

MODERN IRRIGATION SYSTEM IN CAUVERY DELTA REGION

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Abstract

Agriculture is the occupation carried by majority of people; there were some systems of irrigation in India before the advent of British rule. The irrigation system was maintained by the central political authority in ancient times. This tradition continued to some extent in the medieval period. Initially the company did not take any responsibility for irrigation during the eighteenth century, British started on irrigation work in Cauvery Delta districts. Historically, the area has been benefited by the availability of natural flow irrigation from a number of rivers which pass through the region the largest of these, the Cauvery, has a length of 500 miles from its source in neighboring state Karnataka to its outlet in eastern Thanjavur. Irrigation was mostly by tanks, small and large, the whole of them were British. Canals, tanks and wells constitute the main sources of irrigation in the state. Modern methods of applying irrigation water there are three principal methods of irrigation viz. surface, subsurface and aerial. Surface irrigation there are four variations under this method such as Flooding, Bed or border method, Basin method and Furrow method.

Introduction

Cauvery Delta bounded on the east by Nagapattinam west by Tiruchirapalli South by Thiruvarur north by Kollidam, present population is around 52, 86,617. Agriculture is the occupation carried by majority of people; there were some systems of irrigation in India before the advent of British rule. The irrigation system was maintained by the central political authority in ancient times. This tradition continued to some extent in the medieval period. Initially the company did not take any responsibility for irrigation during the eighteenth century, British started on irrigation work in Cauvery Delta districts. Nagapattinam, Thanjavur, Thiruvarur and Tiruchirapalli Nourished by the river Cauvery it is endowed with one of the most fertile tracts in the Delta. Historically, the area has been benefited by the availability of natural flow irrigation from a number of rivers which pass through the region the largest of these, the Cauvery, has a length of 500 miles from its source in neighboring state Karnataka to its outlet in eastern Thanjavur. Altogether the Cauvery and its tributaries irrigate about 1, 70,000 acres in Tamil Nadu more than two thirds of the Delta area is concentrated in Thanjavur. Irrigation was mostly by tanks, small and large, the whole of them were British. The Cauvery, upper and lower Anicut the Kollidam were major irrigation. This Project begun in 1836, they provided irrigation for nearly a million acres. There seem to have been efforts dating from very early times to control the flow of water from the Cauvery for more efficient irrigation, but by the form of the nineteenth century. Little remained of the ancient canal work the first attempt in modern times to rebuild the irrigation system came with the construction of the Cauvery and Vennar regulators in 1886. The area commanded by the Cauvery and Vennar regulators. Accounting for about 900,000 acres, become known as the old Delta after new construction in the 1920's and 1930 extended the area under canal irrigation. Between 1925 and 1934 there were two major improvements the Mettur dam at same time a new canal called the grand anicut canal was built to provide irrigation facilities for an additional 300,000 acres in Thanjavur known as the Cauvery mettur project the

area under the grand ancient canal is the “New Delta” irrigation net area in Cauvery Delta district. The state of groundwater resources development Nagapattinam, Thiruvarur and Thanjavur district is 128%, 83% and 72% respectively. Over-exploitation of ground water Reserves. Present irrigation methods in Cauvery delta region is tank irrigation, well irrigation, canal irrigation, drainage, surface, sub-surface irrigation and sprinkler methods. Thanjavur is known as “rice bowl” of Tamil Nadu similarly agriculture and irrigation one of the districts is Cauvery delta in Tamil Nadu state.

Old irrigation works and their condition of Cauvery Delta

Irrigation in the Cauvery Delta dates from time immemorial. Many old works still extant show that irrigation under some of the old Indian Rulers received considerable attention, the system was, however, more an inundation system than a controlled irrigation system and must have on this score been defective from the very first. For a century before the advent of British Rule these works had been badly neglected changes and in 1801, when the East India Company took over the Thanjavur district, irrigation in the delta was rapidly deteriorating, the channels were silting up and fields were left uncultivated for want of proper water-supply.

Modes of Irrigation in Cauvery Deltas

Water is indispensable to agriculture production. In areas where rainfall is plenty and well-distributed over the years, there is no problem of water. But rainfall is very scanty in certain areas as well as uncertain. Artificial irrigation is needed it may be of three types,

- Well irrigation
- Tank irrigation
- Canal irrigation

Surface wells were the most ancient and the most important method of irrigation till a few decades ago. These wells are mostly constructed by private individuals with their own resources but the state government for their construction. They are not expensive to construct by they can be used to irrigate only small areas up to a maximum of 6 hectares tube wells go far deeper than surface well and can draw a much larger volume of water and for a longer area. Irrigation by surface wells and tube wells is far more suitable whenever canal irrigation is not available.

