India: Rainwater harvesters and forest protectors of the Aravalli hills

During a recent visit to Rajasthan state in India, Patrick McCully from International Rivers Network, had the opportunity to see first hand just how profoundly the work of a local organization called "Tarun Bharat Sangh" (TBS) has improved the lives of hundreds of thousands of people. He was astounded to learn that this social and environmental transformation has been achieved at a tiny fraction of the economic --not to mention human and ecological-- cost of providing water services with big dams. Below some fragments of his experience:

"Generations before us never had the good fortune we have," Lachmabai, an elderly woman from Mandalwas village, told me as we sat on the edge of a large pond created by a newly built earth embankment. "Because of the water we are happy, our cattle are happy, and the wildlife is happy. Our crop yields have gone up, our forest is green, we have firewood, fodder for our cattle, and we have water in our wells."

The people of Mandalwas have built 45 water harvesting structures in the past 15 years, and more are planned. Whereas before farmers had only enough water for grains, now people can grow water-thirsty vegetables and cash crops. Villagers who were forced to survive on one meal a day now eat two to three times a day, and have a greater variety of more nutritious food. Women's chores of fetching water, firewood and fodder, and grazing and watering cattle have become much less time-consuming. The increased availability of fuelwood and tree leaves for fodder are key benefits of forest regeneration.

The water benefits I was witnessing came despite the region suffering one of its driest years in living memory, with some villages getting only a tenth of "normal" rainfall --and this on top of three previous years of drought. According to the Indian People's Union for Civil Liberties, drought contributed to at least 40 starvation deaths in southeast Rajasthan in November. Many people are reported to be surviving by eating grass. The contrast between TBS-improved areas and other regions of Rajasthan is to say the least striking.

Mandalwas is just one of more than 1,000 villages where Tarun Bharat Sangh ("Young India Association") is working. Since 1986, TBS has helped villagers build or restore nearly 10,000 water harvesting structures in Alwar and neighboring districts in the hardscrabble Aravalli hills of northeastern Rajasthan, a few hours south of Delhi. Many additional structures have been built by villagers without TBS involvement. Villagers have also dug more than 1,000 wells to take advantage of the resulting rise in groundwater levels.

While water harvesting is central to TBS's success, it is only part of the reason why the organization has had such far-reaching impacts. By bringing villagers together to solve their severe water problems, TBS has empowered them to take control of other aspects of their lives. The results are seen in village rules to protect forests, in villagers uniting to force the government to provide teachers for their schools and to resist officials' demands for bribes, and in the widespread uptake of organic farming and improvements in traditional and modern health care practices.

The water harvesting structures are mainly crescent-shaped earthen embankments (known as johads), or low, straight, concrete-and-rubble "check dams" built across seasonally flooded gullies (nalas). Johads have been built in Rajasthan for hundreds of years but many fell into disrepair during the 20th century due to the increasing role of the state in water management (and its fixation on large-scale projects) and the consequent weakening of village-level water management institutions and practices.

Monsoon rains fill ponds behind the structures. Only the largest structures hold water year round; most dry up six months or less after the monsoon. Their main purpose, however, is not to hold surface water but to recharge the groundwater beneath. Water stored in the ground does not evaporate or provide mosquito-breeding habitat, is protected from contamination by human and animal waste, and spreads out to recharge wells and provide moisture for vegetation over a wide area.

Several watercourses that had in recent decades held water only after monsoon storms now flow year-round due to the recharged groundwater (although parts of the rivers are drying up again due to severe, extended drought). Forests have regenerated because of the raised water table and because the need to protect forests is a key part of TBS's message. A recognition that good water management requires good land management is one reason for TBS's amazing success: among the benefits of regenerating forests on the rocky slopes of the Aravalli hills is that vegetation slows down run-off and reduces erosion, thus improving groundwater recharge and decreasing sedimentation of the villagers' ponds.

The beneficiary villagers contribute a quarter to a third of the cost of water harvesting structures in both cash and kind. In-kind contributions are normally in the form of free labor but they also can include construction materials and the value of land taken up by the structure and its pond. TBS contributes the remainder of the cost. All the labor on the water harvesting structures is provided by local villagers. Apart from their in-kind contribution, they are paid for this work, meaning that construction brings cash into the villages.

