CHAPTER – IV

IRRIGATIONAL DEVELOPMENTS

The irrigation system of Kanyakumari District dates back to pre-Sangam period. The kings who ruled between 4th century B.C and 9th century A.D showed keen interests in developing the irrigation system.\(^1\) The entire district is endowed with a number of canals and conveyance channels. The irrigation system of the district can be divided as natural and manmade. Further they are sub-divided into rivers, streams, lakes, and rain filled or manmade ponds. The manmade irrigation systems are dams, canals, aqueducts, check dams and tanks. These irrigational systems supply sufficient water for irrigation.\(^2\)

Besides the major rivers such as Kothaiyar, Paraliyar, Pazhayar and Chittar, there are other small rivers such as Alathuraiyar, Valliyar, Mampazhathuraiyar and Mullaiyar. There are also rivulets flowing around different parts of the district. The other major streams are Pannivaikal, Pampoorivaikal, Alenchyvaikal, Puttetivaikal, Paruthivaikal and Shenkodai Vaikal. Besides these there are number of hill streams, which potentially supply sufficient water during the monsoon months.\(^3\) Kanyakumari District has normal and pleasant climatic condition to grow a number of crops. Even though the district is very small, it accommodates various food and non-food crops which grow under different agro climatic condition. Because of its proximity to the equator, its topography and other climatic factors favor the growth of varied crops. The general climate too is therefore pleasant. Both the South West monsoon and North East monsoon influence the climate of

the region. The district has a unique advantage of receiving rainfall during both the monsoon starting from the month of June to the end of September and October to December. The average rainfall of the district is 1465m.m per year.

The only major river in this district is Thambaraparani (Kuzhithuraiar). This river has two major tributaries namely Kothaiyar River and Paraliyar River. There are many tributaries to Kothaiyar, of which Chittar I and Chittar II are the major tributaries. The origin of the main river Thambaraparani is Western Ghats and the river flows through Kanyakumari District for a length of 59.2 km and meets the Arabian Sea near Thengapattinam, west of Cape Comorin, the southern most tip of India. The seasonal failure of monsoons and crop failures caused burden to the revenue to the government. Hence in 1837, the Kothaiyar project was proposed to irrigate agricultural operations at Kalkulam, Eraniel, Thovalai and Agastheeswaram Taluks. Consequently the Pechiparai project was proposed to minimize the wastage of water. Diwan Nanoo Pillai, in 1877 gave life to this project.

Agricultural efficiency and production depended largely upon the inputs and investments in agriculture and the methods of production used. Irrigation, better seeds, better manures and fertilizers, land reclamation and soil conservation, plant protection, use of mechanization are the various aspects of agricultural inputs. Water is indispensable to agriculture. In area where rainfall is plentiful and well distributed over the year, there is no problem of water. But rainfall is very scanty in certain areas as well as uncertain. In such areas, artificial irrigation is absolutely essential, without which cultivation is so

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5 Census of India, Vol IX, Part X-XII, New Delhi, 1961, p.383
for a short period of the year while the rest of the year is dry. As a result, cultivation may not be possible for the whole year. In these regions provision of water for irrigation will facilitate the growing of more than one crop in a year. Finally, there are certain food and cash crops such as rice and sugarcane which require abundant, regular and continued supply of water. In short, continuous supply of water is essential in order to protect various regions from famines and to ensure double and if possible tripple cropping and consequent rapid increase in agricultural production.

**Types of Irrigation**

Irrigation is providing water for agriculture through minor irrigation works such as tanks, canals, surface wells and tube wells and major irrigation works such as reservoirs and dams. It should be noted that minor irrigation is the very important source of irrigation. Exploitation of ground water resources is made possible by the use of minor irrigation works which include tubewells, dubwells and the renovation of tanks. ‘Ayacut development’ refers to water utilization and management in areas brought under irrigation. In a broad sense irrigation projects can be classified into two as natural and man made. Natural irrigation schemes are rivers, streams, canals and ponds. Man made or artificial irrigation schemes include Well irrigation, Tank irrigation, Canal irrigation and Dams. In the following pages we can see the natural and man made irrigational facilities in an orderly manner.

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Rivers: Pazhayar

This river is a natural watercourse with usually fresh water, flowing towards an ocean, along another river. River Pazhayar was formed by the flow of a number of streams. These streams pass through forest areas before they meet and form the main river. Pazhayar flows through the taluks of Thovalai and Agasteeswaram in a South-Easternly direction, touching Bhuthapandy, Nagercoil, Kottar, Thazhakudi and Suchindram on its way and falls into the Manakudy lake after a course of 23 miles. This river is very useful for irrigation. There are number of branches from this river. They are Anadanar, Pallikondankal, Payodkal, Mettukkal, Arasayarkal, Velavadiakal, Terakal, Perumkalayar, Parakkalikal, Suchindramkal and Manakudiyarkal. These are the manmade dams and are small in size. These are otherwise called check dams made to irrigate the paddy fields which are higher from the river beds. Water collected such is passed through small sluices. Pazhayar collects the drain of the valley and irrigated the Nanchilnad. The water discharge standing from the left of Puthen dam runs towards the south and reaches Adayamadal head work. From Adayamadal it is divided into Erattaikarai channel and gets solit off into Thottiyode, Madathattuvilai, Kandavilai, Mallancode, Koduppaikuzhi distributaries and reaches Rajakkamangalam. The Rajakkamangalam branch has some minor distributaries like Santhapuram, Murungavilai and Azhaganvilai branches.

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10 Madras Information, p.7
12 A. Vaidyanathan, Tanks of South India, New Delhi 2001, p.78.
Thiruvithancode channel too has some tributaries like the Eraniel branch, Neyyoor branch, Colachel branch and Cheramangalam branch. The Amaravilai branch reaches Thickanamcode. From Thickanamcode it runs towards the south, joins the Pamboorivaikal and enters the Sea at Colachel. Thus the Pazhayar irrigation system not only satisfies Nanchilnad but Edanadu also.\footnote{M.Gopala Krishnan., 
*Kanyakumari District Gazetteers*, Madras, 1995, p.6.}

**Paraliyar**

The river Paraliyar rises in the Western slopes of Western Ghats from a natural lake called *Perunchani Lake* by the side of Muthukzhivayal hill and Glenrore hills at an altitude of about 1500 meters above sea level and joins with Kothaiyar.\footnote{Madras Information, Vol.II, Madras 1964, p.24.} River paraliyar starts in the hills on the north of Mahendragiri mountains at an altitude of 1600 meters above the sea level. It is intercepted by Perunchani Dam. It receives water from Pechiparai Dam through the Left Bank Channel before it reaches the Puthen Dam.\footnote{T.K.Vellu Pillai, *The Travancore State Manuel*, Vol.I, Trivandrum, 1996, p.414.}

**River Thambraparani**

Thambraparani is the other name of Kuzhithurai river. Thambraparai is a rain fed river. It is formed near Thiruvattar by the merger of the paraliyar and the Kothaiyar.\footnote{G.O.Ms.No. 3854, Public Work Department, Government of Madras, Madras dated 01.06.1948.} After a course of 32 kilometers across Kalkulam and Vilavancode Taluks, river Kothaiyar joins with Paraliyar at Moovattumugam to form the Western Thambraparani which takes a South Western direction and joins the Sea at Thengapattanam.\footnote{The Original Thambraparani flows at Tirunelveli District which begins at Agasthya mountain. The river that flows through Kuzhithurai is called Western Thambraparai.}
The Mullaiyar

The Mullaiyar in Vilavancode Taluk is a stream which flows across a distance of about 11 kms through Kalial, Edaicodu and Pacode. It joins the Western Thambraparani at Thickurichy near Marthandam. The scheme was proposed to irrigate 500 acres of new dry ayacut and to raise wet crops in 216 acres by way of stabilisation.

Valliyar

River Valliyar is in fact a small river. It is one of the old types of canals which carry the surplus water of rivers during rainy season and flood times only. It is 16 kms in length. It starts in the Velimalai hills of Kalkulam Taluk. On its course it also feeds a tank called Periakulam. It passes through Kothanallur, Kalkulam, Eraniel, Thalakulam, Manavalakuruchi and it confluences with the sea at Kadiyapattanam, where a small lagoon is formed. It irrigates only a small area.

The A.V.M Canal

The canal between Chennankara and Trivandrum was the first of its kind in the erstwhile Travancore State. It was constructed during the period of Diwan Venkatarao (1821-1839). However the Ananthan Victoria Marthandavarma Canal popularly known as the A.V.M Canal was the only work of its kind in the whole of South Travancore. The construction of A.V.M canal was completed in July 1860 A.D. During the reign of Uthiram Thirunal Marthandavarma (1846-1860 A.D). By 1860, the canal between Poovar and Colachel was completed. The actual length of the completed canal was 17 ½ miles

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21 Ibid., p.305.
22 Thambimarkathai Palm Leaf Manuscript.
including the 1 ½ miles of natural lake or reservoirs. However, the A.V.M canal work for some time had to be suspended due to the commencement of the Varkala canal work at Travancore.\textsuperscript{23} The A.V.M canal prevents salinisation of drinking water sources from Colachel to Kollencodu. Further it helps agriculture and coconut cultivation. It also serves as a source of development of the rural economy.\textsuperscript{24} Though these irrigational facilities provided necessary water supply for agricultural production, it could not satisfy all the need. Therefore, the need for more new irrigational projects was felt even after the merger with Tamilnadu State. Further the then Chief Minister of Tamilnadu K.Kamaraj showed more attention to agricultural development and new irrigational schemes. It was with two primary aim that Kamaraj brought more attention to this department.\textsuperscript{25} The first aim was to provide irrigation facilities for the vast tracts of lands with a view to increase food production. The second aim was to utilize the power generation that the hydel projects could deliver as a result of the construction of new dams and reservoirs for the purpose of agriculture.\textsuperscript{26}

Some of the important projects were planned and started to be executed in Kanyakumari District during the period of Kamaraj were Vilathurai lift irrigation scheme, Neyyar irrigation project II\textsuperscript{nd} stage, Remodeling of Thiruvithancode channel, Remodeling of Padmanabhapuram Puthanar channel, Kothaiyar extension project, Closing leakage of Pechiparai, Chittar Pattanamkal scheme, Chittar Dam I, Chittar Dam II, Kothaiyar Hydroelectric power project and the Hanging trough of Mathoor.