Irrigation in Nagapattinam, Thiruvarur and Thanjavur district dominated by canal water with ground water making up a relatively small amount However, groundwater reserves has been heavily exploited in Nagapattinam district and all district have ground water levels close to mean sea level and sometimes below sea level the major rivers in the Cauvery basin have been fully exploited by means of reservoirs, dams and Anicuts built across them for irrigation purposes, thus reducing the freshwater discharge to the delta region.

Artificial recharge systems are engineered systems where surface water is put on or in the ground for infiltration and subsequent movement to aquifers to augment ground water resources are requires good supplies of fresh water permeable surface soils to infiltrate to the aquifers, there are various proposals for groundwater recharge there are some concerns of the viabilities of most of these plants in the Cauvery delta.

In Tamil Nadu the Central Government Water Board master plan has no plans for artificial recharge in the Delta area districts of Nagapattinam, Thiruvarur and Thanjavur. Upstream of these districts a number of artificial recharge programmers are envisaged through the use of percolation ponds and check dams, the cost and benefits accrued through this artificial recharge approach will need to be weighed against ground water resource savings that could be achieved through other means such as demand related savings.

Many agencies are pumping enormous ground water at various place for drinking water supply schemes in the Cauvery delta area this will affect the quality of ground water.

Tank Irrigation

Tanks and other catchments refer to the storage of flood water flowing in rivers or directly of rain water and have been used for irrigation. The irrigation tanks are of all sizes, managing from large lakes to village ponds, tank irrigation has been the most common in Deccan but most tanks are old and silted. They are mostly constructed and maintained by the government through village tanks may sometimes, be looked after by the villagers. Jointly in recent years, state government has been directing their efforts to defiling of old tanks.

The grand Anicut canal system supplements 694 tanks in addition there are a large number of tanks fed by local catchments, it is estimated to be about one third of all tanks are fed by canals and two thirds by catchments. The overall irrigated area from tank is 33,000 ha.

The rehabilitation and expansion of ponds and tanks would appear to offer good opportunities to improve the water supplies for irrigation. Tank and pond development should be implemented as an integrated approach for flood relief described below.

Irrigation from tanks and ponds could be by gravity or small low head pump systems. Tanks can provide supplementary water during low rain periods in the monsoon which can be erratic in the delta region.

Canal irrigation

Canal irrigation is at present the most important form of irrigation. The delta modernization report proposes living of main canals and possibly branch canals. Canal are constructed and maintained by the government. They are very expensive to construct but they help to irrigate very large areas of land. There are three types of canal, viz., perennial canals, inundation canal, and storage work canals perennial canals are those which take off water directly from a river and provide water for irrigation throughout the year. Inundation canals take off from the river but have water only during rainy season. Storage work canals take on from a dam or storage works which may be constructed across a river or valley. Since 1950-51 considerable importance had been attached to the provision of canal irrigation and well irrigation. Irrigation works are classified into major and minor irrigation work

Vedaranniyam Canal

The canal in Thanjavur district, was constructed in 1869. Inclusive of its subsequent extension to the salt swamp south of Vedaranniyam its total length from Nagapattinam to its southern end is 35 ½ miles made up of 13 ½ miles of the already existing channels of the Adappar, Vellar and Kaduvaiyar rivers, 10 ½ miles of drainage streams intercepted in their passage down to the sea and 12 miles of new cuts connecting these together. It was designed, and is chiefly used, for the transport of slat from the Vedaranniyam factory to the depot at Nagapattinam but, owing to the absence of a good road between these two places, it is also resorted to for general traffic, the cost of the canal amounted to Rs. 1,34,000. It is maintained jointly by the public works department and the district board.

Lift Irrigation

Lift irrigation was developed to supply water to the high level lands in this area could not be commanded by the gravity systems. The lift schemes were originally operated by the communities but were taken over in 1955 due to persistent representation from the public. The scheme was taken over.

Now there are 29 pumping schemes constructed in the Cauvery delta listed all these schemes come into operation between 1951. The principle objective of the pumping schemes is to supply water for irrigation high level command area by pumping the tail end river drainage water which is going waste into the sea. They provide irrigation facilities to an extent of 21757 acres within the delta.

Drainage

In the Cauvery delta it is important to see how flood control measures can be integrated with drainage and irrigation. There are 177 major drains and 519 minor drains in the delta the drainage requirement includes

- a highly intensive removal of aquatic weeds and proper weed management including spraying and removing roots of weed
- Reshaping the drains with required standards.
- Straightening the meandering courses
- Opening more outlets to the sea by straight cutting the drains.
- Opening of additional drains
- Outlet structure and escapes and improvement of the cross regulator structures to avoid impeding the drainage.

