

# Johads: Revival of Traditional Rainwater Harvesting Structures

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Johads are rainwater harvesting structure. TBS (Tarun Bharat Sangh) identified water as the main problem in rural India in 1985 and concluded that without augmenting water as a resource, no effective development could take place. For rapid progress, they have to rediscover traditional methods of rainwater harvesting. TBS starts to bring people together on the issues of conservation and management of forests and water resources. Having identified Johads for the purposes of bringing about fundamental change in the area, Johads are making strenuous efforts to eradicate the defects in the rural structure and are attempting rural reconstruction by reducing water scarcity and solving social, economic and agricultural problems of the villages.

**Keywords:** Johad, Rainwater Harvesting, Socio-economic Conditions, Environment, TBS.

## Introduction

During the 1930 and 1940, the range of Aravali mountain in Rajasthan was dense forest cover. Abundance of indigenous water conservation structures insured the less rainfall had perfectly harnessed to supply sufficient water during the drought. People's reverence for the environment and traditional conservation practices had fostered a flourishing biodiversity. But this was before the mindless logging began. Greed soon denuded the hills. Every year, when the much-awaited rains came, most of the water was lost as surface runoff. The earth could not absorb the rainwater; as a result, ground water aquifers could not recharge. To make matters worse, the management of water systems was completely taken over by the government. People began expecting the government to fulfill their water needs. This engendered neglect and scorn for time-tested traditions and also created a dependency-syndrome among the community. The synergy between mankind and nature that was the legacy of centuries of tradition was destroyed in a matter of decades. Drought became a recurring and grim reality in the region. People migrated to cities and towns to work as contractual labour for abysmal wages, leaving behind the very old, the frail, women, and children. Education and health concerns took a backseat, as survival became top priority. Despair reigned supreme.

One of the worst droughts in history was ravaging the Alwar district in northeastern Rajasthan during 1985-86, already one of the poorest in Rajasthan. Climatically, the district falls in the semi-arid zone receiving a meager 620 mm rainfall. The famous Sariska National Park and Tiger Reserve is located in Alwar. In 1986, the district was suffering from severe water scarcity; ground water had receded below critical levels and the state government had declared four blocks including Thanagazi tehsil as a 'Dark Zone' – an area where the ground water level has gone down severely, restricting the further extraction of ground water. The region that once sustained the ecosystem of the Aravalli was now barren. Migration was at its peak. The main sources of livelihood of the local community, mainly the Gurjars and Meenas were subsistence agriculture, livestock rearing and forest products. Villages seemed to be populated entirely by women, the very old or very young, everyone else having left in search of employment. Most eventually ended up in urban slums. The water level fell and rivers and wells dried up. Women trudged long distances to fetch a mere pot full of water, spending much of their day in pursuit of this rare necessity. Crop failure was common, the lack of vegetation led to soil degradation and monsoon run off caused soil erosion.

It is an interesting fact that environment degradation is followed by environment protection through organized and unorganized collective effort for environment conservation, as a part of environment revival. Water is an integral part of all our lives. Water is an integral part of the environment, and hence cannot be

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looked upon in isolation. There has been a lack of adequate attention to water conservation, efficiency in water use, water re-use, groundwater recharge, and ecosystem sustainability. An uncontrolled use of the bore well technology has led to the extraction of water at such a high rate that often recharge is not sufficient. The causes of low water availability in many regions are also directly linked to the reducing forest cover and soil degradation.

It is main problem of our research of non-comparative social-scientific study reference to Johad revival. Water is a major component of environment that has been misused in myriad way. Our idea is to study the water revival including its use, new sources of water, water conservation, and traditional technologies for water conservation in the broad framework of the environment. With this motive, we propose to study the Johad Revival in Alwar district of Rajasthan. It is a study of an environment revival where the people organized on their own to overcome the water crisis with a view to enhance the quality of the environment.

