

# WATER RESOURCES SYSTEM IN KANYAKUMARI DISTRICT

Dr. C. SHOBA

Asst. Professor in History

Department of History

T.D.M.N.S. College, T.Kallikulam, Tirunelveli District, Tamil Nadu, South India.

**Abstract :** Kanyakumari District, named after the goddess 'Kanyakumaari', lies at the southernmost tip of peninsular India where the Indian Ocean, the Arabian Sea and the Bay of Bengal confluence. This is one of the smallest districts in the state of Tamil Nadu. It is bounded between  $77^{\circ}-05'$  and  $77^{\circ}-36'$  of the eastern longitude and  $8^{\circ}-35'$  of the northern latitude. The soil is mostly loamy and assumes sandy or clayey character depending on the accumulations of wash on the surface. This District has a pleasant climate and has a unique advantage of both the South-West as well as North-west monsoons. The rainfall is generally very high in the northern parts of the district and considerably low in the southern part of the District. A river is a body of water that originates high in the mountains, flows over land a long channel. As it flows it receives more water from rills, brooks, streams and also from rainfall. All these that carry water to a river are called tributaries, and they form the river system. The region drained by a river system is called the drainage basin. The rain water soaks the ground and accumulates as ground water. Some of this groundwater seeps into the river system and keeps water flowing in most rivers even during dry periods. Such a river is known as "perennial" which is normally having a "healthy watershed". In dry regions there is not always a flow of water and they dry up in some seasons which are known as intermittent rivers. A watershed is an area from which run off resulting from precipitation flows past a single point into a large stream, river, lake or ocean. The terms catchments, river basin, drainage basin, headwaters are used in the same sense. Pazhayar, Paraliar, Kothaiyar, Valliyar, Pechiparai, Perunchani, Chittar I, Chittar II, Kodayar Dam and Pandyan Dams are the water resources system in Kanyakumari District.

**Key Words :** *Perennial, Normally, intermittent, Northern parts, loamy, accumulations*

## INTRODUCTION

Kanyakumari, otherwise called as Cape Comorine, is the southern most part of the Indian peninsula. Here, the Indian ocean, the Bay of Bengal, and the Arabian Sea embrace each other. The present Kanyakumari District was a part of the Travancore-Cochin State until it became a part of Tamil Nadu in 1956, when the states were re-organised on linguistic basis.<sup>1</sup> Kanyakumari District has a unique portion in Tamil Nadu for its abundant water resources, thick green forests and the agricultural lands. In this district, the southwest monsoon and north as monsoon are very strong. The average rainfall of this district is about 1450 mm as against the state's average of 980mm.<sup>2</sup> The Kodayar Irrigation system in the district is an age old system which developed over a span of several hundred years to attain its present status as a modern irrigation system with many reservoirs, link canals, main canals and branch channels, spread over the entire area of the district.<sup>3</sup>

## HYDROLOGY

The average rainfall in the District is about 1500 per annum and it is contributed by southwest monsoon during June to September and Northeast monsoon during October to December. The rain fall in the catchment area is about 2000mm and in the tail end area it is 900mm. The surface water flows in river Kodayar, Paraliyar, Chittar I and Chittar II are stored in four reservoirs.<sup>4</sup> Flows in the drainage carriers such as Pazhayar and Valliyar area is only partially utilized through the anicuts constructed across these rivers. Agriculture in the district is dependent mostly on surface water. Groundwater has no major role in the irrigation in the District. Ground water exploitation is hence very minimal. The district enjoys a very moderate climate conditions with the extreme weather conditions.<sup>5</sup>

## HISTORY OF IRRIGATION SYSTEM

Before the construction of reservoirs and anicuts, earth bunds were constructed across the river to store water for irrigation purposes. But during floods, these earth bunds used to get washed away affecting the crops in the region. To avoid this, small anicuts using stones were constructed and channels were excavated to draw water to the lands to be irrigated.<sup>6</sup>

