

Community Driven Approach for Artificial Recharge –TBS Experience

Rajendra Singh

Tarun Bharat Sangh, Tarun Ashram, Bhikampura, District Alwar, Rajasthan, India

[e-mail: jalpurushtbs@gmail.com](mailto:jalpurushtbs@gmail.com); watermantbs@yahoo.com

Abstract

In India, small water reservoirs in the desert area are a part of a complex inter-linking natural resource management system. Traditional methods of water harvesting were employed by the local communities led by TBS to rejuvenate a local river, recharge the ground water and re-green a village. In Alwar district, 8600 small water harvesting talabs in 1086 villages have been built since 1985. This has resulted in rise of water level in the shallow aquifer, increase of area under single and double crop, and increase in forest cover through social forestry and agro forestry. The villagers have also formed an 'Arvari Sansad' to frame rules of water use. The efforts towards water conservation have numerous positive impacts on the communities inhabiting the area. Employment opportunities have increased and migration has reduced substantially. The paper outlines the community driven approach for artificial recharge using traditional techniques of water harvesting. The paper emphasizes that mobilization of civil society and the community for action on natural resource management and conservation for rural uplift in India is the way to save the environment and bring prosperity to farmers in Indian villages.

1. Introduction

This is a saga of complete ecological change through community action in the desert and semi desert regions of Rajasthan, brought about by water harvesting.

Back in 1985 four young men resolved to take up the challenge of stalling the ecological disaster of desertification. However, before I talk about this, let me tell what was happening prior to the community action on water harvesting invoked in 1985, to see the impact of changes on the ecological front today. Also let me relate clearly the role of water in climate change.

2. Environmental scene in Rajasthan in 1985

In the semi arid region of Rajasthan, especially in Alwar district, excessive drawing of ground water for crop production resulted in its shallow water table aquifers dwindling to very low levels, as low as 100 to 120 meters.

Deep confined aquifers, some times as deep as 300 meters, are either salty or too deep to pump. This left only about 11 per cent of the lands under single cropping out of which only three per cent of the land of Alwar district remained under double cropping. The forest cover in the area, which includes the famous Sariska Tiger Reserve, got reduced to about seven per cent-that is about 6,500 square km. The people were deserting their villages to earn a meagre living elsewhere as very little farming was possible, precious little was left as pasture lands for grazing the cattle and no new tree growth or forest regeneration was taking place. Thus the farmers of this region could grow neither much food, nor fodder or pasture, nor any fuel wood for their rural energy needs. It was a harsh desert climate becoming unbearable due to complete exhaustion of ground water. When rains

came (average about 16-50 cm/year), they came in 3-4 high intensity events in 7-10 days rainy season, resulting into its loss as run off, leaving behind thirsty lands.

3. Water harvesting for carbon fixation and sequestration to reverse climate change

In the absence of water there is very little growth. When there is no vegetation, there is no carbon fixation in to the soil and no carbon sequestration. Thus the temperature increases. I am aware that various models of climate change predict an increase in temperatures of 2-4 degree C in coming 100 years and a disaster is predicted. However, with correct community efforts, if encouraged by all, especially if facilitated by governments in power, it can be reversed.

The carbon build up in the atmosphere is to be arrested on all fronts where carbon is pumped into the atmosphere. However, it is only vegetation (crops, pastures, trees and forests), which sequesters it, and turns it into oxygen, which makes the atmosphere livable. Organic agriculture fixes crop residue by its incorporation into the soil or by recycling the organic residue as composts, taking carbon out of the atmosphere. However, for vegetation to flourish, it needs water.

Below are stories of community efforts in water harvesting carried out to stop environmental degradation and climate change.

4. An old village lady provides vision and becomes my water harvesting Guru

The four youths, including myself who went to live in the village of Mangu Meena and Mrs. Nathi Bhalai[2] in 1985 for rural uplift, were inspired by Gandhian model of rural development. Our idea was to bring prosperity to this semi-arid village but soon we were very depressed seeing no solution around. Two among us left thinking nothing could be done. However, even though I was depressed, I was not willing to give up. In this mood of desperation, Mangu Meena advised me to build talabs (small water dams to stop, store and recharge the ground water). Nathi Bhalai (a lower caste destitute) consoled me by saying, 'you fool you have not understood what is needed'. You need to build talabs so that the water does not run off but is held back to percolate to the ground. With Nathi Bhalai -- whom I call my guru, who showed me the direction-on my side I decided to dig for building a dyke in the village to create a talab. Seeing two of us digging dykes, some of the village youth laughed while others started joining us in digging and making the dyke. Rest is history now. Once the first small talab was ready, the villages saw water. In the surroundings the ecology changed in the very next season. This became an example of how to start restoring the ecology for better food production, vegetation rejuvenation and river restoration.

