

Community Driven Water Resource Management : A Case Study In Alwar District, Rajasthan, India

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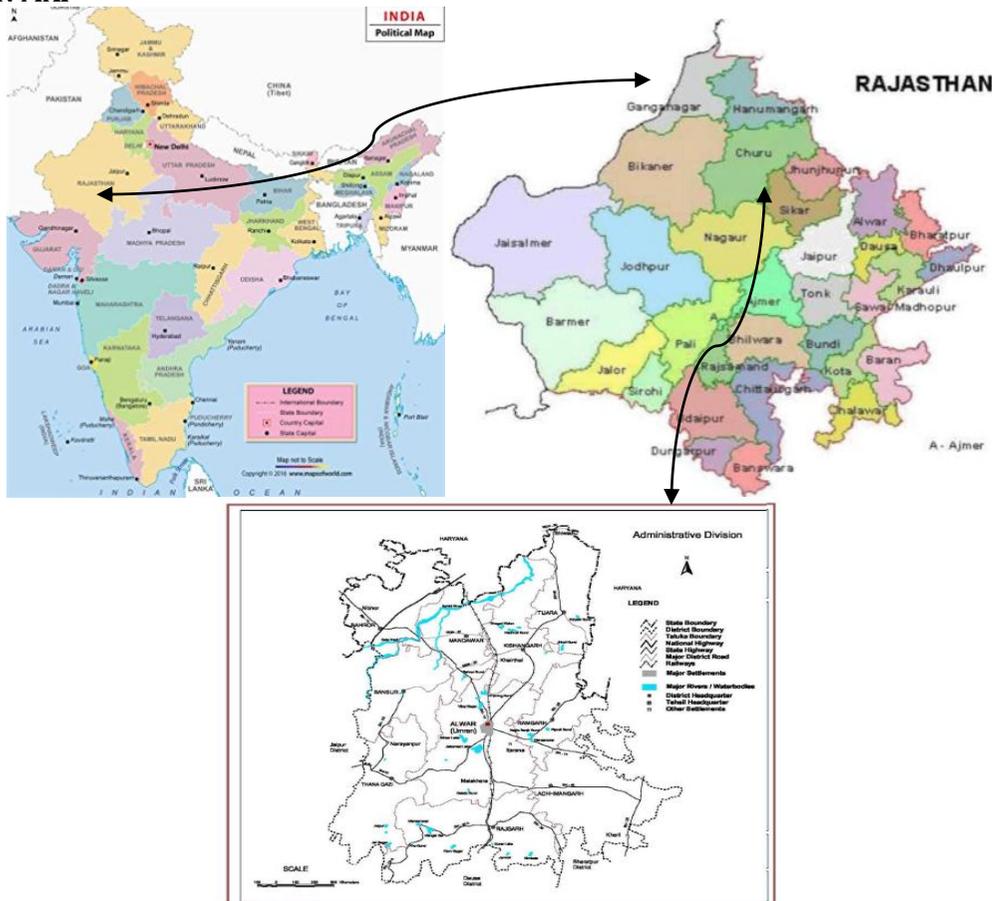
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ABSTRACT

India faces a tumultuous water scenario. Already 15% of aquifers are in critical condition, a number which is projected to increase to a frightening 60% by the year 2030. It seems that climate change will increase the variability of already highly variable rainfall patterns, requiring efforts in managing both scarcity and floods. Integrated water resource management will continue to be an adaptation strategy for people living with rainfall variability. Integrated natural resource management comprises the planned, coordinated and sustainable use of water resources, agricultural resources, grazing lands and forests. Assured water supply causes increased crop yield, which results the achievement of food security and poverty alleviation. In Alwar district, the mostly drought prone district of Rajasthan, India, 8600 small water harvesting 'johads' in 1086 villages have been built with the help of some NGOs, which result in rise water level in shallow aquifers, increase of area under single and double crop and increase in forest cover through social forestry, which prevent further out migration and bring back young working population to successfully change the 'dark village' into the 'green village' and the nature flows into a stable equilibrium state from the metastatic equilibrium state here. The villagers also formed 'Arawari Parliament' to frame rules for water uses. This paper outlines the community driven approach for artificial recharge using traditional techniques of water harvesting. Community participated action on natural resource management and conservation for rural development is the effective way to save the environment and bring the prosperity in village-life.