### **Johad's Structure of Community Self -Reliance**

Johad, popularly known as tank in many parts of the country, is a traditional structure of water storage for lean periods in practiced in the villages of peninsular India. That this tradition had strong community support for erection and maintenance is what makes it stand out as a sustainable system worth a try during a period when most, if not all, schemes of water supply are running short of water, to say the least. Johad are simple mud and rubble barriers quilt across the contour of a slope to arrest rainwater. Sometimes, a series of these is constructed depending upon the type of slope and the terrain. These structures have high embankments on three sides while the fourth side is left open for entry of rainwater.

Johads are earthen check dams that catch and conserve rainwater, leading to improved percolation and groundwater recharge. They are built across a slope to arrest rainwater, with a high embankment on three sides while the fourth side is left open for the rainwater to enter. The height of the embankment is such that the capacity of the Johad is more than the maximum possible run off coming from the catchment. Therefore, the height varies from one Johad to another, depending on the site, water flow, contours etc. In some cases, to ease the water pressure, a masonry structure called 'Afra' (for over flow) is also made for the outlet of excess water.

The construction of Johads is labour intensive. It involves laying a rubble foundation, which is covered and pitched with soil. Johad's water in rainy season was using for many purposes e.g., drinking, irrigation, livestock and etc. The advantage of this structure is that apart from arresting and storing rainwater, it improves the moisture level at the sub-soil level in the fields, particularly in downstream areas, and this recharges ground water and wells. During the winter, when the Johad is dry, it can be used for the Rabi crop due to the moisture present in the soil of the catchment area. Thus, inspired by Mangu Baba, the Tarun Bharat Sangh youth began restoring a derelict and silted-up pond nearby. When the rains arrived, the pond was partially filled with water and the village was convinced that they were on the right track. The work continued for long years and the results were beyond everyone's wildest hopes. Not only was the pond brimming, providing sufficient water to the residents of Gopalpura and Bhanwta-Kolyala wells several kilometers downstream were recharged and full of water.

### **The beginning of the Johad revival**

In 1985, five volunteers from the Tarun Bharat Sangh (TBS), a grass root voluntary organization led by Rajendra Singh, came to Thanagazi in Alwar district. They set up base in Bhikampura and started educating the young and providing basic medical services to the villagers in Gopalpura. One day Rajendra Singh, who had himself come to educate the masses, learned the most valuable lesson of his life from Mangu Patel Meena, an old tribal man from Gopalpura village. Mangu told him "We do not want your literacy, we want water." Intrigued, Rajendra Singh asked him what he thought the solution to the water crisis was and Mangu advised Rajendra to revive the area's traditional water harvesting systems if he really wanted to help the people of Gopalpura. Mangu explained about the forgotten tradition of building Johads, the perfect example of inexpensive, simple, traditional technology that yielded rich benefits in terms of recharging ground water.

A 'blue revolution' was initiated in Gopalpura and Bhanwta-Kolyala village, through the revival of an age-old practice. Utilizing traditional knowledge and wisdom the people of these villages are now managing their needs by tapping each small droplet of rain. The next challenge was of how to spread this water revolution in other drought-affected villages? Again, it was Mangu Baba to the rescue. He suggested using Gopalpura and Bhanwta-Kolyala's social relations with other surrounding villages to spread the message of water conservation and harvesting. Once they saw the impact of the Johad in Gopalpura and Bhanwta-Kolyala, other villages would be keen to follow suit. In this way, water harvesting work began in 45 villages of the region, and soon spread to still more villages, setting off a chain reaction powered by a 'coming-home' of sorts to traditional wisdom, rural technology and cooperation amongst villages. Large-scale structures like canal, dams, and reservoirs have yet to cover more than 30 per cent of the targeted population in the state. Others still depend on rainfed agriculture and traditional systems of in-situ water conservation and harvesting, based on simple, indigenous technology. Beginning with Gopalpura village in 1985, villagers with Tarun Bharat Sangh have played the role of a catalyst and leader, facilitating the building of more than 3,500 Johads and rejuvenating old structures with the help of village communities in 750 villages. This area covers parts of the contiguous districts of Alwar, in Rajasthan.