\textsuperscript{24}\textit{Thina Thanthi}, Tamil Daily, Nagercoil, 18 January 2007, p.12.
\textsuperscript{26}\textit{Ibid.}, p.73.
Well Irrigation

Surface wells were the most ancient and the most important source of irrigation till a few decades ago. These wells were mostly constructed by private individuals with their own resources but the state government also granted loans and subsidies for their construction. They are not expensive to construct but they could be used to irrigate only small areas up to a maximum of six hectares. Tube wells go a deeper than surface well and can draw a much larger volume of water and provide water for a larger periods of time and can be used to irrigate a larger area.²⁷

Tank irrigation

Tanks and other catchments refer to the storage of flood water flowing in river or direct of rainwater and have long been used for irrigation. The irrigation tanks are of all sizes, ranging from large lakes to village ponds. Tank irrigation has been the most common in the Deccan Plateau but most tanks are old and silted. They are mostly constructed and maintained by the government except some village tanks which may be looked after by the villagers jointly.²⁸

Canal Irrigation

Canal irrigation at present is the most important form of irrigation. Canals 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 canals namely, perennial canals, inundation canals and storage work canals. Perennial canals are those

²⁷ K.C.Padhy, Rural Development in Modern India, New Delhi, 1988, p.76.
which take water from a river and provide water for irrigation throughout the year. Inundation canals start from the river but have water only during rainy seasons and storage work canals start from a dam or storage works which may be constructed across a river or valley. The canal network consists of canals, distributaries, water coures and field channels.

**Early dams: Kallanai**

Apart from this minor irrigation schemes, many major irrigation schemes also there in Kanyakumari District. Some of them were very old. In ancient days, even when the technology was unknown the kings built huge dams. These dams were very useful to the people of Kanyakumari District for developing agriculture and for drinking water. The first dam constructed in the district of Kanyakumari was Kallanai. River Kothaiyar gets plently of water from the hills. The dam was constructed in Vannanparai. It was called so, as people used to wash and dry their clothes in these rocks. Huge rocks naturally joined from both the sides of Kothaiyar river and the dam was built. Therefore, it is known as Kallanai. It’s length is 500 mts, width is 10 feet and height is 40 feet. Prisoners, elephants and other labourers were employed to construct this dam. Nearly 5km around the dam water got stagnated. Channels were dug and water was diverted through Suriyacode and Thumbacode to Thalaiyanai. Later, when the Pachiparai Dam was constructed with the help of the British Engineer Vannanparai was completely neglected and was damaged.

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31 Ibid., p.4.
Pandian Dam

The area comprising of the taluks of Agastheeswaram and Thovalai is a fertile region. But the average rainfall in this area is very low and inadequate for the requirements of cultivation. The Pandiyan king Rajasimha in 900 A.D., took the first step to construct the Pandiyan dam across the river Baralayar in Kalkulam Taluk. This was the first diversion work created in the head reaches of the river, Paraliyar. It was also known as Thalaianai. The dam was twenty feet in height. It was built of massive square stones across the paraliar and a channel made through solid rock for a distance of about two miles or three kilometers through the saddle forming the extreme water-shed. The water of Paraliyar was lead into the east flowing Pazhayar river by cutting a leading channel known as Pandian Dam, for about 3km length. Both the anaicut and the channel go by the name of the king who had provided it. Even today they are known as Pandian dam and Pandian Kal.

Puthen Dam

Though Nanchilnad got better water availability than earlier, after the diversion of Paraliyar waters through Pandiankal, the lower plains of Edanad area was languishing or want of adequate water facilities. The demand for similar water diversion works across Paraliyar had gained impetus. Therefore, a quarter of a mile lower down the Pandiyan Dam, Puthen Dam (New dam) was built across the river Paraliyar in 1750 A.D. by the

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34 Report, History of Pechiparai Dam, Water Resources Organization, Dam Safety Directorate, Public Works Department, Chepakkam, Chennai, 2000, p.3.
king of Travancore Marthandavarma to benefit the irrigation sources done centuries ago. Puthen Dam forms the nuclear of the present system of irrigation in the district. The dam stores the water of Paraliyar to the height of more than 20 feet from the bed of the river. The Kalkulam Taluk is supplied with this river water. A channel was also constructed in connection with the dam called the Padmanabhapuram Puthanar, channel (PP channel) running for a length of 19 miles and taken through places involving rock cuttings to the depth of from 30 to 50 feet and over a valley on a embankment at a point of 10 feet high.\textsuperscript{36}

**Pechiparai Dam**

Most of flood waters in the rivers Paraliyar used to flow waste. In Kothaiyar river, entire flow was unutilized and allowed to go waste. But the area around Valliyar and Pazhayar basin steadily increased year after year and it resulted in inadequate supply to irrigate water. It was therefore felt that a storage reservoir was necessary to secure to these commands. Therefore four dams constructed in the district. They are Kothaiyar dam, Perunchani dam, Thirpparappu weir system and Aruvikkarai weir system. Pechiparai dam was constructed across the Kothaiyar River in 1906. This dam was built around 1.61 km below the confluence of three tributaries namely Kallar, Chittar, and Kuttiyar at Pechiparai, a place 11.27 km north of Kulasekaram and 45.08 km from Nagercoil. The combined flow of Pechiparai dam (through left bank canal to Puthar dam) and Paraliyar is flow in Puthan dam was designed to irrigate the area of about 20000ha

\textsuperscript{36} Statistical Hand Book, Government of Tamil Nadu, Madras 1995, p.156.
through five sub systems namely, P.P.channel, N.P.Channel, Ananthanar channel, Thovalai channel and Pazhayar river. This is known as the old Kothaiyar system.\textsuperscript{37}

**Perunchani Dam**

As there was deficiency in the Kothaiyar system, Perunchani dam was constructed in the uperstream of Pandian dam in 1953 to store flood water in Paraliyar River. It is about 9.66 km East of Kulasekaram and about 41.86km North West of Nagercoil. The dam is built between 2 hillocks (part of the western ghats) across the river Paraliyar. It is a straight gravity concrete dam with a length of 373.1 mile(1224 ft) having 275.28 mile(903.1 ft) of bulk head section. A drainage gallery of 1.52 mile x 2.29 mile has been provided in the middle of the river section for a length of 45.7 mile (150 ft) which serves as an outlet for the seepages from the foundation.\textsuperscript{38}

**Thirparappu Weir System**

As there was deficiency in the Kothaiyar system for what purpose. Thirparappu weir across Kothaiyar river below Pechiparai dam was constructed in 1951 at Thirparappu village about 8.05km North West of Kulasekaram. It has two branches on either sides.

**Aruvikkarai Weir System**

Though many it is constructed across the river Paraliyar at a place named Aruvikkarai near Thiruvattar. With all these development there was still potential in Kothaiyar and Paraliyar rivers. Therefore, additional areas in Pattanamkal (on the left bank of Thamaraparani river) region in Radhapuram taluk of the neighbouring Tirunelveli District gained water for irrigation.

\textsuperscript{37}Tamilnadu State Administrative Report, 1965 , Madras, P.195.
\textsuperscript{38}www.wikipedia.com.
Vilathurai Lift Irrigation Project - 1960

There is a large number of major and minor and petty irrigation tanks in the district both in and outside the area under the Kothaiyar irrigation project. Both rain water and water from the dam is stored in these tanks and distributed for irrigation purpose. Vilathurai lift irrigation system was one of the important schemes in Vilavancode taluk of Kanyakumari. Irenipuram and the adjacent areas of Vilavancode taluk were dry and drought hit areas even drinking water was very scarce. The people of the area were primarily dependent upon the rain fed tanks for agriculture and other purposes. The Christians, such as the Lutherans and the Protestants jointly submitted a memorandum to the then Maharaja in 1932. But the memorandums and petitions of the people were put in the dead letter box.

After India’s Independence, the matter again came to the surface. William, M.L.A of Kalkulam Constituency and Ponnappa Nadar of Vilavancode taluk represented the matter to Sri. Panampalli Govinda Menon, the then Chief Minister of Travancore - Cochin State. He gave a patient hearing to the M.L.As and took action. However, when the Kanyakumari District was formed according to the States Re-organization Act in 1956, this project was taken up by then Madras State. Further, the foundation stone was laid by him.

River Pumping Scheme

The Vilathurai scheme aids lifting water from Kuzhithurai in two stages and supplying water to 71 minor irrigation tanks for irrigation and to neighbouring villages.

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41 Letter from William M.L.A to Ponampillai Govinda Menon 15 August 1954.
42 Stone inscription at Vilathurai Lift Irrigation site.
for drinking. The scheme was inaugurated by the then Chief Minister of Madras, K. Kamaraj on 3rd August 1960. The Vilathurai lift irrigation scheme provides water for irrigation for about 700 acres of land in Vilavancode Taluk by pumping water from Kuzhithurai river in Vilathurai village limits to a reservoir constructed at the top of an adjacent hill at a level of about 150 feet above the stream and connecting it to a channel by means of R.C.flume. The water was lifted up to the reservoir in two stages by means of pump sets operated by electricity. The water was then supplied to 71 minor irrigation tanks and neighbouring villages for drinking. In August 1955 and the estimated cost was about Rs.5.7 lakhs.

