

WATER HARVESTING - ALWAR, RAJASTHAN

1 INDIA

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Location

Alwar district, northeastern Rajasthan State.

Main Water Harvesting Aims illustrated here and the social setting

Revival of the traditional water harvesting systems called *johads* (earthen check dams that catch rainwater) leading to improvement of percolation and groundwater recharge. The water collected in a *johad* during the monsoon is used for irrigation, drinking, livestock and other domestic purposes. The *johad* improves the soil moisture in the fields and during winter it can be used for second crop cultivation.

Abstract

The Alwar district is one of the poorest in the State of Rajasthan. The revival of the *johads* in one village is illustrated, with help from a voluntary organization (Tarun Bharat Sangh), that greatly improved the social-economic conditions of the region.

Hydrogeological, climatic setting

The Aravali mountain range (one of the oldest in the world) in western India runs approximately 482 km from northeast to southwest across the State of Rajasthan. Until the 1930s and 1940s, the Aravali range had verdant forest cover. A multitude of traditional water-harvesting systems ensured that the low rainfall was optimally utilised to provide an adequate water supply to the village community throughout the year. However, due to large-scale logging in later years, surface runoff increased every year, resulting in considerable depletion of groundwater recharge. The complete transfer of water management from community to government created a cycle of neglect and scorn for time-tested traditions and a dependency-syndrome among the village community. The synergy between humankind 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 (Kishore, 2003).

The Alwar district, nestled among the hill ranges in northeastern Rajasthan, falls in the semi-arid zone with an average rainfall measuring 620 mm. The temperatures fluctuate from 0°C in winters to 49°C in summers. The region was hard hit by one of the worst droughts in 1985-86. The water table receded below critical levels and rivers and wells dried up. Crop failure became common, the lack of vegetation led to soil degradation and monsoon run off caused soil erosion.

Methodology and results of water harvesting studies

The *johads* are simple, usually semicircular, mud barriers built across the hill slopes to arrest the monsoon runoff (Fig. 1). The height of the embankment varies from one *johad* to another, depending on the site, water flow and topography contours. In some cases, to ease the water pressure, a masonry structure is also added for the outlet of excess water.

Three years subsequent to the construction of *johads*, the rise in groundwater level several kilometers downstream of the rejuvenated structures was visible. The water harvesting work was soon taken up in 45 villages of the region, and quickly spread to still more villages. More than 5,000 *johads* were built and over 2,500 old structures rejuvenated by village communities in 1,058 villages in Rajasthan under the leadership of a voluntary organization Tarun Bharat Singh (TBS). These water

harvesting structures have provided irrigation water to an estimated 140,000 ha. Around 700,000 people in Alwar and neighbouring areas have benefited from improved access to water for household use, farm animals, and crops.

