Soak pits
Kitchen gardens
- 5) **Improved crop management**
Vermicomposting
Sendriya Sanjivani (improved organic fertiliser)
Zero Energy Chambers to store vegetables and fruits
- 6) **Integrated pest management (Cotton)**
Trap crops
Pheromone traps, Light traps
Neem sprays
- 7) **Livestock development**
Improved fodder varieties cultivation
Better management practices
Mass de-worming and pest management
- 8) **Village level information centres**

Revitalising existing structures

Throughout the area, tanks and ponds have been the mainstay of rural communities for centuries. Aurangabad has around 390 structures, with an estimated irrigation potential of 20 000-22 000 hectares. These structures include a large number of nala bunds (tank-like small water harvesting structures) percolation tanks, and small and medium irrigation tanks constructed by the State Irrigation Department. In most cases the tank beds are silted up, reducing the storage capacity far below their potential by about 40 percent. Prolonged siltation had also resulted in the reduced carrying capacity of canals. The government, which is constantly short of resources, has not been able to invest in maintenance and

repair. Some farmers do limited maintenance work before the irrigation season begins, in the parts of the canal closest to their fields, like cleaning out weeds, grass and other foreign matter. However, they do not undertake to de-silt the tanks or canals, strengthening the canal walls or deepening their beds.



Well recharging in Panvadod village, Tal. Kannad. Photo: Mona Dhamankar.

In spite of realising the importance of these structures, farmers are hesitant to voluntarily manage them because of the high royalty that must be paid for the silt, and the cumbersome formalities needed to get permission to use it. This problem was discussed in the initial meeting of *Amrutdhara Jal Abhiyaan* stakeholders, where the District Collector promptly agreed to waive the royalty if the farmers came forward to de-silt the tanks and carry the silt to their own farms at their own expense. Government officers from several departments set the pace by contributing a day's work (shramadan). This motivated the farmers, and up to now around 375 water bodies have been de-silted through collective action.

Water harvesting through well recharging

Through the process of revitalising the existing water-harvesting structures, the farmers realised that silt was nothing but their own fertile soil that was being carried off with the rain. Whenever it rained, the villagers saw the runoff in the streams and rivulets that flowed through the village. They decided to use that water for recharging their dry wells and asked the agriculture department to help them. ATMA provided information about the Swaydhay well-recharging system (see Box).

Well Recharging

(inspired by social reformer, Shri Pandurang Shastri Athawal, founder of the Swadhay Parviar movement)

The well-recharging system is very simple. Two percolation pits are dug next to a well. The large pit is approximately 2.4 x 1.8 x 1.8 metres and the small one is 1.2 x 1.2 x 2.4 metres and is built along the slope of the larger pit, about 3 metres away from the well. The smaller pit is filled with stones, gravel, and coal, which act as a filter. A cement pipe (23 cm diameter) fitted with a wire mesh filter is fixed at the bottom of the smaller pit. This pipe opens into the well. Rainwater that collects in the larger pit, flows into the smaller pit and is filtered clean before it flows into the well through the pipe. The silt that accumulates in the pits can be used in the fields. In this way, soil is conserved as well.

This technology became immensely popular because it was low cost. At an initial expense of Rs.1500-2000 (US\$ 25-30) towards labour (approximately 3-4 person days) and pipes, the farmers reaped benefits throughout the year. Annual maintenance too was negligible at Rs.100. Data from Garaj village, Aurangabad district (2002) indicated that production increased substantially in areas where well recharging was taken up in comparison to those where it was not. Rabbi sorghum increased from 6.5 to 9.3 quintals/ha, wheat from 9.6 to 16.3 quintals/ha and cotton from 6.1 to 10.7 quintals/ha.

Shafiyabad's Water Budget

While working on soil and water conservation measures, the people realised that however much water they collected, it would not be enough if they did not pay very careful attention to how it was used. It was not enough to harvest rainwater and promote viable agriculture packages. Location-specific land-use planning modules were also required. Shafiyabad was one of the first villages to act on this understanding.

Until ten years ago, farmers in Shafiyabad cultivated sugar cane and bananas. Almost every farmer had a pump fitted to his well and drew water relentlessly. Over the years the groundwater was used up, and in recent times these crops are nowhere to be found. The people joined the Abhiyaan in the hope of rejuvenating their water resources, and promised to use their resources sensibly. In consultation with the Agriculture Department they prepared a 'water budget'. They appointed a committee that helped each farmer work out his/her own requirements. Crops that needed more water were discouraged and replaced with perennial crops and new varieties with short gestation periods.



Stakeholders inspecting a farm pond. Photo: Mona Dhamankar.

Thereafter, the water requirement for the entire catchment area, including that for livestock, was worked out and displayed on the wall of the gram panchayat office in the centre of the village. Several other villages have now followed suit and prepared their own water budgets.

Looking ahead

Though only a few of the programme activities are described above, almost all components of the programme have been implemented with the same zeal and participation. The spirit and enthusiasm with which all stakeholders participated gave it a momentum comparable to a peoples' movement, with a promise to redefine the future of agriculture in the region.



A farmer taking his bumper cauliflower crop to the market.

Photo: Mona Dhamankar.

Besides improved agricultural productivity, the programme has also produced a cadre of efficient *barefoot* technicians and trainers for water resource development interventions. These farmers are being invited by other neighbouring villages to help them design their own interventions. In the rest of the district, the traditional institutions for managing water harvesting structures are starting to revive spontaneously, and there is a community-wide dialogue on ways of sustaining and enhancing the water retention. About 15 villages have taken up water resource development activities on their own, and have approached the agriculture department for technical guidance.

The *Amrutdhara Jal Abhiyaan* officially ended in March 2003. As a strategy to maintain the tempo of work and sustain farmers' interest, the 50 focus villages are now part of a larger government-sponsored watershed development programme. For the first time, the state government's Employment Guarantee Scheme is taking up soil and water conservation measures that require higher investments and 1-2 years of consistent support.

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