According to this scheme, a pump well has been constructed in the Kuzhithurai river near Vilathurai village. The water is pumped into Reservoir No.1 with a 105 h.p motor and a 100 h.p motor which had been installed in this pipe house and the pumped water was then carried to Reservoir No.I By 24” via cast iron pipe, the length of which is 1,350. The water collected in Reservoir No.II is by pump sets in pump house No.11 and 16” pipe is used. The R.C.C flume starts and is supported by concrete pillars of 4’0”X2’10”. The R.C.C flume runs to a length of 2,100ft which is then connected to a channel. It was used to irrigate about 6000 acres of existing paddy fields and aid fresh wet cultivation and additional 9000 acres and dry land in the two tanks of Kalkulam and Vilavancode area lying on the left of the lower reaches of the Kuzhithurai river.

The main canal has two branches. The Puthukadai branch starts from one mile and 490ft of the main canal. The cannal is 4 furlongs in length. The Nattalam branch is the

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44 Madras Information, Vol.XII, Madras, 1958, p.4.
45 Madras Information, Vol.XII, Madras, January 1959, pp.5-6.
46 Madras information, Vol.XII, Madras 1958, p.9.
other one which starts from the same one mile and 490 ft of the main channel. It is 4 furlongs in length. The otherside of the Nattalam branch starts from one mile 7 furlongs, and 275ft of the main channel. It has a length of 6 furlongs and 605 feet. This branch ends in Annavathikulam. From this tank, the Nattalam extension to perikaraikulam starts at one mile two furlongs and 110’ long.\textsuperscript{47} The capacity of the scheme is 10 cusces. Two pumps are used to pump this 10cs. A third pump is kept as standby. The area under this scheme is 710 acres spread out under 71 tanks. All the 710 acres are only old wetlands and no new conversion has been taken up. There is no sluice in the main canal. The branch canal also has no sluices.\textsuperscript{48}

Water will be available in the tanks during the major part of the year as only two or three watering will be required. Hence the pumping season has been fixed as August-September and December-January.\textsuperscript{49} The scheme got a little delayed due to stoppage of supply of pipes by the company. Since the company was asking higher prices for materials, the following were the materials urgently required for the above project to be completed at an early date. 1) Pumpsets-3 nos to pump 1800 gallons per minute. 2) Pipes for the pumping. a) 1750 Rfts of 18’’c.1.pipes B.s.s’B’ Class each 12ft long with flange complete with bolts and nuts. 3) 2000 Rft 24’’dia c.1.pipes,each 12’’long B.s.s.’B’ class with flanged ends complete with bolts and nuts. 4) 2 nos 24’’dia sluice value with socket and and spigot tail pieces and withhand wheel for source arrangements. a) 1.No 24’’*9’’c-1.pipes B.s.s.’B’class with flanged ends. b) 1.No 24’’c-1.tail piece with one end flanged and other end with socket B-s.s’B’class. c) 1.No .24’’tail piece with one end

\textsuperscript{47} Madras Information, Vol.XIX, Madras February 1964, P.36. 
\textsuperscript{48} Madras Information, Vol.XVIII, Madras November 1963, P.25. 
flanged and the other end with s pigot, B-s.s ‘B’ class. d) 1. No 9” dia valve with flanged ends and with hand wheel. e) 1. No 9” C-1 tail piece with one end and flanged and the other end plain. 5) 3 No 8” dia reflux valve with flanged ends to suit the delivery side of the pump. a) 3 Nos. 8” dia reflux valve with flanged ends. b) 6 Nos 8” dia sluice valve with flanged ends. 6) Fit the delivery pipe of the pump sets with handwheel. 7) 3 Nos, foot valves with strainers-preferably globe type to suit suction pipe of pumps. 8) 2 tons of piglead. 9) 2 sets of caulking tools. 10) 2 Nos. 18” dia, C-1, bends with 15” bent B.ss,’B’ class with flanged ends. 50

Some of the people did not like the Vilathurai irrigation scheme. The following were the reasons stated by the people to stop the scheme. 1) The electricity bill to the scheme could not be paid by the district. The government had to urge the adjacent Tirunelvel District for this purpose. 2) The revenue department could not meet the expenditure with the fund of this scheme received from the government. 3) The water from Chittar Pattanamkal was distributed to the people free of cost. So the people did not know the real value and perhaps wasted water. 4) Excess flow of water caused inundation affecting the agriculture of the concerned area.

**Neyyar irrigation Project 1960**

The Kanyakumari branch canal forms the part of the Neyyar Irrigation project, which is in the Kerala State and the opening of this canal by the Chief Minister of Tamilnadu, K. Kamaraj, symbolized the co-operation and joint endeavour of both Madras and Kerala States in implementing schemes for the benefit of the people. The Neyyar

river is in Kerala State and has its origin in Western Ghats. After flowing for 30 miles through the Kerala State, the Neyyar river ultimately joins the Arabian sea near Poovar.\textsuperscript{51} There are some dry patches even in this district. The aim of the project is to make these dry patches as fertile.\textsuperscript{52} The Neyyar dam is situated at Kallikkadu panchayath of Neyyattinkara taluk of Trivandrum district. It was established in 1958. It is currently a popular picnic spot. One canal of Neyyar flows into the western district of TamilNadu. The main river flows through Kallikkadu, Ottasekharamanyalam, Aryancodu, Kezharoor, Perumkadavila, Marayamootam, Neyyattinkara, and Poovar and meets the Arabian sea. The dam creates a reservoir of $1,060,000,000 \text{ m}^3$ capacity (859,356 acre ft). The Neyyar irrigation canal stretching from the Madras State border from mile 24 – 2 - 80 of Neyyar left bank cannal is intended to carry water discharge of 150 cusecs. The areas to be irrigated during the year 1960 was nearly 9200 acres in Vilavancode Taluk of Kanyakumari District. The main cannal and the branch cannal were nearing completion during the year 1960. All masonry works and building works were completed.\textsuperscript{53} The project consisting of the dam, the rights bank cannal and the left bank cannal The dam reservoir and the right bank cannals are in Kerala State. The capacity of the reservoir formed is 3750 m.cft. The dam is a solid gravity dam built in concrete and is 1000 feet long and 125 feet high. It is near Sembilammedu, 19 miles South East of Trivandrum and 15 miles east of Neyyatinkara. The Right Bank Cannal is 21 ½ miles long and benefits 18000 acres in Kerala State. It was constructed during the first five year plan. The Left Bank Cannal was taken to the second stage during the 2\textsuperscript{nd} five year plan. The canal is about 37 miles long. The first twentyfour miles and two furlongs of the canal lie in

\textsuperscript{52} \textit{Madras Information}, Vol.XVII, p.213.
\textsuperscript{53} www.wikipeadia.com
Kerala State and the remaining thirteen miles and two furlongs in Kanyakumari District.\textsuperscript{54}

**Kanyakumari Canal**

The first stage of the Neyyar project comprising the construction of the dam and the right side channel. The second stage comprising the construction of the left side channel system which serves in the Madras State, is known as the “Kanyakumari Canal” and it starts from mile 24 of Neyyar Left Bank Canal. The Kerala State agreed to maintain a supply of 150 cusecs of water to this canal near the place at Kaliyakkavilai, where the Left Bank Canal enters Madras State. They also agreed that the excavation of the first 24 miles of the Left Bank Canal common to both States will be done by the Kerala State and that of the Kanyakumari canal may be taken up by the Madras State. Later however it was felt that the Left Bank Canal in the first 24 miles crosses the enclaves of the Madras State at two places, it was found to greatly expedite matters if the portion of the cut that in at 21 mile was also taken over by the Madras State for excavation. This work has also thus been done by the Madras State on behalf of the Kerala State.\textsuperscript{55} This project was inaugurated on 27 July 1958 by the Chief Minister K.Kamaraj at Kaliyakkavilai.\textsuperscript{56}

The Kanyakumari canal passes through undulating and uneven country. Therefore it had to be laid in deep cuttings at ridges and in embankments of valleys. The depth of the cuttings in some places is 96 feet. It had been completed at a cost of Rs.105 during the second five year plan period. Besides roads intervened in deep cuttings, as it was not

\textsuperscript{54}Madras Information, Madras, 1968, p.245.
possible to divert these roads. In such places the canal was cut to the required level, R.C.C box culvert provided for the flow of water, cutting the excavated earth and the roads reformed at top as before. These are the special features of this canal. The soil through which the canal passes consisted of muram and clay and so the banks are slippery. In such places the canal is lined with cement concrete. These difficult circumstances existed when the canal was to be excavated. However considering the benefits for the people the work had been taken up and completed. Therefore in the State of TamilNadu it was said there were 4048.58 hac benefited Vilavancode taluk of Kanyakumari District.\textsuperscript{57}

There are six branches that starts from the Kanyakumari canal, the most important and longest of these being the Mullaiyar branch. The other branches are Pacode, Mancauel, Methukummal, Kollencode, and Venganchi. The amount spent for the construction of the canal was Rs.90.3 lakhs. Besides, an expenditure of Rs.18.6 lakhs was incurred in cutting the portion of canal at the 21\textsuperscript{st} mile by the Madras State on behalf of the Kerala State. Under this project 7,200 acres of dry land was expected to be given water irrigation facilities. Two thousand acres of land was already under cultivation. The additional food production was expected to be 7,700 tons per annum.\textsuperscript{58}

**Pechiparai Reservoir – Pumping Units for Agriculture**

Pechiparai reservoir is located 43 k.m (27 mile) from the town of Nagercoil near the village of Pechiparai in Kanyakumari District. The dam was built across the Kothaiyar river about one mile below the confluence of the Kellar, Chittar and Kuttiyar

\textsuperscript{57} Madras Information, 1958.
tributaries. It was built during the period, 1897-1906 by the European engineer Mr. Minchin (Mookanthurai) during the reign of the Travancore Maharaja Moolam Thirunal. The catchment area of the reservoir is 207.19 km² (80.00 sq.mile). The water from the reservoir is used for both irrigation of crops and for drinking water purposes.⁵⁹

Already in 1953 Kanyakumari District experienced a seasonal failure of rainfall so that the reservoirs in the Koda iyar system have all got nearly empty. The government of Travancore Cochin State had then made arrangements for installation of six pumpsets and pumped the dead storage in the Pechiparai Reservoir for saving the crops. The Travancore Cochin government however removed the pumps and the transformer away from the area in September 1956 before the re-organization of States.