### PANDIAN ANICUT

This anicut across Paraliyar was constructed about one thousand years back. From this anicut, a channel, Pandiyankal was excavated to take the water to Pazhayar at its originating point. The lands in Agasteeswaram and Thoivalai were benefited from this anicut.<sup>7</sup>

### PUTHEN DAM

Over the years, the Pandiyan anicut got silted up and become ineffective. About two hundred years back, during the period of Venad King Marthanda Varma, a new anicut namely Puthen Anicut was constructed across the Paraliyar River about 400m downstream of Pandiyan anicut. This anicut is a diversion weir, from which a canal called Padmanabhapuram Puthanar channel, which feeds the lands in Kalkulam Taluk, was excavated. Puthen Dam is the pivotal point regarding the Irrigation system of Kodayar Basin as the water for the entire irrigation area Pattanamkal anicut area is drawn from Puthen Dam through P.P. canal and Pandiankal.<sup>8</sup>

## RIVERS AND STREAMS IN KANYAKUMARI DISTRICT

### KUZHITHURAYAR

This river, also called as Tambiraparani, originates from the western side of the Western Ghats. This river runs for 59 Km before it confluences in the Arabian Sea near Thengaipattinam of Pynkulam Village in Vilavancode Taluk. The two main tributaries Paraliyar and Kodayar join at Movattumugham to form the Tambiraparani river, which again is joined by another relatively small tributary called Mullayar which originates at Thikkurichi Village in Vilavancode Taluk. Kuzhithurayar is the largest river in Kanyakumari District.<sup>9</sup>

### KODAYAR

Kodayar River, the major tributary to Kuzhithurayar originates from the Western slopes of Agasthiar hills at an altitude of 1500 m above MSL. The two main tributaries to Kodayar is Chittar I originating from Western ghats at an altitude of 900m above MSL and Chittar II originating from Kalimalai at an altitude of 600m above MSL. Thirparrappu Anicut is constructed across Kodayar at a place Thirparrappu about 8km north west of Kulashekham. It has two canals namely Thirparappu L.B.C. and Thirparappu R.B.C. The total anicut is 885 acres.<sup>10</sup>

### PARALIYAR

Paraliyar is another major tributary to Kuzhithurayar, which originates from Western slopes of Mahendragiri hills at an altitude of 1500m above M.S.L. Thatchana Kodayar which is a main tributary to Paraliyar originates from the Western side of Velimalai hills. Aruvikkarai anicut is constructed across Paraliyar at Aruvikkarai near Thiruvattar. It has two canals namely Aruvikkarai L.B.C. and Aruvikkarai R.B.C. with a total anicut of 657 acres.<sup>11</sup>

### PAZHAYAR

Pazhayar basin, which is a separate one, lies in Thoivalai and Agasteeswaram Taluks. Pazhayar river originates from the southern side of Mahendragiri hills. It runs towards south for about 35km and confluences in the Arabian Sea near Manakudi in Thamaraiikulam village of Agasteeswaram Taluk. Other tributaries are Alathurayar, Poigaiyar, Thadavayar, Koyaodai and Ulakkaruviyar. Pazhayar acts also as a major drainage carrier for the anicut of Ananthanar and Thoivalai channels. The Pazhayar command area is mainly benefited by the drainage waters of the above two channels. The Veerapuli anicut, Kutty anicut, Pallikondan anicut, Chattuputhur anicut, Chettithoppu anicut, Veeranarayamangalam anicut, Sabari anicut, Kumar anicut, Cholanthattai anicut, Pillaiopetha anicut and Mission anicut across this river.<sup>12</sup>

**VALLIYAR**

Originating from the southern slopes of Velimalai hills, Valliyar hills, Valliyar is a comparatively small river. It runs for about 16km towards south and falls into Arabian Sea in Kadiapattinam village of Kalkulam Taluk. It is a drainage carrier for the P.P. canal system. Mukkuranai anicut, Odapakulam anicut, Mulagupati anicut, Charod anicut, Kumarapuram anicut, Eraniel anicut, Attuvarampu anicut, Kalpadiela anicut and Thalakulam anicut across this river. Five hundred and sixty seven acres of anicut is benefited from Valliyar River water. The water supply to Indian Rare Earth factory is also drawn from Valliyar.<sup>13</sup>

