

Water visionaries leave a rich legacy

ROYAL TOUCH The Chandela and Bundela rulers built a network of weirs to tap run-off rainwater



**water
WISDOM
PART-II**

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JHANSI(UP)/TIKAMGARH(MP): One does not need to carry out excavations in Bundelkhand to know how advanced the ancient civilisations were when it came to tapping run-off rainwater. Evidence in the form of still-functional water harvesting structures is found all over the region. Some of these structures are 400-1,000 years old.

Possibly, no other region in the country had so many giant water-harvesting systems as Bundelkhand did. Many of these are still functional.

The Chandela and Bundela rulers built innumerable water harvesting systems between the ninth and the 17th centuries. The weirs that dammed water between ridges are a typical example of the water technology of those times.

"Water conservation in ancient India was a norm. In all the geographical regions of the country, water harvesting and conservation were pursued religiously. Methods varied from place to place, depending upon the geographical, geo-morphological and meteorological conditions. Bundelkhand's systems, too, were region and area specific," said VK Joshi, former director of the Geological Survey of India.

The weirs built by both the Chandelas and Bundelas reflect the wisdom involved in the task — right from site selection to design, construction and maintenance of the systems. Locally, these weirs are known as *bandhs*.

Apart from minor differences, the weirs made by the Chandelas and Bundelas were similar in

philosophy and technology. Both were constructed by stopping the flow of water in the rivulets flowing from the hills. "The flow was stopped by erecting massive earthen embankments. Their width was 60 metres or more. Both built the weirs in places where the hills had long stretches of quartz reefs running underneath them. Quartz reefs acted as natural barriers, helping to trap water between the ridges," said Prof Ram Chandra, head of the department of geology, Jhansi University.

The earthen embankments were supported on both sides by walls of coarse stones, forming a series of stone steps. These walls used lime and mortar. This is the reason why they have survived even after centuries.

The Bundelas, whose reign followed the Chandelas, built bigger and more ornate weirs. They also constructed resting and recreational platforms, residences and orchards at the reservoirs. Obviously, their systems were not as cost effective as that of the Chandelas.

Two such weirs are Barwasagar in Jhansi and Nandanwara in Tikamgarh. The Barwasagar reservoir area is spread over 550 acres with a depth of 5.57 metres on the fringes and over ten metres towards the centre. Nandanwara is smaller. This reservoir is spread over 400 acres. The Bundela king Raja Udit Singh of Orchha built Barwasagar between 1705 and 1737. A Chandela king built the Nandanwara reservoir a few centuries before Barwasagar. Both have irrigation canals. One Nandanwara canal is 22 kilometres long. The Barwasagar lake irrigates over 1,000 acres of land and Nandanwara less than 1,000 acres.

The Nandanwara reservoir was made by impounding a rain rivulet, Bargi Nadi. This was done by erecting two embankments between four ridges. The Barwasagar reservoir was made



■ (Above) Water overflowing from Barwasagar dam in Jhansi during the rainy season. Barwasagar reservoir is spread over 550 acres and it irrigates over 1,000 acres of land. It was built by a Bundela king between 1705 and 1737 AD.

■ (Right) Simply miraculous! No one knows how crystal clear water gushes out of these two metal lions on the wall of the Barwasagar dam, even if the water on the other side of the wall is turbid.

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by raising an embankment between two ridges in the way of the Barwa nullah (rivulet) flowing from the adjacent Tikamgarh district.

The Chandela tanks usually had a convex curvature somewhere in the middle of the embankment. Many older and smaller tanks were constructed near the human settlements or near the slopes of a cluster of hills. These tanks served to satisfy the drinking water needs of villagers and cattle.

"The kings entrusted water management to castes that are associated with water, like the Nishads," said Pushpendra Dangi (a Nishad) at the Nandanwara



reservoir. The person employed by the king maintained these tanks. Many times the king employed villagers to de-silt the tanks. In case of smaller tanks or ponds, beneficiary communities were meant to manage and maintain them, including de-silting and cleaning.

Fringes and patches of the pond beds that dried up as the summer progressed, were used for cultivation till the water filled up again in the monsoon.

"The Chandela ingenuity was

strikingly demonstrated in the temples at Khajuraho and the irrigation systems built by the dynasty that helped to sustain large semi-arid areas. A millennium later, the Viceroy, Lord Curzon decided to dam the streams in the region to irrigate the poor soil," says the book, 'The forts of Bundelkhand'.

A good monsoon filled up the reservoirs with enough water to last four to five successive rain deficient years.

NEXT: POND WATER