On account of the extreme scarcity of water it was decided by the then Tamilnadu State Government that as an emergency measure electrically operated pump–sets should be installed at Pechiparai for pumping the dead or unusable water available below the skill level of the sluice vide in the government order PNM-1-531/53/PWC/ dated 13-1-53. In the year 1960 also Kanyakumari District faced such a situation worse than that of 1953.⁶⁰ The reservoirs were getting empty and it would not be possible to meet the full demand of the ryots even for about two weeks though water is required till 2/57 for the present crop. So pumping was essential even to save a portion of the existing crop. Every effort was made to distribute the water equitably. It is better to shift the system to distribute the available water.⁶¹

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⁵⁹ www.wikipedia.com
⁶⁰ G.O.Ms. No.1413, Public Works Department, Madras, 7 May 1960, p.7.
Chittar Pattanamkal Project

Since the area comprising of the Kanyakumari District was transferred to the Madras State in 1956, the government of Madras had been concentrating their attention in implementing several development projects for the advancement of the farmers. Pechiparai dam which serves Kanyakumari District was constructed in the early years of the present century (1905). Because of the age and the methods of concentration adopted in those days, the dam was found leaking rather badly in several places.\textsuperscript{62}

Further the Neyyar Irrigation project of the erstwhile Travancore Cochin State was expected to benefit this area but no work had been commenced till the Madras Public Works Department took charge of the area. Since taking change the department excavated the Kanyakumari branch canal and attended to the other allied works. Kanyakumari branch canal was opened by K.Kamaraj the then Chief Minister, on 25\textsuperscript{th} April 1963. This project helped to irrigate an extent about 7000 acres in Kanyakumari District.\textsuperscript{63}

Pattanamkal System-1963

Some portions of the Vilavancode Taluk in Kanyakumari District do not have even good drinking water during the summer. Though there are numerous small tanks, they were often become dry. To benefit this area the Vilathurai Lift Irrigation scheme was executed. There were still more areas in Vilavancode and Kalkulam Taluks that do not have any irrigation facilities. After the Congress government took over, with the new proposals the whole of the commendable area of Kanyakumari District was expected to

be covered by irrigation.\textsuperscript{64} This project helped to irrigate an extent of about 7000 acres in Kanyakumari District.

Chittar Pattanamkal scheme consisted of two earthen dams constructed across Chittar I and II and to inter connect both the reservoirs by means of an inter connecting channel and raising F.R.L of Pechiparai and Perunchani dam by 6”-0”. The feeder canal excavated from Chittar Dam I will supply water to Kothaiyar L.B.C. When the scheme was taken up for consideration at a meeting held at Nagercoil in 1957 there was a vehement agitation against combining the waters of the Chittar reservoirs with Pechiparai reservoirs. Consequently, the scheme was split of into Chittar and Pattanamkal schemes.\textsuperscript{65} The Chittar scheme provided for forming a reservoir on one of the Chittars and for extending the two channels taking off from the Thirpparappu river to irrigate originally designed \textit{ayacut} of 5000 acres. The Pattanamkal scheme, which would depend upon the water of Kothaiyar only without the assistance from Chittar provided for excavation of a new channel from 10/400 of the Left Bank Channel to irrigate 10,000 acres. Subsequently, the Thirpparappu extension \textit{ayacut} under Patanamkal was arrived at 15,000 acres. The dam of Chittar I is located inside the Ambadi estate and is situated a mile above the confluence of the river with the Kothaiyar.\textsuperscript{66} Chittar Dam II starts from the Kilamalai Reserve Forest slightly west of Chittar I at an altitude +2300 M.S.L. It is formed by two tributaries having their origin on the eastern and southern slope of Kurinchimalai and joins each other at Sivalogam east and falls into Kothaiyar.\textsuperscript{67} The two reservoirs of Chittars were interlinked and feeder channel from Chittar I was excavated.

\textsuperscript{64}Madras Information, Vol.XVII, Madras, 1964, p.11.
\textsuperscript{65}Inscription at the entrance of Chittar Dam 1.
\textsuperscript{66}Engineer Report, Government of Tamilnadu, Public Works Department, Chittar Pattanamkal Division, Kuzhithurai, 1999, p.1.
to connect the Chittar water with the Kothaiyar Left Bank Canal at 4.6 km and Pattanamkal main channel was branched off at km 10/400 of left bank canal. This was came to be known as Chittar Pattanamkal scheme. The catchment is influenced by both South West and North East monsoon. The average rainfall is about 1700 mm. The Pattanamkal canal excavated from M.6/4-200 of Kothaiyar L.B.C for a length of 43 km with branches of distributaries for irrigating about 6072.87 hact of double crop wet land in Vilavancode and Kalkulam Taluks. An extent of 3791.52 hact including the entire existing area under Pattanamkal system had been developed so far.

**Surplus water utilization of the project**

The Kanyakumari branch canal was opened by Sri.K.Kamaraj, the Chief Minister on 25th April 1963. The foundation stone for the project was also incidentally laid by Sri. K.Kamaraj the then former Chief Minister on 26th Septemper 1963.

The Chittar Pattanamkal project as approved by government had to cover the following works. The list of works covered by the Chittar Pattanamkal Project is as follows: 1) Raising the F.R.L –of Pechiparai reservoir by 6’ and increasing its storage by 840 M.cft. 2) Raising the F.R.L – of Perunchani reservoir by 6’ and increasing its storage by 590 M.cft. 3) Construction of two dams across the two Chittar rivers to form 2 reservoirs – One on Chittar I with a gross capacity of 535 M.cft. The other on Chittar II with a capacity of 964 M.cff. 4) An inter connecting channel between the Chittar I and II reservoirs to use the storages of both. 5) A feeder channel from the reservoir on Chittar to the existing Left Bank canal of the Kothaiyar system. 6) Improving and lining the Left Bank canal of Kothaiyar system to take in the additional flow diverted from the two

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Chittar reservoirs. 7) Excavation of the new Pattanamkal channel from mile 6/4 of the Left Bank canal of Kothaiyar system of irrigation of 10,000 acres of double crop through a network of distributaries. 8) Extending the existing two canals originating from the Thirparappu weir (The Left Bank Canal by 16 miles and the Right Bank Canal by 16 and the Right Bank Canal by 5 ½ mile) to benefit 5000 acres of double crop including the existing irrigation of 1543 acres. 9) Improvements and lining the Pandiankal up to mile 1/3 and Thovalai channel up to the branching of Nilapara channel and also for the first one mile and two furlongs of the Nilapara channel. 10) Excavating a new channel from mile 1/2/250 of Nilapara Channel for a length of 20 miles 4 furlongs up to Radhapuram tapering into Mahendra Tank to benefit 17,000 acres.70

The cost of the project was estimated at Rs.680 lakhs. The area benefited by the project would be 15,000 acres which was also pave way to raise two crops in Kanyakumari District. Thus the gross area benefited will be 47,000 acres. In Kanyakumari District wet corps are to be raised, while in Tirunelveli District dry crops are benefited for irrigation (Ragi, cholam, chillies, etc). The sub soil water level in the present dry area of Radhapuram sub taluk would be also improved. With the supply of water from wells, coconut and plantain crops which are already grown would also be benefitted. The dams across Chittar would sub merge about 2000 acres of plantations and government lands. Out of the 2000 acres, 960 acres consists of rubber plantations. It is hoped that the people of the area have already welcomed the project and extended their whole hearted support for the early implementation of the scheme and also utilize the irrigation potential fully and quickly. Hence the irrigation of dry crops besides benefiting

70 Statistical Hand Book, Government of Tamil Nadu, Madras, 1955, p.156.
a larger area will produce greater wealth than wet crop can do. The raising of coconuts and plantains on large scale was also visualized.\textsuperscript{71}

**Remodelling of Thiruvithancode Channel of the Kothaiyar Project System**

The various measures investigated to improved the irrigation in Kodayar System. The newly integrated areas are benefited by the major irrigation system known as Kodayar irrigation project. This project consists of two reservoirs one across Kodayar called Pechiparai Dam and another across Paraliyar called Perunchani Dam. This project was originally designed for an ayacut of 64,000 acres. Reviewing the seasonal conditions that prevailed in 1957 the Collector made the following suggestions. The work of remodelling and realignment of the project, channel systems and the sluices may be taken up pursued vigorously. The programme of desilting of irrigation tanks may be taken ups immediately. Construction of supplemental dams to supplement supply and increasing the present storage capacity of Pechiparai Dam sinking of wells in the projects area, their purchasing of small pumpsets and river pumping schemes and so on. A special Public Work Department sub division was formed to take up the delimitation of ayacut under the Kodayar system. Special Revenue staff were also employed to collect the particulars of ayacut under this system. Accordingly every channel was investigated from the head to the Act and complete list of sluice, and cross masonry works were collected and component registers were prepared by the special staff. Hence proposal for extension of ayacut under the Kodayar system were framed and seven schemes were consideration. They are Extension of ayacut under Cheramangalam major branch channel for serving an ayacut of 330 acres for irrigation purpose. Extension of ayacut under Muttam channel of

\textsuperscript{71} Memorandam, dated 23, September 1869, p.10.
Erattakara Kal channel for serving 450 acres for irrigation. Extension of Chmbakulam under Anandanar system for an extent of ayacut 316.70 acres for food and agriculture. Extension of ayacut under Thickanamcode and Chenamvilai for an ayacut of 1181.97 acres for food and agriculture. Extension of ayacut under Kottayadi channel for an additional 4400 acres. Extension of ayacut under Athikadai channel of Anandanar system for an ayacut of 508.61 acres.\(^2\)

Extension of ayacut under Nilapara channel of Thovala channel for an ayacut of 1600 acres. Further it was found that remodelling the channels was the only way and the proposals were investigated and the work is furnished. They are remodelling of Thovala channel remodelling of Padmanabhapuram, Puthanar channel, remodelling Thickanamcode channel remodelling of Erattakarakal channel remodelling of Thiruvithancode channel. Improvements to Anandhanar channel and its branches, Remodelling of Kodayar Left bank Canal and Remodelling of Najilnad Puthanar channel was taken into consideration. Sum of the projects are given in this work.

