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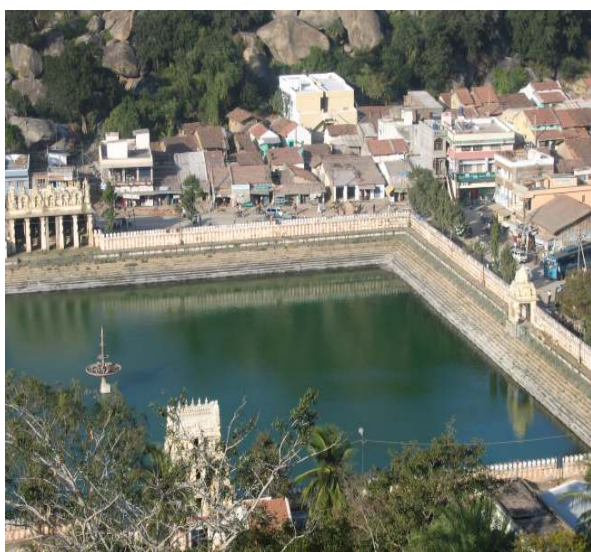
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IRRIGATION SYSTEM IN ANCIENT KARNATAKA



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ABSTRACT

Agriculture came to be practiced when man gave up his nomadic habits and settled in favourable climate and topography. Initially depending on wild roots, fruits and seeds for his sustenance, man eventually adopted the practice of tilling the land to grow. The people of the Indus civilization, also very much known the agriculture. A country's prosperity depends upon the economic condition. The Indian economy is agri based and land and water are the two most important natural resources in the development of agriculture.

KEYWORDS: Agriculture, Irrigation, Farmers

INTRODUCTION:

Historically the abundance of natural resources is indicator of the progress of the nation. Agriculture is the backbone and main occupation for the people of the countries. India's agriculture is seasonal and depends on monsoons, climatic conditions, quality of land, irrigation facilities, quality of seeds, financial inputs, pesticides, fertilizers etc. Even the historical scriptures say that 'land is mother and farmers are children of land.' Agriculture provides food and fodder to both men and animals respectively. Humans depend on water in many ways, well beyond the few liters needed daily for drinking. Water is also essential for the production of food.

MEANING OF IRRIGATION:

Irrigation is the artificial application of water to the soil usually for assisting in growing crops. In crop production it is mainly used to replace missing rainfall in periods of drought, but also to protect plants against frost. Irrigation has two primary objectives 1) to supply essential moisture for plant growth, which includes transport of essential nutrients 2) to leach or dilute salts in soil. Besides this irrigation provides number of side benefits, such as cooling the soil and atmosphere to create more favourable environment for crop growth. Irrigation supplements the supply of water received from precipitation and other types of atmospheric water, flood waters and ground water.

ANCIENT IRRIGATION SYSTEM:

The earliest mentions of irrigation are found in *Rigveda*. The Veda mentions only well-style

irrigation, where *kupa* and *avata* wells once dug are stated to be always full of water, from which *varatra* (rope strap) and *cakra* (wheel) pull *kosa* (pails) of water. This water was, state the Vedas, led into *surmi susira* (broad channels) and from there into *khanitrima* (diverting channels) into fields.

The Indus Valley Civilization in Pakistan and North India (from 2600 BC) also had an early canal irrigation system. Large scale agriculture was practiced and an extensive network of canals was used for the purpose of irrigation. Sophisticated irrigation and storage systems were developed, including the reservoirs built at Girnar in 3000 BC.

Later, the 4th-century BC Indian scholar P. ʔini, mentions tapping several rivers for irrigation. The mentioned rivers include *Sindhu*, *Suvastu*, *Varnu*, *Sarayu*, *Vipas* and *Chandrabhaga*. Buddhist texts from the 3rd century BC also mention irrigation of crops. Texts from the *Maurya Empire* (3rd century BC) mention that the state raised revenue from charging farmers for irrigation services from rivers.

Patanjali, in *Yogasutra* of about the 4th century A.D. explains a technique of yoga by comparing it to "the way a farmer diverts a stream from an irrigation canal for irrigation". In Tamil Nadu, the Grand Anicut (canal) across the Kaveri river was implemented in the 3rd century A.D. and the basic design is still used today.

Ancient Indian writers and ancient Indian scriptures have made references to wells, canals, tanks and dams. These irrigation technologies were in the form of small and minor works, which could be operated by small households to irrigate small patches of land. In the south, perennial irrigation may have begun with construction of the Grand Anicut by the Cholas as early as second century to provide irrigation from the Kaveri River. The entire landscape in the central and southern India is studded with numerous irrigation tanks, which have been traced back to many centuries before the beginning of the Christian era. In northern India also there are a number of small canals in the upper valleys of rivers which are very old.

