

NECESSITY OF REVIVAL OF STEP WELLS FOR WATER CONSERVATION IN INDIA

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Abstract

Step wells in Marathwada and several droughts affected parts of Maharashtra were the main source of drinking till a few decades ago. It is noticed that the stepwells built in ancient era are still functioning effectively and they ensure the availability of water during periods of drought. Step Wells that were used to supply drinking water during the Nizam's time have become defunct because people use them to throw trash and other debris. They have become breeding grounds for mosquitoes and harmful creatures. At present on account of tremendous pressure on the land due to over population and the concrete jungles, percolation of rain water into ground has reduced drastically. Therefore, it is essential to restore and rejuvenate such ancient wells as water conservation structures.

Keywords- Stepwells, Barav, Underground Springs, Rivulets, Baolis, Spring-Fed Wells, Stepwell Atlas, Heritage Wells.

Introduction

Stepwells, in simple term, "Wells which have Stairs". They are wells in which the water is reached by descending a set of steps to the water level. They may be multi-storied with a bullock turning a water wheel to raise the well water to the first or second floor. They are most common in western India. The construction of step wells is mainly utilitarian, though they may include embellishments of architectural significance, and be temple tanks. These wells were fed by mineral-rich, underground springs and the water from them were pure and potable. They were such a significant part of the community during the Nizams era that entire localities were named after these wells.

A number of surviving step wells can be found across India, including in North Karnataka (Karnataka), Gujarat, Rajasthan, Delhi, Madhya Pradesh, and Maharashtra. In 2016 a collaborative mapping project, Stepwell Atlas, started to map GPS coordinates and collate information on stepwells. Over 2700 stepwells have so far been mapped.

Historical background

In India, stepwells are standing since the age of Harappa and Mohenjo-Daro, which is as old as 2500 BCE, roughly 4500 years old. During this period, square bath wells with steps created, with surrounding rooms and one could rest for a while. Coming back to 3500 years after Mohenjo-Daro, India had stepwells which were much deeper, have room type structure on two sides (or even 1), and travelers or commuters use to rest in them as the temperature in these Stepwells are 5-degree lower than the actual temperature outside.



Chand Baori, Rajasthan

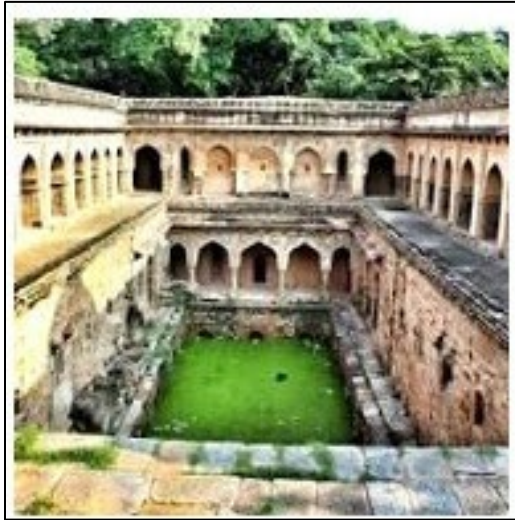
The Kakatiyas and Nizams understood the importance of wells in a semi-arid place like Hyderabad. With rivers like Godavari and Krishna out of reach and the rocky terrain making waterways and canals difficult, in circumstances like this well were the only source of clean drinking water during that time. The Kakatiya rulers put a lot of thought into water conservation and storage during their 400-year reign. They built many tanks and lakes downstream from small streams and rivulets to ensure that these tanks were always full. The surrounding spring-fed wells also served to keep these tanks full of water.



Rani ki Vav, Gujarat

The area around these wells were well maintained so that people could gather around them and a sense of community was maintained among the people. The Nizams who ruled later were equally diligent about building and maintaining tanks and wells. It is said that the Nizam VII, Mir Osman Ali Khan only drank the local spring water from these wells and carried it wherever he went. They understood the importance of wells as wells not only stored water but they also recharged the ground water below during the monsoon season.

History provides us with valuable lessons on how to manage and conserve water resources efficiently. Our ancestors had devised a number of techniques to do so and these efforts helped to meet the water needs of not just the people but the livestock and agriculture as well in areas where perennial rivers were absent and the population depended on rains and often faced water scarcity or droughts.



Rajaon Ki Baoli, New Delhi

Stepwells in Maharashtra

Stepwells were also constructed in Maharashtra although they do not seem to be architecturally as elaborate as those found in Gujarat and Rajasthan due to the topography of the region. They are known as *baravs* in local language and were constructed to supply water perennially for irrigation. One prominent step well is located in Satara district of Maharashtra.

Barav (Bara Motechi Vihir):

A *barav* or locally known as Bara Motechi Vihir in “Limb” village near Satara in Maharashtra serves as a good example of the ingenuity of our ancestors in constructing water storage structures that not only provided water for irrigation and served as resting places for travelers but was also a meeting place for strategic planning by the rulers of those times.

Background:

The well can be traced back to the times of the great Maratha ruler Chhatrapati Shahu Maharaj and was constructed around 1719 to



Adlaj Ni Vav, Gujarat

1724 by queen Virubaisaheb Bhosale (Loksatta, December 1, 2016). The well is octagonal in shape and is made to resemble a shiva linga from the top and is popularly known as *Bara motachi vihir* meaning a well with 12 lifting wheels. It is around 110 feet deep and 50 feet in circumference.