The major irrigation project of Kanyakumari District namely the Kothaiyar irrigation project was originally conceived to serve and to irrigate about 60000 acres of wet lands consisting of about 25500 acres of old wet lands and 23000 acres of dry converted wet lands. The Pechiparai dam across the Kothaiyar constructed with sluice to serve the right bank channel was closed. Now the left bank channel only takes off from the left of the river and is 11 miles long up to Paraliyar. The channel joins the Paraliyar by a level crossing above the Puthan dam. A reservoir known as Perunchani dam across

\(^2\) G.O.MS.No.1413, Public Work Department , dated 7 May 1960.
the river Paraliyar was also constructed. The present anacut that is being irrigated under
the left bank channel has the benefit of the storage by two reservoirs. After the take off
from the left of the Paraliyar river the channel gets divided into two main branches,
known as Pandiyankal and the other known as Padmannabapuram Puthanar (P.P)
channel. The Pandian kal branches off into four main channels known as Thovalai
channel, Anandanar channel, Pazhayar channel and Nanjilnad Puthanar channel. The P.P
channel divides into two channels namely, Thiruvithancode channel and Erattakarakal
channel.

**Necessity for remodeling**

The present cultivation is reported to be done on around one lakh acres. The
projects increased the quantity of the cultivation area. The capacity of the two reservoirs
are insufficient to serve the needs of the entire ayacut. The capacity of the main canal in
certain section too is inadequate to pass down the required discharge. Hence some
positive measures were found necessary to put the irrigation system as a whole under
better working conditions either by carrying out improvements and remodeling the
channels or by checking the feasibility of augmenting the water resources by diverting
the flow from the adjoining rivers. (The government decided that every canal has to be
investigated in detail from the head to the tail, redesigned and remodeled for satisfactory
working). Large quantities of water are lost through seepage in some canals due to the
sandy nature of the terrain, with the result that water does not reach the tail ends. All
these confirmed the need for remodeling.

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73 G.O.Ms.No.27, Public Works Department, 5, January 1960, Madras, p.3.
74 Ibid., pp.3-4.
It is noted that the project is based on 50 acres per cusecs for dry land and 100 acres per cusecs for wet land in the transferred area.\textsuperscript{75} The Thiruvithancode channel has seven distributaries. They are Eraniel branch channel, Neyyoor branch channel, Colachal branch channel, Cheramangalam major and minor branch channel, Thickanamcode branch channel and Chemponvilai branch channel. The length of the distributaries and ayacut under each of them are given in the following table\textsuperscript{76}.

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Tributaries</th>
<th>M.Fg.Ft</th>
<th>Old wet</th>
<th>Conversion</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eraniel branch channel</td>
<td>10 5</td>
<td>532</td>
<td>1073.31</td>
<td>2063.54</td>
</tr>
<tr>
<td>2</td>
<td>Neyyoor branch channel</td>
<td>0 6</td>
<td>300</td>
<td>96.92</td>
<td>293.66</td>
</tr>
<tr>
<td>3</td>
<td>Colachal branch channel</td>
<td>1 0</td>
<td>120</td>
<td>47.23</td>
<td>406.73</td>
</tr>
<tr>
<td>4</td>
<td>Cheramangalam major branch channel</td>
<td>1 7</td>
<td>350</td>
<td>4.28</td>
<td>367.29</td>
</tr>
<tr>
<td>5</td>
<td>Cheramangalam minor branch channel</td>
<td>1 2</td>
<td>30</td>
<td>31.18</td>
<td>256.93</td>
</tr>
<tr>
<td>6</td>
<td>Thickanamcode channel</td>
<td>4 6</td>
<td>180</td>
<td>363.04</td>
<td>291.08</td>
</tr>
<tr>
<td>7</td>
<td>Chemponvilai or Chemponvilai branch channel</td>
<td>1 5</td>
<td>32</td>
<td>5306.29</td>
<td></td>
</tr>
</tbody>
</table>

For Thiruvithancode main channel there no proposal was made for remodeling the head sluice.\textsuperscript{77} For Remodelling the Thiruvithancode channel an estimated amount of Rs.93, 200 was sanctioned.

\textsuperscript{75} Department Annual Report for 1927, Agriculture Trivandrum Government of Travancore, 1928, p.3.
\textsuperscript{76} G.O.Ms.No.27, Public Works Department, Madras, 1\textsuperscript{st} May, 1960, p.21.
\textsuperscript{77} G.O.Ms.No.27, Public Works Department, Madras, 1\textsuperscript{st} May, 1960, p.21.
These schemes were normally sanctioned under “special repairs” or “Extensions and improvements sheme. The general abstract for extending the Thiruvithamcode channel system is given in the following table\textsuperscript{78}

<table>
<thead>
<tr>
<th>Item</th>
<th>Description of work</th>
<th>Rate per amount</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remodeling of T.code main channel</td>
<td>56700</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Remodeling of Eraniel branch</td>
<td>32000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Remodeling of Neyyoor branch</td>
<td>1400</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Remodeling of Colachal branch</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Remodeling of Cheramangalam minor branch</td>
<td>1300</td>
<td></td>
</tr>
</tbody>
</table>

93200

It was technically sanctioned for Rs.93200/ Rupees ninety three thousands two hundred only and registered as C.R.No 50/58-59.\textsuperscript{79}

The government sanctioned the estimate for Rs.93200 for remodelling the i) Thiruvithamcode channel under Kothaiyar project system in Kanyakumari District ii) The expenditure is to meet construction of Irrigation works (commercial) productive works of Kothaiyar system. The expenditure during 1960 was met by reappropriation from the lumsum provision of Rs.5,13700/ made in the B.E in 1959-1960 under the same for expenditure on medium irrigation schemes in Kanyakumari District.

\textsuperscript{78} Ibid.
\textsuperscript{79} B.A.Jeya Balan., \textit{New Irrigation Era} No: 1, Vol.XVIII, January 1979, p.15.
The action of the Section Engineer, Trichrapalli circle, having technically sanctioned the estimate in anticipation of approval of government and having instructed the EE, Kanyakumari District, division to proceed with the execution of the works ratified it. This order was issued with the concurrence of the finance department vide their V.O.No: 130921 E B/59/ dept 31-12-59.\textsuperscript{80} The general abstract is given in the following table.\textsuperscript{81}

<table>
<thead>
<tr>
<th>Sl.no</th>
<th>Name of the Channel</th>
<th>Length</th>
<th>Ayacut</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>P.P.channel</td>
<td>17 miles</td>
<td>19400</td>
</tr>
<tr>
<td>2</td>
<td>Thiruvithancode channel</td>
<td>16 miles</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Erattakara channel</td>
<td>4.4 miles</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Thovalai channel</td>
<td>30-2512 ft</td>
<td>12609</td>
</tr>
<tr>
<td>5</td>
<td>Anandanar channel</td>
<td>14-6-0</td>
<td>10700</td>
</tr>
<tr>
<td>6</td>
<td>Pazhayar channel</td>
<td>22-0-0</td>
<td>10100</td>
</tr>
<tr>
<td>7</td>
<td>N.P.Channel</td>
<td>15-0-0</td>
<td>10800</td>
</tr>
</tbody>
</table>

**Necessity for the Remodelling of Errattakara Channel**

There was much difficulty in serving the needs of ayacut which originally got water from the Kothaiyar project to harness the waters of Paraliyar and to augment the supplies to the irrigated area. So another dam called the Perunchani dam was constructed above the Puthan dam during the first five year plan period to hold 230 Mcft of water. The two reservoirs to be jointly operated to feed the whole ayacut.

\textsuperscript{80} G.O.Ms.No.27, Public Works Department, Madras, 1\textsuperscript{st} May 1960, p.35.

\textsuperscript{81} *Ibid.*
The actual area irrigated in each channel, distributary, or both, the area entitled to be watered from the system was been complied and made available. Previously there was also no check over the development of the ayacut and consequently it was found difficult to estimate the needs of each channel and regulate supplies.\textsuperscript{82} The main channel is divided into three reaches.

In reach 1 (a) the channel has to carry 156 cusecs inclusive of transmission losses with a total ayacut of 8204.73 acres comprising of 3785.69 acres of old wet and 4419.04 acres of dry converted lands. In this reach there are 20 sluices. Necessary labour provided for lining the channel to standard quality. In Reach 1 (b) 5/4-0 to 8/5-625 the channel has 5 sluices and one major distributary (Eraniel branch channel) and an ayacut of 5301.07 acres comprising of 1743.62 acres of old wet and 3557.45 acres of converted lands.\textsuperscript{83} In reach II 8/5-625 to 9/3-485 water is carried by a tunnel arrangement. In this reach there are 2 sluices and both are major distributaries (Thickanamcode branch) with an ayacut of 930.09 acres comprising 627.67 acres of old wet and 302.42 acres of conversion land. In reach III 9/3-485 to 16/0-77 of the channel is carried with a tunnel arrangement. In this reach there are 35 sluices. It was proposed to reduce the size of these 8 sluices by inserting suitable pipes.

The head sluice of Eraniel branch channel has consists of one vent of size 7’-0” x 4’-6” at a head area of 0.50’. Eraniel branch channel starts from 8/5-605 of Thiruvithamcode channel from the left side and runs to a length of 10 miles 5 furlongs and 532 feet, providing water to an ayacut of 1252.93 acre of old wet and 3399.15 acres.