Keywords: aquifers, johads, Alwar District, Arawari Parliament

LOCATION MAP



Introduction: Water can be considered as one of the most vital resource for human existence out of all natural resources. However, Rajasthan is not very well endowed with this resource and is the driest state in India with scarce water resources. As none of the rivers in this state originate from snow-fed glaciers, they depend entirely on the rainfall to feed. The alluvium and the blown sand which occupy the major part of the state are the soft rocks along with the semi consolidated formation comprising the Tertiary and the Mesozoic era rocks. The most productive aquifers in the region are under the alluvium covers but the quality of ground water in the region is saline. The district of Alwar in Rajasthan is considered as the driest part of the country. The only source of annually renewable water supply in the district is precipitation as most of the rivers are seasonal. Therefore, the region requires intense water harvesting for ground water recharge by both traditional and modern method. That is why 'johad' plays an important role in this regard in the region.

Objectives:

1. to find out the major constraints regarding water scarcity in this region.
2. to understand the capacity of riparian and agrarian communities regarding adaptations towards climate change.
3. to understand the role of rural communities in the project area for sustainable and equitable natural resource conservation and management.

Database and methodology: The data base of the present study was carried out by both primary and secondary levels. So many visits were made with the local officials, NGOs for data and informations in this regard. Many personal interviews had been conducted by the author of this drought affected area. The collected informations have been assessed, analysed and interpreted in a lucid manner.

Study Area: Alwar district is located in the north eastern part of Rajasthan and extends between north latitude 27 degree 03' and 28 degree 14' and east longitude 76 degree 07' and 77 degree 13'. It covers 8720 square km. of geographical area. Its length from south to north is about 137 km. and breadth from east to west is about 110 km. The district occupies about 2.45% of total area of the state. The district has 1991 villages and the rural population is 30.18 lacs (census 2011).

Climate of the district can be classified as semi arid, characterised by very hot summer, temperature may go up to 47 degree centigrade, and very cold winter. Most of the rainfall occurs during south-west monsoon period of about 631mm. The potential evaporation rates are quite high during May and June.

Different kinds of traditional water harvesting processes have been practised in the study area:

'Kui': to minimize the wastage of water, small well known as kui or beri is constructed near a water leaking as oozing tank. Its opening is covered by strips of wood and mostly they remain kaccha.

'Khadeen': khadeen is a most multipurpose method of water construction. The run-off from upland and rocky surfaces is collected in a khadeen from the adjoining valley against an embankment having a masonry water barrier for outflow of excess runoff. The standing water in a khadeen assists continuous ground water recharge.

'Bawari': step wells are locally known as bawari and jhalara, mainly constructed to conserve rain water.

'Johad': a johad is a dam that collect rain water to channel it into the ground to replenish the supply of underground water.



A Johad In Gopalpura Village, In Alwar District

A history of the journey from dry to wet: Alwar had a rich history of water conservation embodied in its 'johads'-crescent-shaped earthen dams that checked the flow of water and allowed the rainwater to percolate into the soil below and replenish underground aquifers. One of the main contribution of Johad is to serve the need of water for livestock and the other one which is utterly significant is to recharge ground water by holding water. Which spread across many kilometres. Ground water reserve becomes capable of supplying the need of huge water demand in dry session. Alwar existed in a stable equilibrium, where even if there was a drought, the johads and the forests made it possible for water to be stored underground.

The villagers are used to construct and maintain Johads by forming a community together. Earlier days kings or local rulers used to fund the construction of Johads. Instead they collect one-sixth of crop from villagers. The other major part of community activity is forest construction as it was bound up with water. They have regulated cutting trees. In 1890, 60% of land was covered by forest.

Post 1940 in Alwar, district of Rajasthan, local kings or Rulers had sold entire forest to loggers the impact of deforestation started taking place. As a result, damaging affect on water, a natural resource, had cascaded the disaster to other natural resource.

The impoverishment of nature had brought impoverishment of poor villagers. Topsoil got exposed due to forest destruction. In rainy season, that eroded topsoil washed down to Johads through slopes of hill. Thousands of Johads were filled up with silts.

The aquifers located at bottom surface of Johads failed to get recharged. Underground water retreated deep. Earlier days villagers, jointly, used to dig silt out of Johads and rebuilt them. But when government seized most of the common land where Johads belong, the villagers started losing interest.

Manglo Patel, a local villager, stated that "Village unity collapsed and people neglected their Johad structures , because Johads can only be made by group, not by individuals." That way Johads became ruined and useless one by one.

Around 1950 with the influence of modern technologies, government had installed diesel driven tube wells. The technology made it lot easier to draw water by tube wells. The villagers happened to be tempted to drill more deep to acquire water as the table also was going down. Villagers were then habituated with easy water - easy life. But one day, they could not drill anymore. Water level had gone deep so far. As an inevitable consequence, wells were dried out and surrounding streams and rivers ran out of water.