“Limb village, located on the banks of river Krishna, is on a higher elevation than the river. While drinking water was often procured from the river, the well was mainly to meet the irrigation needs as it was difficult to lift water from the river located at a lower level for the fields in the village. The water was used largely for the mango orchards around the area.

Many such traditional water harvesting systems can be found in the country and the longevity of the traditional water harvesting structures is proof that they are sustainable technologies. It is important that we learn precious lessons in water conservation from these remnants of history and restore them to make the most of them in these difficult times.

Basic idea behind constructing step wells

The basic idea behind constructing step wells, was to ensure year-round water supply even during the long dry spells the population had to face for most of the year. Many of these step wells are intricately carved and are looked upon even today as architectural marvels. They typically have beautiful arches, carved motifs and sometimes, even rooms for rest and recreation. They served many purposes depending on the location. For example,

- 1) *Baolis* within villages were mainly used for procuring water and for social gatherings while
- 2) *Baolis* located on trade routes often served as resting places.
- 3) *Stepwells* used exclusively for agriculture had drainage systems that channeled water into the fields.

Many of these structures, however, are in the worst condition now, either ignored by communities and turned into garbage dumps or exploited for their stones or just left around to decay. Current systems of water distribution like taps and pipes have made these heritage structures seem redundant.

Step wells as hydrological structure for water Conservation

Water conservation is a key element of any strategy that aims to alleviate the water scarcity crisis in India. With rainfall patterns changing almost every year, the Indian government has started looking at means to revive the traditional systems of water

harvesting in the country. Given that these methods are simple and eco-friendly for the most part, they are not just highly effective for the people who rely on them but they are also good for the environment.

In 2016 a collaborative mapping project, Stepwell Atlas, started to map GPS coordinates and collate information on stepwells. Over 2700 stepwells have so far been mapped. (Wikipedia). All these wells may be utilized for strengthening of Ground Water regime Monitoring Network. A number of surviving stepwells can be found across India, including in North Karnataka (Karnataka), Gujarat, Rajasthan, Delhi, Madhya Pradesh, and Maharashtra. Therefore, it becomes useful that old and historical stepwells of India may be restored and rejuvenated as water conservation structures.

As groundwater levels fall, some of the step wells gets dry. Once dry, they are neglected and are encroached. When the wells were brimming with water, they were revered and had a unique intricate code woven around them. While unsustainable and unregulated use, inattention and destruction to recharge mechanisms, changing rainfall patterns and droughts have played a role in the demise of these appropriate structures, it is also true that they have been neglected. They found no place in programs like JalYukta Shivar or any other such programs.

Participatory approach of Stakeholders

In the existing monitoring system, it is proposed to increase the number of monitoring stations and also the frequency of measurements with the public participation to strengthen the monitoring system. Ground water stakeholders are those who have in interest in the resource for different purposes like domestic, agriculture and industrial activities. The main objective of the stakeholders should be to protect and augment this valuable resource. In the monitoring system the primary Stakeholders are individual ground water users, volunteers, community workers, agricultural extension workers, government departments involved in ground water management and NGO's in water sector becomes secondary stakeholders. Hydrogeologists with vast field experience should be identified as a resource person for providing inputs related to delineating the watershed aquifer system, to train farmers for identifying various aquifers, techniques of data collection, data interpretation and its usage.

Women, who are the sentinel of our cultural ethics, either poor or rich are affected by water shortages as water is regarded as the responsibility of women to the extent it relates to household use. Therefore, it is essential to ensure women participation in Ground Water Monitoring of these ancient historical assets.

Conclusion

As groundwater exploitation has increased, many traditional Step Wells have gone dry. When the wells were brimming with water, they were revered. As such, they are now neglected and are encroached. Unregulated development of groundwater, lack of recharge mechanisms, changing rainfall patterns and droughts have played a major role in the demise of these appropriate structures. Protection of these useful structures has found no place in flagship programs like *Jal Yukta Shivar* in Maharashtra or elsewhere. At present, many wells all over Hyderabad that were used to supply drinking water during the Nizam's time have become defunct because of negligence and people's apathy. One of the biggest hurdles facing the revival and maintenance of these ancient wells is that they are not listed in The Heritage Conservation List, which covers buildings only and not *water bodies*.

Preservation of "Stepwells" are important not only because they help in water conservation but because they are a part of our heritage and we owe it to our future generations. These places can be developed tourist spots as "Heritage Wells" and the money collected from this could be used to maintain them as recharge pits while also preserving a slice of our history.

We expect that old and historical wells of India are restored and rejuvenated through various new programs like Jal Yukta Shivar in Maharashtra, which should include well recharging initiatives.

Let us also anticipate that sensible water management, attention to existing and increasing groundwater recharge, judicious cropping patterns and some extremely good monsoons will make country's historical wells full of water again.

REFERENCE

1. "Traditional Water Systems and minor irrigation Schemes" Version2, CE, IIT, Kharagpur.
2. "Study of ancient storage systems on forts in Nashik district of Maharashtra" by Shriram Vaijapurkar and Sidhant Vaijapurkar.
3. "Participation of Stakeholders in Ground Water Regime Monitoring and surveillance" published in module on Participatory Ground Water Management by Rajiv Gandhi National Drinking Water Training and Research Center, Raipur
4. "Traditional Water Management Practices of Maharashtra" by Dr D. M. More.
5. "Traditional Water Conservation System" by Sanchetri Pal