\textsuperscript{82} G.O.Ms.No.27, Public Works Department, Madras, 1\textsuperscript{st} January 1960, p.7.
of converted lands. This branch is divided into 4 reaches.\textsuperscript{84} In reach from 0/0 to 5/4-330 there are 16 sluices serving an ayacut of 1257.40 acres, comprising of 468.72 Acres of old wet and 788.68 acres of converted lands. In reach II 5/4-330 to 8/1-510 there are 13 sluices serving an ayacut of 1391.13 acres comprising of 522.58 acres of old wet land and 866.56 acres of converted lands. It was proposed to provide revetments in front of this sluice for maintaining the F.S.L. proposed. In the Reach III from 8/1-510 to 9/0-510 the channel had to carry 5590 cusecs of water to serve an ayacut of 2235.54 acres comprising 261.62 acres of old wet and 2073.92 acres of conversion lands. In this reach there are 2 sluices and one distributary (Neyyar branch channel) and sluice no: 31 and 31 are proposed to reduce and refix.\textsuperscript{85} In Reach IV 9/0-510 to 10/5-332 (End) the channel has to carry a supply of 45.47 cusecs of water to serve an ayacut of 1841.18 acres comprising 136.68 acres of old wet and 1714.50 acres of conversion lands. In this reach there are 7 sluices and three distributaries.\textsuperscript{86}

The head sluice of Neyyar branch channel consists of one vent of size 4’-0” x 3’-0” capable. There are three sluices in these limits.\textsuperscript{87} The vent of the Read sluice of Colachel branch channel is of 1’-9’ x 4’-8’. This branch is divided into 2 reaches and there are 8 sluice in it, sluices no.4,5,6, and 7 are proposed to reduce water seepage. The vent Cheramangalam minor branch channel 4’-0’ x 4’-0’ capable. It serves an ayacut of 288 acres comprising 31-18 acres of old wet and 256.93 acres of converted lands.\textsuperscript{88} The

\textsuperscript{84} G.O. Ms.No.27, Public Works Department, Madras, 1 January 1960, p.21.
\textsuperscript{85} G.O. Ms.No.27, Public Works Department, Madras, 1\textsuperscript{st} January, 1960, p.8.
\textsuperscript{86} G.O. Ms.No.27, Public Works Department, Madras, 1\textsuperscript{st} January, 1960, p.9.
\textsuperscript{88} G.O. Ms.No.631, Public Works Department, dated 25\textsuperscript{th} April 1960, p.120.
length of these channels and the ayacut under each channel are furnished in the following table.89

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Branches</th>
<th>M.F</th>
<th>F.F</th>
<th>OW</th>
<th>Conversion</th>
<th>New</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Madathattuvilai</td>
<td>21</td>
<td>0</td>
<td>146.58</td>
<td>253.35</td>
<td></td>
<td>399.93</td>
</tr>
<tr>
<td>2</td>
<td>Kandamvilai</td>
<td>16</td>
<td>330</td>
<td>171.25</td>
<td>300.92</td>
<td></td>
<td>472.47</td>
</tr>
<tr>
<td>3</td>
<td>Mallancode</td>
<td>17</td>
<td>0</td>
<td>141.25</td>
<td>207.57</td>
<td></td>
<td>348.82</td>
</tr>
<tr>
<td>4</td>
<td>Koduppakuzhi</td>
<td>30</td>
<td>0</td>
<td>408.09</td>
<td>657.85</td>
<td></td>
<td>1065.94</td>
</tr>
<tr>
<td>5</td>
<td>Rajakkamangalam</td>
<td>32</td>
<td>0</td>
<td>303.84</td>
<td>945.21</td>
<td>194.34</td>
<td>1443.89</td>
</tr>
<tr>
<td>6</td>
<td>Santhapuram</td>
<td>15</td>
<td>400</td>
<td>42.94</td>
<td>358.18</td>
<td></td>
<td>401.12</td>
</tr>
<tr>
<td>7</td>
<td>Alaganvilai</td>
<td>05</td>
<td>267</td>
<td>6.69</td>
<td>170.91</td>
<td></td>
<td>177.60</td>
</tr>
<tr>
<td>8</td>
<td>Munchiravilai</td>
<td>04</td>
<td>119</td>
<td>5.71</td>
<td>162.42</td>
<td></td>
<td>168.13</td>
</tr>
<tr>
<td>9</td>
<td>Muttom</td>
<td>24</td>
<td>0</td>
<td>373.63</td>
<td>1024.08</td>
<td>460.00</td>
<td>1847.71</td>
</tr>
<tr>
<td>10</td>
<td>E.K.Kal main</td>
<td>42</td>
<td>130</td>
<td>431.97</td>
<td>647.03</td>
<td></td>
<td>1129.0</td>
</tr>
</tbody>
</table>

Grand Total: 2082.25  4727.52  644.84  7454.61

**Errattakkara Channel Proposals**

Large quantities of water was lost through seepages in some canals due to the sandy nature of the terrain, as a result the water does not reach the tail ends. In such conditions the canals had to be lined with brick or concrete. The Errattakkara channel is one of the main branches of Padmanabhapuram Puthanar and is 4 miles and 3 furlongs long with 9 branches. There are many tanks in the ayacut to be repaired to cater to the needs of the ayacut and to serve in times of scarcity of water. The branches of

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Errattakkara channel namely are Madathattuvilai, Kandamvilai, Mallancode, Kodupakuzhi, Rajakamangalam, Santhapuram, Alaganvilai, Munchiravilai, Muttom and Erattakara Kal main.\(^{90}\)

**Special Repairs To L.B.C of Kothaiyar System**

The Kothaiyar Left Bank Canal in Kanyakumari District is the main channel taking off from the left flank of the Pechiparai dam and is 10 miles and 4 furlong long up to Paraliyar. As the channel passes through porous soil, the seepage loss was very high and the capacity of the channel was also not adequate to serve the whole ayacut. Measure to prevent the seepage losses and to meet the needs of the ayacut were considered. In May 1959, an estimate for Rs.5.73 lakhs for remodelling and carrying out repairs and improvements to the Kothaiyar Left Bank Canal was sanctioned by the government.

At present the Kothaiyar Left Bank Canal has been lined with concrete for a length of four miles only. This is taken up under “Medium irrigation scheme”. Separate estimate was provided for lining the remaining length of the channel so as to eliminate the loss through seepage and to improve the carrying capacity. The proposal estimated a cost of Rs.8, 00,500.\(^{91}\) Details of the estimates regarding L.B.C of Kothaiyar reach are given in the following table.\(^{92}\)

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\(^{90}\) G.O.Ms.No.27, Public Works Department, 1\(^{st}\) January, 1960, Madras, p.5.

\(^{91}\) G.O.Ms.No.2509, Public Works Department, Madras, 3 September 1964, p.17.

\(^{92}\) Ibid.
<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Details of the L.B.C of Kothaiyar reach</th>
<th>Reach</th>
<th>Sluices</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>S.R to L.B.C of Kothaiyar reach</td>
<td>0/0 to 1/0</td>
<td>81200</td>
</tr>
<tr>
<td>2.</td>
<td>----------------</td>
<td>1/0 to 2/0</td>
<td>45100</td>
</tr>
<tr>
<td>3.</td>
<td>----------------</td>
<td>2/0 to 3/0</td>
<td>97500</td>
</tr>
<tr>
<td>4.</td>
<td>----------------</td>
<td>3/0 to 4/0</td>
<td>150000</td>
</tr>
<tr>
<td>5.</td>
<td>----------------</td>
<td>4/0 to 5/0</td>
<td>111000</td>
</tr>
<tr>
<td>6.</td>
<td>----------------</td>
<td>5/0 to 7/6-92</td>
<td>130000</td>
</tr>
<tr>
<td>7.</td>
<td>----------------</td>
<td>7/6-92 to 10/4</td>
<td>173000</td>
</tr>
</tbody>
</table>

Reach I (a) 0/0 to 0/7-0 has no need for remodelling in this existing sluice. Reach I (b) 0/7-0 to 1/0-470 has one sluice and one branch to serve an ayacut of 466-05 Acres comprising 162-87 acres old wet and 303.13 Acres converted lands. Reach II (a) 1/0-470 to 1/5-292 has 3 sluices serving an ayacut of 257.02 acres comprising 133.13 acres old wet and 123.89 acres conversion lands. Reach II (B) 1/5 - 292 to 1/7-373 serves an ayacut of 472-47 acres comprising 171-55 old wet land and 300-92 acres converted lands. No remodelling had been proposed. Reach III 1/7 - 373 to 2/7 – 450 has one sluice and 2 branches serving an ayacut of 1622-08 acres comprising 675-97 acres of old wet and 946-11 acres of converted lands.\(^{94}\) Reach IV 2/7-450 to 4/2 – 130 has 6 sluices serving an


\(^{94}\) G.O.Ms.No.27, Public Works Department, Madras, 1\(^{st}\) January, 1960, p.4.
ayacut of 2142-52 ½ acres comprising of 177.87 ½ acres old wet land and 342-57 acres of converted lands. The pipe was to be removed. No remodelling of sluices was necessary for this reach.

