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International Journal For Research in  
Applied Science and Engineering Technology



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# **INTERNATIONAL JOURNAL FOR RESEARCH**

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

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**Volume: 8      Issue: IV      Month of publication: April 2020**

**DOI:**

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# A Case Study on Periyar Valley Irrigation Project

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**Abstract:** Periyar is the longest river in the state. It begins from the Sivagiri peaks of Sundaramala in Tamilnadu. The overall length of the river is about 300km. The catchment area of periyar is around 5396 sqkm and the total annual flow is founded to be 11607 cubic meters. The Land lying on the left bank of Periyar River through a network of canal systems and controlling devices is called Periyar valley irrigation project. The project was polish offed during the year 1992. It is spreaded over Kothamangalam, Muvattupuzha, Kunnathunadu, Aluva, Kanayannur and Paravur Taluk in Ernakulam district. It is delibrated for irrigating an area of 32800 Ha. Few problems were identified in the project during our case study. And we have to suggest some possible remedial measures to rectify the problems

**Keywords:** Periyar river, periyar irrigation project, irrigation

## I. INTRODUCTION

The Periyar valley Irrigation Project gives the canvas of utilization of the tail race discharging from the Muthirapuzha tributary of river Periyar together with the controlled release from Ennackal dam constructed by Kerala State Electricity Board across the Idamalayar tributary and the dependable run off from the uncontrolled catchment of Periyar River. 32800 Ha of land lying on the left bank of Periyar River through a network of canal systems and controlling devices is planned for irrigating. Thus the gross potential area served by the periyar valley irrigation project will be 85600 Ha and is spreaded over Kothamangalam, Muvattupuzha, Kunnathunadu, Aluva, Kanayannoor and Paravur Taluk in Ernakulam district.

Other than the Irrigation on left bank of Periyar, it allows the, supply of water to FACT, supply of minimum quantity of water through the river to check the intrusion of saltness at lower reaches as well as to meet the needs of many lift Irrigation scheme of river Periyar. Water supply for drinking, industrial purposes etc. is watched by a portion of water stored by the barrage of Bhoothathankettu. The project was polish offed during the year 1992.

Periyar is the longest river of the state, the total length of the river is about 300km. The catchment area of periyar is around 5396 sqkm and the total annual flow is founded to be 11607 cubic meters. From the case study we have noticed few problems faced by the periyar irrigation project. One of the problems faced by the project is the salt water intrusion near the aluva region and it makes the drinking water useless. Another problem is the water pollution created by the industries and solid wastes. The discharge of effluents from industries creates a major problem in the project. It affects aquatic life as well as it also affects human life. And another problem is the flooding, Kerala state has experienced a devastating flood event during the month of August 2018. While an extreme rainfall event (ERE) was the primary reason for this flood, there was criticism at different levels that the authorities failed to manage the flood effectively through reservoir operations..

## II. PERIYAR VALLEY IRRIGATION SYSTEM

### A. Periyar

Periyar is the longest river in kerala. It is the major source of irrigation in Ernakulam district. Since it is a perennial river, the irrigation process is throughout the year. Periyar contributes a greater part in solving water scarcity around the district in the summer season. It provides water for irrigation as well as for domestic use. The river is also rich in the count of fishes, so as it promotes fishing for the fisherman near the banks. These are the reasons behind it being named as the "lifeline of kerala".

It begins from the Sivagiri peaks of Sunderamala in Tamil Nadu. The flow from Sivagiri peaks reaches the dam constructed over there. The flow continues from Mullaperiyar to Vaigai dam in Tamil nadu and to the idukki dam. The flow to idukki dam contributes to the periyar river. The flow is through Vandiperiyar, Vallakkadavu, Upputhara and finally reaches the Idukki dam. Then it flows to the panamkutty junction. It's other major tributary is from Munnar. Munnar is formed by the joining of three rivers named as Muthirapuzhha, Kundala, and Nallathanni. It later flows to Muthirapuzhayar, Pallivasal and Ellakal and joins the Panniyar river at Panniyar kutty junction. Kuthumkal waterfalls, Mathikettan chola etc tributes to Ponmudi dam.

Later the water from Ponnudi dam also reaches Panniyarkutty through Vellathooval substation and natural flow. Then the water flows to the Kallarkutty dam and then to the Panamkutty junction. The left and right tributaries start from Sivagiri peaks and Munnar joins at Panamkutty junction. Later it flows to Lower periyar dam and then to Koottikkal junction where the water from Kuttampuzha also meets. The water from Valparai region reaches Idamalayar, and after power generation the water joins streams Pooyamkutty, Urulanthanni etc at kuttampuzha.

The whole system makes the periyar to a single unit and reaches Bhoothathakettu. Further it flows through Malayattur, Kaladi and reaches Aluva. The river deviates into two major branches from aluva, a right deviation named as Mangalappuzha and a left deviation. This again deviates into two branches known as Idamula branch and Varattar branch. Eloor, Patahalam, Mupphadam, Kadungallur areas coming under Varattar branch which consists of a large number of industries. Mangalappuzha branch is called as the actual periyar. Finally both the left and right deviations from aluva and their distributaries reach the Arabian sea.

