



THE HISTORY AND EVOLUTION OF IRRIGATION SYSTEM IN INDIA, (WITH SPECIAL REFERENCE TO KARNATAKA)

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ABSTRACT

Irrigation was the livelihood from the earlier times in Karnataka and Indian states, because of the availability of fertile soil and resourceful rivers like Cauvery, Tungabhadra etc, and the earliest mentions of irrigation are found in "Rig-Veda" chapters 1.55, 1.85, 1.105, 7.9, 8.69 and 10.101. 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. Later, the 4th-century BCE Indian scholar Pāṇini, mentions tapping several rivers for irrigation. The mentioned rivers include Sindhu, Suvastu, Sarayu, Vipasa and Chandrabhaga. Buddhist texts from the 3rd century BCE also mention irrigation of crops. Texts from the Maurya Empire era (3rd century BCE) mention that the state raised revenue from charging farmers for irrigation services from rivers. Patanjali, in Yogasutra of about the 4th century CE, 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 and Karnataka, the Grand Anicut (canal) across the Kaveri river was implemented in the 3rd century CE, and the basic design is still used today.

But the modern evidences explain the changes in the irrigation patterns in Karnataka and the southern Indian states during the Vijayanagara Empire and some development during British period. This research paper is an attempt for putting together the ancient wisdom in establishing irrigation systems, particularly in Karnataka the Vijayanagara period from 1335 A.D. - 1565 A.D and contributions during British era in Karnataka, India.

KEY WORDS: Irrigation system in Karnataka, Vijayanagara kingdom irrigation patterns/system, Irrigation in Karnataka during British period

DEFINITIONS / LITERATURE REVIEW

➤ Merriam-Webster

According to Merriam Webster "ir·ri·ga·shen" is the watering of land by artificial means to foster plant growth and the therapeutic flushing of a body part with a stream of liquid

INTRODUCTION

Irrigation is defined as the process of artificial application of water to the soil in order to reach these following objectives: ensure enough moisture for agricultural crop growth, provide crop insurance against short duration drought, reduce hazards of soil piping, soften the tillage pan (a dense compact layer), cool the soil and atmosphere to provide a good atmosphere for plant growth, and wash out or dilute harmful salts in the soil (Mazumder, 1983; Basak, 1999; and Misra, 1981).

IRRIGATION EVOLUTION IN KARNATAKA

In Karnataka, the Vijayanagara period from - "1335 A.D. - 1565 A.D". i.e. for a term of 230 years and more the amount of efforts of the people involved during those times, the forethought of the kings and the people was the reason in having an flexible and well planned irrigation and agriculture economy, The stable food production with good yield and

irrigation facility and overall prosperity of the people of Vijayanagara times. The Vijayanagara Empire was spread from the areas like present - Bellary district and Raichur district, and most parts of South India with the capital at Hampi near present day Hosapet in the Bellary district. It had many irrigation systems constructed utilizing the waters of "Tungabhadra river" by way of a number of anicuts across the river, thereby channelizing the flows from the impounded small reservoirs to the banks of the river to irrigate the fields. Innumerable tanks and ponds were constructed in the region, lift works on a small scale on the banks of river and wells tapping the groundwater were constructed for irrigation purposes. The best practices in management and maintenance of the water resources so that the irrigation systems were kept in good condition to continue to serve the farmers for generations to come are commendable.

- The various type of irrigation systems built during the Vijayanagara Empire are mainly classified as **River anicuts, Tanks, Wells & Lifts**

a. Anicuts irrigation system



A dam made in a stream for maintaining and regulating irrigation. Anicuts are used to maintain required water level in the upstream by releasing only the excess water to

downstream. In the lifting gate, water is allowed to flow from the bottom and this causes high erosion in the canal.

b. Tank Irrigation System



Southern India as well as the arid areas of Central, Western India have seasonal rivers which limit the scope for canal irrigation while the scope for wells is limited due to the presence of hard granite and gneisses. As a result of these, tank irrigation is prominent in these areas. This tank irrigation

evolution evidences is primarily concerned with small reservoirs. Karnataka, Andhra Pradesh and Tamil Nadu have thousands of old tanks in various stages of maintenance. However, the decay of the management and reward mechanisms in place earlier has led to a corresponding decay

in these tanks. While the old social systems that maintained these tanks are no longer in existence, they have not been replaced by satisfactory institutional arrangements. This book

aims to learn from the history of tanks and examine their relevance to the present.

c. Well Irrigation system



d. Lift Irrigation



Lift irrigation schemes must accomplish two main tasks: first, to carry water by means of pumps or other way, from the water source to the main delivery chamber, which is situated at the top most point in the command area. Second, they must distribute this water to the field of the beneficiary farmers by means of a suitable and proper distribution. So that in Lift Irrigation system, the gravity flow of water by canals or river is not available or used.

