



## Hydrology in Ancient India: Some Fascinating Facets

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Hydrology in India has a historical footprint of several millennia. As in many ancient civilisations across the world, the need to manage water drove the growth of hydrology in ancient India also. The famous “Great Bath” of Mohenjodaro city of the Indus civilisation (about 2500 BC) is arguably the oldest public water tank in the world. Evidence exists showing that the bath designs were in fact based on sound hydrologic logic. The city is also known to have well-designed drainage systems. Dugwells were found in most houses in the city, and the walls protected the city from floods. Records from the period around 6th Century BC to 8th Century AD suggest that technology of construction of dams and irrigation facilities was well developed at that time. Indeed, archaeological evidence proves that several dams existed around the period 5th to 6th century AD (Sutcliffe et al., 2011). The first rock-cut step wells in India date from 200-400 AD; many step wells are still in use (e.g., the Adalaj vav in Ahmedabad).

Evidences from ancient history provide an insight into the hydrological knowledge generated by Indians more than 5000 years ago. What is less known, however, is the rigorous discussion in the Hindu mythology on several aspects of hydrologic processes as we understand them today. A compilation on hydrology in ancient India (NIH, 1990) chronicles the references in mythological literature to such activities and processes as rainfall measurement, infiltration, groundwater, streamflow and evapotranspiration. The literature itself dates back to around 3000 BC (Rigveda) to 7th century AD (e.g., skanda purana). A verse in the Rigveda, for example, states that the ‘rays of the sun are the cause of the rain and that the sun extracts water from all parts of the world and the start of creation (of the world) is continuously engaged in extraction and discharge of water’, pointing to a description of the hydrologic cycle. Kautilya’s Arthashastra (about 300 BC) contains details of scientific measurements of rainfall and suggestions on use of rainfall data towards providing relief to farmers. The epic Meghdoot, by Kalidasa around the 7th century contains a description of the monsoon .

As we investigate deeper into hydrologic references in Indian mythology, many fascinating dimensions of the early scientific endeavours of mankind emerge. Fortunately, the ancient Indian works have been well documented and provide us with pointers to the human history, in general, and growth of water sciences in India. This brief presentation highlights some interesting developments in hydrology in India, starting from the ancient (around 3000 BC) period to the more recent colonial era (around 19th century, AD), with a critical perspective on whether India slowed down somewhere in making significant original contributions to facilitate the growth of hydrologic sciences.

### References:

Sutcliffe, J., Shaw, J., and Brown, E., (2011) Historical water resources in South Asia: the hydrological background, *Hydrological Sciences Journal*, 56:5, 775-788, DOI: 10.1080/02626667.2011.587425.

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