It was a series of interconnected and mutually reinforcing vicious cycles that drove depletion of aquifer. Scarcity of ground water made the trees and vegetables dead. Eroded soil expedited the slit deposition in Johads. Less vegetation leads to less transpiration and the same leads to less rain. Monsoon seasons became shorter from 101 days in 1973 to 55 days in 1987. Lands with ability of multi-crop farming turned to single crop production land after irrigation based farming went standstill. Out migration of young male to Delhi , Ahmadabad had started to provide economic support to their family. Even the children stopped going to school to fetch water from two miles away. Women could not find time to help their family by performing other economic activities. Community institution totally collapsed. .

Story of a reborn river: in 1985-86, unusually low rainfall and excessive logging lead to the worst droughts in History in Alwar, Rajasthan, one of the poorest district in the state. The groundwater level reached critically below the normal and the district was declared as 'dark zone' that means further extraction of ground water is fully restricted.

Community water management:

Dr. Rajendra Sing, director of anon government organisation named Tarun Bharat Sangh, in 1985, had a radical plan to work in the most destitute corner of Rajasthan – the Gopalpur village in Alwar district. He had made the move to renovate Johads with the help of local villagers. In rainy season of 1986 ,Johads again started filling up with water. Eventually surrounding dry wells also got filled with water and Goalpura had created its tipping point.

Revival of rivers brought prosperity of aquatic life. Fish population had grown. But government had given the lease of rivers to private parties for fishing. Villagers were not happy with this step. They , themselves did the hardwork to revive the rivers. The conflict and agitation developed from this issue prompted formation of dispute resolution mechanism in 1999 – The Arawari River Parliament.



A Johad In Dry Season, In Alwar District

The parliament had formed with two representatives from each of 72 adjacent villages. The objective of this parliament was to control & protect usage of water and thereby all aspects of water management by framing 11 laws.

Arawari Parliament organized regular meetings and became successful in resolving conflicts and secured water resource. But this parliament did not obtain any legal status and therefore there were no legal obligations for their decisions. However, the moral force of villagers kept their parliament alive and functional.

The workers and associates of Tarun Bharat Sangh worked as facilitators. It was a success story of contribution from locals.

To strengthen 'Arawari Parliament, Tarun Bharat Sangh prepared legal strategy that would help Johad management. But it requires legislature support to achieve success in all respect.

One achievement kept leading to another. By 1996, Gopalpura had built nine johads, covering 2,381 acres and 162 millions gallons of water had risen from an average level of 45' below the surface to 22', and all the wells had water. As a result, decreasing uses of fuel pumps led to decrease the fuel cost. The area of wheat fields jumped from 33 to 108 hectares, agricultural lands became two-cropping. The villagers also restored their forest resources and revived the traditional gram sabha council. They charged monetary fine against every felling of tree.

Effect of this success spreaded to the neighbouring villages and the villagers also adopted those traditional techniques of reviving johads and got success, too.

Magic of check dams, a new era begins: The Kohar village of Alwar district received very little annual rainfall and about 78% of the water available was saline. The villagers did not just face problems with respect to irrigation for agriculture but also experienced difficulties in arranging water for day to day activities, as a result laege scale out migration was indispensable.

It was this hopeless situation that the Sehgal Foundation first encountered when it decided to come here in 2014. The organisation achieved this amazing result by constructing a check dam to solve the acute water crisis. A check dam is a small barrier, constructed of rock, gravel bags, sand bags, fibre rolls or reusable products, placed across a constructed swale or drainage ditch. Check dams reduce the effective slope of the channel, thereby reducing the velocity.

Since the construction of check dams requires little machinery, funding and large scale work, this technique is perfect for a location like Kohar where the community can also be engaged in the construction of the dam. The villagers have started showing interest in organic farming and are trying their hands at composting, too. All these have become possible because their water crisis was addressed through check dams.

Findings:

1. Rural communities in this project area get organised for integrated natural resource conservation and management.

2.Enhanced capacity of riparian and agrarian communities regarding adaptation towards climatic change

Recommendations:

1. Small water harvesting system or earthen dams, can be constructed. Upstream irrigation will also increase the recharge of ground water.
2. modern agriculture as well as irrigation techniques have to be adopted for the optimum utilisation of water.
- 3.high water requirement crops should be discouraged. Farmers should be properly trained to grow low water requirement crops.
- 4.need to educate the next generation population and imbue them with a link to the johad, the forest and the community,-a critical step in maintaining the equilibrium.

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