



## WATER : THE DEVELOPMENT OF CIVILIZATION IN INDIA

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### ABSTRACT :

*As in many other parts of the World, civilization in India also flourished around rivers and deltas, and rivers remain an enduring symbol of national culture. Different generations have considered rivers as sacred. The seven important rivers Ganga (the Ganges), Yamuna, Godavari, Saraswathi (underground river), Narmada, Sindhu (Indus) and Kaveri (Cauveri) cover the length and breadth of undivided India, and connect people with different life styles, languages, costumes, etc.*



**KEYWORDS :** *civilization , national culture.*

### 1. INTRODUCTION :

Ancient civilizations such as those at Mohanjodaro and Harrapa in the Indus Valley, started around 4000-5000 BC. Excavations at these sites, scattered information in the old literature, and studies of the truth behind religious practices provide an idea about the role that water played in their rich cultural heritage.

### 2. WATER IN CIVILIZATION:

#### **Indus Valley civilization:**

The Indus Valley civilization, one of the earliest civilizations, was the world's largest in extent. Its total area covered 1 x 10<sup>6</sup> km<sup>2</sup>, comprising north India and the present Pakistan. The first major settlements in the civilization based on Mohenjo-daro and Harappa, were found along the Indus River and its tributary, the Ravi. Exploration in recent decades has disclosed several sites along the dry bed of a huge river, now. Role of water in the development of civilization in India—A review 161

#### **Water management and technologies:**

Drier climates and water scarcity in India led to numerous innovations in water management techniques, since the Indus valley civilization. Irrigation systems, different types of wells, water storage systems and low cost and sustainable water harvesting techniques were developed throughout the region. The reservoirs built in 3000 BC at Girnar, the artificial irrigation lake Bhojsagar in Madhya Pradesh constructed in the 11th century (it covered 650 1cm<sup>2</sup>), the artificial lake fed by the Kaveri River in the same century and ancient step-wells in Western India are examples of some of the skills. Technologies based on water were also prevalent in ancient India. Reference to the manually operated cooling device "variyantra" (revolving waterspray for cooling the air) is given in the centuries old writing "Arthashastra" of Kautilya, 400 BC. The

"Arthashastra" and "Astadhyayi" of Panini, 700 BC, give reference to rain gauges.

### 3. WATER IN ANCIENT INDIAN LITERATURE:

Ancient Indian literature points towards an intuitive understanding of nature and natural processes. However, many of the ideas are presented in a philosophical manner, so skill and effort are needed to trace the meaning out of the lines. The Vedas, Upanishads, Puranas, Epics and scholarly writings such as "Mayurchitraka" "Vrihat Samhita" are vast treasure troves of scientific knowledge. Many of the hydrological concepts developed in the last few centuries were known and well documented in them by 3000 BC. Even for hydrology alone it is not possible to explain their contents in just a few pages. Only a small fraction of the scientific knowledge in them has so far been studied in detail. A valuable attempt to undertake this work was carried out by the National Institute of Hydrology (1990).

The beginnings of studies on weather and water in India can be traced back some thousands of years. Early philosophical writings contain descriptions of the Earth's revolution around the Sun, the seasons, and the processes of cloud formation and rain. Though "Indra" was worshipped as the God of rain, the ancient scholars knew that basically the energy of the Sun causes rainfall. Rig Veda says that the Sun is the cause widely recognized as the legendary River Saraswati praised in the ancient literature "Rig Veda". Satellite images also show signs of channels of water in northern and western India that disappeared long ago. Some scholars have made the point that the Harappan civilization would be better named the "Indus-Saraswati civilization" (Danino, 1999). Urban centres were often planned near rivers or at the coast. The great and well planned cities provided public and private baths, sewerage through underground drains built with precisely laid bricks, and an efficient water management system with numerous reservoirs and wells. In the impressive drainage systems, drains from houses were connected to the larger public drains. Agriculture was practised on a wide scale, with extensive networks of canals for irrigation. It appears that fire and flood control measures to protect farms and villages were also practiced. The concept of rainfall and water ("Aditya Jayate Vrishti" or the Sun gives rainfall) that evaporates by the sun's rays moves up into the sky for conversion to clouds and rain and then is finally stored in rivers and oceans. "Arthashastra" contains records of scientific measurements of rainfall in various parts of India and its application to the country's revenue and relief work. It also classifies climates and identifies the zones suitable for agriculture. The great poet Kalidasa of the 7th century BC, in his masterpiece "Meghadoot", or the message of clouds, mentioned the date of onset of the monsoon over central India and the path of the monsoon clouds (India Meteorological Department, 2003). In the Vedic period itself the concepts of evaporation due to the sun's rays and winds, the concept of hydrological cycle, the types of clouds, the process of cloud formation and precipitation, methods of measuring rainfall, the nature of winds, the estimation of slopes from river flow, and the dimensions of meandering rivers along with velocity of flow, were well understood.