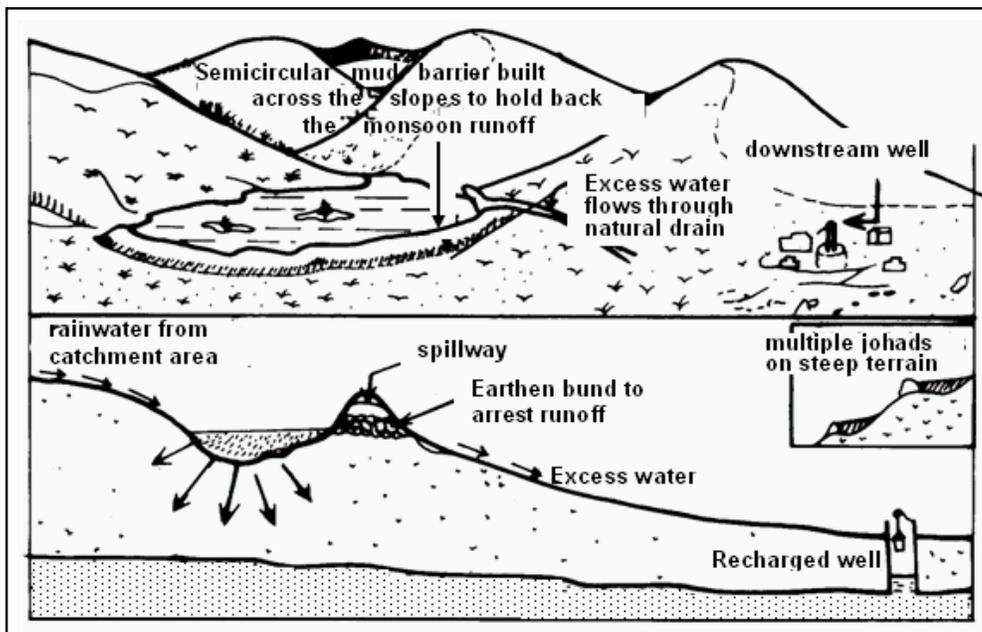


Figure 1. Rainwater harvesting using *johads* (adapted from Kishore, 2003)

Table 1. Rise in groundwater level in Village Buja

No.	Total depth of well (m)	Depth of water level in 1985 before construction of <i>Johad</i> (m)	Depth of water level in 1994 after construction of <i>Johad</i> (m)
1	24.68	Dry	11.12
2	22.25	Dry	10.98
3	20.4	19.4	8.05
4	17.0	15.7 (mostly dry)	8.8
5	24.68	21.68	4.57
6	21.0	15.0	5.76
7	13.10	8.5	2.44
8	25.30	19.3	7.63
9	24.50	19.0	7.75
10	20.25	Dry	12.63

Source: AFPRO (1994)

Findings and conclusions.

The revival of the system of *johads* has had a visible impact on the socio-economic scenario of the region. Studies have shown that an investment of Rs. 100 per capita on a *Johad* raises the economic production in a village by as much as Rs. 400 per capita per annum (Singh, 2007).

Aquifers have been recharged (Table 1) and water supply is now ensured for the entire year to meet the needs of both people and livestock. Livestock rearing being

the lifeline of local communities, increased water and fodder availability has brought about an improvement in their economic status. Besides satisfying primary needs – drinking and domestic uses – it has increased food production, helped in conserving soil, increased biomass productivity, and increased the longevity of the five seasonal rivers – the Arvari, Ruparel, Sarsa, Bhagani-Teldeh and Jahajwali Nadi.

Credits

Rajendra Singh, Head, Tarun Bharat Sangh – a voluntary organisation, Alwar, Rajasthan, India

References

AFPRO (1994) Survey conducted by AFPRO (Agriculture for Food Production) in Village Buja, Alwar District, Rajasthan. Data published in Ecologist Asia, Vol. 11, No. 3, July-September 2003.

Kishore, A. (2003) Taking control of their lives. Ecologist Asia, Vol. 11, No. 3, July-Sept. 2003 (<http://www.sanctuaryasia.com/features/detailfeaturescategory.php?id=558&catid=41>)

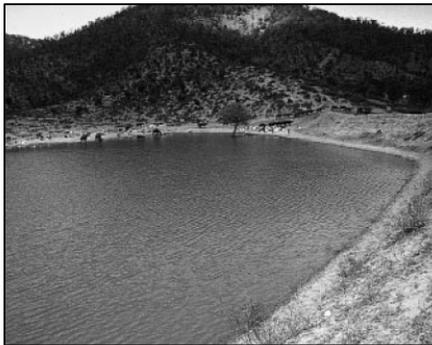
Singh, R. (2007) Community driven decentralized ground water management. Technical Papers, National Ground Water Congress, Sept. 11, 2007, New Delhi, India.

Further reading – 2 or three specific references/web links

Agarwal, A. and Narain, S. (1997) Dying Wisdom: Rise and Fall of India's Traditional Water harvesting System. Centre for Science and Environment. New Delhi.

Singh, R. (2007) Community driven decentralized ground water management. Technical Papers, National Ground Water Congress, Sept. 11, 2007, New Delhi, India.

Photographs



Johad built across natural slope of hill to hold back rainwater.



Initiative by women in water harvesting work

(Photographs by S. Padre, 2000).

Padre, S. (2000) Harvesting the monsoon: livelihoods reborn. ILEIA Newsletter, March 2000.

