A GENERAL FRAMEWORK FOR ANALYZING THE IRRIGATION SYSTEM OF WESTERN DISTRICTS IN TAMILNADU

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Tamil Nadu has historically been an agricultural state. Agriculture is heavily dependent on the irrigation. Irrigation plays a vital role in increasing food production of every country. In olden days Traditional Irrigation Methods are used like (i) Check Basin Method (ii) Furrow Irrigation Method (iii) Strip Irrigation Method (iv) Basin irrigation method. After independence used Modern Irrigation Methods like Sprinkler Irrigation Method , Drip Irrigation Method , Pot Irrigation Method etc.

***Key words*:** Irrigation, Check Basin, Furrow, Strip, Basin, Sprinkler, Drip, Pot Irrigation

I. INTRODUCTION

"Plant your tiny seeds and keep watering them every day. Soon, they'll grow."

Irrigation helps grow agricultural crops, maintain landscapes and revegetate disturbed soils in dry areas and during periods of inadequate rainfall. Irrigation also has other uses in crop production including frost protection, suppressing weed growth in grain fields and preventing soil consolidation. Irrigation is the application of controlled amounts of water to plants at needed intervals. Irrigation plays a vital role in increasing food production of every country. About three-quarters of the irrigated lands are presently in the developing countries. In these countries, almost 60 percent of the production of major cereals, primarily rice and wheat is derived from irrigation[1]. Since higher yields are obtained with irrigated agriculture and because it is less dependent on the vagaries of weather, it assumes special importance in this regard.

II. OBJECTIVES OF THE STUDY

Primary objectives of the study are,

1. To study the traditional method of irrigations used in western districts of Tamilnadu.
2. To assess the contribution of British in irrigation and water management in Tamilnadu.
3. To evaluate modern irrigation systems in the current scenario of water scarcity.

III. WESTERN DISTRICTS OF TAMILNADU

Western districts also called Kongu Nadu comprises the modern day districts of Coimbatore district, Nilgiris district, Tirupur district, Erode district, Namakkal district, Salem district and Karur districts in the South Indian state of Tamil Nadu. The Western Ghats mountain range passes through the region with major rives Kaveri, Bhavani, Amravati and Noyyal flowing through the region. Palghat Gap, a mountain pass connects the neighbouring state of Kerala to the region.

Tamil Nadu has historically been an agricultural state, while its advances in other fields launched the state into competition with other areas. Agriculture is heavily dependent on the river water and monsoon rains. The perennial rivers are Palar, Cheyyar, Ponnaiyar, Kaveri, Meyar, Bhavani, Amaravathi, Vaigai, Chittar and Tamaraparani. Non-perennial rivers include the Vellar, Noyyal, Suruli, Siruvani, Gundar, Vaipar, Valparai and Varshali. Tamil Nadu is also the leading producer of kambu, corn, rye, groundnut, oil seeds and sugarcane in India. At present, Tamil Nadu is India's second biggest producer of rice. Tamil Nadu is the home to Dr. M. S. Swaminathan, known as the "father of the Green Revolution" in India. The state is one of the major producers of turmeric in India.

IV. TRADITIONAL IRRIGATION METHODS IN TAMILNADU

The earliest mentions of irrigation are found in Rigveda[2]. The Veda mentions only well-style irrigation, where wells once dug are stated to be always full of water, from which rope strap and wheel pull of water. This water was, state the Vedas, led into broad channels and from there it was diverted to sub channels in order to reach agricultural fields. Later, the 4th century Indian

scholar panini mentions tapping several rivers for irrigation[3]. The mentioned rivers include Sindhu, Suvastu, Varnu, Sarayu, Vipas 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.[4] In Tamil Nadu, the Grand Anicut (canal) across the Kaveri river was implemented in the 3rd century CE, and the basic design is still used today. **Kodiveri Anicut**built by Chera Kings Kongalvan(Vettuva gounder) in the year 1125 AD on the Bhavani Tributary of Cauvery[5]. **Kalingarayan anicut** was constructed by kongu chieftain Kalingarayan(konguvellalar community) and completed in 1283. It is one of the ancient River linking projects, which established the link between Bhavani river and Noyyal river[6]

The kongu colas constructed 16 dams on the Noyal river and tanks to store water. The inscriptions mentioned Sangalikarupan anai ,Kumarasami eri,Sitirachavadi vaikkal, Puluvapatti dam ,Acchankulam near sulur and others in Coimbatore district[7]. In certain villages of Namakkal taluk which have advantage of Cauvery channel irrigation. The Bhavani tributary of Cauvery irrigated at present taluks of Erode, Gobichettipalayam and sathiyamangalam taluk. The river Amaravathy and Noyyal were also irrigated sources for nanjai cultivation in Coimbatore district[8]

Eris or Lakes are Tamil Nadu's traditional water harvesting systems. Approximately one-third of the irrigated area of Tamil Nadu is watered by Lakes. Lakes play many roles in maintaining the ecological balance – they act as flood-control systems, preventing soil erosion and wastage of runoff during heavy rainfall. They also recharge the groundwater in the surrounding areas. The presence of lakes provided an appropriate micro-climate for the local areas. Without Lakes, cultivation of crops would have been impossible in ancient times.