Alwar is home to one of India's best known wildlife reserves, the Sariska Tiger Sanctuary. TBS has built numerous structures in the "buffer zone" around the sanctuary as well as inside the reserve itself. At first, sanctuary officials were hostile to TBS. But now they encourage TBS's work, realizing that the group has not only provided water sources for wildlife and helped regenerate the forest, but has also persuaded villagers to stop poaching. Furthermore, after a hard-fought struggle, including a case in the Supreme Court, TBS forced the closure of stone quarries that were causing considerable environmental damage inside the park (including lowering the water table and so diminishing the benefits of water harvesting). Thanks to reduced poaching and increased prey animals, the number of Tigers has increased in recent years from 18 to around 25.

The most remarkable illustration of the Alwar villagers' enjoyment of the ecological benefits of water harvesting is the "People and Wildlife Sanctuary" created by the people of the twin villages of Bhaonta and Koylala.

The rules for the protected area are painted on the face of the stone-and-concrete buttress arch dam. Among the rules are "no hunting in this forest created by god," "without permission of the gram sabha (village council) and sarpanch (headman) no tree may be cut because there is god in trees," "do not allow cattle, goats or your camels to destroy the forest," and "every drop of water in the watershed of this village should be made available to the wildlife and cattle of the village."

I sat on top of this dam and listened to the elders talk excitedly about the animals they've seen in the sanctuary --including wild boar, hyena, monkeys, jackal, numerous types of deer and leopard. And although none of them have seen one, they told me with great pride that they'd found the tracks of a tiger beside the pond and that these had been officially noted by the state wildlife department. The villagers say that none of these animals were seen near the village before they started water harvesting and forest protection.

The people of Bhaonta have played a key role in an exciting local initiative in participatory river management. The Arvari River has become perennial in all but the driest years because of water harvesting. Villagers living in the Arvari watershed decided that they should draw up rules to ensure that the newly flowing river did not become over-exploited and to encourage forest protection. In 1999 representatives of village councils from 34 villages met and formally declared the creation of the Arvari Parliament.

Seventy-two villages now send representatives to the parliament. Besides dealing with forest and water use issues it has also forced the state government to rescind a license it had given to an outside contractor for fishing rights in the Arvari. While it has no legal authority, the parliament has the moral authority to be able to impose fines on rule-breakers and to resolve resource-use disputes between villages.

Despite only minimal government support --and often in the face of outright official hostility-- TBS's structures have provided irrigation water to an estimated 140,000 hectares. TBS calculates that around 700,000 people in Alwar and the neighboring districts benefit from improved access to water for household use, farm animals and crops. Each structure is small-scale, but the total benefits of TBS's work are most certainly large-scale.

Not a single family has been displaced to achieve these impressive benefits. Unlike big dams, the johads and check dams have not destroyed any rivers or submerged huge areas of forests and farmland: on the contrary, TBS's work has actually created rivers and forests.

TBS has contributed around 70 million rupees (US$1.4 million) in outside funding to the cost of the water harvesting structures. This works out to a cost of 500 rupees per hectare irrigated and 100 rupees (US$2!) per person supplied with drinking water. An admittedly back-of-the-envelope comparison of these costs with those of the notorious Sardar Sarovar dam project (SSP) in Gujarat state gives startling results. Taking a conservative estimate of the total cost of SSP of 300 billion rupees ($6bn) gives a per-person cost of 10,000 rupees for drinking water supplied --100 times more than in Alwar. The cost of supplying one hectare with irrigation water from SSP works out to be 170,000 rupees --340 times more than in Alwar.

Theoretically, if the budget for SSP was available to TBS-type water harvesters, they could provide drinking water to three billion people (half the world's population) while irrigating 600 million hectares (more than twice the world's irrigated area).

More than a billion people are estimated to lack decent access to drinking water. The World Bank and other dam builders and water privatizers use this shocking statistic to build up the case that $180 billion a year must be invested in the water sector and that multinational corporations are key in mobilizing this huge amount of money. But at Alwar costs, $180 billion would be enough to supply water to 15 times the world's current population. The needs of the one billion who lack water could be met for about the cost of a single major dam.

The draft of the new World Bank water resources strategy argues for new megaprojects by claiming that "easy and cheap" options have mainly been exploited. In reality, easy and cheap options such as rainwater harvesting have hardly even been looked at by the water Establishment.

Alwar is no utopia. It is a desperately poor region with deplorable government services and infrastructure, high levels of illiteracy and an appalling level of oppression for the majority of women. But if there is to be an answer to the acute water problems of India --and the world-- I am convinced it lies with the rainwater harvesters and forest protectors of the Aravalli hills."

By: Patrick McCully, International Rivers Network,"Harvesting Rain, Transforming Lives" . The complete article will be published in the January 2003 issue of the World Rivers Review.