The "Vayu Purana" and the "Matsya Purana" mention the rainfall potential of clouds and the formation of clouds by cyclonic, convectional and orographic effects. The "Vishnu Purana" discusses the glorious sun that exhales moisture from seas, rivers, the Earth and living creatures. Similar verses are also found in the epic "Mahabharata". The book "Meghmala" written in AD 900 (author disputed) is on cloud-related studies. The "Thaithariya Aranyaka" classifies clouds and winds in an appreciable manner. Information on infiltration can be found in "Taittiriya Samhita" and in "Mahabharata". The rivers were considered as the daughters of the Sun and cloud and the "mantras" of the "Rig Veda" denotes that creation started with the origin of water. Knowledge of Geography, Geomorphology and streamflow was developed and, according to the "Atharva Veda", rivers of a mountain origin are perennial and summer flow is maintained if the mountain is snow-covered. For several thousands of years, Indians have recognized the importance of groundwater development and utilization, as life was dependent on agriculture and because many parts of North India experienced dry climates. The Vedas mention clearly the use of water abstracted from wells. Three chapters of "Vrihat Samhita" of Varaha Mihira, of the 5th century AD, are fully on meteorology and climatology, and one chapter is fully dedicated to groundwater exploration, exploitation and equipment. Physiographic features, termite mounds, soils, flora, fauna, rocks and minerals, were used to

detect groundwater. Estimation of the depth of the water table was based on the presence of termite mounds and on certain trees near them. In the famous Bhagavad-Gita, Lord Krishna in his advice, comments on sinking wells for water as great work (yagna) and highlights the role of water in the evolution of all beings (Ramakrishnan, 2000).

Methods to assess and maintain water quality and treatment methods to improve it are explained in Vedas and books on "Ayurveda". Varahamihira presented methods for obtaining potable water from a contaminated source, using plants, metals and heat. Water conservation, water use and management were given considerable importance in ancient India. There are quotations in Vedas and in early scholarly manuscripts on canal irrigation, drought management, water allocation, water pricing and eventransboundary water management. As per "Yajur Veda" pure water will purify all things through rain: "may waters, like mother purify our bodies".

#### 4. WATER IN BELIEFS AND RELIGIOUS PRACTICES:

The physical and aesthetic properties of water give it a unique mythical-religious potential and therefore it has played an important role in myths and religious rituals. Lord Vishnu, the God of existence, is also known as "Narayan", which means one who resides in water. The origin of life from water and the development of species explained through the ten incarnations of Lord Vishnu, is a Hindu theological concept in Vedic history. The incarnations through the ages start from water as a fish and continue as a tortoise, boar and lion to a perfect human being. Importance of rivers and water bodies is highlighted throughout the epics "Ramayana" and "Mahabharata". There are several legends about water and water bodies. The epic "Ramayana" (Valmiki) explains a lot about the river Sarayu (Ganges) in which Lord Sri Ram disappeared on the way to heaven. Saints appearing in epics always lived in the vicinity of rivers, as physical purity associated with mental purity was believed a must in realizing eternal truth.

In all religious practices, the sprinkling of divine water is an inevitable part. The water is purified with "mantras", inviting the presence of the seven sacred rivers. This divine water is used to anoint the idol, which is then distributed to devotees. Associated with every Hindu temple and ashrams, there are big ponds and wells. It is a popular belief that bathing in holy rivers or drinking some drops of water from these rivers before the last breath, can help remove the sins acquired from the evil deeds during the lifetime and through the generations. In the functions following funerals and during the offerings to ancestors, bathing and dipping items for worship in holy water bodies, including the ocean, is considered of great spiritual value. Praying with a handful of water in the morning and the evening was part of daily life. There are several water bodies considered sacred in the different States of India. Cultural traditions have helped conserve many of the water resources and the forests and wetlands that maintain them.

Former generations gave due consideration to the right to use water for all creations. Open wells have been in use for centuries. Near the well, they used to construct small pits to fill water so that birds, reptiles or animals could drink. Some class of Brahmins even judged the behaviour of a newly-wedded girl by asking her to water the sacred plant "tulsi" and by watching to see if she kept some water in the bucket used to draw the water from the well for other creatures. It was a custom not to empty the bucket until sunset.

#### 5. WATER IN TRADITIONAL PRACTICES AND PROVERBS:

Societies and cultures have traditionally developed sustainable techniques for conserving and managing nature and natural resources. For example, making small heaps of sands before the end of the winter monsoon in the central part of Kerala was, in fact, a multi-purpose method involving water and agricultural management. Water trapped in between the heaps infiltrates to groundwater, so that there is no serious water shortage in the dry months. In addition, the weeds are removed and soil becomes loose to fit the land for agriculture. Unfortunately, because of changing life styles, the rising cost of land and the shortage of land availability due to the increasing population, this sustainable and environment-friendly method is becoming uncommon. However, the recent water crisis is initiating a drive to improve traditional, reliable and cost-effective domestic rainwater harvesting methods.