**Gram Kosh: The Village Fund**

The Gram Sabha for sustainable resource mobilization has established a Gram Kosh (village fund) in each village. Each villager contributes a fixed amount decided by the Gram Sabha every year and the fund are used as emergency utilization and for operational & maintenance activities for the Johads. For example, in the village of Bhanwta-Kolyala, the Gram Sabha has decided that each household should contribute five kilo-grams of grain after the harvest for sustaining development activities. The objective of creating a Gram Kosh is to ensure financial independence of the village institution. Such initiatives towards financial autonomy can strengthen future resource development initiatives and help provide relief to the needy during times of drought. The Gram Kosh could also be used for future capital generation for any natural resource development activities.

**Decision Making Process**

Peoples' participation is a prerequisite for the sustainability of any development activity. Both men and women actively and collectively participate in the decision-making process of the Gram Sabha meetings, where details such about the actual construction of Johad, the proposed catchment area, soil type, and other physical attributes, details regarding the villages' contribution to the Johad building, etc. Villagers have full control and total ownership of the Johads, with the Tarun Bharat Sangh role restricted to that of a catalyst and motivator.

**Shramdaan: Voluntary Labour**

The most critical ingredient in this entire system is the contribution of each member of the village to the initiative. Villagers are willing to pay for the construction and maintenance of the Johads as it fulfills three major requirements: firstly, employment and water for irrigation and drinking; secondly, water for livestock; and thirdly, ecological stability by increasing ground water. Before initiating any developmental activity in the village, the cost required is discussed in meetings of the Gram Sabha. As a matter of policy, Tarun Bharat Sangh will not start any construction till the cost sharing norms have been sorted out. Contribution may come in the form of labour from the very poor or cash and kind from the better off. Johad construction requires mainly local resources, i.e. soil / mud, rubble, labour, etc. Tarun Bharat Sangh during the initial days would follow the norm of having a contribution of at least 25 per cent of the total project cost from the village community. This has subsequently been increased to 33 per cent i.e. 1/3<sup>rd</sup> either in form of labour, cash or in kind (local building materials). This contribution helps in withstanding the dependency syndrome created by the attitude of being dependent on Government and helps the people move towards self-reliance. When dealing with very poor communities, it can sometimes become difficult to convince people to make contributions. On the other hand, there are also many instances where the people have themselves met 100 per cent of the cost of the Johad, with Tarun Bharat Sangh only hiring the skilled labour (masonry workers), buying cement, iron, diesel for tractor etc and providing the technical advice.

The capital cost required during the construction of a typical Johad includes:

1. Cost of mud (soil) and stones (locally available).
2. Cost of Labour: (most comes voluntarily from the villagers except for skilled masonry required during construction).
3. Masonry labour cost (mainly provided by Tarun Bharat Sangh).
4. Tractor for lifting the soil and diesel (provided by Tarun Bharat Sangh).
5. Concrete material, i.e., cement, bricks etc. (if needed) Tarun Bharat Sangh tried to maximize the contribution of the local community to create a sense of ownership, accountability, and belonging towards the common property resource created. This will then ensure the Johads long-term sustainability, safety and maintenance.

### **Impact of Johad on Social, Economic and environment**

#### **Impact on Migration**

People have started returning to villages, now with the availability of water is guaranteed. Earlier, people were ashamed to leave the village but as migration were driven by unemployment. Now, leaving the village is seen as a sigh of prosperity. As a result, people's self-esteem has increased and villages have been reborn, just like the Johad they depend on.

#### **Impact on Women**

The unhappy lot of fetching water has traditionally been the women. In times of scarcity, women would have to walk four to five kilometers for water. They also procure fodder and fuel wood, both of which are scarce in times of drought. The average time spent by women on these activities was 18 hours a day. But the Johads have changed all this; with water readily available to them much time is now saved and utilized in productive work. The increased availability of water for cooking, washing and bathing has definitely improved the standard and quality of their life.

