Traditional rainwater harvesting in India

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Traditional Rainwater Harvesting in Rajasthan

Though the state of Rajasthan India's largest state by area and supports about 5 percent of the human population and 20 percent of the livestock, it possesses just 1.2 percent of the total surface water and only 1.7 percent of the groundwater available in India.

The importance of water resource management has been recognized since ancient times and the rulers of princely state in Rajasthan had created structures for rainwater harvesting structures. These structures catered to the local needs utilized local resources and were based on wisdom and knowledge handed down from generation to generation. Many community TRH structures also had temples or religious associations with them and became centers of pilgrimage. Many were built with royal patronage or rich businessmen. The main TRH structures of Rajasthan are;

- **Kundi:** It is essentially a circular undergrounded well with a sauce shaped catchment area that gently slopes towards the center where well is situated.
- **Kul/beri:** it is a 10 to 12-meter deep pit dug near tanks to collect seepage. It is used to harvest rainwater in areas with meager rainfall. And the mouth of a pit is made narrow to prevent the evaporation of collected water. These structures are covered with wooden planks.

- **Baori/ber: It is a community well whose water is used**

mainly for drinking. They were built by Banjaras(mobile trading communities) for their drinking water needs. They are shallower than wells and have beautiful arches along with their height.

- Jhalara: it is a human-made tank, meant for community bathing and religious rites. It is rectangular in design. It also has steps on three or four sides. It receives subterranean seepage of a lake located upstream.
- Nadi: It is a small excavated or embanked village pond used for storing water from an adjoining natural catchment during rainy season its depth ranges from 1.5 to 12 meters. This practice of water harvesting is over 500 years old. Each village has one or more such structures
- Toba: it is a natural ground depression within a catchment area. It is usually flanked by groves of shady trees, which helps in reducing evaporation of water.

- **Tanka:** It is a small circular or square underground tank constructed with lime mortar or cement plaster. Normally constructed on the fallow ground where surface runoff can be diverted to the tank by creating a clean catchment all around. It is constructed either for an individual family or for a community depending upon the requirements.
- **Khadin:** It is a Construction designed to harvest surface run-off water for agriculture. In this system, runoff water from uplands and the rocky surface is collected in suitable deep soil plots located in the lower valley segments of the area. An earthen bund is put in place on which trees & grasses are established. which help in stabilizing bund & reducing evaporation losses.

- **Johad: It is a small earthen check dam that captures & conserves rainwater, improving percolation & recharging groundwater.**

- **Anicut:** It is a structure constructed across the stream. It uses an earth fill section with a spillway and is designed to hold sufficient water to submerge a substantial upstream area during the rainy season

Causes for the dysfunctional state of TRH

Following are the causes for the dysfunctional state of TRH structures;

- Availability of other sources of water(piped water, hand pumps and canal water)
- Requirement of financial resources for their use and maintenance
- Requirement of time and labour to use water from these structures.
- Lack of ownership and participation of community
- Tendency to disregard age old and time tested lifestyle in favour of latest technology in name of modernization

Revival strategies for TRH structures:

The work done by Tarun Bharat Sangha (TBS)

- It has received maximum attention. TBS has been working on revival of johad since 1986. The TBS NGO revived five river systems, which were dried up for last several decades. By 2016,11,600 johads had been built in 1280 villages most of them in Alwar district of state, TBS relied on community participation by undertaking padyatras & involving religious leaders. With its effort entire area which was earlier classified under ‘dark

zone', got converted to 'white zone'.

- Rajendra Singh, who runs NGO was awarded the Ramon Magsaysay award for community leadership in 2001 & Stockholm Water Prize (known as Nobel Prize for water) in 2015.

Jal Bhagirathi Foundation (JBF)

- It was founded in 2002 has been working in the area of water security for Marwar region, comprising seven districts. In western part of the state.
- JBF promotes revival & construction of TRH structures by using inexpensive, simple & traditional technology.
- JBF has revived or constructed over 2,000 TRH structures covering about 500 villages. Financial sustainability & community ownership are ensured through a development fund, called Jal Kosh, in which community deposits at least 30 % of project cost.

Other numerous NGO's

- **Gramin Vikas Vigyan Samiti (GRAVIS)** : It has built over 7,000 tanks & over 600 beris in Thar desert area. Focus has been on capacity building of rural communities by involving them in this task.
- **Samajik Vikas Sansthan:** It has promoted restoration of existing ponds – Sekhawati
- **Mewar Krishak Vikas Samiti:** It has constructed about 30 nadis in Rajsamand district.
- **Bhoruka Charitable Trust:** It has encouraged villages in Churu district to build & renovate kundis & johads.
- **2015 Vedanta Cairn** was involved in cleaning & maintaining Bhap nadi in Barmer district, benefitting 19 villages.
- **Lupin Limited** has been involved in constructing check dams & anicuts in Bharatpur & Dholapur Districts.

Central Arid Zone Research Institute (CAZRI)

- **In the 1990's** developed improved technology of Tanka construction for various types of users (capacity ranging from 5000 liters for individual family to 600,000 liters for community use) in jodhpur using stone masonry with cement plaster & cement concrete.
- Paper prepared by researchers from CAZRI for **international Water Management Institute** in 2005 **observed that** TRH systems, are improved & untied on a large scale, **they can meet the requirements of drinking water of rural population & mitigate drought impact**, at least partially.

Initiatives by state Government of Rajasthan

- In 2016 it launched a comprehensive scheme to ensure effective implementation of water conservation & water harvesting related activities in rural areas
- It aims to cover about 21,000 villages with 7 lakh water conservation structures in four years.
- Following Union Government's Model Bill for Ground Water Management (2011) & National Water Policy (2012) State Government has made **rainwater harvesting mandatory for all public establishments & all properties** in plots covering more than 500 sq. m in urban areas