**THOOVALAR**

This is a small river originating from Maruthamar hills of Western Ghats and flows through Thalakulam, Vilukuri, and joins Valliyar at Shantamangalam Village. Sodaserikulam anicut, Easalarikulam anicut, Kumarakovil anicut, and Puliyarkutuchi anicut across this river. Totally 304 acres of land is benefited from this river.<sup>14</sup>

**PAMPOORI VAIKKAL**

This water course receives water from the drainage of Pattanamkal anicut area and originates near Kappiarai village and runs a distance of 14.5km through Valvechakoshtam, Lakshimpuram, Colachel and finally joins the Arabian sea. About 324 acres of land are irrigated through the Karaikulam anicut and Colachel anicut. Water from this river is also utilized for the drinking water purpose of the near by seashore villages.<sup>15</sup>

**PANNI VAIKKAL**

This Vaikkal originates at the surplus course on Achiyankulam near Sunkankadai and runs for 12.5 km through Aloor village, Neendakarai village and joins the Arabian Sea near Eathamozhi village. About 110 acres of anicut are benefited from this Vaikkal. It is also benefited for the drinking water supply to the seashore village.<sup>16</sup>

**ALATHURAYAR**

This originates from Mahendragiri in Western Ghats and divided into two water courses from the anicut at Kanjiparaion the top of the hills. One course reaches Panakudi in Thirunelveli District and another course reaches Kadukkarai and Seethapal village of Kanyakumari District. About 360 acres of anicut is benefited through 12 tanks from the water of this channel.<sup>17</sup>

**MULLAYAR THODU**

This originates at Ayyathoorathu hills of Western Ghats and runs for 11.20km and joins Tambiraparani near Thikkurichi village. This natural stream irrigates about 696 acres of land.<sup>18</sup>

**RESERVOIRS IN KANYAKUMARI DISTRICT  
PECHIPPARAI DAM**

Construction of Puthen Dam facilitated the use of considerable quantity of water in Paraliyar River by diverting the same for irrigation requirements of Pazhayar basin. But the water in Kodayar River was utilized. As the river Tambiraparani and its tributaries run through a highly undulating terrain, developed command in the area has not happened. But at the same time, the command area in Pazhayar Basin was continuously increasing. Due to the increase in the command area, the water available at Puthen Dam was found insufficient to meet the increased demand from the enlarging command area. Hence, the then Maharaja of Travancore decided to construct Pechipparai Reservoir across Kodayar.<sup>19</sup> A link canal connecting the same to Puthen Dam was also excavated. Mr. Minchin, a European engineer was in charge of the construction of this Dam. The construction of the Pechipparai Dam was started in 1896 and completed 1906. This dam is a straight gravity type masonry dam and is 425.5m long and 120.70m high above the deepest foundation. The link canal, which is 16.80km long, is called Kodayar left bank canal.<sup>20</sup>

The Kodayar water was diverted to Puthen Dam and a new canal called Thoivalai Channel was excavated along the foot of the Western Ghats hills to feed the area on the left side of Pazhayar river. The height of the reservoir was increased by 6 feet, during 1965 to 1972 under Chittar Pattaamkal project.