According to Sekhar Ragavan, "Eris are designed such that they are all interconnected, and if the water in one overflows, it automatically gets diverted to the next village. There are 39,000 such *lakes* in Tamilnadu, and are a wonderful example of a natural, non-invasive method of using and sharing water. The only thing is that they must be de-silted regularly. Else, there will not be enough space to accommodate the water, and floods may result. The silt is actually excellent for the fertility of the soil in those areas. It was being beautifully managed until the British took over, and centralized the whole system, taking the control out of the hands of the local population. This has continued post-independence in the form of the State Public Works Department. De-centralization and local self-governance remains only in letter" [9].

In the olden days, irrigation is done manually. There, a farmer pulls out water from wells or canals by himself or using cattle and carries to farming fields. This method can vary in different regions. The main advantage of this method is that it is cheap but efficiency is poor because the even distribution of water is not always possible. Also, chances of water loss while carrying is high. Some examples of traditional system are pulley system, lever system, chain pump and dhekli. Among these, the pump system is most common and used widely. In Coimbatore and Salem districts dependent well irrigation for grow paddy and other crops.

Traditional Irrigation Methods: (i) Check Basin Method (ii) Furrow Irrigation Method (iii) Strip Irrigation Method (iv) Basin irrigation method.

V. BRITISH REFORMS TOWARDS IRRIGATION AND WATER MANAGEMENT

In 1800, nearly 800,000 hectares was irrigated in India. In the colonial Era, British Government built significant number of canals and irrigation systems in Tamilnadu, Uttar Pradesh, Bihar, Punjab, Assam and Orissa. The Ganges Canal reached 350 miles from Haridwar to Kanpur in Uttar Pradesh. In Assam, a jungle in 1840, by 1900 had 4,000,000 acres under cultivation, especially in tea plantations. In all, the amount of irrigated land multiplied by a factor of eight. Historian David Gilmour states British colonial government had built irrigation network with Ganges canal and that, "by the end of the century the new network of canals in the Punjab" were in place. In 1877 -1892 Barur tank system was improved at salem district [10]. In Tamilnadu British Government built one of the largest dams in India located across the river Cauvery which is built in 1934. The United Kingdom provided funds for the dam and evacuated the people of Nayambadi village where the dam was eventually sited. Apart from this british government attempted many reforms in regenerating old lakes and dams including Bhavanisagar, Varattupallam, etc.

VI. MODERN IRRIGATION METHODS USED IN TAMILNADU

The modern method compensates disadvantages of traditional methods and thus helps in the proper way of water usage. In Tamilnadu, the modern method involves two systems: Sprinkler system and Drip system. A sprinkler system as its name suggests sprinkles water over the crop and helps in an even distribution of water. This method is much advisable in areas facing water scarcity. Here a pump is connected to pipes which generate a pressure and water is sprinkled through nozzles of pipes.

In Drip system, water supply is done drop by drop exactly at roots using a hose or pipe. This method can also be used in regions where water availability is less.

Irrigation should be optimum because even over-irrigation can spoil the crop production. Excess water leads to water logging, hinder germination, increased salt concentration and uprooting because roots can't withstand standing water. Thus the proper method is to be used for best cultivation.

Modern Irrigation Methods: (v) Sprinkler Irrigation Method (vi) Drip Irrigation Method (vii) Pot Irrigation Method.

VII. CONCLUSION

Irrigation plays a vital task in increasing food production of every country. About three-quarters of the irrigated lands are presently in the developing countries. In these countries, almost 60 percent of the production of major cereals, primarily rice and wheat, is derived from irrigation. Since higher yields are obtained with irrigated agriculture and because it is less dependent on the vagaries of weather, it assumes special importance in this regard. Expansion of irrigated agriculture could contribute

significantly towards achieving and stabilizing food and fiber needs. However, new water supplies for such expansion are limited. Irrigated agriculture is already the largest consumer of developed water resources. At the same time, drainage return from irrigated lands is one of the major causes of water logging and of waters pollution due to salts, nitrates, agricultural chemicals and certain natural, potentially toxic trace elements. The farmers are advised to follow similar methods for cultivation. So that they can produce more yield. i.e. the farmers should follow same irrigation method and crop cultivation method. The farmers should consult the agricultural officers and to utilize the schemes and subsidies provided by the government for the welfare of the agricultural society.

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