**Table(7) : Special repairs to L.B.C Mile 0/0 to 1/0**

*Estimate form Abstract*

<table>
<thead>
<tr>
<th>Item no</th>
<th>Quantity</th>
<th>Description of work</th>
<th>Rate</th>
<th>Per</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27600 sq.ft</td>
<td>Up rooting and clearing prickly –pear jungle S.I.3 A</td>
<td>0.56</td>
<td>100sq.ft</td>
<td>155</td>
</tr>
<tr>
<td>2</td>
<td>7000 Rft</td>
<td>Benching old embankment slope 1’6” x size S.I.22 Earth work excavation and deposition on the bank with initial lead lift in hard stiff clay stiff clay stiff black cotton, hard muram, ordinary gravel, stoney earth &amp; earth mixed with 50% fair sized boulders S.S.20A.</td>
<td>5.50</td>
<td>1000Rft</td>
<td>39</td>
</tr>
<tr>
<td>3</td>
<td>28000 cft</td>
<td>Earth work excavation and deposition on the bank with initial lead lift in hard gravelly soil S.S.20A. Extra for every additional lead of 10 yards or part there of over initial lead.</td>
<td>16.00</td>
<td>1000cft</td>
<td>448</td>
</tr>
<tr>
<td>4</td>
<td>28000 cft</td>
<td>Earth work excavation and deposition on the bank with initial lead lift in hard gravelly soil S.S.20A. Extra for every additional lift of 1 yard or part there of over initial lift.</td>
<td>18.00</td>
<td>1000cft</td>
<td>504</td>
</tr>
<tr>
<td>5</td>
<td>336000 cft</td>
<td>Extra for every additional lift of 1 yard or part there of over initial lift.</td>
<td>1.00</td>
<td>1000cft</td>
<td>336</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Quantity</td>
<td>Unit</td>
<td>Rate</td>
<td>Total</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------</td>
<td>----------</td>
<td>------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>6</td>
<td>Blasting and removing hard granite measured in solid.</td>
<td>112000 cft</td>
<td></td>
<td>22.00</td>
<td>112</td>
</tr>
<tr>
<td>7</td>
<td>Cement concrete 1:5:10 using 60% of 1½ metal and 40% of ¾” metal land as directed by the departmental officers S.S.28.</td>
<td>400 cft</td>
<td>100 cft</td>
<td>118.00</td>
<td>88</td>
</tr>
<tr>
<td>8</td>
<td>Random rubble masonry in cement mortar 1:5 SS-36.</td>
<td>19600 cft</td>
<td></td>
<td>102.50</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Plastering with 0:1 mixed cement mortar 1:3½” thick over the bed and sloping sides to the concrete (Grade oil) 5% by weight of cement to be supplied departmentally s.s.61.</td>
<td>16500 cft</td>
<td>100 cft</td>
<td>102.50</td>
<td>16913</td>
</tr>
<tr>
<td>10</td>
<td>Random Rubble masonry in cement motor 1:5 ss-36</td>
<td>97800 sq.ft</td>
<td></td>
<td>18.00</td>
<td>1760495</td>
</tr>
<tr>
<td></td>
<td>Plastering with oil mixed cement motor 1:3½” thick over the bed and sloping side to the concrete (crude oil) 5.1 by weight of cement to be supplied departmentally.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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95G.O.Ms.No.2509, Public Works Department, Madras, dated 3 September 1964, p.5.
The special repairs to Kothaiyar L.B.C From 7/6-92 to $1\frac{3}{4}$ Estimate form Abstract

<table>
<thead>
<tr>
<th>Item no</th>
<th>Quantity</th>
<th>Description of work</th>
<th>Rate</th>
<th>Per</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34700 sq.ft</td>
<td>Up rooting and clearing prickly – pear jungle S.I.3 A</td>
<td>0.56</td>
<td>100sq.ft</td>
<td>194.00</td>
</tr>
<tr>
<td>2</td>
<td>1350 Rft</td>
<td>Benching old embankment slope 1’6” x size S.I.22</td>
<td>5.50</td>
<td>1000Rft</td>
<td>7.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Earth work excavation and deposition on the bank with initial lead lift in hard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>stiff clay, stiff clay, stiff black cotton, hard re earth muram, ordinary gravel,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>stoney earth &amp; earth mixed with 50% fair sized boulders S.S.20A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>34000 cft</td>
<td>Earth work excavation and deposition on the bank with initial lead lift in hard</td>
<td>16.00</td>
<td>1000cft</td>
<td>544.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gravelly soil S.S.20A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>204000 cft.</td>
<td>Extra for every additional lead of 10 yards or part there of over</td>
<td>1.00</td>
<td>1000cft</td>
<td>204.00</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
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<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>102000cft</td>
<td>initial lead.</td>
<td>1.00</td>
<td>1000cft</td>
<td>102.00</td>
</tr>
<tr>
<td></td>
<td>1420cft</td>
<td>Extra for every additional lift of 1 yard or part there of over initial lift.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>50500cft</td>
<td>Blasting and removing hard granite measured in solid.</td>
<td>22.00</td>
<td>100cft</td>
<td>312.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cement concrete 1:5:10 using 60% of 1 ½ metal and 40% of ¾ ” metal land in parels as directed by the departmental officers S.S.28.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>227300</td>
<td></td>
<td>118.00</td>
<td>100cft</td>
<td>59590</td>
</tr>
<tr>
<td>8</td>
<td>sq.ft</td>
<td>Plastering with oil mixed cement mortor 1:3 ½ ” thick over the bed and sloping sides to the concrete (Grade oil) 5% by weight of cement to be supplied departmentally s.s.61.</td>
<td>18.00</td>
<td>100sq.ft</td>
<td>40914</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Plastering with oil mixed cement mortor 1:3 1/2’ thick over the bed and sloping side of the concrete by with of cement (crude oil 5%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>102479</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The total costs of these estimate works out to Rs.8,10,000/. The present proposals are:

1) To provide cement concrete lining for the bed and sides. 2) To grout and plaster the existing dry revetment if there is no provision for remodelling. 3) To blast and remove the rocky projections which have been obstructing the flow and line such pockets with concrete. 4) To raise the banks where ever required.

The present estimate has been prepared for providing concrete lining for the portions where there is no existing brick lining revetment for the retaining wall. The concrete lining is of cement concrete 1:5:10 using 60% of ½ ′ metal and 40% of ¾ ′ metal. It is proposed to plaster the concrete with cement mortar of 1:3:1/2′ thickness using and an admixture of crude oil 5% of the weight of cement. The existing revetment and retaining walls are proposed to be grouted and plastered with cement mortar with 1:3, ¾′ thickness.

Blasting and removing rock in certain places are found necessary and provision has been made for the same. In certain places where there is rocky sides it was proposed to conduct construct the slopes in R.R. masonry in cement mortar 1:5 and plaster the surface with cement mortar 1:3, ½ thick. It is proposed to contruct 3 steps for people to have access to the canal for communal purposes. The steps are proposed to be constructed in R.R. concrete and cement mortar of ratio 1:6. Provision has been made for turfing the slopes of the bank above the lining. Necessary provision for the petty supervisor and contingencies and unforeseen items was also made.

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96 G.O.Ms.No 3840, Public Works Department, Madras, 6 December 1957.
97 G.O.Ms.No 3840, Public Works Department, Madras, 6-12-1957. Record received from the Kerala Government relates Kothaiyar Irrigation, p.2.
amounts was Rs. 81,200.\(^98\) The special repairs to Kothaiyar L.B.C from 7/6-92 to \(\frac{3}{4}\) was proposed with special repairs to L.B.C mile 0/0 to 1/0. Estimate form abstracts are given in the table\(^99\).  

From the station finally arrived at by the special staff the following in the total irrigated areas for each channel system noted below:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Description of work</th>
<th>Area Irrigated (hect)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thovalai channel</td>
<td>12864.72</td>
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</tr>
<tr>
<td>2</td>
<td>A.P channel</td>
<td>8990.51</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ananthanar channel</td>
<td>9901.67</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Pazhayar channel</td>
<td>6830.61</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>P.P. channel system including Valliyar, Thuvalar, Pannivaikal</td>
<td>4592.44</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>A.F.K.Kal and its branches</td>
<td>6907.06</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Thiruvithancode channel with its branch channel, Thickanamcode channel</td>
<td>8202.87</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>L.B.C (Pchipparai) by Seepage</td>
<td>429.66</td>
<td><strong>58289.88</strong></td>
</tr>
<tr>
<td>9</td>
<td>Thirparappu R.B.C</td>
<td>401.47</td>
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</tr>
<tr>
<td></td>
<td>L.B.C</td>
<td>483.39</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Arivikarai R.B.C</td>
<td>126.91</td>
<td>1542.05</td>
</tr>
<tr>
<td></td>
<td>L.B.C</td>
<td>530.28</td>
<td>59831.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5231.68</td>
</tr>
<tr>
<td></td>
<td><strong>Grand Total</strong></td>
<td></td>
<td><strong>65063.61</strong></td>
</tr>
</tbody>
</table>

\(^{99}\) Copy of the Report from the special Depty Collector Nagercoil,27/06/1958,p.69.
Closing Leakage and Strengthening the Pechiparai Dam

Pechiparai dam is a major reservoir of the district. Closing the leakage and strengthening the dam, the work of drilling and grouting Pechiparai dam to close the leakages had not yet been completed. The work was done in two shifts of 8 hours each and close watch was essential for the proper up keep and repairs and running of the drills, compressor, grouting equipments etc. at the site and to ensure speedy progress the services of a Junior Mechanical Engineer was very essential at the site and so a J.E was appointed for a pay of 6 month.\textsuperscript{100}

Pechiparai dam across Kothaiyar in Kanyakumari district was constructed by the former Travancore State. The dam is built of surki concrete hearing and rubble masonry. It does not provide for any uplift and grouting appears to the foundation. There is no drainage gallery arrangements in the body of the dam.\textsuperscript{101}

Leakage and cracks were observed in the dam and reported to the former Travancore Cochin government Dr.J.D Savage, the American expert inspected the dam and suggested remedial measures. On the general recommendation of the Dr.J.D Savage the erstwhile Travancore Cochin government sanctioned an estimate of Rs.5.20 Lakhs in G.P order No.D.Dist.1952/53 P.W.C dated 18-7-58 for closing leakage and strengthening the dam as the provision made in the estimate was found to be inadequate during the execution of the work, a revised estimate was submitted for Rs.7.07 lakhs for approval with a view to complete the entire work by September 1960. The government sanctioned the revised estimate for 7.07000/- lakhs (Rupees seven lakhs and seven Thousand only).