Construction of Pechipparai Dam opened a new era in the irrigation system in Kanyakumari district, as it was the beginning of the present modern Kodayar irrigation system.<sup>21</sup>

### PERUNCHANI RESERVOIR

As the Puthen Dam was acting only as diversion weir, most of the flood water in Paraliyar was going waste. To tap this surplus water, a reservoir called Perunchani Reservoir was constructed across Paraliyar on the upstream side of Puthen Dam at distance of about 1km. It was constructed during 1948 to 1953, under the first five year plan. The water from the dam is being released to the river itself and this is being picked up at Puthen Dam. This is the first dam to be constructed in the district after the Independence. The height of the dam was further increased by six feet under Chittar Pattanamkal project during 1965 to 1972. The dam is a straight gravity masonry dam of 373.10m length.<sup>22</sup>

### CHITTAR I&CHITTAR II RESERVOIR

Even after the construction of the Pechipparai and Perunchani reservoirs, still surplus water was available in Kodayar and Paraliyar. Therefore it was proposed to develop some areas on the left side of Tambiraparani River in Vilavancode Taluk and the drought prone area in Radhapuram Taluk of Tirunelveli District, by utilizing the surplus water. For this purpose, two new reservoirs with earthen dam namely Chittar I & Chittar II were constructed across rivers Chittar I & Chittar II respectively during the year 1965 to 1972.<sup>23</sup> Chittar II was connected to Chittar I by a link canal and Chittar I was connected to KLBC through a feeder canal. Under this scheme called Chittar Pattanamkal scheme, FRL of Pechipparai and Perunchani Reservoirs were increased by 1.8 m(6ft). The carrying capacity of KLBC was also increased to take the additional supply from Chittar I feeder canal. A new canal called Pattanamkal was excavated to feed about 5583 ha of land on the left side of Tambiraparani River and another channel called Radhapuram channel was excavated which takes off from the Nillapparai branch Channel of Thoivalai main channel. These works were carried out during 1965 to 1972.<sup>24</sup>

### NEW RESERVOIRS

This is a new reservoir constructed recently across Pogaiyar river at an estimated cost of ten crores at Aralvaimozhi village of Thoivalai Taluk. The total anicut to be benefited by the reservoir is 1615 acres with the new anicut of about 252 acres. The work of the reservoir is completed and the construction of the canals is nearing completion.<sup>25</sup>

### MAMPAZHATHURAYAR RESERVOIR

This is a new scheme sanctioned by the Government, and the construction work is yet to start. The estimated cost is about ten cores and it is proposed to be built across Mampazhathurayar near Villukuri village of Kalkulam Taluk. New anicut to be benefited by this reservoir is about 155 acres double crop area and another 600 acres of 3<sup>rd</sup> crop area.<sup>26</sup>

### MAIN CANALS AND CHANNELS

*Kodayar Left Bank Canal* is the conveyer of water from Pechipparai Dam, Chittar I and Chittar II Dams to Puthen Dam where waters from Perunchani also joins. The original capacity of KLBC was 24.07 cumecs and it was further raised to 32.99 cumecs to carry the water from Chittar I and Chittar II by carrying out improvement works during the year 1965 under Chittar pattinam kal scheme. It is a lined canal with a command of 174 Ha.<sup>27</sup> *Padmanabhapuram Puthanar Canal* takes off on the left side of Puthanar. It is a ridge canal carrying a discharge of 9.77 cumecs. It has a double crop paddy anicut of 797 Ha with a duty of 1.054 1/s/Ha. It is an unlined canal.<sup>28</sup> *PANDIYAN KAL* taking off from Puthendam splits into two as Thoivalai canal and regulator kal at Chellanthuruthi Head works. This is an unlined canal having a capacity of 24.2 cumecs and a length of 12.20km.<sup>29</sup> *THOVALAI CHANNEL* originally had a capacity 5.78 cumecs to deliver water to 5208 Ha of double crop paddy at a duty of 1.054 1/sec/Ha. The capacity was further increased to 10.08 cumecs under Chittar pattinam kal scheme to deliver water to the newly excavated Radhpuram channel. Thoivalai channel is a lined contour canal.<sup>30</sup> *REGULATOR KAL* is a feeder canal for Ananthanar canal and Pazhayar River. It is an unlined canal with a capacity of 22.4 cumecs and a length of 2kms.<sup>3</sup> *ANANTHAR CHANNEL* taking off at Surulakod head works. Ananthanar canal has a capacity of