India has a fascinating and significant ancient tradition of conserving land and water and even today, local people follow several such traditional conservation practices. They include protecting patches of forests and water bodies in the name of local deities. The "sarpakavu" (Snake forests or sacred groves) and the miniature forest to worship holy snakes (and certain other deities) were once integral parts of agricultural plots and many households in Kerala in south India, and they still exist in isolation. This ecosystem consists of many species of trees (some of them considered sacred where some of the deities are believed to dwell), shrubs and rare herbs of high medicinal value. A well-protected pond, which helps a lot in recharging and conserving water, is an essential part of this forest. Every year, there used to be "puja" (offerings) to the snakes and deities and before offering "puja" the ponds were cleaned. The quality and quantity of water in nearby wells are largely influenced by this ecosystem. There is a proverb "cutting the kavu destroys the nation". This has become true, as the destruction of the forests and the filling of ponds has resulted in falling water tables and created serious water shortages in non-rainy months. These preserved biodiversity-related cultural phenomena exist by different local names in different parts of India.

There are several proverbs related to rainfall in the different Indian languages, the collection and explanation of them is a large task. They were developed through keen observations of nature. As examples some of the numerous proverbs existing in the southern State of Kerala, are summarized below:

- a. "Those who stand in 'kalavarsham' (summer monsoon) and those who run in 'thulavarsham' (winter monsoon) get wet". Summer monsoon rainfall is continuous and winter monsoon rainfall is short and heavy, because of the differences in circulation pattern and types of clouds.
- b. "Clouds over pounding shed, rain is sure". Pounding shed is in the northwest corner of the house and huge winter monsoon thunderclouds appear there.
- c. "South clear, weather clear". This is related to the formation of clouds due to typical circulation pattern during summer monsoon.
- d. "Haifa 'koda' (very heavy rainfall) for 1000 'venais' (hot summers)". This means that if the summer is very hot, it will be followed by heavy rain.
- e. "If planted in 'njattuvella' (break monsoon), even dry sticks will grow". The break monsoon gives rain and strong sunshine alternately several times a day, and this is a good time to plant small plants and trees.
- f. "Water should be inside 'thundams' (heaps of sand) in the 'thulavarsham' (winter monsoon)". The winter monsoon is the end of the rainy season and the detention of water enhances groundwater recharge.
- g. "Rain in 'makaram' destroys 'malayalam' (Kerala)". 'Makaram' is a month in the local calendar that falls during January-February. This is a harvest month and if there is rain, whole crops will perish.

The old farmers could even predict droughts and floods by the observation of the pre-monsoon weather. To them the position of celestial bodies, clouds, winds and the role of water in the development of civilization in India—A review 165 behaviour of birds and animals were indicators of the nature of forthcoming rainfall and the availability of resources.

## 6. THE INFLUENCE OF THE GREAT RIVERS ON CULTURAL DEVELOPMENTS:

The influence of the great rivers is reflected in all facets of development in the civilization and the famous ancient kingdoms. Almost all major cities in India were on the banks of rivers. The most important is the River Ganga, the heavenly river that is believed to be brought down to the Earth by King Bhagirath, to wash away the sins of his forefather. Many of the holiest of Indian cities grew along her banks. There are numerous festivals and fairs held in and around rivers, the most important being the "Kumbh Mela".

Since time immemorial, the Kumbh Mela, has been the greatest of the Indian fairs and with the highest state of water symbolism, attracting the world's largest congregation of religious pilgrims. Symbolically speaking, the forces of creation are collected in one vessel (Kumbh) and a celebration (mela) ensues, which is why this event is called "Kumbh Mela". Millions of worshippers take a dip in the holy rivers to wash away their sins. The month long festival represents a time when the river is believed to turn into purifying nectar, allowing the devotees to cleanse their souls as they bathe. It is a very important occasion that takes place every 3 years at the following four locations in India:

- a. Allahabad (Prayag), at the confluence of the rivers Ganga, Yamuna and the mythical river, Saraswati;
- b. Haridwar, where the River Ganga enters the plains from the Himalayas;
- c. Ujjain, on the banks of the Shipra;
- d. Nasik, on the banks of the Godavari.

The "Ardh (half) KumbhMela" is held in every 6 years at Allahabad and Haridwar and the "Purna (complete) KumbhMela", the biggest and the most auspicious fair, every 12 years. The "Purna KumbhMela" is always held at Allahabad, which is exceptionally sacred because of the confluence of holy rivers. The "MahaKumbhMela" (Grand Pitcher Festival) occurs every 144 years. In addition, the "MaghMela" or the Annual Mini Kumbh (in the month of Magh in the national calendar that falls during January-February) is held every year at Allahabad, except the years of "Purna KumbhMela" and "ArdhKumbhMela". It is a popular belief that a dip in the sacred waters on this auspicious day ensures salvation or freedom from the cycle of birth and death.

Two other important festivals connected to the Ganges (Ganga) are the "GangaDashara" and the "Ganga Dhara". Celebration of these festivals varies from city to city. In the Hindu festivals like this, there is a common theme of giving thanks to God for food, water and shelter. The legend behind this says that Lord Shiva provided water in times of extreme drought. Many legends related to the rivers are based on religious, cultural, as well as social events in history.

In short, since Vedic times, water has been enjoying the most respectable and unique status in India. Development to a modern society through the centuries was always linked to the holy rivers. The rituals and ceremonies associated with the sacred rivers still continue, sometimes more actively than in the past.

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