IRRIGATION SYSTEM IN KARNATAKA:

Ancient Karnataka people were well developed in agriculture sector. The inscriptions reveal that the size of land holding was not uniform. The wet and garden lands were found in smaller unit than dry land. The distribution of land was also scattered among individuals and institutions. The formation of *agraharas* and common ownership of land based on different quality of land. The agricultural land was bifurcated as wet land, dry land, garden land, unclassifiable forest land, grass lands, and waste lands, etc. the farmers use to produce various crops based on type of land and method of irrigation. Farmers, most of the time depended on rain water. But rain was not even throughout the state. Therefore irrigation was invented.

The various types of Systems of Irrigation practiced in ancient Karnataka

The evidence from inscription explained the various types of systems of irrigation practiced in different parts of Karnataka. Irrigation was carried on through wells, tanks, canals, perennial canal, Multi-purpose river valley projects, etc. The different names of tank or pond irrigation was named in inscriptions are *kere*, *samudra*, *eri*, *katte*, *kola*, *kuttai*, *kumje*, *sarovara*, *tirtha*, *tataka*, *done* etc. Based on the purpose of use of irrigation, they were named as *agasarakatte*, *devakola* or *kopanatirtha*. These names called in various dynasties, ruler, wives of important dignitaries, queens, rich individuals donated to construct such tanks. The inscription also suggests that the pounds and wells were constructed not only for irrigation purpose but also for the public purpose. The village leaders manage the sharing of water among the different villages. Income generated through marriage, penalties, gifts and income from other ritual functions was used to construct the pounds and well.

Inscriptions mention that, 320 BC, *Mouryan* tank construction has led a high level of excellence.

The *Chalukyas* of Kalyana reign is considered the golden age of tanks and canals constructed by them are worth for follow till today. It was in this period that the technique of planning a cascading series of tanks for flood control as well as irrigation was refined. Several cases of water supply such as the tanks at Bagali and the Kalyana city water supply are described. The contemporaries of the *Chalukyas*, the Cholas, are also mentioned in the writings. The *Hoysalas* are described as the greatest builders of tanks in Karnataka. The history of these tanks, the capital region, its neighborhood, the management system, and the people are all mentioned in different sources.

Sources of Irrigation

1. Well Water Irrigation:

The scriptures mentions about well irrigation in northern part of India, but we can also this type of irrigation even in Karnataka and Tamil Nadu. There are various types of wells – shallow wells, deep wells, tube wells, artesian wells, etc. From the shallow wells water is not always available as the level of water goes down during the dry months.

2. Tank Water Irrigation system:

In the Deccan, water-reservoirs are made by constructing dams. This system is greatly adopted in the States of Tamil Nadu, Andhra Pradesh, Karnataka, etc. In Northern India also, tanks are constructed for storing water. From all these tanks, water is carried to the fields through canals.

In many places, rain-water harvesting systems are installed and water is stored in large artificial reservoirs to be used for agricultural purposes.

3. Canal Irrigation system:

Canal irrigation is playing a vital role in Indian agriculture. Its share is near about 42% of total irrigated land. In many places during the rainy season, there is flood in the rivers. The flood water is carried to the field through canals. These canals are found in plain areas.

4. Perennial Canals Irrigation System:

The perennial canals get the supply of water either from the river directly or through the reservoirs of the river projects. In order to supply water throughout the year, reservoirs are constructed for storing water. From these reservoirs, water was being supplied to the fields whenever there is demand for it. So this system of irrigation ensures supply of water in all seasons.

TRADITIONAL RAIN WATER HARVESTING METHOD:

It can be traced back to the earliest period. Traditional rainwater harvesting, which is still prevalent in rural areas, was done in surface storage bodies like lakes, ponds, irrigation tanks, temple tanks etc. In urban areas, due to shrinking of open spaces, rainwater will have to necessarily be harvested as ground water, hence harvesting in such places will depend very much on the nature of the soil viz., clayey, sandy etc. The below listed are the various kinds of traditional rainwater harvesting methods. The Modern methods of rainwater harvesting are categorised under two, they are Artificial Recharging and Rain Water Harvesting. The former is classified into Absorption Pit Method, Absorption Well Method, Well cum Bore Method and Recharge trench cum injection well. The later is categorized into Individual Houses and Grouped Houses which are further classified into Percolation Pit Method, Bore Well with Settlement Tank, Open Well Method with filter bed Sump and percolation Pit with Bore

Method.