The idea spread like fire in the parched villages. Village people started approaching me for helping them to do the same in their areas.

India has a tradition of water harvesting (Mishra, 1994, 1995) which in modern times seems to have been lost. Hence let us look at some of the traditional water harvesting systems in India as reported by Miss Sheena (1997).

Carrying a spade and basket and accompanied by Nathi Bhalai of Gopalpura village, we started building a dyke to hold water in the hot sun in village Gopalpura. That was 23 years back, in November 1985. By now the community has built over 8,600 such talabs in over 1,068 villages in the district of Alwar alone over an area of 6,500 square km under the leadership of Tarun Bharat Sangh (TBS literal translation, "Indian Youth Association"). There are many such efforts going on in India. I shall recount some of them below (Sheena, 1997).

5. Revival of ecology by *talaabs, johads and chaals* in India

Traditional methods of water harvesting flourishing today through the efforts of noble Gandhian souls Anupam Mishra[3] (1995), who is recognized as an authority on traditional water harvesting systems in India, rightly says "hundreds and thousands of traditional, small reservoirs (tanks) did not appear all of a sudden from the blue in India in older times. For each promoter of tanks, there were tens of people who actually worked on these tanks. These 'ones' and 'tens' combined to make hundreds and thousands. But a society brought up on superficial modern education that it has acquired in the past 200 years - has reduced these tens, hundreds and thousands into non-entities.

The stethoscope of modern thinking has pronounced many traditional rural cultures and self-sufficient societies as backward, obsolete and incapable of sustaining themselves without comprehending or admitting to the causes of disruption and destabilization of the independent self-sustaining rural societies. Yet, in many parts of the world examples of sustainable management systems can be found. In India, small water reservoirs in the desert areas were part of a complex inter-linking natural resource management system. It is based on this knowledge that all the civil societies movements for water harvesting in India are being built up.

There are examples aplenty.

A. Johads in Alwar

In the district of Alwar, the Tarun Bharat Sangh (TBS, a youth civil society organization), led by myself, is today regarded with reverence, pride and sometimes awe by many living in villages close to the Sariska sanctuary in Rajasthan. Referred to as the "Ashram (spiritual house)" by the local people, it has become synonymous with the johads (talabs or small reservoirs) that today ripple with waves on the once eroded landscape of the Aravalli hills. Today at least 1,068 villages have altogether more than 8,600 small and big johads, built with the active and increasing local participation in an area of 6,500 square km. In the Aravalli hills most johads are built along contours of the mountain slopes for arresting and storing rainwater. During a heavy monsoon downpour in 1988, the people's johads stood firm while the government built dam at Jaitpura, costing more than one hundred thousand rupees, got washed away (Sheena, 1997).

i. Bhaonta - An Alwar village empowered, recharged and re greened

The Babajiwala Johad (johad is an earthen check-dam), the 160-meter long structure, has an earthen embankment with a masonry spillway and was built by the community. The embankment is 13 meter wide at the base and 1.3 meter wide at the top. It is 4.5 meter high and has a catchment area of 10.25 sq. km. The details that have gone into the making and maintenance of the dam are etched on a stone wall, 1.3-1.6 meters in height, that is meant to keep cattle from getting on to the embankment.

In its valley below, Sankhara ka Bandh, which owes its name to the site of construction that is enclosed in a narrow passage between the steep slopes of the adjoining hillsides-sankhara means narrow-- was renovated by the community. The cemented, stone-limed embankment has been built to withstand the great force and swift flow of water. With a catchment of 9 sq. km., the crescent-shaped, convex embankment has been raised across a length of 260 meters and is 7 meters high. Its base is a strong 7-meter wide, narrowing to 2.6 meters at the top.

These small dams have not only recharged all the wells in the village downstream but also contributed to the revival of the river Arvari, one of the main sources of which originates in

Bhanonta-Koylala. The forest in the catchment of the johad does not look very green due to the nature of the ecology of the region: semi-arid, but it shows its colour during the rain. On the embankment of the Sankhra ka Bandh, a sign is painted that says "Bhairondev People's Wildlife Sanctuary", a mark of the respect the village has towards the wildlife that is an inherent part of the forest ecosystem. The village elders have put numerous self-imposed restraints, which are fully practiced by the village in obtaining forest produce. These have regenerated the forest in the valley.

The village leaders decided to select this site to build these small dams for following reasons:

1. The point was the narrowest in the valley;
2. The rock formation at that particular site was such that the dam just merged into it;
3. The site ensured that the embankment did not bear the brunt of the high-speed run-off; and
4. From past experiences, they knew that groundwater recharge would be the maximum at that site.

ii. A river revived – How farmers revive rivers and turn the sand dunes back

The beauty of the regeneration efforts facilitated by the Tarun Bharat Sangh (TBS) in the villages of Alwar (all above cases) is that the fruits of toil may not seem very obvious, but are definitely there. More to the point, they are long-standing and their impact is more visible downstream, as in the case of the river Arvari. Nowhere more so than at Hamirpur, a village downstream of Bhaonta-Koylala, where the statue of River Arvari blesses all at the entry point itself. The perennial flow in the river is the result of the 95 johads and dams, such as the Babajiwala Johad and Sankhra ka Bandh, built by villagers upstream.