IRRIGATION DEVELOPMENT IN KARNATAKA DURING BRITISH PERIOD

The Karnataka Irrigation Act (1965) seeks to consolidate the provisions of the Mysore irrigation (levy of betterment contribution and water rate) act, which was passed by the Legislature in the year 1957 and other allied Acts in force in the different areas in so far as they related to the levy of betterment contribution and water rate. There were different enactments in force in 1965 in the different areas of the State in regard to the construction, maintenance and regulation of



irrigation works and other matters pertaining to irrigation. Some important points in the act are -

- It provides among other things for the regulation of water from irrigation works, and gives certain powers to irrigation officers in regard to the survey, investigation, execution and maintenance of irrigation works.
- It provides as before for the performance of customary obligations in regard to maintenance of irrigation works by the beneficiaries.
- There is provision for taking over certain notified irrigation works all over the State for maintenance by Government if it is found necessary to do so in the interest of their proper preservation and of the economic utilization of and regulation of water from such works.
- This is subject to the payment by the beneficiaries of a cess, the proceeds of which will be put into a fund. A contribution up to 50 per cent of such proceeds is to be made by Government to the fund out of the general revenues. This fund is to be utilised not merely for

maintenance but also for providing facilities for proper use of water from the irrigation work and for constructing and maintaining ayacut roads, culverts, etc.,

- It is proposed to take over all but very small irrigation works for maintenance over a period of years, so that at the end of that period, the State will have complete control and responsibility for maintenance of all such works, while the responsibility for the others will continue to vest in the beneficiaries or other appropriate agencies.
- There is also provision to enable Government to construct field channels in the event of failure on the part of the ryots to construct them, subject to recovery of the cost of such construction from the holders of lands benefited from such field channels.
- The Bill also provides for certain safeguards for irrigation works and for certain safeguards for irrigation works and for penalties for the contravention of the mandatory provisions of the Bill

Colonial era



Data / Statistics

- *Irrigation system methods during Vijayanagara period*



It was entirely by chance that we stumbled upon the kere (Lake). We were in Chikkabenakal, a small village to the northwest of Hampi, in 2008, looking for the megalithic site that was said to exist nearby. Chikkabenakal is accessed from the highway connecting...

The main categories of irrigation work popular during the reign of the Vijayanagara kings were either river-fed or rain-fed. The former employed small dams called anicuts to channelize river water to canals which enabled large tracts of land away from the places.

OBJECTIVES

- To understand the importance of irrigation for the development of the economy from the past time in Karnataka.
- For greater knowledge and important contributions of the past kingdoms in development of rivers, canals, irrigational projects, etc.
- For efficient usage of water and natural resources by following the old and historical records and developments.

Sir M vishveshwaraiya and his role in development of irrigation in Karnataka, building of the KRS (Krishna Raja Sagara) reservoir and dam

The Krishnarajasagara dam is the biggest landmark in Mysuru. Dating back to the 1930s, this 130 feet high dam isn't just a popular tourist attraction; it is also the source of irrigation and drinking water for large parts of Karnataka. The dam is closely linked to two individuals; Krishnaraja Wodeyar IV, the erstwhile king of Mysuru at the time this dam was built and the dam's designer and engineer, Sir Mokshagundam vishveshwaraiya

CONCLUSION

Though irrigation is highly advanced and is on very large scale in the present times with its own pitfalls such as siltation of reservoirs, land becoming water logged and saline, many aspects of hydraulics, construction and management that were adopted in the ancient times of Vijayanagara period are noteworthy and the techniques adopted and lessons learnt by our predecessors in successful construction and management of irrigation systems will continue to inspire the generations to come in better management of rich water resources of the Karnataka State, Vijayanagara empires contributions for irrigation development, contributions of Dr. Sir M Vishveshwaraya's contributions was the milestone in the Indian irrigation history. The contributions of Sir M V made



useful for thousands of agricultural lands for growing seasonal crops.

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