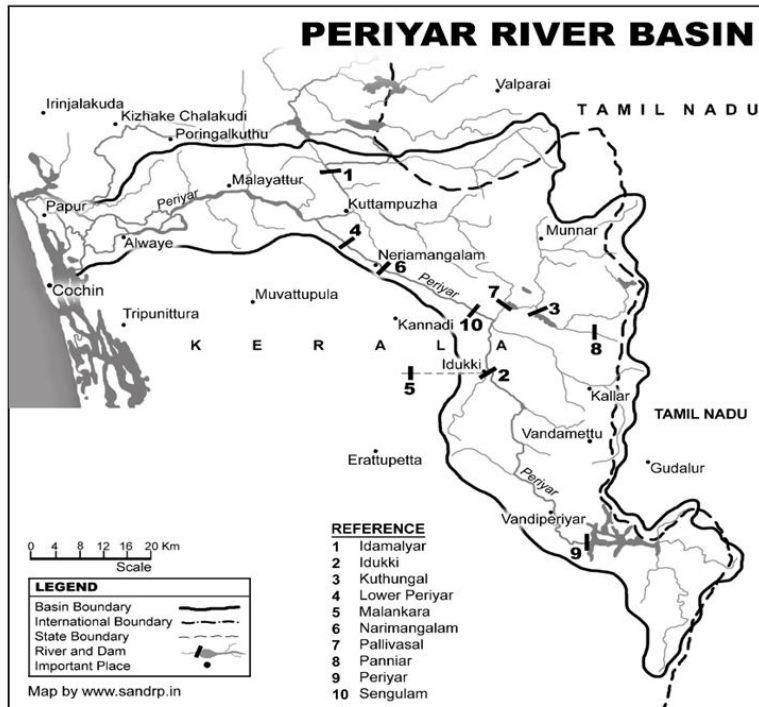


Fig 1. Periyar Valley Irrigation system

There are two irrigation schemes coming under periyar. They are Periyar valley irrigation system and Idamalayar irrigation system. The Periyar valley irrigation system is the largest among them and also known as the left bank system. It starts from Bhoothathankettu, the dam constructed over there has no live storage and shutters are at bed level. There is no other public source of water in between Bhoothathankettu and Malayattur region. So, irrigation in between these areas are provided by lift irrigation systems. This project is intended to provide irrigation all over Ernakulam district over an area of 32800 Ha. The particular scheme helps in stabilization of first and second crop in an area of about 32800 Ha and also raising an additional crop in an area of about 20000 Ha of third crop or puncha. It is spreaded over Kothamangalam, Muvattupuzha, Kunnathunadu, Aluva, Kanayannur and Paravur Taluk in Ernakulam district and the gross potential ayacut is about 85600 Ha. The irrigation project was completed during the year 1992.

### III. PROBLEMS AND OUR SUGGESTIONS

The main problems faced by this project that we found out are as follows:

#### A. Salt water Intrusion

We found that saltwater intrusion occurs mainly at three places namely, Paathalam, Pura Pallikavu and Manjummal.

In the case of saltwater intrusion, the authorities themselves found a solution by constructing regulators across the river between the pillars of the bridge at the above mentioned places.

### B. Wastes

By visiting the places of regulators, we understood that there is a problem of waste formations mainly solid wastes and chemicals. By the construction of regulators the movement of water was restricted and it led to the settlement of solid wastes behind the regulator. It has been occurring at all the three sites. One of the places Paathalam is highly concentrated with industries. The chemical pollution caused by them to the river water is also high.

Suggestion:-

Possible methods

- 1) Manual waste collection method.
- 2) By the method of wave action.

We found that the second method is more effective and efficient than the manual waste collection method. We are suggesting it as a modification for the existing regulator design.

The method is to provide a wave action across the river like that seen in amusement parks. Thus we can easily collect and remove the waste from one side of the river. It has to be provided just behind the regulator.

It also allows the movement of water at the regulator site thereby reducing the possibilities of breeding of mosquitoes.

In the case of chemicals we cannot remove them. So we are suggesting to implement regular periodic checking of chemical content especially at Pathalam and provide necessary awareness regarding this to the industrial heads.

### C. Flood

It is also a major problem to be solved. Peak time floods like those occurring during rainy seasons are more dangerous.

Suggestion:-

Possible methods

- 1) Construction of a dam.
- 2) Construction of canal

From this the suitable method is the construction of dams, because in the case of canal construction there arose the problem of land availability. The construction of dam should be in such a way that it didn't obstruct the flow of water during normal time. At peak time of rainfall it should be able to hold additional amounts of water and thus the chance of flood can be avoided.

## IV. CONCLUSION

As we discussed in this paper, we figured out the main problem faced by the Periyar Valley Irrigation Project. Also we have suggested remedial measures to solve the problem. The main problems faced by the Irrigation project are salt water intrusion, wastes i.e. solid wastes and chemical wastes and flood. The problem of salt water intrusion has already been solved by the authorities.

The second problem was settling of solid waste behind regulators. Those waste can be removed by providing a modification to the regulators i.e. a wave action is provided across the river that makes the waste settle at one side thus it can be removed. The wave action provided also helps to prevent the possible breed of mosquitoes.

The final problem was flooding during the rainy season due to the huge amount of runoff water. The most possible way to reduce the flood was to construct a dam across. The possible site for the construction of the dam between the Idukki dam and Pambala dam. Thus we can solve the problems faced by the Irrigation project

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