CONCLUSIONS:

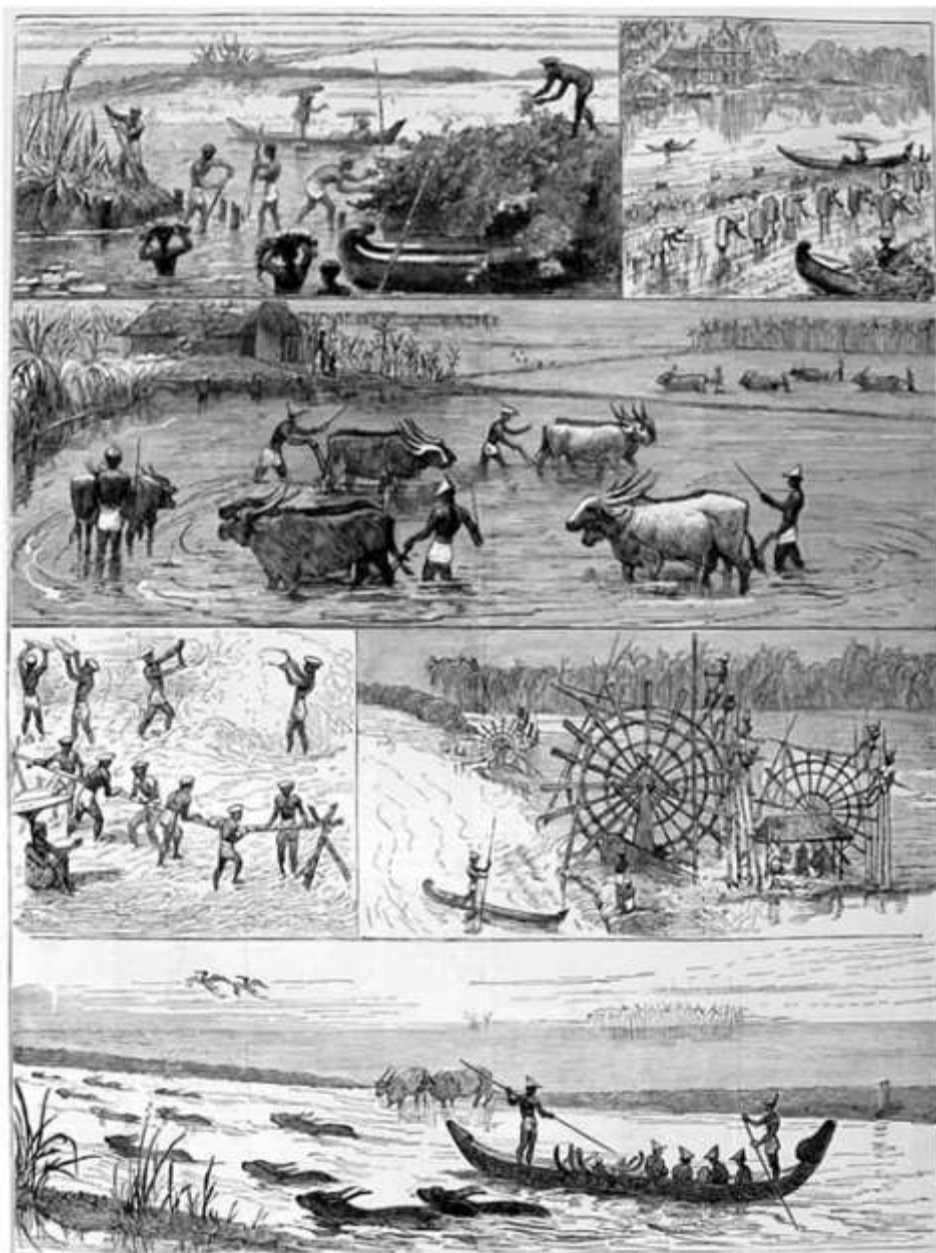
Practices of irrigation and rainwater harvesting adopted in ancient period were more relevant in Indian agriculture today. Water is elixir or life and kingpin of successful agriculture. The writings of the history indicate that today's irrigation is not new to the ancient period. People were well versed with all types of irrigation system. The kings, rich peoples and village leaders constructed wells, tanks, pounds etc. in mark of their wives, or favourable ones. These were allowed to use for personal and also for public purpose. Priority was given for water conservation for efficient use for agriculture and for domestic needs too. Sustainability of irrigation system was very much stressed where the tanks, wells or canals must ensure continuous supply of water. Due to this people in ancient period use to get good crops and they were happy in deed. The modern irrigation method should adopt our ancient and historical method of cultivation then only we can achieve progress in our economy.

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Annexure I: History of irrigation development in India

Sl. No.	Period	Irrigation Development
1.	Ancient Period 2500 - 1000 BC	People settled near the banks of river / tanks for the purpose of getting water for drinking and irrigation.
2.	Chalcolithic 3000 - 1700 BC.	Practice of irrigation to crops was evolved
3.	Vedic period 1500 - 1600 BC	People employed craftsman to dig channels from rivers to their fields. Well irrigation through kuccha and puccha wells and were practiced
4.	Pandyas / Chola chera's Period (1st Century 300 AD)	Irrigated rice cultivation started during this period. Dams and Tanks were constructed for irrigation.
5.	Medieval period (1200 - 1700 AD)	Irrigated agriculture was developed during Mogul period. Canals, Dams and Tanks were constructed (e.g.) 1. Construction of western Yamuna canal 2. Constructions of Anantnagar sagar



Method of Irrigation in Ancient Karnataka

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