4.76 cumecs. It has an anicut of 4452 Ha of double crop paddy with a duty of 1.0541 / sec/Ha. It is a lined canal.<sup>32</sup> *NACILNADU PUTHENAR CHANNEL* has an anicut of 3640 Ha of double crop paddy and designed to have a capacity of 10.6 cumecs. It takes off at Chattuputhur anicut of Pazhayar River and is an unlined channel. It also carries drainage flows from Thoivalai channel command area.<sup>33</sup> Kanyakumaridistrict is benefited from Neyyar irrigation system. Kanyakumaribranchchannel takes off from Kollamkode Head works at 13.616km of left bank canal of Neyyardam, in Kerala. As per the understanding between the two government of Tamilnadu and Kerala a normal supply of 152cumecshas to be made available at Kollamcode head works for irrigating the anicut inTamil Nadu area. In the absence of any interstate agreement ,regular and adequate supply is not being received from Kerala. Out of the total anicut of 2347 Ha, only about 1535 Ha have been developed so far.<sup>34</sup>

## TANKS

Kanyakumari District has a large number of tanks scattered through out the district. They function as the nerve center of the day to day life and activities of the people of the villages. There are 1200 numbers of small and large tanks in this tiny district. They serve the purpose of irrigation multi various uses and domestic needs of the people.<sup>35</sup>

## WATER FOR NON-AGRICULTURAL PURPOSES DRINKING WATER

Water is supplied for drinking water purpose from main rivers by providing boreholes, sump wells infiltration galleries etc by Tamil Nadu water supply and drainage board, concerned Municipalities, Panchayat union etc. During scarcity period Nagercoil Municipality approaches the government through the Collector of Kanyakumari to obtain special order for realizing Kodayar water through Ananthanar channel for augmenting the municipal water supply.<sup>36</sup>

## HYDROELECTRIC PROJECT

The Tamil Nadu Electricity Board constructed two reservoirs namely upper Kodayar and lower Kodayar to produce 100MW of power by intercepting catchment of Pechipparai reservoir.<sup>37</sup>

## INDUSTRIAL USE

Water is supplied from Valliyar River to the Indian Rare Earths Limited, at Manavalakurchi. An average annual supply in the order of 1.00 mcum of water is being supplied and water charges at the rare of Rs 60 per 1000cum is being collected by PWD. An average quantity of 3500 cum of water is drawn annually from the leading channel of Perunchani by Government Rubber Plantation Perunchani.<sup>38</sup>

## FARMER'S MANAGEMENT TO IRRIGATION SYSTEMS

Availability of Irrigation water in a predictable and dependable pattern and assured intervals to all the farmers in the entire command area is an essential requirement for optimizing irrigation utilization and increased crop production under the system. Currently in many irrigation projects the tail end reaches of the distribution system are not getting their quota of allocated water and hence irrigation service to tail end farmers is not satisfactory, affecting the increase in the crop production. This has been compounded by a purely governmental approach despite the limited capacity for the government to intervene, especially at below the distributary level of the system. The need for remedying this situation has been a major concern of the Tamil Nadu Government. Experience, all over the world has shown that transfer of irrigation systems from government agencies to Farmer's organization can be a viable alternative. This has also been reflected in the national water policy adopted by the Government of India in 1987 and of State's water policy issued in 1994.<sup>39</sup> The ministry of water resources, Government of India is also advocating the policy of Participatory Irrigation Management with full of involvement of the farmers in operation and maintenance of the irrigation systems to ensure effective realization of the benefits of irrigation. There is a felt need for reforming the irrigation sector for sustainable management and developed through democratic decentralization, Farmer's Management with financial autonomy leading to sustainable water resources management<sup>40</sup>

## CONCLUSION

Kanyakumari district has a very well developed Water Resources System with abundant water resources. In spite of bottlenecks the system has a high sustainability. It is up to us to effect proper management of the system and improve it for the overall development of the District. Let us not allow it to get deteriorated. Let us improve it and preserve its goodness for the future generations to come.

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