

Lesson in water management A Rajasthan village shows way how to mitigate water scarcity

Parth Gohel



Water is an essential element for the sustenance of life. It is chiefly for this reason that the effective management of this precious resource is vital. With advancements in science and technology, various innovative methods have facilitated water management in urban and rural areas.

However, of enhanced importance is the judicious management of water in parts of the country where agriculture is predominant and the resource is scarce, for

example, the state of Rajasthan.

Rajasthan's climate is primarily arid to semi-arid with short spells of showers brought by the southwest monsoon. The Thar Desert and the Aravalli mountain range are primary geographical features of the state. The rivers Chambal, Banas, Luni and their tributaries drain the eastern and southeastern part of the state.

Being an arid region, the natural vegetation is primarily thorny, with occasional dry deciduous forests near the

northern and eastern plains. The average annual precipitation of the state stands at a mere 200 mm, significantly lower compared to the national average of 650 mm. Diurnal and annual ranges of temperature are high across the state.

Water scarcity

An arid climate with low annual average rainfall makes Rajasthan a water-deficit state. Lack of precipitation reduces the sub-surface water resource. Perched aquifers

have dried up in many places. The only option for farmers is to dig deep borewells and mine the water from deep aquifers.

Farmers with large landholdings are able to channel required resources to dig borewells, but marginal farmers cannot afford the financial risk, as there is no guarantee of hitting the water table. The prohibitive cost of borewell also fuels water trade among farmers.

The terms of trade are not beneficial to beneficiary farmers, as access to water is only available once the owner has supplied required irrigation to his/her field. Evidence suggests that untimely and inadequate irrigation reduces the productivity of the crop, and therefore its monetary realisation. This further forces the farmer to approach local moneylenders for dear credit, eventually entering into a debt trap.

Unavailability of water negatively affects the pastoralist community as well as animal husbandry. Cattle are starved of water, and farmers are unable to cultivate high-quality fodder, both of which are crucial to attain high milk yield. The situation becomes worse when the majority of the population is dependent on agriculture and allied activities for livelihood and do not have many alternative income sources.

Water scarcity increases the drudgery of women and children as they are forced to travel long distances to fetch water for domestic purposes. The villages in Rajasthan are scattered and most families tend to dwell near fields, which increases their difficulty to access village hand pumps.

In the water-scarce district of Karauli, per CGWB, decreased rainfall has led to an increase in the extraction of groundwater resources, leading to the classification "overexploited." As the district is not serviced by any canal or irrigation scheme, farmers primarily depend on groundwater sources for irrigation.

A few village ponds were constructed as part of MGREGA that act as drinking water sources for cattle, and also recharge groundwater. During summer months, most ponds dry up, as losses due to evaporation increase due to high atmospheric temperature.

Initiatives to mitigate scarcity

Scarcity must be addressed with sustainable

solutions. To mitigate water scarcity, methods employed are subsequent to the availability of funds, geography, socioeconomic factors, technical feasibility, etc.

Conventional wisdom suggests that watershed management (treating a micro watershed of 500–1,000 Ha by intercepting small streams and rivulets using check dams, ponds, gully plugs, and other such structures) is the most sustainable and effective method to improve water scarcity in parched regions such as Rajasthan. The state has a history of traditional water management practices in the form of johads and baolis.

To improve water security in the region, the availability of indigenous methods has to be considered, such as water conservation and the willingness of people to participate effectively. The use of indigenous knowledge is expected to provide sustainable solutions.

To provide a conducive environment for farmers to double their income, artificial groundwater recharge methods must be designed and implemented. Studies show that the presence of green pastures improves the groundwater recharge capacity of a given land mass.

Therefore, an adequate thrust needs to be given to tree plantation on farm bunds and commons. Overall efforts should aim to preserve the natural ecosystem and make agriculture and allied activities more remunerative for farmers.

In the Nadoti block of Karauli district, a series of nine check dams were constructed over three streams, treating a command area of 2,000 hectares. The intervention started with multiple meetings with villagers and panchayat members, which helped to identify potential locations and consider social, geographical, legal and technical feasibility.

For a successful watershed project, the gram panchayat (as per the Panchayati Raj Act of 1992, one of the objectives of the gram panchayat is to improve access to water as well as preserve the natural resources of the village) plays a crucial role.

The project could be sustained without the requisite permission from the gram panchayat to undertake water conservation interventions over the common land, which includes non-perennial streams and rivulets. In addition, the villagers participated during

the construction phase by contributing their labour for a significant number (250) of days.

To ensure the longevity of the structure, a bank account was opened in the name of the village development committee, and contributions, in cash, by the villagers were deposited in it. Seeing the enthusiasm of villagers of one village, other gram panchayats invited Sehgal Foundation to explore possibilities for water conservation structures within their jurisdictions. The continued enthusiasm of four gram panchayats and seven villages led to the construction of nine check dams, over three streams, within a span of ten months, with a total outlay of Rs 1.8 crore.

Expected benefits

Zeal shown by villagers and panchayats to conserve water resources in their area led to several qualitative and quantitative benefits:

- Catchment area treated: 2,000 Ha
- Water harvesting potential created: 52 million litre
- Number of farmer households benefited: 1,400
- Number of cattle receiving access to water: 4,500
- Number of bore/tube wells influenced by groundwater recharge: 268
- Additional area to be brought under irrigation: 1,300 Ha

The way forward

Despite being a water-deficit state, Rajasthan has developed its water resource potential by constructing rainwater harvesting tanks. Efforts to rejuvenate traditional water harvesting structures are being undertaken by the state government.

New initiatives, such as *Mukhyamantri Jal Swavalamban Abhiyaan* aim to increase groundwater recharge by constructing village ponds and check dams.

To increase water security for rural people and to achieve the SDG of access to safe water, effective participation of local institutions is essential. People-led water conservation interventions ensure effective and equitable distribution of any accrued benefits.

(The author is programme leader - water management at Sehgal Foundation.)