The village elders can tell you that this river was a mere barsati nullah (a monsoon drain or seasonal rivulet) that used to flow for less than a week during the rainy season. As a direct result of harvesting the run-off upstream, the river became perennial in 1996, and has not ceased to flow since then. Even in the hottest months of summer, there is plenty of water in the river. This is attributed to the 'base flow', caused by the upstream small dams built by the farmers, making the river perennial.

In fact the government had issued fishing license to contractors from outside the region soon after fish appeared in the river. When the residents of Hamirpur protested, the contractors put in Aldrin in the river to kill the fish. But the community did not give up the fight against the abuse of a river that belonged to them. After initial indifference on the part of the police, it appreciated the gravity of the situation and assisted the village in preventing any further unfortunate incidents. Despite new surface water resources, no incidence of malaria is reported, thanks to the fishes.

On way to Bhaonta from Thana Gazi, a narrow road divides the landscape ahead into two. The botched up efforts of government agencies can be seen alongside the success story of people's efforts based on traditional water harvesting models. The systematic process of conservation beginning with recharging of groundwater by percolation tanks, protecting the scant vegetation and allowing it to regenerate shows people's very own model of development. On the contrary, a top-heavy approach of building boulder check-dams along eroded mountain slopes and contour bunding by government departments has only escalated soil erosion and gullies.

iii. Extracting prosperity from sand - Nimbi's Green revolution.

In contrast to Alwar villages, this area in the adjoining Jaipur district is sandy. A dam built about 400 years ago had been rendered useless by shifting sand dunes. The village had fallen on bad days-agriculture was negligible lands were barren; and sand was all about, as a result of the strong gusts

of wind in the Bhanpur Kalan gap between two parallel ranges of the Aravallis. About 10 years ago, Nathu Lal Gujjar, the representative of the village in the local panchayat (village council), met Nanak Ram of TBS at village Agar. Thus he came in touch with TBS. By then, all his pleas for help to government agencies had failed. The village was about to be abandoned by the residents.

The first thing that TBS assessed was the capacity of the community as well as the organization's capacity to help the village. It then got an idea of the kind of intervention needed to improve the environmental conditions in the village. At Nimbi, the people could have tried to restore the old dam straight away. But the village and TBS jointly decided that it was important to first rehabilitate the smaller dam. The dam was completed much before the schedule, which shows how hard working the people of this village are. And the result was for all to see.

On the other side of the village, an earthen embankment built to connect the breach in the larger old dam to the far end of the valley was built. This earthen structure was built at a cost of about Rs. 500,000[4] (Gopal Singh, 1997). And the result is that crop production in the area downstream of the embankment increased eight times.

iv. Impact of water harvesting on environmental regeneration, agriculture and climate change

I am neither a scientist, nor a professional water engineer nor a climate change expert. I am a small constructive worker of Gandhi and I mobilize the civil society and the community for action on natural resources management and conservation for rural uplift in India. Here I am recording the impact of the above work on the ecology of 6,500 square km area in Alwar district from 1985-2007. Since 1985, 8,600 small water harvesting talabs in 1,068 villages of Alwar district covering 6,500 square km area have been built. This has resulted in the shallow aquifer recharge in ground water bringing up the water table from about 100-120 meters depth to 3-13 meters at present. The area under single cropping increased from 11 per cent to 70 per cent out of which area under double cropping increased from 3 per cent to 50 per cent bringing prosperity to the farmers. The forest cover, which used to be around 7 per cent increased to 40 per cent through agro-forestry and social forestry, providing sufficient fuel wood and sequestering carbon from atmosphere.

The 1,068 villages formed an Arvari Sansad (Arvari Parliament) to frame rules of water use and restricting areas from growing more water consuming crops including paddy. It fixed the rules for pasture use on the basis of rotation. The forest use was limited to lopping of tree branches for fuel or cutting poles for domestic use, but never any tree felling.

I believe this is the way to save the environment and bring prosperity to farmers in Indian villages. Based on this many civil society organizations formed the National Jal Biradari (National Water Federation) to save the Yamuna river. Alwar is a part of the catchment of The Yamuna River, which dries out by the time it passes Delhi, the capital of India. This people's campaign is now in progress.

I invite scientists to estimate the impact of such large community actions on carbon sequestration and fixation. I already know its impact on the rural population. Most farmers who left Alwar for lack of sustenance have already returned to their villages.