Vedaranyam is an old navigation channel. The Cauvery Delta Modernization Project Report also proposes the transfer of flood waters of north east monsoon rains from the basin. Five major drains that join Vennar river from Trichy and Pudukottai district carry heavy flows causing flooding every year. In the year 2005, a maximum discharge of 850 cumecs was carried through these drains that caused extensive damages in the delta. This proposed to divert such water during high floods to the rain parched part of Pudukottai districts. This water can be also used for ground water recharge in that area. The viabilities of these proposals would be confirmed by modeling of the drainage capacities with present and future sea levels.

Modern Methods of Applying Irrigation Water in Cauvery Delta Region

Modern methods of applying irrigation water there are three principal methods of irrigation viz. surface, subsurface and aerial. Surface irrigation there are four variations under this method

- Flooding
- Bed or border method
- Basin method and
- Furrow method

Flooding

Flooding consist of opening a water channel in a plot of land or field so that water may flow freely in all directions and cover the surface of the land with a continuous sheet. Under this method only 20 percent of the water is actually used by the plants. It is, therefore the most inefficient method of irrigation.

Bed Method

Under this method, the field is leveled and thrown up into small beds surrounded by bunds, small irrigation channels are provided between two adjacent rows of beds, though the initial cost is high, it requires less labour and has low maintenance cost. This method is adaptable to most soil textures.

Basin Method

Basin irrigation is suitable for orchards and other high value crops when the size of the plot to be irrigated is very small. It requires level land and is suitable for all types of soils. It is also efficient in the use of water.

Furrow Method

In furrow irrigation, water is led through the furrow opened between crop rows. There is great economy in the use of water which is a greater consideration in life irrigation.

Sub-surface Irrigation

Sub-surface irrigation may be natural or artificial. Natural sub-surface irrigation is possible where an impervious layer exists below the root zone. Water is led into a series of ditches dug upto the impervious layers, which then moves latterlly and wets the root zone. In artificial sub-surface irrigation perforated or porous pipe are laid underground below the root zone, and water is led into the pipes by suitable means. It is very efficient in the use of water for evaporation is eliminated completely. It involves a high initial cost but its maintenance is very cheap. As it requires special soil conditions for successful operation its use is very limited.

Aerial or Sprinkler Irrigation

Cauvery delta ensures a uniform distribution of water, adaptable to most kind of soils and offers no hindrance to the use of farm implements. In sprinkler irrigation, water is conveyed under pressure through pipes to the area to be irrigated, where it is passed out through sprinklers the system. Comprises of four parts:

- Power generator
- Pump
- Pipeline and
- Sprinkler

The original cost is very high, so is the cost of operation and maintenance.

Sources of Irrigation

Canals, tanks and wells constitute the main sources of irrigation in the state. In 1973-74 out of the gross irrigated area irrigation through tanks accounted for 25.27 percent and through government canals 25.14 percent Infect well have become the major source of irrigation in the state. In 1973-74 out of the grows irrigated area irrigation through tanks accounted for 25.27 percent and through government canals 25.14 percent. In fact wells have become the major source of irrigation in the delta.

The recent development in Tamil Nadu agriculture have made the farmers realize that irrigation water is an important farm input for increasing the productivity of crops and farm income. The profit earned by the farmer is directly governed by the cost of irrigation. The cost irrigation in turn is governed by the irrigation whether surface or ground water and the method of lifting the water i.e. whether by electric power (or) oil engine.

Utilization of Irrigation in Delta Region

An official survey conducted by the union ministry of agriculture for 1979-80 observes that Tamil Nadu under utilization of irrigation potential or lag in utilization in these states was found to vary between 1.5 percent and 3 percent.

Presently total irrigation area was 18,789 central department lacks, canal branches 29, 484, 86 Rivers and 200 Dams in Tamilnadu state. Utilization were all Delta Districts most Important irrigation and using of only River that Cauvery each and every Delta District penifet of irrigation. Developed in the Agriculture Actually Thanjavur is main such as Cauvery That branches of Vettaru, Vennaru, Kollidam and Akkini The people of this Rivers to irrigation. Than main Rivers are Cauvery, Vennaru, Pamini River and Kudamuruti River in Thiruvarur District Rivers. Pamini River and Cauvery River was famous Rivers in Thiruvarur District. They have 83% percent belongs to River water. Similarly Nagapattinam peoples only using for Cauvery and Vennaru. There were most Important of canal irrigation Vedaranyam canal was famous that area. Presently utilization of Nagapattinam Therefore Delta Districts is the back bone of agriculture belongs to Irrigation. Thanjavur, Nagapattinam, Thiruvarur some branches of Rivers view, but currently using for only Cauvery River. More than people applying new methods in irrigation work, this River water.

Conclusion

Though there are widespread modern irrigation system available in this region due to lack of techniques and encroachment of tanks, lakes the modern irrigation system happens to be failure method so agriculture in this region is lacking far behind when comparing to olden days so government with the cooperation of the agriculturists should take proper remedies to improve the irrigation system and improve the agriculture in this region because India is an country mostly dependant on agriculture.

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