\textsuperscript{100} G.O.Ms.No.1018, Public Works Department, Madras, 2 April 1962, p.12.
\textsuperscript{101} G.O.Ms.No.1436, Public Works Department, Madras, 10 May 1963, p.8.
for closing leakages in the stern of the Pechiparai dam across Kothaiyar in Kanyakumari District. The revised estimate was thus submitted with an extra cost of Rs. 1.87 lakhs sanction. The government also directed that the works should be carried out as economically as possible. The expenditure is debitable to XVII, Irrigation, Navigation, Embankment and drainage works working expansion- extension-and improvements.  

Proposals for Closing Leakages and Strengthening Pechiparai Dam

1) Drilling 2 ½ dr.grout holes of about 250 in number totalling 22500 Rft for forming a grouted cutoff zone. 2) Drilling 4” dr. vertical holes of about 50 in number totalling 4000 Rft for the drainage arrangements on the rear side of the Dam. 3) Drilling 4” dr. horizontal holes for drainage purpose near stream bed level. 4) Drilling 6” dr test holes to obtain 100 or more test of cylinders 6”x12” from different parts of the dam. 5) Providing temporary buildings. 6) Providing ordinary tools and industrial plants including small workshop at Perunchani with one turner, one black smith, one fitter with a lathe, power drill, hacksaw, and other necessary equipments. 7) Provision to meet cost of service for the electric motors. 8) Provision for reinforcing upstream face of the dam. 9) Fund for special tools and plant. 10) Miscellaneous works.

Originally the entire work was Proposed to be completed in about three years time. The revised estimate was prepared with a view to complete the entire work by September 1960. As the drills were old ones, the progress of the work was slow. The workers for the work made in the original estimate was not sufficient for the speedy completion of the work. Therefore the provision was suitably revised to meet the current

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103 G.O.Ms.No.1436, Public Works Department, Madras,10 May 1960, p.10.
situation and for the speedy completion of the work. The work was carried out and supposed to be completed as per the instruction of the Chief Engineer (Irrigation). The estimate was however revised in view of the increased quantity of work involved and also in view of the increase in cost. The details have been given below.\textsuperscript{104}

**Kothaiyar Hydro Electric Power Project 1964**

The Kothaiyar river is the main source of irrigation in kanyakumari District. The Pechiparai dam put up across the Kothaiyar river and the Perunchani dam are the two important reservoirs in Kanyakumari District. A project for utilizing the waters of the river for the production of electricity was drawn. The scheme envisaged the construction of two dams, the Upper Kothaiyar dam and the Lower Kothaiyar dams, with twelve diversion rivers, four tunnels, a pump house and two power house station with a total capacity of 1000,000, k.w. The project was inaugurated by K.Kamaraj, President of the Indian National Congress on the 15\textsuperscript{th} April 1964.

The Upper Kothaiyar dam was to be located at a level of over 4000 feet above sea level. The Upper Kothaiyar basin was to have a storage capacity of 4197 million cubic feet of water will reach the first power house through a tunnel of 10,000 feet length and made of steel and a penstock pipe of about 7340 feet length. This power house was designed to have a single unit of 60,000 K.W capacity operating at a height of 3192 feet about 100 feet higher. Thus it is the highest head power station of the Madras grid.\textsuperscript{105}

The tail waters of the first power house was to be stored in the Lower Kothaiyar dam built across the Kothaiyar river at a level of 960 feet above the sea level. In addition

\textsuperscript{104}Madras Information, Vol.XVII, Madras,1964, June, p.29.
\textsuperscript{105}G.O.Ms.No.2749, Public Works Department, Madras, 29 August 1960, p.12.
to that water the Lower Kothaiyar dam will impound storage from 11.22 square miles of
the lower Kothaiyar basin and will have a net storage capacity of about 31 million c.f.
Water from neighbouring hill streams, totalling about 10.45 sq.m of catchment area, will
also be diverted in to the Lower Kothaiyar reservoir by suitable diversion weirs, twelve in
all by leading through channels and tunnels. Water from the lower Kothaiyar reservoir
will then be led into the second power house through a tunnel of about 4800 feet steel and
penstock pipe about 1150 feet long. The Second power house would have a single unit
and a machine of 40,000 K.V. operating at a height of 877 feet. The power generated
from these two power houses is proposed to be fed into the Madras grid at Kayathyar by
a double circuit 110 K.V. line (45 Miles in length). The total cost of the generation
scheme was estimated to be Rs.788.20 lakhs. The scheme on completion will add an
energy potential of 381 million units of power to the Madras grid and would meet the
power demand of the Kanyakumari and Tirunelveli District in particular and the Madras
State in general.¹⁰⁶

**Benefits of the Scheme**

The following are some of the benefits due to this scheme. 1) The scheme add
substantial block of hydro electric power to the Madras Grid and will also help the
industrial development of Kanyakumari District. 2) This scheme also provide additional
irrigation facilities to Kanyakumari District due to the storage provided in the higher
reaches. The tail race waters from the power stations can be stored during summer

¹⁰⁶ Department Annual Report for Agriculture, Trivandrum, Government of Travancore,1958, p.4.
months from the existing Kothaiyar lake and again utilized for irrigation. 3) This scheme provide facilities for the industrial development of Kanyakumari District.\textsuperscript{107}

**Mathur Hanging Bridge**

The Mathur Hanging Trough canal was constructed during the congress administration when Mr. Baktavatsalam was the Chief Minister of the then Madras State.\textsuperscript{108} Kalkulam and Vilavancode taluks were the two poverty stricken taluks in Kanyakumari District. There was a long demand for water understanding the plight of the people, K. Kamaraj the then State Congress President, took relentless efforts to starts this projects. The trough unites two hills and carries water from one end to the other end. It converted the dry lands of Kalkulam and Vilavancode taluks more fertile.\textsuperscript{109}

The Mathur hanging Trough is the tallest as well as the longest trough bridge in Asia. It is a drought relief measure across the river Pharali.\textsuperscript{110} It’s purpose is to carry water for irrigation from an elevated level of one hill to another. The irrigation water feeds the taluks of Vilavancodu and Kalkulam. The hanging bridge or the aqueduct was constructed in 1966 by the former Chief Minister of Tamilnadu, K. Kamaraj. This aqueduct was necessitated due to the undulating land terrain of the area adjacent to the hills of the Western ghats.

The Trough canal is called Pattanamkal. Mathur Aqueduct is a structure held up by 28 huge pillars, the maximum height of the pillars reaching 115 ft. The trough structure is 7 ft in height with a width of 7.5 ft. The trough is partly covered on top with

\textsuperscript{107} Report of Assistant Director of Agriculture, Nagercoil, 1989, p.7.
\textsuperscript{109} Ib\textsuperscript{id},. p.1186.
\textsuperscript{110} Pahrali’ means ‘Old River’ in Tamil
concrete slabs allowing people to walk on the bridge and also see the water going through the trough. Some of the pillars are set on rocks in the Paharali river, and some five pillars are set in the hills on either side.\textsuperscript{111}

**Development in the Western Ghats after the Construction of Aqueduct**

Soon after the construction of the aqueduct at Mathur, development of subtropical fruits and spices in and around Mathur area cultivated under the Western Ghats development programme was founded by central and state government. The important schemes are development of "KEW" variety pineapple, development of hybrid pepper, distribution of hybrid vegetable seeds, banana development scheme, cashew development scheme and distribution of pulses and vegetable mini kits.\textsuperscript{112} The villages namely Ponmanai, Aruvikkarai, Attoor, Kappiyarai, Valvachagostam Meykode and Colachel were benefited in Kalakulam Taluk. The villages benefited in the Vilavancode taluks are Nallur, Nattalam, Keelmidalam, Keezkeralam, Midalam and Killioor. Mathur has now become a tourist center, a sort of resort, and picnic center. The river is also calm and suitable for bathing peacefully.

Kanyakumari District which gets rain in both the monsoons is basically an agriculture district. The main crop of agriculture in Kanyakumari District is paddy. For paddy cultivation large quantity of water is needed at various stages. Though Kanyakumari is a rainfed district, the quantity of water received from rain is not enough for paddy cultivation during the whole year. Therefore, the necessity of irrigation felt.

\textsuperscript{111} M. Gopala Krishnan, P.1185.
\textsuperscript{112} Ibid.,
In olden days well irrigation, tank irrigation, canal irrigation and pond irrigation were common. Well irrigation is an ancient method of irrigation. It is less expensive but more dependable. Normally well water is utilised to cultivate small farms only. The defects of cannal irrigation is highly significant and attract the attention of the authorities. Therefore, the need for dams felt and the dams were built. Hence the dams like Pechiparai and Perunchani were built in Pechiparai and Perunchani respectively. Likewise minor dams like Chittar dams and Mathur aqueduct were constructed consequently. Along with the dams, its channels were also dug. The water above the still level of the two major dams (Pechiparai, Perunchani) was completely exhausted and the only alternative to save the standing crops was to pump out the dead storage in the Pechiparai reservoir. More than 2/3 of the standing crops were saved thus. (Over 40,000 acers). The policy of the government was to give priority to supply for agricultural consumers in the matter of supply of water. With a view of this a project for utilising the water of Kothaiyar river for the production of electricity was drawn up. The scheme envisaged the construction of two dams the upper and the lower dams, with twelve diversion wires, four tunnels, a pump house and two power house stations with a total capacity of 100,000 k.w. The power generated from these two power houses is proposed to be fed into the Madras Grid at Kayathar by a double circuit.

The provision of irrigation has changed the system of cropping in various parts of the district. In some areas two crops in a year have been made possible where one crop was raised before. But irrigation has led to excessive concentration on cash crops and has lowered the standard of crop rotation in many parts of the district. It is essential in the present context of the developing economy to safeguard against the power demand in the
state outstripping the availability of supply. With a view to meet contingency the congress government gave priority for supply of power for agricultural purposes and various concessions have been granted to agricultural consumers of this district. It helps the industrial development of the Kanyakumari District.