#### **Impact on Marriage**

People's stance on marrying their sons and daughters has much easier since the awaited of make with area. Earlier, because of the difficulty of fetching of water, people were discouraged to get their sons and daughters married. In the areas where these was water crisis, parents found it hard to get their sons married. Even lower caste communities such as Meenas and Gurjars did not want their daughters to walk several hours each day just to fetch water. People have started Johad revival to remove water scarcity. This has resulted positively for people to seek marriage alliances for their sons and daughters.

#### **Impact on Unity**

People now are better organizers and can negotiate and interact with government official with greater confidence. Working with Tarun Bharat Sangh has shown them how to mobilize resources. These experience of building Johads and dams has taught them to undertake development projects immensely. Also, the transparency that characterizes Tarun Bharat Sangh supported projects has made them to demand and to look for greater openness in government projects. One of the indirect results of Johads in the Alwar therefore is that village folk can now monitor the cost of Government projects, based on their own experience. They no longer simply accept what is told to them.

#### **Impact on Cultural**

Johads are much more than being a water harvesting structures for the community to which they belong. These are also an integral part of the socio-cultural milieu. More and more ceremonies are becoming part of the people's cultural life.

When a new born arrives in the family, villagers worship the Johad. Three days after the birth, the entire house is cleaned with water from the Johad. The local belief is that since a cow drinks water from the same Johad, the water is sacred and helps purify the house. During wedding ceremonies, the bride and bridegroom along with other women in the village take a salutary walk (parikrama) around the Johad. According to the villagers, the purpose of this is to show the bride, the water reservoir upon which the entire village is dependent so that she knows from the very first day her water destination.

Also, as part of the marriage rituals, the bride's family is supposed to contribute to the village committee worth any amount between Rs 11 – 101 for the maintenance of the Johads. When a person dies in the village, villagers, after the cremation, bathe in Johad. On the 10th day after the cremation, the villagers perform all the last rites on the bank of Johad.

Johad being regarded a sacred place; a small temple is constructed on the embankment of the Johad. It also serves a practical purpose. According to the villagers, while visiting the temple every day, people take note of any breakage in the bund and also of any other maintenance required.

**Impact on Agricultural Production**

With the construction of Johads, a hundred percent increase in crop yields has been observed. Water availability has significantly increased, with the region changing from an officially marked 'dark zone' (no water) to a 'white zone' (water surplus). Wastelands that were hardly cultivated before are now cultivated with higher cropping intensity. It has increased production of crops i.e., wheat, gram, pulse and oil-seeds etc.

**Impact on Milk production**

The increase in agriculture productivity has also led to an increase in crop residue availability, used as fodder. Johad has provided enough water for livestock to drink, so increased livestock. There is a very strong tradition in the district of efficient fodder management by using a mix of trees, grass and shrub species. Surplus fodder doubled the livestock population in the eight blocks associated with Tarun Bharat Sangh.

**Impact on fisheries production**

Over the decade, Johad watershed initiative has revived several dry rivers such as Arvari and Ruparel in the region. With his perennial source of water, aquatic lives have begun to reappear in the rivers. By the year 1996, visible aquatic life resources attracted the attention of the Fisheries Department, Government of Rajasthan for the purpose of establishing fishing rights. Unfortunately, this led to granting of fishing contracts to a few private companies in the year 1996 for fishing in Arvari and Ruparel, completely ignoring the local peoples' rights. Mass protests for several days against the 'outside companies' followed. Eventually the villagers forced the Government to withdraw the contracts granted to these companies. The incident underscores the issue of control over water bodies and its aquatic life in a community watershed initiative. In fact, the Pisciculture Act, 1956, Government of Rajasthan, clearly states that the ownership of the water resources remains with Government of Rajasthan.

**Impact on Environment**

The people's relationship with their natural environment has been strengthened. Revival and recharging of the Johads and rivers have shown them that they have a strong stake in conserving forests and water. Villagers were forced to give up control of the area's natural resources; they felt they had no stake in conserving them. As was obvious, their link with the natural environment was greatly weakened and their own internal organization, previously devoted to forest conservation and community water storage system, broke down. Tarun Bharat Sangh has demonstrated to people in the area that humans are not masters of environment but part of it. The two could co-exist and should. On Sariska National Park: Johad building has altered the status of the Sariska Tiger Reserve. The number of tigers has increased to 27 from just five about 10 years ago, partly due to the increased availability of water and therefore preys following the construction of Johads. Despite five years of drought, Johads in the park are still an important water source for wildlife.

Many birds and animals have returned to the area. Cattle, goats and other animals in the villages and wild animals in the Sariska region come to these Johads for drinking water. In 1985 more than 80 per cent of the area faced erosion. Now it is only 5 per cent. Forest cover has increased from 12 to 50 per cent

**Ground water**

The increase in the ground water level is a cumulative effect of several interventions by the local communities and Tarun Bharat Sangh: the protection of forest land, construction of Johads, field bunding on farmland etc. Wells are the main source of drinking water. A survey conducted by Tarun Bharat Sangh with the help of Action for Food Production (AFPRO) in 1998 suggests that out of 970 wells in 120 villages, only 170 wells were operational and the rest didn't have any water. The same team conducted another survey in 1994 and found all 970 wells supplied water perennially and the ground water level has risen by 9 to 30 meters.

**Rejuvenation of five Rivers**

Five monsoon rivers namely the Arvari, Ruparel, Sarsa, Bhagani –Teldeh and Jahajwali Nadi were dead, dry water-course through which water flowed only during the monsoons. The Johads have rejuvenated these rivers and turned them into perennial water sources. As of now, more than 350 Johads have been built in the catchment of the Arvari River, raising the water level in the entire catchment area of the river.

**Conclusion**

The environment revival has come to a long way. It is not merely a social revival for changing or restoration but the degradation of environment has compelled segments of people to act upon and solve their problems related to environmental degradation, for example Water holes, underground reservoir, depleting rivers, streams etc. Breakdown in indigenous technology for rainwater harvesting for many centuries has created a crisis of water, flora and fauna and also deprived the people to have good harvests. Johad revival in Alwar district of Rajasthan is an environment revival for water which is special because of –

- 1- It is organized and its activists are common villagers.
- 2- No political party has been associated with Johad revival hence no political ideology as such exists, the only aim is to make water available to people which is needed for their own survival and progress of the community.
- 3- It has created other cooperative ventures among the local people Gram Kosh (village fund) namely revival or construction of Johad.
- 4- Although Tarun Bharat Sangh provided the leadership to Johad revival but the decision making is entirely democratic and depending upon the participation of every local person-men and women.
- 5- This revival is continuous revival which has reduced the suffering of local women who had to walk about five kilometers twice a day to fetch portable water on their head during pre-Johad era. Now, they have more time for domestic course, for their children and home making also their association is more frequent with other people of the villages.
- 6- The village can access to Johad which is in the village area itself. Enthusiastic with this resource, the women are involved in Johad revival and contribute for its maintenance.
- 7- Johad revival has also reduced the phenomenon of head of the household out migrating. As the agriculture is economically visible in the area and people “men and women” work in their field and rear cattle for their bread and other such things. Now the cultivation of fodder is easy.
- 8- Culturally speaking the people of other places now do not hesitate marry their daughters.
- 9- Even Johad revival has reduced the use of alcohol and others drugs. As there is a frequent meeting (Chaupal) of the villagers where they short out their problems and problem of domestic violence is very less.
- 10- The Johad revival for water has made their locality greener. Environment protection to be practiced and they also are enhancing the environment by planting more trees. The green acre the proportionally high in post Johad. Inculcating and nurturing of the belief that only people can conserve and regenerate the forest at the same time managing the other natural resources.
- 11- Even the civil disputes and the cases of the crime have been reduced.

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